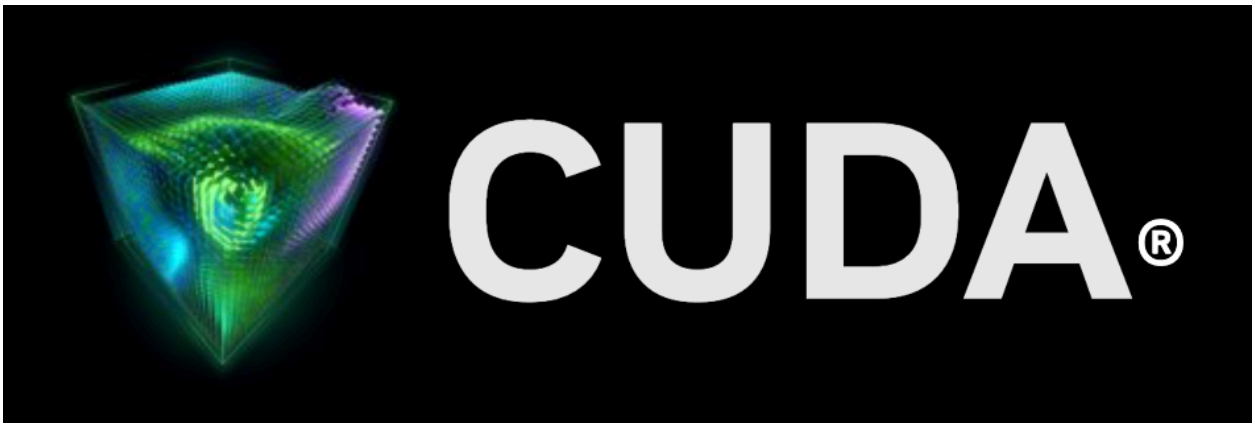


npp

Release 13.4

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Chapter 1. Indices and Search

- genindex
- search

1.1. What is NPP ?

NVIDIA NPP is a library of functions for performing CUDA accelerated 2D image and signal processing.

The primary set of functionality in the library focuses on image processing and is widely applicable for developers in these areas. NPP will evolve over time to encompass more of the compute heavy tasks in a variety of problem domains. The NPP library is written to maximize flexibility, while maintaining high performance.

NPP can be used in one of two ways:

- A stand-alone library for adding GPU acceleration to an application with minimal effort. Using this route allows developers to add GPU acceleration to their applications in a matter of hours.
- A cooperative library for interoperating with a developer's GPU code efficiently.

Either route allows developers to harness the massive compute resources of NVIDIA GPUs, while simultaneously reducing development times. After reading this Main Page it is recommended that you read the General API Conventions page below and either the Image-Processing Specific API Conventions page or Signal-Processing Specific API Conventions page depending on the kind of processing you expect to do. Finally, if you select the Modules tab at the top of this page you can find the kinds of functions available for the NPP operations that support your needs.

What is NPP? general_conventions_lb nppi_conventions_lb npps_conventions_lb

1.1.1. Files

NPP API is defined in the following files:

1.1.1.1 Header Files

- npp.h
- nppdefs.h
- nppcore.h
- nppi.h
- npps.h

All those header files are located in the following CUDA Toolkit's directory:

```
/include/
```

1.1.1.2 Library Files

NPP's functionality is split up into 3 distinct library groups:

- A core library (NPPC) containing basic functionality from the npp.h header file as well as common functionality used by the other two libraries.
- The image processing library NPPI. Any functions from the nppi.h header file or the various header files named "nppi_xxx.h" are bundled into the NPPI library.
- The signal processing library NPPS. Any function from the npps.h header file or the various header files named "npps_xxx.h" are bundled into the NPPS library.

On the Windows platform the NPP stub libraries are found in the CUDA Toolkit's library directory:

```
/lib/nppc.lib
```

```
/lib/nppial.lib
```

```
/lib/nppicc.lib
```

```
/lib/nppidei.lib
```

```
/lib/nppif.lib
```

```
/lib/nppig.lib
```

```
/lib/nppim.lib
```

```
/lib/nppist.lib
```

```
/lib/nppisu.lib
```

```
/lib/nppitc.lib
```

```
/lib/npps.lib
```

The matching DLLs are located in the CUDA Toolkit's binary directory. Example

```
* /bin/nppial64_111_<build_no>.dll  // Dynamic image-processing library for 64-bit
↪Windows.
```

On Linux platforms the dynamic libraries are located in the lib directory and the names include major and minor version numbers along with build numbers

```
* /lib/libnppc.so.11.1.<build_no>   // NPP dynamic core library for Linux
```

1.1.2. Library Organization

Note: To minimize library loading and CUDA runtime startup times it is recommended to use the static library(s) whenever possible. To improve loading and runtime performance when using dynamic libraries, NPP provides a full set of NPPI sub-libraries. Linking to only the sub-libraries that contain functions that your application uses can significantly improve load time and runtime startup performance. Some NPPI functions make calls to other NPPI and/or NPPS functions internally so you may need to link to a few extra libraries depending on what function calls your application makes. The NPPI sub-libraries are split into sections corresponding to the way that NPPI header files are split. This list of sub-libraries is as follows:

- NPPC, NPP core library which MUST be included when linking any application, functions are listed in nppCore.h,
- NPPIAL, arithmetic and logical operation functions in nppi_arithmetic_and_logical_operations.h,
- NPPICC, color conversion and sampling functions in nppi_color_conversion.h,
- NPPIDEI, data exchange and initialization functions in nppi_data_exchange_and_initialization.h,
- NPPIF, filtering and computer vision functions in nppi_filtering_functions.h,
- NPPIG, geometry transformation functions found in nppi_geometry_transforms.h,
- NPPIM, morphological operation functions found in nppi_morphological_operations.h,
- NPPIST, statistics and linear transform in nppi_statistics_functions.h and nppi_linear_transforms.h,
- NPPISU, memory support functions in nppi_support_functions.h,
- NPPITC, threshold and compare operation functions in nppi_threshold_and_compare_operations.h,

For example, on Linux, to compile a small color conversion application `foo` using NPP against the dynamic library, the following command can be used:

```
nvcc foo.c  -lnppc -lnppicc -o foo
```

Whereas to compile against the static NPP library, the following command has to be used:

```
nvcc foo.c  -lnppc_static -lnppicc_static -o foo
```

It is also possible to use the native host C++ compiler. Depending on the host operating system, some additional libraries like pthread or dl might be needed on the linking line. The following command on Linux is suggested:

```
g++ foo.c  -lnppc_static -lnppicc_static -lcudart_static -lpthread -ldl
-I <cuda-toolkit-path>/include -L <cuda-toolkit-path>/lib64 -o foo
```

NPP_Plus and NPP are stateless APIs. The default stream ID on any GPU device is 0. NPP_Plus and NPP applications using version 12.5 or greater MUST use the fully stateless application managed stream context interface described below. Also, the only function that remains in nppcore.h is nppGetVersion. The application can create one application managed stream context which can be modified on the fly or many appliction managed stream contexts each of which is unique to particular streams and/or GPU devices. The lifetime of application managed stream contexts are determined by the application. In general it is recommended to limit the number of unique application managed stream contexts to the number of GPUs in use as reinitializing an application managed stream context can have high overhead due to the need for CUDA device calls. However the stream ID of a single application managed stream context can be changed on the fly as needed with no extra overhead. It is the responsibility of the application to detect and respond to GPU resets if they happen and to reinitialize any existing application managed stream contexts. Calling older NPP non application managed stream context functions will now return the new NPP_STREAM_CONTEXt_ERROR value.

All NPP functions should be thread safe.

Note: In NPP 12.4 in order to support very large images NPP 12.4 and beyond has change the return value from GetBufferSize calls for statistics functions and a few others from int to size_t. Signal lengths have also changed from int to size_t. This should be the only change required for applications to be rebuilt using these versions of NPP.

Note: NPP 12.1 is the last release of NPP which will support NPP API calls that do not contain NPP stream context parameters. Also NPP will soon release an API variant that provides collapsed combined parameter versions of many API calls. For example a call like nppiAdd_8u_C3R_Ctx(pSrc1, nSrc1Step, pSrc2, nSrc2Step, pDst, nDstStep, oSizeROI, nppStreamCtx) will become nppiAdd_Ctx(NPP_8U, NPP_CH_3, pSrc1, nSrc1Step, pSrc2, nSrcStep2, pDst, nDstStep, oSizeROI, nppStreamCtx). This makes adding support for new data types and number of channels simpler as well as significantly reducing redundant documentation.

Note: New to NPP 11.6 are

```
nppiContoursImageMarchingSquaresInterpolation_32f_C1R_Ctx
```

```
nppiContoursImageMarchingSquaresInterpolation_64f_C1R_Ctx
```

Note: New to NPP 10.1 is support for the fp16 (__half) data type in GPU architectures of Volta and beyond in some NPP image processing functions. NPP image functions that support pixels of __half data types have function names of type 16f and pointers to pixels of that data type need to be passed to NPP as NPP data type *Npp16f*. Here is an example of how to pass image pointers of type __half to an NPP 16f function that should work on all compilers including Armv7.

```
nppiAdd_16f_C3R_Ctx(reinterpret_cast<const Npp16f *>((const void *)(pSrc1Data)),
↪nSrc1Pitch,
                    reinterpret_cast<const Npp16f *>((const void *)(pSrc2Data)),
↪nSrc2Pitch,
                    reinterpret_cast<Npp16f *>((void *)(pDstData)),  nDstPitch,
                    oDstROI, nppStreamCtx);
```

Application Managed Stream Context Application Managed Stream Context

Note: Also new to NPP 10.1 is support for application managed stream contexts. Application managed stream contexts make NPP truely stateless internally allowing for rapid, no overhead, stream context switching. While it is recommended that all new NPP application code use application managed stream contexts, existing application code can continue to use nppSetStream() and nppGetStream() to manage stream contexts (also with no overhead now) but over time NPP will likely deprecate the older

non-application managed stream context API. Both the new and old stream management techniques can be intermixed in applications but any NPP calls using the old API will use the stream set by the most recent call to nppSetStream() and nppGetStream() calls will also return that stream ID. All NPP function names ending in _Ctx expect application managed stream contexts to be passed as a parameter to that function. The new *NppStreamContext* application managed stream context structure is defined in nppdefs.h and should be initialized by the application to the Cuda device ID and values associated with a particular stream. Applications can use multiple fixed stream contexts or change the values in a particular stream context on the fly whenever a different stream is to be used.

Note: NPP 10.2 and beyond contain an additional element in the *NppStreamContext* structure named nStreamFlags which MUST also be initialized by the application. Failure to do so could unnecessarily reduce NPP performance in some functions.

Note: NPP does not support non blocking streams on Windows for devices working in WDDM mode.

Note that some of the "GetBufferSize" style functions now have application managed stream contexts associated with them and should be used with the same stream context that the associated application managed stream context NPP function will use.

Note that NPP does minimal checking of the parameters in an application managed stream context structure so it is up to the application to assure that they are correct and valid when passed to NPP functions.

Note that NPP has deprecated the nppicom JPEG compression library as of NPP 11.0, use the NVJPEG library instead.

1.1.3. Supported NVIDIA Hardware

NPP runs on all CUDA capable NVIDIA hardware. For details please see http://www.nvidia.com/object/cuda_learn_products.html

1.2. General Conventions

1.2.1. Memory Management

The design of all the NPP functions follows the same guidelines as other NVIDIA CUDA libraries like cuFFT and cuBLAS. That is that all pointer arguments in those APIs are device pointers.

This convention enables the individual developer to make smart choices about memory management that minimize the number of memory transfers. It also allows the user the maximum flexibility regarding which of the various memory transfer mechanisms offered by the CUDA runtime is used, e.g. synchronous or asynchronous memory transfers, zero-copy and pinned memory, etc.

The most basic steps involved in using NPP for processing data is as follows:

1. Transfer input data from the host to device using

   ```
   cudaMemCpy(...)
   ```

2. Process data using one or several NPP functions or custom CUDA kernels
3. Transfer the result data from the device to the host using

```
cudaMemCpy(...)
```

1.2.1.1 Scratch Buffer and Host Pointer

Some primitives of NPP require additional device memory buffers (scratch buffers) for calculations, e.g. signal and image reductions (Sum, Max, Min, MinMax, etc.). In order to give the NPP user maximum control regarding memory allocations and performance, it is the user's responsibility to allocate and delete those temporary buffers. For one this has the benefit that the library will not allocate memory unbeknownst to the user. It also allows developers who invoke the same primitive repeatedly to allocate the scratch only once, improving performance and potential device-memory fragmentation.

Scratch-buffer memory is unstructured and may be passed to the primitive in uninitialized form. This allows for reuse of the same scratch buffers with any primitive require scratch memory, as long as it is sufficiently sized.

The minimum scratch-buffer size for a given primitive (e.g. *nppsSum_32f_Ctx()*) can be obtained by a companion function (e.g. *nppsSumGetBufferSize_32f_Ctx()*). The buffer size is returned via a host pointer as allocation of the scratch-buffer is performed via CUDA runtime host code.

An example to invoke signal sum primitive and allocate and free the necessary scratch memory:

```
// pSrc, pSum, pDeviceBuffer are all device pointers.
NppStreamContext nppStreamCtx; // previously initiallzed
Npp32f * pSrc;
Npp32f * pSum;
Npp8u * pDeviceBuffer;
size_t nLength = 1024;

// Allocate the device memroy.
cudaMalloc((void **)(&pSrc), sizeof(Npp32f) * nLength);
nppsSet_32f_Ctx(1.0f, pSrc, nLength, nppStreamCtx);
cudaMalloc((void **)(&pSum), sizeof(Npp32f) * 1);

// Compute the appropriate size of the scratch-memory buffer, note that nBufferSize
↪and nLength data types have changed from int to size_t.
size_t nBufferSize;
nppsSumGetBufferSize_32f_Ctx(nLength, &nBufferSize, nppStreamCtx);
// Allocate the scratch buffer
cudaMalloc((void **)(&pDeviceBuffer), nBufferSize);

// Call the primitive with the scratch buffer
nppsSum_32f_Ctx(pSrc, nLength, pSum, pDeviceBuffer, nppStreamCtx);
Npp32f nSumHost;
cudaMemcpy(&nSumHost, pSum, sizeof(Npp32f) * 1, cudaMemcpyDeviceToHost);
printf("sum = %f\n", nSumHost); // nSumHost = 1024.0f;

// Free the device memory
cudaFree(pSrc);
cudaFree(pDeviceBuffer);
cudaFree(pSum);
```

1.2.2. Function Naming

Since NPP is a C API and therefore does not allow for function overloading for different data-types the NPP naming convention addresses the need to differentiate between different flavors of the same algorithm or primitive function but for various data types. This disambiguation of different flavors of a primitive is done via a suffix containing data type and other disambiguating information.

In addition to the flavor suffix, all NPP functions are prefixed with by the letters "npp". Primitives belonging to NPP's image-processing module add the letter "i" to the npp prefix, i.e. are prefixed by "nppi". Similarly signal-processing primitives are prefixed with "npps".

The general naming scheme is:

```
npp<module info><PrimitiveName>_<data-type info>[_<additional flavor info>](
↪<parameter list>)
```

The data-type information uses the same names as the Basic NPP Data Types. For example the data-type information "8u" would imply that the primitive operates on *Npp8u* data.

If a primitive consumes different type data from what it produces, both types will be listed in the order of consumed to produced data type.

Details about the "additional flavor information" is provided for each of the NPP modules, since each problem domain uses different flavor information suffixes.

1.2.3. Integer Result Scaling

NPP signal processing and imaging primitives often operate on integer data. This integer data is usually a fixed point fractional representation of some physical magnitue (e.g. luminance). Because of this fixed-point nature of the representation many numerical operations (e.g. addition or multiplication) tend to produce results exceeding the original fixed-point range if treated as regular integers.

In cases where the results exceed the original range, these functions clamp the result values back to the valid range. E.g. the maximum positive value for a 16-bit unsigned integer is 32767. A multiplication operation of 4 * 10000 = 40000 would exceed this range. The result would be clamped to be 32767.

To avoid the level of lost information due to clamping most integer primitives allow for result scaling. Primitives with result scaling have the "Sfs" suffix in their name and provide a parameter "nScaleFactor" that controls the amount of scaling. Before the results of an operation are clamped to the valid output-data range by multiplying them with $2^{\text{-nScaleFactor}}$.

Example: The primitive *nppsSqr_8u_Sfs_Ctx()* computes the square of 8-bit unsigned sample values in a signal (1D array of values). The maximum value of a 8-bit value is 255. The square of $255^2 = 65025$ which would be clamped to 255 if no result scaling is performed. In order to map the maximum value of 255 to 255 in the result, one would specify an integer result scaling factor of 8, i.e. multiply each result with $2^{-8} = \frac{1}{2^8} = \frac{1}{256}$. The final result for a signal value of 255 being squared and scaled would be:

$$255^2 \cdot 2^{-8} = 254.00390625$$

which would be rounded to a final result of 254.

A medium gray value of 128 would result in

$$128^2 * 2^{-8} = 64$$

1.2.4. Rounding Modes

Many NPP functions require converting floating-point values to integers. The *Rounding Modes* enum lists NPP's supported rounding modes. Not all primitives in NPP that perform rounding as part of their functionality allow the user to specify the round-mode used. Instead they use NPP's default rounding mode, which is NPP_RND_FINANCIAL.

1.2.4.1 Rounding Mode Parameter

A subset of NPP functions performing rounding as part of their functionality do allow the user to specify which rounding mode is used through a parameter of the *Rounding Modes* type.

1.3. Image Processing Conventions

1.3.1. Function Naming

Image processing related functions use a number of suffixes to indicate various different flavors of a primitive beyond just different data types. The flavor suffix uses the following abbreviations:

- "A" if the image is a 4 channel image this indicates the result alpha channel is not affected by the primitive.
- "Cn" the image consists of n channel packed pixels, where n can be 1, 2, 3 or 4.
- "Pn" the image consists of n separate image planes, where n can be 1, 2, 3 or 4.
- "C" (following the channel information) indicates that the primitive only operates on one of the color channels, the "channel-of-interest". All other output channels are not affected by the primitive.
- "I" indicates that the primitive works "in-place". In this case the image-data pointer is usually named `pSrcDst` to indicate that the image data serves as source and destination at the same time.
- "M" indicates "masked operation". These types of primitives have an additional "mask image" as as input. Each pixel in the destination image corresponds to a pixel in the mask image. Only pixels with a corresponding non-zero mask pixel are being processed.
- "R" indicates the primitive operates only on a rectangular region_of_interest or "ROI". All ROI primitives take an additional input parameter of type *NppiSize*, which specifies the width and height of the rectangular region that the primitive should process. For details on how primitives operate on ROIs see: :ref: 'roi_specification'.
- "Sfs" indicates the result values are processed by fixed scaling and saturation before they're written out.

The suffixes above always appear in alphabetical order. E.g. a 4 channel primitive not affecting the alpha channel with masked operation, in place and with scaling/saturation and ROI would have the postfix: “AC4IMRSfs”.

1.3.2. Image Data

Image data is passed to and from NPPI primitives via a pair of parameters:

1. A pointer to the image’s underlying data type.
2. A line step in bytes (also sometimes called line stride).

The general idea behind this fairly low-level way of passing image data is ease-of-adoption into existing software projects:

- Passing a raw pointer to the underlying pixel data type, rather than structured (by color) channel pixel data allows usage of the function in a wide variety of situations avoiding risky type cast or expensive image data copies.
- Passing the data pointer and line step individually rather than a higher-level image struct again allows for easy adoption by not requiring a specific image representation and thus avoiding awkward packing and unpacking of image data from the host application to an NPP specific image representation.

1.3.2.1 Line Step

The line step (also called “line stride” or “row step”) allows lines of oddly sized images to start on well-aligned addresses by adding a number of unused bytes at the ends of the lines. This type of line padding has been common practice in digital image processing for a long time and is not particular to GPU image processing.

The line step is the number of bytes in a line **including the padding.** An other way to interpret this number is to say that it is the number of bytes between the first pixels of successive rows in the image, or generally the number of bytes between two neighboring pixels in any column of pixels.

The general reason for the existence of the line step it is that uniformly aligned rows of pixel enable optimizations of memory-access patterns.

Even though all functions in NPP will work with arbitrarily aligned images, best performance can only be achieved with well aligned image data. Any image data allocated with the NPP image allocators or the 2D memory allocators in the CUDA runtime, is well aligned.

Particularly on older CUDA capable GPUs it is likely that the performance decrease for misaligned data is substantial (orders of magnitude).

All image data passed to NPPI primitives requires a line step to be provided. It is important to keep in mind that this line step is always specified in terms of bytes, not pixels.

1.3.2.2 Parameter Names for Image Data

There are three general cases of image-data passing throughout NPP detailed in the following sections.

1.3.2.2.1 Passing Source-Image Data

Those are images consumed by the algorithm.

1.3.2.2.2 Source-Image Pointer

The source image data is generally passed via a pointer named

```
pSrc
```

The source image pointer is generally defined constant, enforcing that the primitive does not change any image data pointed to by that pointer. E.g.

```
nppiPrimitive_32s_C1R_Ctx(const Npp32s * pSrc, ...)
```

In case the primitive consumes multiple images as inputs the source pointers are numbered like this:

```
pSrc1, pScr2, ...
```

1.3.2.2.3 Source-Batch-Images Pointer

The batch of source images data is generally passed via a pointer of *NppiImageDescriptor* type named

```
pSrcBatchList
```

The source batch pointer is generally defined constant, enforcing that the primitive does not change any source data pointed to by that pointer. E.g.

```
nppiYUVToRGBBatch_8u_C3R_Ctx(NppiSize oSizeROI, const NppiImageDescriptor*
↪pSrcBatchList, ...)
```

All primitives processing batch data require providing the size of the batch in a separate parameter.

1.3.2.2.4 Source-Planar-Image Pointer Array

The planar source image data is generally passed via an array of pointers named

```
pSrc[]
```

The planar source image pointer array is generally defined a constant array of constant pointers, enforcing that the primitive does not change any image data pointed to by those pointers. E.g.

```
nppiPrimitive_8u_P3R_Ctx(const Npp8u * const pSrc[3], ...)
```

Each pointer in the array points to a different image plane.

1.3.2.2.5 Source-Planar-Image Pointer

The multiple plane source image data is passed via a set of pointers named

```
pSrc1, pSrc2, ...
```

The planar source image pointer is generally defined as one of a set of constant pointers with each pointer pointing to a different input image plane.

1.3.2.2.6 Source-Image Line Step

The source image line step is the number of bytes between successive rows in the image. The source image line step parameter is

```
nSrcStep
```

or in the case of multiple source images

```
nSrcStep1, nSrcStep2, ...
```

1.3.2.2.7 Source-Planar-Image Line Step Array

The source planar image line step array is an array where each element of the array contains the number of bytes between successive rows for a particular plane in the input image. The source planar image line step array parameter is

```
rSrcStep[]
```

1.3.2.2.8 Source-Planar-Image Line Step

The source planar image line step is the number of bytes between successive rows in a particular plane of the multiplane input image. The source planar image line step parameter is

```
nSrcStep1, nSrcStep2, ...
```

1.3.2.2.9 Passing Destination-Image Data

Those are images produced by the algorithm.

1.3.2.2.10 Destination-Image Pointer

The destination image data is generally passed via a pointer named

```
pDst
```

In case the primitive generates multiple images as outputs the destination pointers are numbered like this:

```
pDst1, pDst2, ...
```

1.3.2.2.11 Destination-Batch-Images Pointer

The batch of destination images data is generally passed via a pointer of *NppiImageDescriptor* type named

```
pDstBatchList
```

All primitives processing batch data require providing the size of the batch in a separate parameter.

1.3.2.2.12 Destination-Planar-Image Pointer Array

The planar destination image data pointers are generally passed via an array of pointers named

```
pDst[]
```

Each pointer in the array points to a different image plane.

1.3.2.2.13 Destination-Planar-Image Pointer

The destination planar image data is generally passed via a pointer to each plane of a multiplane output image named

```
pDst1, pDst2, ...
```

1.3.2.2.14 Destination-Image Line Step

The destination image line step parameter is

```
nDstStep
```

or in the case of multiple destination images

```
nDstStep1, nDstStep2, ...
```

1.3.2.2.15 Destination-Planar-Image Line Step

The destination planar image line step is the number of bytes between successive rows for a particular plane in a multiplane output image. The destination planar image line step parameter is

```
nDstStep1, nDstStep2, ...
```

1.3.2.2.16 Passing In-Place Image Data

1.3.2.2.17 In-Place Image Pointer

In the case of in-place processing, source and destination are served by the same pointer and thus pointers to in-place image data are called:

```
pSrcDst
```

1.3.2.2.18 In-Place-Image Line Step

The in-place line step parameter is

```
nSrcDstStep
```

1.3.2.2.19 Passing Mask-Image Data

Some image processing primitives have variants supporting masked_operation.

1.3.2.2.20 Mask-Image Pointer

The mask-image data is generally passed via a pointer named

```
pMask
```

1.3.2.2.21 Mask-Image Line Step

The mask-image line step parameter is

```
nMaskStep
```

1.3.2.2.22 Passing Channel-of-Interest Data

Some image processing primitives support channel_of_interest.

1.3.2.2.23 Channel_of_Interest Number

The channel-of-interest data is generally an integer (either 1, 2, or 3):

```
nCOI
```

1.3.2.3 Image Data Alignment Requirements

NPP requires pixel data to adhere to certain alignment constraints.

For 2 and 4 channel images the following alignment requirement holds:

```
data_pointer % (\#channels * sizeof(channel type)) == 0
```

E.g. a 4 channel image with underlying type *Npp8u* (8-bit unsigned) would require all pixels to fall on addresses that are multiples of 4 (4 channels * 1 byte size).

As a logical consequence of all pixels being aligned to their natural size the image line steps of 2 and 4 channel images also need to be multiples of the pixel size.

For 1 and 3 channel images only require that pixel pointers are aligned to the underlying data type, i.e. `pData % sizof(data type) == 0`. And consequentially line steps are also held to this requirement.

1.3.2.4 Image Data Related Error Codes

All NPPI primitives operating on image data validate the image-data pointer for proper alignment and test that the point is not null. They also validate the line stride for proper alignment and guard against the step being less or equal to 0. Failed validation results in one of the following error codes being returned and the primitive not being executed: NPP_STEP_ERROR is returned if the data step is 0 or negative. NPP_NOT_EVEN_STEP_ERROR is returned if the line step is not a multiple of the pixel size for 2 and 4 channel images. NPP_NULL_POINTER_ERROR is returned if the image-data pointer is 0 (NULL). NPP_ALIGNMENT_ERROR if the image-data pointer address is not a multiple of the pixel size for 2 and 4 channel images.

1.3.3. Region-Of-Interest (ROI)

In practice processing a rectangular sub-region of an image is often more common than processing complete images. The vast majority of NPP's image-processing primitives allow for processing of such sub regions also referred to as regions-of-interest or ROIs.

All primitives supporting ROI processing are marked by a "R" in their name suffix. In most cases the ROI is passed as a single *NppiSize* struct, which provides the width and height of the ROI. This raises the question how the primitive knows where in the image this rectangle of (width, height) is located. The "start pixel" of the ROI is implicitly given by the image-data pointer. I.e. instead of explicitly passing a pixel coordinate for the upper-left corner (lowest memory address), the user simply offsets the image-data pointers to point to the first pixel of the ROI.

In practice this means that for an image (`pSrc`, `nSrcStep`) and the start-pixel of the ROI being at location (x, y), one would pass

```
pSrcOffset = pSrc + y * nSrcStep + x * PixelSize;
```

as the image-data source to the primitive. `PixelSize` is typically computed as

```
PixelSize = NumberOfColorChannels * sizeof(PixelDataType).
```

E.g. for a pimitive like *nppiSet_16s_C4R_Ctx()* we would have

- NumberOfColorChannels == 4;
- sizeof(Npp16s) == 2;
- and thus PixelSize = 4 * 2 = 8;

1.3.3.1 ROI Related Error Codes

All NPPI primitives operating on ROIs of image data validate the ROI size and image's step size. Failed validation results in one of the following error codes being returned and the primitive not being executed: NPP_SIZE_ERROR is returned if either the ROI width or ROI height are negative. NPP_STEP_ERROR is returned if the ROI width exceeds the image's line step. In mathematical terms `(widthROI * PixelSize) > nLinStep` indicates an error.

1.3.4. Masked Operation

Some primitive support masked operation. An "M" in the suffix of those variants indicates masked operation. Primitives supporting masked operation consume an additional input image provided via a mask_image_pointer and mask_image_line_step. The mask image is interpreted by these primitives as a boolean image. The values of type Npp8u are interpreted as boolean values where a values of 0 indicates false, any non-zero values true.

Unless otherwise indicated the operation is only performed on pixels where its spatially corresponding mask pixel is true (non-zero). E.g. a masked copy operation would only copy those pixels in the ROI that have corresponding non-zero mask pixels.

1.3.5. Channel-of-Interest API

Some primitives allow restricting operations to a single channel of interest within a multi-channel image. These primitives are suffixed with the letter "C" (after the channel information, e.g. *nppiCopy_8u_C3CR_Ctx()*). The channel-of-interest is generally selected by offsetting the image-data pointer to point directly to the channel- of-interest rather than the base of the first pixel in the ROI. Some primitives also explicitly specify the selected channel number and pass it via an integer, e.g. *nppiMean_StdDev_8u_C3CR_Ctx()*.

1.3.5.1 Select-Channel Source-Image Pointer

This is a pointer to the channel-of-interest within the first pixel of the source image. E.g. if `pSrc` is the pointer to the first pixel inside the ROI of a three channel image. Using the appropriate select-channel copy primitive one could copy the second channel of this source image into the first channel of a destination image given by `pDst` by offsetting the pointer by one:

```
nppiCopy_8u_C3CR_Ctx(pSrc + 1, nSrcStep, pDst, nDstStep, oSizeROI);
```

1.3.5.2 Select-Channel Source-Image

Some primitives allow the user to select the channel-of-interest by specifying the channel number (`nCOI`). This approach is typically used in the image statistical functions. For example,

```
nppiMean_StdDev_8u_C3CR_Ctx(pSrc, nSrcStep, oSizeROI, nCOI, pDeviceBuffer, pMean,
↪pStdDev );
```

The channel-of-interest number can be either 1, 2, or 3.

1.3.5.3 Select-Channel Destination-Image Pointer

This is a pointer to the channel-of-interest within the first pixel of the destination image. E.g. if `pDst` is the pointer to the first pixel inside the ROI of a three channel image. Using the appropriate select-channel copy primitive one could copy data into the second channel of this destination image from the first channel of a source image given by `pSrc` by offsetting the destination pointer by one:

```
nppiCopy_8u_C3CR_Ctx(pSrc, nSrcStep, pDst + 1, nDstStep, oSizeROI);
```

1.3.6. Source-Image Sampling

A large number of NPP image-processing functions consume at least one source image and produce an output image (e.g. *nppiAddC_8u_C1RSfs_Ctx()* or *nppiFilterBox_8u_C1R_Ctx()*). All NPP functions falling into this category also operate on ROIs (see :ref: _roi_specification) which for these functions should be considered to describe the destination ROI. In other words the ROI describes a rectangular region in the destination image and all pixels inside of this region are being written by the function in question.

In order to use such functions successfully it is important to understand how the user defined destination ROI affects which pixels in the input image(s) are being read by the algorithms. To simplify the discussion of ROI propagation (i.e. given a destination ROI, what are the ROIs in in the source(s)), it makes sense to distinguish two major cases:

1. Point-Wise Operations: These are primitives like *nppiAddC_8u_C1RSfs_Ctx()*. Each output pixel requires exactly one input pixel to be read.
2. Neighborhood Operations: These are primitives like *nppiFilterBox_8u_C1R_Ctx()*, which require a group of pixels from the source image(s) to be read in order to produce a single output.

1.3.6.1 Point-Wise Operations

As mentioned above, point-wise operations consume a single pixel from the input image (or a single pixel from each input image, if the operation in question has more than one input image) in order to produce a single output pixel.

1.3.6.2 Neighborhood Operations

In the case of neighborhood operations a number of input pixels (a "neighborhood" of pixels) is read in the input image (or images) in order to compute a single output pixel. All of the functions for image_filtering_functions and image_morphological_operations are neighborhood operations.

Most of these functions have parameters that affect the size and relative location of the neighborhood: a mask-size structure and an achor-point structure. Both parameters are described in more detail in the next subsections.

1.3.6.2.1 Mask-Size Parameter

Many NPP neighborhood operations allow the user to specify the size of the neighborhood via a parameter usually named `oMaskSize` of type *NppiSize*. In those cases the neighborhood of pixels read from the source(s) is exactly the size of the mask. Assuming the mask is anchored at location (0, 0) (see anchor_point_parameter below) and has a size of (w, h), i.e.

```
assert(oMaskSize.w == w);
assert(oMaskSize.h == h);
assert(oAnchor.x == 0);
assert(oAnchor.y == 0);
```

a neighborhood operation would read the following source pixels in order to compute destination pixel $D_{i,j}$:

$$\begin{matrix} S_{i,j} & S_{i,j+1} & \dots & S_{i,j+w-1} \\ S_{i+1,j} & S_{i+1,j+1} & \dots & S_{i+1,j+w-1} \\ \vdots & \vdots & \ddots & \vdots \\ S_{i+h-1,j} & S_{i+h-1,j+1} & \dots & S_{i+h-1,j+w-1} \end{matrix}$$

1.3.6.2.2 Anchor-Point Parameter

Many NPP primitives performing neighborhood operations allow the user to specify the relative location of the neighborhood via a parameter usually named `oAnchor` of type *NppiPoint*. Using the anchor a developer can chose the position of the mask (see mask_size_parameter) relative to current pixel index.

Using the same example as in mask_size_parameter, but this time with an anchor position of (a, b):

```
assert(oMaskSize.w == w);
assert(oMaskSize.h == h);
assert(oAnchor.x == a);
assert(oAnchor.y == b);
```

the following pixels from the source image would be read:

$$\begin{matrix} S_{i-a,j-b} & S_{i-a,j-b+1} & \cdots & S_{i-a,j-b+w-1} \\ S_{i-a+1,j-b} & S_{i-a+1,j-b+1} & \cdots & S_{i-a+1,j-b+w-1} \\ \vdots & \vdots & \ddots & \vdots \\ S_{i-a+h-1,j-b} & S_{i-a+h-1,j-b+1} & \cdots & S_{i-a+h-1,j-b+w-1} \end{matrix}$$

1.3.6.2.3 Sampling Beyond Image Boundaries

NPP primitives in general and NPP neighborhood operations in particular require that all pixel locations read and written are valid and within the boundaries of the respective images. Sampling outside of the defined image data regions results in undefined behavior and may lead to system instability.

This poses a problem in practice: when processing full-size images one cannot choose the destination ROI to be the same size as the source image. Because neighborhood operations read pixels from an enlarged source ROI, the destination ROI must be shrunk so that the expanded source ROI does not exceed the source image's size OR if the neighborhood operation function supports a Border version then this version can be used without ROI adjustment with the appropriate border protection mode selected.

For cases where this "shrinking" of the destination image size is unacceptable and a Border version of the function is not available, NPP provides a set of border-expanding Copy primitives. E.g. *nppiCopyConstBorder_8u_C1R_Ctx()*, *nppiCopyReplicateBorder_8u_C1R_Ctx()* and *nppiCopyWrapBorder_8u_C1R_Ctx()*. The user can use these primitives to "expand" the source image's size using one of the three expansion modes. The expanded image can then be safely passed to a neighborhood operation producing a full-size result.

1.4. Signal Processing Conventions

1.4.1. Signal Data

Signal data is passed to and from NPPS primitives via a pointer to the signal's data type.

The general idea behind this fairly low-level way of passing signal data is ease-of-adoption into existing software projects:

- Passing the data pointer rather than a higher-level signal struct allows for easy adoption by not requiring a specific signal representation (that could include total signal size offset, or other additional information). This avoids awkward packing and unpacking of signal data from the host application to an NPP specific signal representation.

1.4.1.1 Parameter Names for Signal Data

There are three general cases of image-data passing throughout NPP detailed in the following sections.

Those are signals consumed by the algorithm.

1.4.1.1.1 Source Signal Pointer

The source signal data is generally passed via a pointer named

```
pSrc
```

The source signal pointer is generally defined constant, enforcing that the primitive does not change any image data pointed to by that pointer. E.g.

```
nppsPrimitive_32s(const Npp32s * pSrc, ...)
```

In case the primitive consumes multiple signals as inputs the source pointers are numbered like this:

```
pSrc1, pScr2, ...
```

1.4.1.1.2 Destination Signal Pointer

The destination signal data is generally passed via a pointer named

```
pDst
```

In case the primitive consumes multiple signals as inputs the source pointers are numbered like this:

```
pDst1, pDst2, ...
```

1.4.1.1.3 In-Place Signal Pointer

In the case of in-place processing, source and destination are served by the same pointer and thus pointers to in-place signal data are called:

```
pSrcDst
```

1.4.1.2 Signal Data Alignment Requirements

NPP requires signal sample data to be naturally aligned, i.e. any pointer

```
NppType * p;
```

to a sample in a signal needs to fulfill:

```
assert(p % sizeof(p) == 0);
```

1.4.1.3 Signal Data Related Error Codes

All NPPI primitives operating on signal data validate the signal-data pointer for proper alignment and test that the point is not null.

Failed validation results in one of the following error codes being returned and the primitive not being executed: NPP_NULL_POINTER_ERROR is returned if the image-data pointer is 0 (NULL). NPP_ALIGNMENT_ERROR if the signal-data pointer address is not a multiple of the signal's data-type size.

1.4.2. Signal Length

The vast majority of NPPS functions take a

```
nLength
```

parameter that tells the primitive how many of the signal's samples starting from the given data pointer are to be processed.

1.4.2.1 Length Related Error Codes

All NPPS primitives taking a length parameter validate this input.

Failed validation results in the following error code being returned and the primitive not being executed: NPP_SIZE_ERROR is returned if the length is negative.

1.5. Data Types, Structs, Enums, and Constants

struct **Npp16f**

Workarounds for cuda_fp16.h C incompatibility *Npp16f*.

Public Members

short **fp16**

Original Cuda fp16 data size and format.

struct **Npp16f_2**

Npp16f_2.

Public Members

short **fp16_0**
Original Cuda fp16 data size and format.

short **fp16_1**
Original Cuda fp16 data size and format.

enum **NppiInterpolationMode**
Filtering methods.
Values:

enumerator **NPPI_INTER_UNDEFINED**
Undefined filtering interpolation mode.

enumerator **NPPI_INTER_NN**
Nearest neighbor filtering.

enumerator **NPPI_INTER_LINEAR**
Linear interpolation.

enumerator **NPPI_INTER_CUBIC**
Cubic interpolation.

enumerator **NPPI_INTER_CUBIC2P_BSPLINE**
Two-parameter cubic filter (B=1, C=0)

enumerator **NPPI_INTER_CUBIC2P_CATMULLROM**
Two-parameter cubic filter (B=0, C=1/2)

enumerator **NPPI_INTER_CUBIC2P_B05C03**
Two-parameter cubic filter (B=1/2, C=3/10)

enumerator **NPPI_INTER_SUPER**
Super sampling.

enumerator **NPPI_INTER_LANCZOS**
Lanczos filtering.

enumerator **NPPI_INTER_LANCZOS3_ADVANCED**
Generic Lanczos filtering with order 3.

enumerator **NPPI_SMOOTH_EDGE**
Smooth edge filtering.

enum **NppiBayerGridPosition**

Bayer Grid Position Registration.

Values:

enumerator **NPPI_BAYER_BGGR**

Default registration position BGGR.

enumerator **NPPI_BAYER_RGGB**

Registration position RGGB.

enumerator **NPPI_BAYER_GBRG**

Registration position GBRG.

enumerator **NPPI_BAYER_GRBG**

Registration position GRBG.

enum **NppiMaskSize**

Fixed filter-kernel sizes.

Values:

enumerator **NPP_MASK_SIZE_1_X_3**

1 X 3 filter mask size.

enumerator **NPP_MASK_SIZE_1_X_5**

1 X 5 filter mask size.

enumerator **NPP_MASK_SIZE_3_X_1**

3 X 1 filter mask size, leaving space for more 1 X N type enum values.

enumerator **NPP_MASK_SIZE_5_X_1**

5 X 1 filter mask size.

enumerator **NPP_MASK_SIZE_3_X_3**

3 X 3 filter mask size, leaving space for more N X 1 type enum values.

enumerator **NPP_MASK_SIZE_5_X_5**

5 X 5 filter mask size.

enumerator **NPP_MASK_SIZE_7_X_7**

7 X 7 filter mask size.

enumerator **NPP_MASK_SIZE_9_X_9**

9 X 9 filter mask size.

enumerator **NPP_MASK_SIZE_11_X_11**

11 X 11 filter mask size.

enumerator **NPP_MASK_SIZE_13_X_13**

13 X 13 filter mask size.

enumerator **NPP_MASK_SIZE_15_X_15**

15 X 15 filter mask size.

enum **NppiDifferentialKernel**

Differential Filter types.

Values:

enumerator **NPP_FILTER_SOBEL**

Differential kernel filter type sobel.

enumerator **NPP_FILTER_SCHARR**

Differential kernel filter type scharr.

enum **NppStatus**

Error Status Codes.

Almost all NPP function return error-status information using these return codes. Negative return codes indicate errors, positive return codes indicate warnings, a return code of 0 indicates success.

Values:

enumerator **NPP_LIBRARY_VERSION_MISMATCH_ERROR**

Application and NPP library version mismatch.

enumerator **NPP_INVALID_HOST_POINTER_ERROR**

Invalid host memory pointer error.

enumerator **NPP_INVALID_DEVICE_POINTER_ERROR**

Invalid device memory pointer error.

enumerator **NPP_LUT_PALETTE_BITSIZE_ERROR**

Color look up table bitsize error.

enumerator **NPP_ZC_MODE_NOT_SUPPORTED_ERROR**

ZeroCrossing mode not supported error.

enumerator **NPP_NOT_SUFFICIENT_COMPUTE_CAPABILITY**

Not sufficient Cuda compute capability error.

enumerator **NPP_TEXTURE_BIND_ERROR**
Texture bind error.

enumerator **NPP_WRONG_INTERSECTION_ROI_ERROR**
Wrong intersection region of interest error.

enumerator **NPP_HAAR_CLASSIFIER_PIXEL_MATCH_ERROR**
Haar classifier pixel match error.

enumerator **NPP_MEMFREE_ERROR**
Memory free request error.

enumerator **NPP_MEMSET_ERROR**
Memory set request error.

enumerator **NPP_MEMCPY_ERROR**
Memory copy request error.

enumerator **NPP_ALIGNMENT_ERROR**
Memory alignment error.

enumerator **NPP_CUDA_KERNEL_EXECUTION_ERROR**
Cuda kernel execution error, most commonly Cuda kernel launch error.

enumerator **NPP_STREAM_CTX_ERROR**
Non CTX function support has been deprecated.

enumerator **NPP_ROUND_MODE_NOT_SUPPORTED_ERROR**
Unsupported round mode.

enumerator **NPP_QUALITY_INDEX_ERROR**
Image pixels are constant for quality index.

enumerator **NPP_RESIZE_NO_OPERATION_ERROR**
One of the output image dimensions is less than 1 pixel.

enumerator **NPP_OVERFLOW_ERROR**
Number overflows the upper or lower limit of the data type.

enumerator **NPP_NOT_EVEN_STEP_ERROR**
Step value is not pixel multiple.

enumerator **NPP_HISTOGRAM_NUMBER_OF_LEVELS_ERROR**
Number of levels for histogram is less than 2.

enumerator **NPP_LUT_NUMBER_OF_LEVELS_ERROR**
Number of levels for LUT is less than 2.

enumerator **NPP_ZERO_MASK_VALUE_ERROR**
All values of the mask are zero.

enumerator **NPP_CORRUPTED_DATA_ERROR**
Processed data is corrupted.

enumerator **NPP_CHANNEL_ORDER_ERROR**
Wrong order of the destination channels.

enumerator **NPP_DATA_TYPE_ERROR**
Data type is incorrect or not supported.

enumerator **NPP_QUADRANGLE_ERROR**
The quadrangle is nonconvex or degenerates into triangle, line or point.

enumerator **NPP_RECTANGLE_ERROR**
Size of the rectangle region is less than or equal to 1.

enumerator **NPP_COEFFICIENT_ERROR**
Unallowable values of the transformation coefficients.

enumerator **NPP_NUMBER_OF_CHANNELS_ERROR**
Bad or unsupported number of channels.

enumerator **NPP_COI_ERROR**
Channel of interest is not 1, 2, or 3.

enumerator **NPP_DIVISOR_ERROR**
Divisor is equal to zero.

enumerator **NPP_CHANNEL_ERROR**
Illegal channel index.

enumerator **NPP_STRIDE_ERROR**
Stride is less than the row length.

enumerator **NPP_ANCHOR_ERROR**
Anchor point is outside mask.

enumerator **NPP_MASK_SIZE_ERROR**
Lower bound is larger than upper bound.

enumerator **NPP_RESIZE_FACTOR_ERROR**

enumerator **NPP_INTERPOLATION_ERROR**

enumerator **NPP_MIRROR_FLIP_ERROR**

enumerator **NPP_MOMENT_00_ZERO_ERROR**

enumerator **NPP_THRESHOLD_NEGATIVE_LEVEL_ERROR**

enumerator **NPP_THRESHOLD_ERROR**

enumerator **NPP_FFT_FLAG_ERROR**

enumerator **NPP_FFT_ORDER_ERROR**

enumerator **NPP_STEP_ERROR**
Step is less or equal zero.

enumerator **NPP_NOT_SUPPORTED_MODE_ERROR**
Not supported mode error.

enumerator **NPP_CONTEXT_MATCH_ERROR**

enumerator **NPP_SCALE_RANGE_ERROR**

enumerator **NPP_OUT_OFF_RANGE_ERROR**

enumerator **NPP_DIVIDE_BY_ZERO_ERROR**

enumerator **NPP_MEMORY_ALLOCATION_ERR**

enumerator **NPP_NULL_POINTER_ERROR**

enumerator **NPP_RANGE_ERROR**

enumerator **NPP_SIZE_ERROR**

enumerator **NPP_BAD_ARGUMENT_ERROR**

enumerator **NPP_NO_MEMORY_ERROR**

enumerator **NPP_NOT_IMPLEMENTED_ERROR**

enumerator **NPP_ERROR**

enumerator **NPP_ERROR_RESERVED**

enumerator **NPP_NO_ERROR**

Error free operation.

enumerator **NPP_SUCCESS**

Successful operation (same as NPP_NO_ERROR)

enumerator **NPP_NO_OPERATION_WARNING**

Indicates that no operation was performed.

enumerator **NPP_DIVIDE_BY_ZERO_WARNING**

Divisor is zero however does not terminate the execution.

enumerator **NPP_AFFINE_QUAD_INCORRECT_WARNING**

Indicates that the quadrangle passed to one of affine warping functions doesn't have necessary properties.

First 3 vertices are used, the fourth vertex discarded.

enumerator **NPP_WRONG_INTERSECTION_ROI_WARNING**

The given ROI has no intersection with either the source or destination ROI.

Thus no operation was performed.

enumerator **NPP_WRONG_INTERSECTION_QUAD_WARNING**

The given quadrangle has no intersection with either the source or destination ROI.

Thus no operation was performed.

enumerator **NPP_DOUBLE_SIZE_WARNING**

Image size isn't multiple of two.

Indicates that in case of 422/411/420 sampling the ROI width/height was modified for proper processing.

enumerator **NPP_MISALIGNED_DST_ROI_WARNING**

Speed reduction due to uncoalesced memory accesses warning.

struct **NppLibraryVersion**

NPPLibraryVersion This struct contains the NPP Library Version information.

Public Members

int **major**
Major version number.

int **minor**
Minor version number.

int **build**
Build number.
This reflects the nightly build this release was made from.

typedef unsigned char **Npp8u**
8-bit unsigned chars

typedef signed char **Npp8s**
8-bit signed chars

typedef unsigned short **Npp16u**
16-bit unsigned integers

typedef short **Npp16s**
16-bit signed integers

typedef unsigned int **Npp32u**
32-bit unsigned integers

typedef int **Npp32s**
32-bit signed integers

typedef unsigned long long **Npp64u**
64-bit unsigned integers

typedef long long **Npp64s**
64-bit signed integers

typedef float **Npp32f**
32-bit (IEEE) floating-point numbers

typedef double **Npp64f**
64-bit floating-point numbers

struct **Npp8uc**
Complex Number This struct represents an unsigned char complex number.

Public Members

Npp8u **re**
Real part.

Npp8u **im**
Imaginary part.

struct **Npp16uc**
Complex Number This struct represents an unsigned short complex number.

Public Members

Npp16u **re**
Real part.

Npp16u **im**
Imaginary part.

struct **Npp16sc**
Complex Number This struct represents a short complex number.

Public Members

Npp16s **re**
Real part.

Npp16s **im**
Imaginary part.

struct **Npp32uc**
Complex Number This struct represents an unsigned int complex number.

Public Members

Npp32u **re**
Real part.

Npp32u **im**
Imaginary part.

struct **Npp32sc**
Complex Number This struct represents a signed int complex number.

Public Members

Npp32s **re**
Real part.

Npp32s **im**
Imaginary part.

struct **Npp32fc**
Complex Number This struct represents a single floating-point complex number.

Public Members

Npp32f **re**
Real part.

Npp32f **im**
Imaginary part.

struct **Npp64sc**
Complex Number This struct represents a long long complex number.

Public Members

Npp64s **re**
Real part.

Npp64s **im**
Imaginary part.

struct **Npp64fc**
Complex Number This struct represents a double floating-point complex number.

Public Members

Npp64f **re**
Real part.

Npp64f **im**
Imaginary part.

enum **NppDataType**

Data types for nppiPlus functions.

Values:

enumerator **NPP_8U**

8-bit unsigned integer data type

enumerator **NPP_8S**

8-bit signed integer data type

enumerator **NPP_16U**

16-bit unsigned integer data type

enumerator **NPP_16S**

16-bit signed integer data type

enumerator **NPP_32U**

32-bit unsigned integer data type

enumerator **NPP_32S**

32-bit signed integer data type

enumerator **NPP_64U**

64-bit unsigned integer data type

enumerator **NPP_64S**

64-bit signed integer data type

enumerator **NPP_16F**

16-bit original Cuda floating point data type

enumerator **NPP_32F**

32-bit floating point data type

enumerator **NPP_64F**

64-bit double precision floating point data type

enum **NppiChannels**

Image channel counts for nppiPlus functions.

Values:

enumerator **NPP_CH_1**

Single channel per pixel data.

enumerator **NPP_CH_2**
Two channel per pixel data.

enumerator **NPP_CH_3**
Three channel per pixel data.

enumerator **NPP_CH_4**
Four channel per pixel data.

enumerator **NPP_CH_A4**
Four channel per pixel data with alpha.

enumerator **NPP_CH_P2**
Two channel single channel per plane pixel data.

enumerator **NPP_CH_P3**
Three channel single channel per plane pixel data.

enumerator **NPP_CH_P4**
Four channel single channel per plane pixel data.

NPP_MIN_8U
Minimum 8-bit unsigned integer.

NPP_MAX_8U
Maximum 8-bit unsigned integer.

NPP_MIN_16U
Minimum 16-bit unsigned integer.

NPP_MAX_16U
Maximum 16-bit unsigned integer.

NPP_MIN_32U
Minimum 32-bit unsigned integer.

NPP_MAX_32U
Maximum 32-bit unsigned integer.

NPP_MIN_64U
Minimum 64-bit unsigned integer.

NPP_MAX_64U
Maximum 64-bit unsigned integer.

NPP_MIN_8S
Minimum 8-bit signed integer.

NPP_MAX_8S
Maximum 8-bit signed integer.

NPP_MIN_16S
Minimum 16-bit signed integer.

NPP_MAX_16S
Maximum 16-bit signed integer.

NPP_MIN_32S
Minimum 32-bit signed integer.

NPP_MAX_32S
Maximum 32-bit signed integer.

NPP_MIN_64S
Minimum 64-bit signed integer.

NPP_MAX_64S
Minimum 64-bit signed integer.

NPP_MINABS_32F
Smallest positive 32-bit floating point value.

NPP_MAXABS_32F
Largest positive 32-bit floating point value.

NPP_MINABS_64F
Smallest positive 64-bit floating point value.

NPP_MAXABS_64F
Largest positive 64-bit floating point value.

struct **NppiPoint**
2D Point

Public Members

int **x**
x-coordinate.

int **y**
y-coordinate.

struct **NppiPoint32f**
2D Npp32f Point

Public Members

Npp32f **x**
x-coordinate.

Npp32f **y**
y-coordinate.

struct **NppiPoint64f**
2D Npp64f Point

Public Members

Npp64f **x**
x-coordinate.

Npp64f **y**
y-coordinate.

struct **NppPointPolar**
2D Polar Point

Public Members

Npp32f **rho**
Polar rho value.

Npp32f **theta**
Polar theta value.

struct **NppiSize**
2D Size This struct typically represents the size of a a rectangular region in two space.

Public Members

int **width**
Rectangle width.

int **height**
Rectangle height.

struct **NppiRect**
2D Rectangle This struct contains position and size information of a rectangle in two space.
The rectangle's position is usually signified by the coordinate of its upper-left corner.

Public Members

int **x**
x-coordinate of upper left corner (lowest memory address).

int **y**
y-coordinate of upper left corner (lowest memory address).

int **width**
Rectangle width.

int **height**
Rectangle height.

enum **NppiAxis**
nppiMirror direction controls
Values:

enumerator **NPP_HORIZONTAL_AXIS**
Flip around horizontal axis in mirror function.

enumerator **NPP_VERTICAL_AXIS**
Flip around vertical axis in mirror function.

enumerator **NPP_BOTH_AXIS**
Flip around both axes in mirror function.

enum **NppCmpOp**
Pixel comparison control values.
Values:

enumerator **NPP_CMP_LESS**

Threshold test for less than.

enumerator **NPP_CMP_LESS_EQ**

Threshold test for less than or equal.

enumerator **NPP_CMP_EQ**

Threshold test for equal.

enumerator **NPP_CMP_GREATER_EQ**

Threshold test for greater than or equal.

enumerator **NPP_CMP_GREATER**

Threshold test for greater than.

enum **NppRoundMode**

Rounding Modes.

The enumerated rounding modes are used by a large number of NPP primitives to allow the user to specify the method by which fractional values are converted to integer values. Also see *Rounding Modes*.

For NPP release 5.5 new names for the three rounding modes are introduced that are based on the naming conventions for rounding modes set forth in the IEEE-754 floating-point standard. Developers are encouraged to use the new, longer names to be future proof as the legacy names will be deprecated in subsequent NPP releases.

Values:

enumerator **NPP_RND_NEAR**

Round to the nearest even integer.

All fractional numbers are rounded to their nearest integer. The ambiguous cases (i.e. <integer>.5) are rounded to the closest even integer. E.g.

- roundNear(0.5) = 0
- roundNear(0.6) = 1
- roundNear(1.5) = 2
- roundNear(-1.5) = -2

enumerator **NPP_ROUND_NEAREST_TIES_TO_EVEN**

Alias name for NPP_RND_NEAR.

enumerator **NPP_RND_FINANCIAL**

Round according to financial rule.

All fractional numbers are rounded to their nearest integer. The ambiguous cases (i.e. <integer>.5) are rounded away from zero. E.g.

- roundFinancial(0.4) = 0

- roundFinancial(0.5) = 1
- roundFinancial(-1.5) = -2

enumerator **NPP_ROUND_NEAREST_TIES_AWAY_FROM_ZERO**

Alias name for NPP_RND_FINANCIAL.

enumerator **NPP_RND_ZERO**

Round towards zero (truncation).

All fractional numbers of the form <integer>.<decimals> are truncated to <integer>.

- roundZero(1.5) = 1
- roundZero(1.9) = 1
- roundZero(-2.5) = -2

enumerator **NPP_ROUND_TOWARD_ZERO**

Alias name for NPP_RND_ZERO.

enum **NppiBorderType**

Supported image border modes.

Values:

enumerator **NPP_BORDER_UNDEFINED**

Image border type undefined.

enumerator **NPP_BORDER_NONE**

Image border type none.

enumerator **NPP_BORDER_CONSTANT**

Image border type constant value.

enumerator **NPP_BORDER_REPLICATE**

Image border type replicate border pixels.

enumerator **NPP_BORDER_WRAP**

Image border type wrap border pixels.

enumerator **NPP_BORDER_MIRROR**

Image border type mirror border pixels (IPP mirrored border / OpenCV BORDER_REFLECT_101): gfedcb|abcdefgh|gfedcba — edge pixel is NOT repeated.

enumerator **NPP_BORDER_MIRROR_REFL**

Image border type mirror with replication (IPP mirrored border with replication / OpenCV BORDER_REFLECT): fedcba|abcdefgh|hgfedcba — edge pixel IS repeated.

enum **NppHintAlgorithm**

Hints.

Values:

enumerator **NPP_ALG_HINT_NONE**

Hint none, currently these are all ignored.

enumerator **NPP_ALG_HINT_FAST**

Hint fast, currently these are all ignored.

enumerator **NPP_ALG_HINT_ACCURATE**

Hint accurate, currently these are all ignored.

enum **NppiAlphaOp**

Alpha composition mode controls.

Values:

enumerator **NPPI_OP_ALPHA_OVER**

Alpha composition over operation.

enumerator **NPPI_OP_ALPHA_IN**

Alpha composition in operation.

enumerator **NPPI_OP_ALPHA_OUT**

Alpha composition out operation.

enumerator **NPPI_OP_ALPHA_ATOP**

Alpha composition atop operation.

enumerator **NPPI_OP_ALPHA_XOR**

Alpha composition xor operation.

enumerator **NPPI_OP_ALPHA_PLUS**

Alpha composition plus operation.

enumerator **NPPI_OP_ALPHA_OVER_PREMUL**

Alpha composition over premultiply operation.

enumerator **NPPI_OP_ALPHA_IN_PREMUL**

Alpha composition in premultiply operation.

enumerator **NPPI_OP_ALPHA_OUT_PREMUL**

Alpha composition out premultiply operation.

enumerator **NPPI_OP_ALPHA_ATOP_PREMUL**
Alpha composition atop premultiply operation.

enumerator **NPPI_OP_ALPHA_XOR_PREMUL**
Alpha composition xor premultiply operation.

enumerator **NPPI_OP_ALPHA_PLUS_PREMUL**
Alpha composition plus premultiply operation.

enumerator **NPPI_OP_ALPHA_PREMUL**
Alpha composition premultiply operation.

struct **NppiHOGConfig**
The *NppiHOGConfig* structure defines the configuration parameters for the HOG descriptor:

Public Members

int **cellSize**
square cell size (pixels).

int **histogramBlockSize**
square histogram block size (pixels).

int **nHistogramBins**
required number of histogram bins.

NppiSize **detectionWindowSize**
detection window size (pixels).

NPP_HOG_MAX_CELL_SIZE
HOG Cell controls.
max horizontal/vertical pixel size of cell.

NPP_HOG_MAX_BLOCK_SIZE
max horizontal/vertical pixel size of block.

NPP_HOG_MAX_BINS_PER_CELL
max number of histogram bins.

NPP_HOG_MAX_CELLS_PER_DESCRIPTOR
max number of cells in a descriptor window.

NPP_HOG_MAX_OVERLAPPING_BLOCKS_PER_DESCRIPTOR
max number of overlapping blocks in a descriptor window.

NPP_HOG_MAX_DESCRIPTOR_LOCATIONS_PER_CALL
max number of descriptor window locations per function call.

struct **NppiHaarClassifier_32f**
Data structure for HaarClassifier_32f.

Public Members

int **numClassifiers**
number of classifiers.

Npp32s ***classifiers**
packed classifier data 40 bytes each.

size_t **classifierStep**
packed classifier byte step.

NppiSize **classifierSize**
packed classifier size.

Npp32s ***counterDevice**
counter device.

struct **NppiHaarBuffer**
Data structure for Haar buffer.

Public Members

int **haarBufferSize**
size of the buffer

Npp32s ***haarBuffer**
buffer

enum **NppsZCType**
Signal sign operations.
Values:

enumerator **nppZCR**
sign change

enumerator **nppZCXor**
sign change XOR

enumerator **nppZCC**
sign change count_0

enum **NppiHuffmanTableType**
HuffMan Table controls.
Values:

enumerator **nppiDCTable**
DC Table.

enumerator **nppiACTable**
AC Table.

enum **NppiNorm**
Norm controls.
Values:

enumerator **nppiNormInf**
maximum

enumerator **nppiNormL1**
sum

enumerator **nppiNormL2**
square root of sum of squares

struct **NppiConnectedRegion**
Data structure of connected pixel region information.

Public Members

NppiRect **oBoundingBox**
x, y, width, height == left, top, right, and bottom pixel coordinates

Npp32u **nConnectedPixelCount**
total number of pixels in connected region

Npp32u **aSeedPixelValue**[3]
original pixel value of seed pixel, 1 or 3 channel

struct **NppiImageDescriptor**
General image descriptor.
Defines the basic parameters of an image, including data pointer, step, and image size. This can be used by both source and destination images.

Public Members

void ***pData**

device memory pointer to the image

int **nStep**

step size

NppiSize **oSize**

width and height of the image

struct **NppiBufferDescriptor**

struct *NppiBufferDescriptor*

Public Members

void ***pData**

per image device memory pointer to the corresponding buffer

int **nBufferSize**

allocated buffer size

struct **NppiCompressedMarkerLabelsInfo**

Provides details of uniquely labeled pixel regions of interest returned by CompressedLabelMarkersUF function.

Public Members

Npp32u **nMarkerLabelPixelCount**

total number of pixels in this connected pixel region

Npp32u **nContourPixelCount**

total number of pixels in this connected pixel region contour

Npp32u **nContourPixelsFound**

total number of pixels in this connected pixel region contour found during geometry search

NppiPoint **oContourFirstPixelLocation**

image geometric x and y location of the first pixel in the contour

NppiRect **oMarkerLabelBoundingBox**

bounding box of this connected pixel region expressed as leftmostX, topmostY, rightmostX, and bottommostY

struct **NppiContourBlockSegment**

Provides details of contour pixel grid map location and association.

Public Members

Npp32u **nMarkerLabelID**

this connected pixel region contour ID

Npp32u **nContourPixelCount**

total number of pixels in this connected pixel region contour

Npp32u **nContourStartingPixelOffset**

base offset of starting pixel in the overall contour pixel list

Npp32u **nSegmentNum**

relative block segment number within this particular contour ID

struct **NppiContourPixelGeometryInfo**

Provides contour (boundary) geometry info of uniquely labeled pixel regions returned by nppiCompressedMarkerLabelsUFInfo function in host memory in counterclockwise order relative to contour interiors.

Public Members

NppiPoint **oContourOrderedGeometryLocation**

image geometry X and Y location in requested output order

NppiPoint **oContourPrevPixelLocation**

image geometry X and Y location of previous contour pixel

NppiPoint **oContourCenterPixelLocation**

image geometry X and Y location of center contour pixel

NppiPoint **oContourNextPixelLocation**

image geometry X and Y location of next contour pixel

Npp32s **nOrderIndex**

contour pixel counterclockwise order index in geometry list

Npp32s **nReverseOrderIndex**

contour pixel clockwise order index in geometry list

Npp32u **nFirstIndex**

index of first ordered contour pixel in this subgroup

Npp32u **nLastIndex**
index of last ordered contour pixel in this subgroup

Npp32u **nNextContourPixelIndex**
index of next ordered contour pixel in *NppiContourPixelGeometryInfo* list

Npp32u **nPrevContourPixelIndex**
index of previous ordered contour pixel in *NppiContourPixelGeometryInfo* list

Npp8u **nPixelAlreadyUsed**
this test pixel is has already been used

Npp8u **nAlreadyLinked**
this test pixel is already linked to center pixel

Npp8u **nAlreadyOutput**
this pixel has already been output in geometry list

Npp8u **nContourInteriorDirection**
direction of contour region interior

NPP_CONTOUR_DIRECTION_SOUTH_EAST
Provides contour (boundary) direction info of uniquely labeled pixel regions returned by CompressedLabelMarkersUF function.

Contour direction south east

NPP_CONTOUR_DIRECTION_SOUTH
Contour direction south.

NPP_CONTOUR_DIRECTION_SOUTH_WEST
Contour direction south west.

NPP_CONTOUR_DIRECTION_WEST
Contour direction west.

NPP_CONTOUR_DIRECTION_EAST
Contour direction east.

NPP_CONTOUR_DIRECTION_NORTH_EAST
Contour direction north east.

NPP_CONTOUR_DIRECTION_NORTH
Contour direction north.

NPP_CONTOUR_DIRECTION_NORTH_WEST

Contour direction north west.

NPP_CONTOUR_DIRECTION_ANY_NORTH

Provides contour (boundary) diagonal direction info of uniquely labeled pixel regions returned by CompressedLabelMarkersUF function.

Contour direction any north

NPP_CONTOUR_DIRECTION_ANY_WEST

Contour direction any west.

NPP_CONTOUR_DIRECTION_ANY_SOUTH

Contour direction any south.

NPP_CONTOUR_DIRECTION_ANY_EAST

Contour direction any east.

struct **NppiContourPixelDirectionInfo**

Data structure for contour pixel direction information.

Public Members

Npp32u **nMarkerLabelID**

MarkerLabelID of contour interior connected region.

Npp8u **nContourDirectionCenterPixel**

provides current center contour pixel input and output direction info

Npp8u **nContourInteriorDirectionCenterPixel**

provides current center contour pixel region interior direction info

Npp8u **nConnected**

direction to directly connected contour pixels, 0 if not connected

Npp8u **nGeometryInfoIsValid**

direction to directly connected contour pixels, 0 if not connected

NppiContourPixelGeometryInfo **oContourPixelGeometryInfo**

Pixel geometry info structure.

NppiPoint **nEast1**

Pixel coordinate values in each direction.

NppiPoint **nNorthEast1**
Pixel coordinate values in each direction.

NppiPoint **nNorth1**
Pixel coordinate values in each direction.

NppiPoint **nNorthWest1**
Pixel coordinate values in each direction.

NppiPoint **nWest1**
Pixel coordinate values in each direction.

NppiPoint **nSouthWest1**
Pixel coordinate values in each direction.

NppiPoint **nSouth1**
Pixel coordinate values in each direction.

NppiPoint **nSouthEast1**
Pixel coordinate values in each direction.

Npp8u **nTest1EastConnected**
East connected flag.

Npp8u **nTest1NorthEastConnected**
North east connected flag.

Npp8u **nTest1NorthConnected**
North connected flag.

Npp8u **nTest1NorthWestConnected**
North west connected flag.

Npp8u **nTest1WestConnected**
West connected flag.

Npp8u **nTest1SouthWestConnected**
South west connected flag.

Npp8u **nTest1SouthConnected**
South connected flag.

Npp8u **nTest1SouthEastConnected**
South east connected flag.

struct **NppiContourTotalsInfo**

Data structure for contour total counts.

Public Members

Npp32u **nTotalImagePixelContourCount**

total number of contour pixels in image

Npp32u **nLongestImageContourPixelCount**

longest per contour pixel count in image

enum **NppiWatershedSegmentBoundaryType**

Provides control of the type of segment boundaries, if any, added to the image generated by the watershed segmentation function.

Values:

enumerator **NPP_WATERSHED_SEGMENT_BOUNDARIES_NONE**

Image watershed segment boundary type none.

enumerator **NPP_WATERSHED_SEGMENT_BOUNDARIES_BLACK**

Image watershed segment boundary type black.

enumerator **NPP_WATERSHED_SEGMENT_BOUNDARIES_WHITE**

Image watershed segment boundary type white.

enumerator **NPP_WATERSHED_SEGMENT_BOUNDARIES_CONTRAST**

Image watershed segment boundary type contrasting intensity.

enumerator **NPP_WATERSHED_SEGMENT_BOUNDARIES_ONLY**

Image watershed segment boundary type render boundaries only.

struct **NppStreamContext**

1.5.1. Application Managed Stream Context

NPP stream context structure must be filled in by application.

Populate all fields as shown below. Set hWorkspace = 0 to opt out of the optional workspace cache (pass a handle from nppiWorkspaceCreate() to enable it):

```
NppStreamContext ctx;
ctx.hStream = myStream;
cudaGetDevice(&ctx.nCudaDeviceId);
cudaDeviceProp props;
```

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```
cudaGetDeviceProperties(&props, ctx.nCudaDeviceId);
ctx.nMultiProcessorCount               = props.multiProcessorCount;
ctx.nMaxThreadsPerMultiProcessor       = props.maxThreadsPerMultiProcessor;
ctx.nMaxThreadsPerBlock                = props.maxThreadsPerBlock;
ctx.nSharedMemPerBlock                 = props.sharedMemPerBlock;
ctx.nCudaDevAttrComputeCapabilityMajor = props.major;
ctx.nCudaDevAttrComputeCapabilityMinor = props.minor;
cudaStreamGetFlags(myStream, &ctx.nStreamFlags);
ctx.hWorkspace = 0;   // must be zero unless using nppiWorkspaceCreate()
```

Public Members

cudaStream_t **hStream**

From current Cuda stream ID.

int **nCudaDeviceId**

From cudaGetDevice().

int **nMultiProcessorCount**

From cudaGetDeviceProperties().

int **nMaxThreadsPerMultiProcessor**

From cudaGetDeviceProperties().

int **nMaxThreadsPerBlock**

From cudaGetDeviceProperties().

size_t **nSharedMemPerBlock**

From cudaGetDeviceProperties().

int **nCudaDevAttrComputeCapabilityMajor**

From cudaGetDeviceAttribute().

int **nCudaDevAttrComputeCapabilityMinor**

From cudaGetDeviceAttribute().

unsigned int **nStreamFlags**

From cudaStreamGetFlags().

NppWorkspace **hWorkspace**

Optional workspace handle; 0 = no workspace.

Set via nppiWorkspaceCreate().

Npp32u **nReserved0**

Deprecated:

Use hWorkspace. Same type and storage, kept for source compatibility with existing code that sets nReserved0 = 0.

union *NppStreamContext*.[anonymous] **[anonymous]**

struct **NppiResizeBatchCXR**

NPP Batch Geometry Structure Definitions.

Public Members

const void ***pSrc**

source image device memory pointer.

int **nSrcStep**

source image byte count per row.

void ***pDst**

destination image device memory pointer.

int **nDstStep**

device image byte count per row.

struct **NppiResizeBatchROI_Advanced**

Data structure for variable ROI image batch resizing.

Public Members

NppiRect **oSrcRectROI**

per source image rectangle parameters.

NppiRect **oDstRectROI**

per destination image rectangle parameters.

struct **NppiMirrorBatchCXR**

Data structure for batched nppiMirrorBatch.

Public Members

const void ***pSrc**
source image device memory pointer, ignored for in-place versions.

int **nSrcStep**
source image byte count per row.

void ***pDst**
destination image device memory pointer.

int **nDstStep**
device image byte count per row.

struct **NppiWarpAffineBatchCXR**
Data structure for batched nppiWarpAffineBatch.

Public Members

const void ***pSrc**
source image device memory pointer.

int **nSrcStep**
source image byte count per row.

void ***pDst**
destination image device memory pointer.

int **nDstStep**
device image byte count per row.

Npp64f ***pCoeffs**
device memory pointer to the tranformation matrix with double precision floating-point coefficient values to be used for this image.

Npp64f **aTransformedCoeffs**[2][3]
FOR INTERNAL USE, DO NOT INITIALIZE.

struct **NppiWarpPerspectiveBatchCXR**
Data structure for batched nppiWarpPerspectiveBatch.

Public Members

const void *__pSrc__
: source image device memory pointer.

int __nSrcStep__
: source image byte count per row.

void *__pDst__
: destination image device memory pointer.

int __nDstStep__
: device image byte count per row.

Npp64f *__pCoeffs__
: device memory pointer to the tranformation matrix with double precision floating-point coefficient values to be used for this image.

Npp64f __aTransformedCoeffs__[3][3]
: FOR INTERNAL USE, DO NOT INITIALIZE.

struct __NppiColorTwistBatchCXR__
: Data structure for batched nppiColorTwistBatch.

Public Members

const void *__pSrc__
: source image device memory pointer.

int __nSrcStep__
: source image byte count per row.

void *__pDst__
: destination image device memory pointer.

int __nDstStep__
: device image byte count per row.

Npp32f *__pTwist__
: device memory pointer to the color twist matrix with floating-point coefficient values to be used for this image.

1.6. Core NPP Functions

Basic functions for library management, in particular library version and device property query functions.

Functions

const *NppLibraryVersion* ***nppGetLibVersion**(void)

Get the NPP library version.

Returns

A struct containing separate values for major and minor revision and build number.

1.7. Image Arithmetic And Logical Operations

These functions can be found in the nppial library.

Linking to only the sub-libraries that you use can significantly save link time, application load time, and CUDA runtime startup time when using dynamic libraries.

1.7.1. Arithmetic Operations

1.7.1.1 Arithmetic Operations

The set of image processing arithmetic operations available in the library.

1.7.1.2 AddC

Adds a constant value to each pixel of an image.

Note: If you use one of the device constant versions of these functions and the function called immediately preceeding that function generates that device constant you MUST either call cudaStreamSynchronize() or cudaDeviceSynchronize() before calling the device constant function.

Functions

NppStatus **nppiAddC_8u_C1RSfs_Ctx**(const *Npp8u* *pSrc1, int nSrc1Step, const *Npp8u* nConstant, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

One 8-bit unsigned char channel image add constant, scale, then clamp to saturated value.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.

- **nConstant** – host memory Constant.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiAddDeviceC_8u_C1RSfs_Ctx**(const *Npp8u* *pSrc1, int nSrc1Step, const *Npp8u* *pConstant, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

One 8-bit unsigned char channel image add constant, scale, then clamp to saturated value.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **pConstant** – pointer to device memory Constant.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiAddC_8u_C1IRSfs_Ctx**(const *Npp8u* nConstant, *Npp8u* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

One 8-bit unsigned char channel in place image add constant, scale, then clamp to saturated value.

Parameters

- **nConstant** – host memory Constant.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiAddDeviceC_8u_C1IRSfs_Ctx**(const *Npp8u* *pConstant, *Npp8u* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

One 8-bit unsigned char channel in place image add constant, scale, then clamp to saturated value.

Parameters

- **pConstant** – pointer to device memory Constant.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiAddC_8u_C3RSfs_Ctx**(const *Npp8u* *pSrc1, int nSrc1Step, const *Npp8u* aConstants[3], *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Three 8-bit unsigned char channel image add constant, scale, then clamp to saturated value.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **aConstants** – fixed size host memory array of constant values, one per channel.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiAddDeviceC_8u_C3RSfs_Ctx**(const *Npp8u* *pSrc1, int nSrc1Step, const *Npp8u* *pConstants, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Three 8-bit unsigned char channel image add constant, scale, then clamp to saturated value.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.

- **pConstants** – fixed size device memory array of constant values, one per channel.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiAddC_8u_C3IRSfs_Ctx**(const *Npp8u* aConstants[3], *Npp8u* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Three 8-bit unsigned char channel 8-bit unsigned char in place image add constant, scale, then clamp to saturated value.

Parameters

- **aConstants** – fixed size host memory array of constant values, one per channel.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiAddDeviceC_8u_C3IRSfs_Ctx**(const *Npp8u* *pConstants, *Npp8u* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Three 8-bit unsigned char channel 8-bit unsigned char in place image add constant, scale, then clamp to saturated value.

Parameters

- **pConstants** – fixed size device memory array of constant values, one per channel.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiAddC_8u_AC4RSfs_Ctx**(const *Npp8u* *pSrc1, int nSrc1Step, const *Npp8u* aConstants[3], *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Four 8-bit unsigned char channel with unmodified alpha image add constant, scale, then clamp to saturated value.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **aConstants** – fixed size host memory array of constant values, one per channel.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiAddDeviceC_8u_AC4RSfs_Ctx**(const *Npp8u* *pSrc1, int nSrc1Step, const *Npp8u* *pConstants, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Four 8-bit unsigned char channel with unmodified alpha image add constant, scale, then clamp to saturated value.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **pConstants** – fixed size device memory array of constant values, one per channel.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiAddC_8u_AC4IRSfs_Ctx**(const *Npp8u* aConstants[3], *Npp8u* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Four 8-bit unsigned char channel with unmodified alpha in place image add constant, scale, then clamp to saturated value.

Parameters

- **aConstants** – fixed size host memory array of constant values, one per channel.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiAddDeviceC_8u_AC4IRSfs_Ctx**(const *Npp8u* *pConstants, *Npp8u* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Four 8-bit unsigned char channel with unmodified alpha in place image add constant, scale, then clamp to saturated value.

Parameters

- **pConstants** – fixed size device memory array of constant values, one per channel.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiAddC_8u_C4RSfs_Ctx**(const *Npp8u* *pSrc1, int nSrc1Step, const *Npp8u* aConstants[4], *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Four 8-bit unsigned char channel image add constant, scale, then clamp to saturated value.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **aConstants** – fixed size host memory array of constant values, one per channel.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.

- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiAddDeviceC_8u_C4RSfs_Ctx**(const *Npp8u* *pSrc1, int nSrc1Step, const *Npp8u* *pConstants, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Four 8-bit unsigned char channel image add constant, scale, then clamp to saturated value.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **pConstants** – fixed size device memory array of constant values, one per channel.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiAddC_8u_C4IRSfs_Ctx**(const *Npp8u* aConstants[4], *Npp8u* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Four 8-bit unsigned char channel in place image add constant, scale, then clamp to saturated value.

Parameters

- **aConstants** – fixed size host memory array of constant values, one per channel.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiAddDeviceC_8u_C4IRSfs_Ctx**(const *Npp8u* *pConstants, *Npp8u* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Four 8-bit unsigned char channel in place image add constant, scale, then clamp to saturated value.

Parameters

- **pConstants** – fixed size device memory array of constant values, one per channel.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiAddC_16u_C1RSfs_Ctx**(const *Npp16u* *pSrc1, int nSrc1Step, const *Npp16u* nConstant, *Npp16u* *pDst, int nDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

One 16-bit unsigned short channel image add constant, scale, then clamp to saturated value.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **nConstant** – host memory constant.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiAddDeviceC_16u_C1RSfs_Ctx**(const *Npp16u* *pSrc1, int nSrc1Step, const *Npp16u* *pConstant, *Npp16u* *pDst, int nDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

One 16-bit unsigned short channel image add constant, scale, then clamp to saturated value.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **pConstant** – device memory constant.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.

- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiAddC_16u_C1IRSfs_Ctx**(const *Npp16u* nConstant, *Npp16u* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

One 16-bit unsigned short channel in place image add constant, scale, then clamp to saturated value.

Parameters

- **nConstant** – host memory constant.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiAddDeviceC_16u_C1IRSfs_Ctx**(const *Npp16u* *pConstant, *Npp16u* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

One 16-bit unsigned short channel in place image add constant, scale, then clamp to saturated value.

Parameters

- **pConstant** – device memory constant.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiAddC_16u_C3RSfs_Ctx**(const *Npp16u* *pSrc1, int nSrc1Step, const *Npp16u* aConstants[3], *Npp16u* *pDst, int nDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Three 16-bit unsigned short channel image add constant, scale, then clamp to saturated value.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **aConstants** – fixed size host memory array of constant values, one per channel.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiAddDeviceC_16u_C3RSfs_Ctx**(const *Npp16u* *pSrc1, int nSrc1Step, const *Npp16u* *pConstants, *Npp16u* *pDst, int nDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Three 16-bit unsigned short channel image add constant, scale, then clamp to saturated value.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **pConstants** – fixed size device memory array of constant values, one per channel.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiAddC_16u_C3IRSfs_Ctx**(const *Npp16u* aConstants[3], *Npp16u* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Three 16-bit unsigned short channel in place image add constant, scale, then clamp to saturated value.

Parameters

- **aConstants** – fixed size host memory array of constant values, one per channel.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.

- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiAddDeviceC_16u_C3IRSfs_Ctx**(const *Npp16u* *pConstants, *Npp16u* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Three 16-bit unsigned short channel in place image add constant, scale, then clamp to saturated value.

Parameters

- **pConstants** – fixed size device memory array of constant values, one per channel.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiAddC_16u_AC4RSfs_Ctx**(const *Npp16u* *pSrc1, int nSrc1Step, const *Npp16u* aConstants[3], *Npp16u* *pDst, int nDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Four 16-bit unsigned short channel with unmodified alpha image add constant, scale, then clamp to saturated value.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **aConstants** – fixed size host memory array of constant values, one per channel.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiAddDeviceC_16u_AC4RSfs_Ctx**(const *Npp16u* *pSrc1, int nSrc1Step, const *Npp16u* *pConstants, *Npp16u* *pDst, int nDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Four 16-bit unsigned short channel with unmodified alpha image add constant, scale, then clamp to saturated value.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **pConstants** – fixed size device memory array of constant values, one per channel.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiAddC_16u_AC4IRSfs_Ctx**(const *Npp16u* aConstants[3], *Npp16u* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Four 16-bit unsigned short channel with unmodified alpha in place image add constant, scale, then clamp to saturated value.

Parameters

- **aConstants** – fixed size host memory array of constant values, one per channel.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiAddDeviceC_16u_AC4IRSfs_Ctx**(const *Npp16u* *pConstants, *Npp16u* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Four 16-bit unsigned short channel with unmodified alpha in place image add constant, scale, then clamp to saturated value.

Parameters

- **pConstants** – fixed size device memory array of constant values, one per channel.
- **pSrcDst** – *In-Place Image Pointer*.

- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiAddC_16u_C4RSfs_Ctx**(const *Npp16u* *pSrc1, int nSrc1Step, const *Npp16u* aConstants[4], *Npp16u* *pDst, int nDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Four 16-bit unsigned short channel image add constant, scale, then clamp to saturated value.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **aConstants** – fixed size host memory array of constant values, one per channel.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiAddDeviceC_16u_C4RSfs_Ctx**(const *Npp16u* *pSrc1, int nSrc1Step, const *Npp16u* *pConstants, *Npp16u* *pDst, int nDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Four 16-bit unsigned short channel image add constant, scale, then clamp to saturated value.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **pConstants** – fixed size device memory array of constant values, one per channel.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiAddC_16u_C4IRSfs_Ctx**(const *Npp16u* aConstants[4], *Npp16u* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Four 16-bit unsigned short channel in place image add constant, scale, then clamp to saturated value.

Parameters

- **aConstants** – fixed size host memory array of constant values, one per channel.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiAddDeviceC_16u_C4IRSfs_Ctx**(const *Npp16u* *pConstants, *Npp16u* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Four 16-bit unsigned short channel in place image add constant, scale, then clamp to saturated value.

Parameters

- **pConstants** – fixed size device memory array of constant values, one per channel.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiAddC_16s_C1RSfs_Ctx**(const *Npp16s* *pSrc1, int nSrc1Step, const *Npp16s* nConstant, *Npp16s* *pDst, int nDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

One 16-bit signed short channel image add constant, scale, then clamp to saturated value.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.

- **nConstant** – host memory constant.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiAddDeviceC_16s_C1RSfs_Ctx**(const *Npp16s* *pSrc1, int nSrc1Step, const *Npp16s* *pConstant, *Npp16s* *pDst, int nDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

One 16-bit signed short channel image add constant, scale, then clamp to saturated value.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **pConstant** – device memory constant.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiAddC_16s_C1IRSfs_Ctx**(const *Npp16s* nConstant, *Npp16s* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

One 16-bit signed short channel in place image add constant, scale, then clamp to saturated value.

Parameters

- **nConstant** – host memory constant.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiAddDeviceC_16s_C1IRSfs_Ctx**(const *Npp16s* *pConstant, *Npp16s* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

One 16-bit signed short channel in place image add constant, scale, then clamp to saturated value.

Parameters

- **pConstant** – device memory constant.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiAddC_16s_C3RSfs_Ctx**(const *Npp16s* *pSrc1, int nSrc1Step, const *Npp16s* aConstants[3], *Npp16s* *pDst, int nDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Three 16-bit signed short channel image add constant, scale, then clamp to saturated value.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **aConstants** – fixed size host memory array of constant values, one per channel.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiAddDeviceC_16s_C3RSfs_Ctx**(const *Npp16s* *pSrc1, int nSrc1Step, const *Npp16s* *pConstants, *Npp16s* *pDst, int nDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Three 16-bit signed short channel image add constant, scale, then clamp to saturated value.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.

- **pConstants** – fixed size device memory array of constant values, one per channel.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiAddC_16s_C3IRSfs_Ctx**(const *Npp16s* aConstants[3], *Npp16s* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Three 16-bit signed short channel in place image add constant, scale, then clamp to saturated value.

Parameters

- **aConstants** – fixed size host memory array of constant values, one per channel.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiAddDeviceC_16s_C3IRSfs_Ctx**(const *Npp16s* *pConstants, *Npp16s* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Three 16-bit signed short channel in place image add constant, scale, then clamp to saturated value.

Parameters

- **pConstants** – fixed size device memory array of constant values, one per channel.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiAddC_16s_AC4RSfs_Ctx**(const *Npp16s* *pSrc1, int nSrc1Step, const *Npp16s* aConstants[3], *Npp16s* *pDst, int nDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Four 16-bit signed short channel with unmodified alpha image add constant, scale, then clamp to saturated value.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **aConstants** – fixed size host memory array of constant values, one per channel.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiAddDeviceC_16s_AC4RSfs_Ctx**(const *Npp16s* *pSrc1, int nSrc1Step, const *Npp16s* *pConstants, *Npp16s* *pDst, int nDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Four 16-bit signed short channel with unmodified alpha image add constant, scale, then clamp to saturated value.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **pConstants** – fixed size device memory array of constant values, one per channel.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiAddC_16s_AC4IRSfs_Ctx**(const *Npp16s* aConstants[3], *Npp16s* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Four 16-bit signed short channel with unmodified alpha in place image add constant, scale, then clamp to saturated value.

Parameters

- **aConstants** – fixed size host memory array of constant values, one per channel.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiAddDeviceC_16s_AC4IRSfs_Ctx**(const *Npp16s* *pConstants, *Npp16s* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Four 16-bit signed short channel with unmodified alpha in place image add constant, scale, then clamp to saturated value.

Parameters

- **pConstants** – fixed size device memory array of constant values, one per channel.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiAddC_16s_C4RSfs_Ctx**(const *Npp16s* *pSrc1, int nSrc1Step, const *Npp16s* aConstants[4], *Npp16s* *pDst, int nDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Four 16-bit signed short channel image add constant, scale, then clamp to saturated value.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **aConstants** – fixed size host memory array of constant values, one per channel.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.

- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiAddDeviceC_16s_C4RSfs_Ctx**(const *Npp16s* *pSrc1, int nSrc1Step, const *Npp16s* *pConstants, *Npp16s* *pDst, int nDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Four 16-bit signed short channel image add constant, scale, then clamp to saturated value.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **pConstants** – fixed size device memory array of constant values, one per channel.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiAddC_16s_C4IRSfs_Ctx**(const *Npp16s* aConstants[4], *Npp16s* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Four 16-bit signed short channel in place image add constant, scale, then clamp to saturated value.

Parameters

- **aConstants** – fixed size host memory array of constant values, one per channel.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiAddDeviceC_16s_C4IRSfs_Ctx**(const *Npp16s* *pConstants, *Npp16s* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Four 16-bit signed short channel in place image add constant, scale, then clamp to saturated value.

Parameters

- **pConstants** – fixed size device memory array of constant values, one per channel.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiAddC_16sc_C1RSfs_Ctx**(const *Npp16sc* *pSrc1, int nSrc1Step, const *Npp16sc* nConstant, *Npp16sc* *pDst, int nDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

One 16-bit signed short complex number (16-bit real, 16-bit imaginary) channel image add constant, scale, then clamp to saturated value.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **nConstant** – host memory constant.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiAddC_16sc_C1IRSfs_Ctx**(const *Npp16sc* nConstant, *Npp16sc* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

One 16-bit signed short complex number (16-bit real, 16-bit imaginary) channel in place image add constant, scale, then clamp to saturated value.

Parameters

- **nConstant** – host memory constant.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.

- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiAddC_16sc_C3RSfs_Ctx**(const *Npp16sc* *pSrc1, int nSrc1Step, const *Npp16sc* aConstants[3], *Npp16sc* *pDst, int nDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Three 16-bit signed short complex number (16-bit real, 16-bit imaginary) channel image add constant, scale, then clamp to saturated value.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **aConstants** – fixed size host memory array of constant values, one per channel.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiAddC_16sc_C3IRSfs_Ctx**(const *Npp16sc* aConstants[3], *Npp16sc* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Three 16-bit signed short complex number (16-bit real, 16-bit imaginary) channel in place image add constant, scale, then clamp to saturated value.

Parameters

- **aConstants** – fixed size host memory array of constant values, one per channel.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiAddC_16sc_AC4RSfs_Ctx**(const *Npp16sc* *pSrc1, int nSrc1Step, const *Npp16sc* aConstants[3], *Npp16sc* *pDst, int nDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Four 16-bit signed short complex number (16-bit real, 16-bit imaginary) channel with unmodified alpha image add constant, scale, then clamp to saturated value.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **aConstants** – fixed size host memory array of constant values, one per channel.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiAddC_16sc_AC4IRSfs_Ctx**(const *Npp16sc* aConstants[3], *Npp16sc* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Four 16-bit signed short complex number (16-bit real, 16-bit imaginary) channel with unmodified alpha in place image add constant, scale, then clamp to saturated value.

Parameters

- **aConstants** – fixed size host memory array of constant values, one per channel.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiAddC_32s_C1RSfs_Ctx**(const *Npp32s* *pSrc1, int nSrc1Step, const *Npp32s* nConstant, *Npp32s* *pDst, int nDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

One 32-bit signed integer channel image add constant, scale, then clamp to saturated value.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **nConstant** – host memory constant.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.

- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiAddDeviceC_32s_C1RSfs_Ctx**(const *Npp32s* *pSrc1, int nSrc1Step, const *Npp32s* *pConstant, *Npp32s* *pDst, int nDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

One 32-bit signed integer channel image add constant, scale, then clamp to saturated value.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **pConstant** – device memory constant.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiAddC_32s_C1IRSfs_Ctx**(const *Npp32s* nConstant, *Npp32s* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

One 32-bit signed integer channel in place image add constant, scale, then clamp to saturated value.

Parameters

- **nConstant** – host memory constant.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiAddDeviceC_32s_C1IRSfs_Ctx**(const *Npp32s* *pConstant, *Npp32s* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

One 32-bit signed integer channel in place image add constant, scale, then clamp to saturated value.

Parameters

- **pConstant** – device memory constant.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiAddC_32s_C3RSfs_Ctx**(const *Npp32s* *pSrc1, int nSrc1Step, const *Npp32s* aConstants[3], *Npp32s* *pDst, int nDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Three 32-bit signed integer channel image add constant, scale, then clamp to saturated value.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **aConstants** – fixed size host memory array of constant values, one per channel.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiAddDeviceC_32s_C3RSfs_Ctx**(const *Npp32s* *pSrc1, int nSrc1Step, const *Npp32s* *pConstants, *Npp32s* *pDst, int nDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Three 32-bit signed integer channel image add constant, scale, then clamp to saturated value.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **pConstants** – fixed size device memory array of constant values, one per channel.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.

- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiAddC_32s_C3IRSfs_Ctx**(const *Npp32s* aConstants[3], *Npp32s* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Three 32-bit signed integer channel in place image add constant, scale, then clamp to saturated value.

Parameters

- **aConstants** – fixed size host memory array of constant values, one per channel.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiAddDeviceC_32s_C3IRSfs_Ctx**(const *Npp32s* *pConstants, *Npp32s* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Three 32-bit signed integer channel in place image add constant, scale, then clamp to saturated value.

Parameters

- **pConstants** – fixed size device memory array of constant values, one per channel.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiAddC_32sc_C1RSfs_Ctx**(const *Npp32sc* *pSrc1, int nSrc1Step, const *Npp32sc* nConstant, *Npp32sc* *pDst, int nDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

One 32-bit signed complex integer (32-bit real, 32-bit imaginary) channel image add constant, scale, then clamp to saturated value.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **nConstant** – host memory constant.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiAddC_32sc_C1IRSfs_Ctx**(const *Npp32sc* nConstant, *Npp32sc* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

One 32-bit signed complex integer (32-bit real, 32-bit imaginary) channel in place image add constant, scale, then clamp to saturated value.

Parameters

- **nConstant** – host memory constant.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiAddC_32sc_C3RSfs_Ctx**(const *Npp32sc* *pSrc1, int nSrc1Step, const *Npp32sc* aConstants[3], *Npp32sc* *pDst, int nDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Three 32-bit signed complex integer (32-bit real, 32-bit imaginary) channel image add constant, scale, then clamp to saturated value.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **aConstants** – fixed size host memory array of constant values, one per channel.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.

- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiAddC_32sc_C3IRSfs_Ctx**(const *Npp32sc* aConstants[3], *Npp32sc* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Three 32-bit signed complex integer (32-bit real, 32-bit imaginary) channel in place image add constant, scale, then clamp to saturated value.

Parameters

- **aConstants** – fixed size host memory array of constant values, one per channel.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiAddC_32sc_AC4RSfs_Ctx**(const *Npp32sc* *pSrc1, int nSrc1Step, const *Npp32sc* aConstants[3], *Npp32sc* *pDst, int nDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Four 32-bit signed complex integer (32-bit real, 32-bit imaginary) channel with unmodified alpha image add constant, scale, then clamp to saturated value.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **aConstants** – fixed size host memory array of constant values, one per channel.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiAddC_32sc_AC4IRSfs_Ctx**(const *Npp32sc* aConstants[3], *Npp32sc* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Four 32-bit signed complex integer (32-bit real, 32-bit imaginary) channel with unmodified alpha in place image add constant, scale, then clamp to saturated value.

Parameters

- **aConstants** – fixed size host memory array of constant values, one per channel.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiAddC_16f_C1R_Ctx**(const *Npp16f* *pSrc1, int nSrc1Step, const *Npp32f* nConstant, *Npp16f* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

One 16-bit floating point channel image add constant.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **nConstant** – host memory 32-bit floating point constant.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiAddDeviceC_16f_C1R_Ctx**(const *Npp16f* *pSrc1, int nSrc1Step, const *Npp32f* *pConstant, *Npp16f* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

One 16-bit floating point channel image add constant.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **pConstant** – device memory 32-bit floating point constant.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiAddC_16f_C1IR_Ctx**(const *Npp32f* nConstant, *Npp16f* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

One 16-bit floating point channel in place image add constant.

Parameters

- **nConstant** – host memory 32-bit floating point constant.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiAddDeviceC_16f_C1IR_Ctx**(const *Npp32f* *pConstant, *Npp16f* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

One 16-bit floating point channel in place image add constant.

Parameters

- **pConstant** – device memory 32-bit floating point constant.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiAddC_16f_C3R_Ctx**(const *Npp16f* *pSrc1, int nSrc1Step, const *Npp32f* aConstants[3], *Npp16f* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Three 16-bit floating point channel image add constant.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **aConstants** – fixed size host memory array of 32-bit floating point constant values, one per channel.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiAddDeviceC_16f_C3R_Ctx**(const *Npp16f* *pSrc1, int nSrc1Step, const *Npp32f* *pConstants, *Npp16f* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Three 16-bit floating point channel image add constant.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **pConstants** – fixed size device memory array of 32-bit floating point constant values, one per channel.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiAddC_16f_C3IR_Ctx**(const *Npp32f* aConstants[3], *Npp16f* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Three 16-bit floating point channel in place image add constant.

Parameters

- **aConstants** – fixed size host memory array of 32-bit floating point constant values, one per channel.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiAddDeviceC_16f_C3IR_Ctx**(const *Npp32f* *pConstants, *Npp16f* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Three 16-bit floating point channel in place image add constant.

Parameters

- **pConstants** – fixed size device memory array of 32-bit floating point constant values, one per channel.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.

- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiAddC_16f_C4R_Ctx**(const *Npp16f* *pSrc1, int nSrc1Step, const *Npp32f* aConstants[4], *Npp16f* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four 16-bit floating point channel image add constant.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **aConstants** – fixed size host memory array of 32-bit floating point constant values, one per channel.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiAddDeviceC_16f_C4R_Ctx**(const *Npp16f* *pSrc1, int nSrc1Step, const *Npp32f* *pConstants, *Npp16f* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four 16-bit floating point channel image add constant.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **pConstants** – fixed size device memory array of 32-bit floating point constant values, one per channel.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiAddC_16f_C4IR_Ctx**(const *Npp32f* aConstants[4], *Npp16f* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four 16-bit floating point channel in place image add constant.

Parameters

- **aConstants** – fixed size host memory array of 32-bit floating point constant values, one per channel.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiAddDeviceC_16f_C4IR_Ctx**(const *Npp32f* *pConstants, *Npp16f* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four 16-bit floating point channel in place image add constant.

Parameters

- **pConstants** – fixed size device memory array of 32-bit floating point constant values, one per channel.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiAddC_32f_C1R_Ctx**(const *Npp32f* *pSrc1, int nSrc1Step, const *Npp32f* nConstant, *Npp32f* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

One 32-bit floating point channel image add constant.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **nConstant** – host memory constant.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiAddDeviceC_32f_C1R_Ctx**(const *Npp32f* *pSrc1, int nSrc1Step, const *Npp32f* *pConstant, *Npp32f* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

One 32-bit floating point channel image add constant.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **pConstant** – device memory constant.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiAddC_32f_C1IR_Ctx**(const *Npp32f* nConstant, *Npp32f* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

One 32-bit floating point channel in place image add constant.

Parameters

- **nConstant** – host memory constant.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiAddDeviceC_32f_C1IR_Ctx**(const *Npp32f* *pConstant, *Npp32f* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

One 32-bit floating point channel in place image add constant.

Parameters

- **pConstant** – device memory constant.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiAddC_32f_C3R_Ctx**(const *Npp32f* *pSrc1, int nSrc1Step, const *Npp32f* aConstants[3], *Npp32f* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Three 32-bit floating point channel image add constant.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **aConstants** – fixed size host memory array of constant values, one per channel.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiAddDeviceC_32f_C3R_Ctx**(const *Npp32f* *pSrc1, int nSrc1Step, const *Npp32f* *pConstants, *Npp32f* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Three 32-bit floating point channel image add constant.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **pConstants** – fixed size device memory array of constant values, one per channel.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiAddC_32f_C3IR_Ctx**(const *Npp32f* aConstants[3], *Npp32f* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Three 32-bit floating point channel in place image add constant.

Parameters

- **aConstants** – fixed size host memory array of constant values, one per channel.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiAddDeviceC_32f_C3IR_Ctx**(const *Npp32f* *pConstants, *Npp32f* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Three 32-bit floating point channel in place image add constant.

Parameters

- **pConstants** – fixed size device memory array of constant values, one per channel.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiAddC_32f_AC4R_Ctx**(const *Npp32f* *pSrc1, int nSrc1Step, const *Npp32f* aConstants[3], *Npp32f* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four 32-bit floating point channel with unmodified alpha image add constant.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **aConstants** – fixed size host memory array of constant values, one per channel.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiAddDeviceC_32f_AC4R_Ctx**(const *Npp32f* *pSrc1, int nSrc1Step, const *Npp32f* *pConstants, *Npp32f* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four 32-bit floating point channel with unmodified alpha image add constant.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **pConstants** – fixed size device memory array of constant values, one per channel.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.

- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiAddC_32f_AC4IR_Ctx**(const *Npp32f* aConstants[3], *Npp32f* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four 32-bit floating point channel with unmodified alpha in place image add constant.

Parameters

- **aConstants** – fixed size host memory array of constant values, one per channel.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiAddDeviceC_32f_AC4IR_Ctx**(const *Npp32f* *pConstants, *Npp32f* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four 32-bit floating point channel with unmodified alpha in place image add constant.

Parameters

- **pConstants** – fixed size device memory array of constant values, one per channel.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiAddC_32f_C4R_Ctx**(const *Npp32f* *pSrc1, int nSrc1Step, const *Npp32f* aConstants[4], *Npp32f* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four 32-bit floating point channel image add constant.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **aConstants** – fixed size host memory array of constant values, one per channel.
- **pDst** – *Destination-Image Pointer*.

- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiAddDeviceC_32f_C4R_Ctx**(const *Npp32f* *pSrc1, int nSrc1Step, const *Npp32f* *pConstants, *Npp32f* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four 32-bit floating point channel image add constant.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **pConstants** – fixed size device memory array of constant values, one per channel.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiAddC_32f_C4IR_Ctx**(const *Npp32f* aConstants[4], *Npp32f* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four 32-bit floating point channel in place image add constant.

Parameters

- **aConstants** – fixed size host memory array of constant values, one per channel.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiAddDeviceC_32f_C4IR_Ctx**(const *Npp32f* *pConstants, *Npp32f* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four 32-bit floating point channel in place image add constant.

Parameters

- **pConstants** – fixed size device memory array of constant values, one per channel.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiAddC_32fc_C1R_Ctx**(const *Npp32fc* *pSrc1, int nSrc1Step, const *Npp32fc* nConstant, *Npp32fc* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

One 32-bit complex floating point (32-bit floating point real, 32-bit floating point imaginary) channel image add constant.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **nConstant** – host memory constant.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiAddC_32fc_C1IR_Ctx**(const *Npp32fc* nConstant, *Npp32fc* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

One 32-bit complex floating point (32-bit floating point real, 32-bit floating point imaginary) channel in place image add constant.

Parameters

- **nConstant** – host memory constant.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiAddC_32fc_C3R_Ctx**(const *Npp32fc* *pSrc1, int nSrc1Step, const *Npp32fc* aConstants[3], *Npp32fc* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Three 32-bit complex floating point (32-bit floating point real, 32-bit floating point imaginary) channel image add constant.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **aConstants** – fixed size array of host memory constant values, one per channel.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiAddC_32fc_C3IR_Ctx**(const *Npp32fc* aConstants[3], *Npp32fc* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Three 32-bit complex floating point (32-bit floating point real, 32-bit floating point imaginary) channel in place image add constant.

Parameters

- **aConstants** – fixed size array of host memory constant values, one per channel.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiAddC_32fc_AC4R_Ctx**(const *Npp32fc* *pSrc1, int nSrc1Step, const *Npp32fc* aConstants[3], *Npp32fc* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four 32-bit complex floating point (32-bit floating point real, 32-bit floating point imaginary) channel with unmodified alpha image add constant.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **aConstants** – fixed size array of host memory constant values, one per channel.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.

- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiAddC_32fc_AC4IR_Ctx**(const *Npp32fc* aConstants[3], *Npp32fc* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four 32-bit complex floating point (32-bit floating point real, 32-bit floating point imaginary) channel with unmodified alpha in place image add constant.

Parameters

- **aConstants** – fixed size array of host memory constant values, one per channel.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiAddC_32fc_C4R_Ctx**(const *Npp32fc* *pSrc1, int nSrc1Step, const *Npp32fc* aConstants[4], *Npp32fc* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four 32-bit complex floating point (32-bit floating point real, 32-bit floating point imaginary) channel image add constant.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **aConstants** – fixed size array of host memory constant values, one per channel.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiAddC_32fc_C4IR_Ctx**(const *Npp32fc* aConstants[4], *Npp32fc* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four 32-bit complex floating point (32-bit floating point real, 32-bit floating point imaginary) channel in place image add constant.

Parameters

- **aConstants** – fixed size array of host memory constant values, one per channel.

- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

1.7.1.3 MulC

Multiplies each pixel of an image by a constant value.

Note: If you use one of the device constant versions of these functions and the function called immediately preceeding that function generates that device constant you MUST either call cudaStreamSynchronize() or cudaDeviceSynchronize() before calling the device constant function.

Functions

NppStatus **nppiMulC_8u_C1RSfs_Ctx**(const *Npp8u* *pSrc1, int nSrc1Step, const *Npp8u* nConstant, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

One 8-bit unsigned char channel image multiply by constant, scale, then clamp to saturated value.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **nConstant** – host memory constant.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiMulDeviceC_8u_C1RSfs_Ctx**(const *Npp8u* *pSrc1, int nSrc1Step, const *Npp8u* *pConstant, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

One 8-bit unsigned char channel image multiply by constant, scale, then clamp to saturated value.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.

- **pConstant** – device memory constant.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiMulC_8u_C1IRSfs_Ctx**(const *Npp8u* nConstant, *Npp8u* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

One 8-bit unsigned char channel in place image multiply by constant, scale, then clamp to saturated value.

Parameters

- **nConstant** – host memory constant.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiMulDeviceC_8u_C1IRSfs_Ctx**(const *Npp8u* *pConstant, *Npp8u* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

One 8-bit unsigned char channel in place image multiply by constant, scale, then clamp to saturated value.

Parameters

- **pConstant** – device memory constant.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiMulC_8u_C3RSfs_Ctx**(const *Npp8u* *pSrc1, int nSrc1Step, const *Npp8u* aConstants[3], *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Three 8-bit unsigned char channel image multiply by constant, scale, then clamp to saturated value.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **aConstants** – fixed size host memory array of constant values, one per channel.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiMulDeviceC_8u_C3RSfs_Ctx**(const *Npp8u* *pSrc1, int nSrc1Step, const *Npp8u* *pConstants, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Three 8-bit unsigned char channel image multiply by constant, scale, then clamp to saturated value.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **pConstants** – fixed size device memory array of constant values, one per channel.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiMulC_8u_C3IRSfs_Ctx**(const *Npp8u* aConstants[3], *Npp8u* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Three 8-bit unsigned char channel 8-bit unsigned char in place image multiply by constant, scale, then clamp to saturated value.

Parameters

- **aConstants** – fixed size host memory array of constant values, one per channel.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiMulDeviceC_8u_C3IRSfs_Ctx**(const *Npp8u* *pConstants, *Npp8u* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Three 8-bit unsigned char channel 8-bit unsigned char in place image multiply by constant, scale, then clamp to saturated value.

Parameters

- **pConstants** – fixed size device memory array of constant values, one per channel.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiMulC_8u_AC4RSfs_Ctx**(const *Npp8u* *pSrc1, int nSrc1Step, const *Npp8u* aConstants[3], *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Four 8-bit unsigned char channel with unmodified alpha image multiply by constant, scale, then clamp to saturated value.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **aConstants** – fixed size host memory array of constant values, one per channel.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.

- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiMulDeviceC_8u_AC4RSfs_Ctx**(const *Npp8u* *pSrc1, int nSrc1Step, const *Npp8u* *pConstants, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Four 8-bit unsigned char channel with unmodified alpha image multiply by constant, scale, then clamp to saturated value.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **pConstants** – fixed size device memory array of constant values, one per channel.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiMulC_8u_AC4IRSfs_Ctx**(const *Npp8u* aConstants[3], *Npp8u* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Four 8-bit unsigned char channel with unmodified alpha in place image multiply by constant, scale, then clamp to saturated value.

Parameters

- **aConstants** – fixed size host memory array of constant values, one per channel.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiMulDeviceC_8u_AC4IRSfs_Ctx**(const *Npp8u* *pConstants, *Npp8u* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Four 8-bit unsigned char channel with unmodified alpha in place image multiply by constant, scale, then clamp to saturated value.

Parameters

- **pConstants** – fixed size device memory array of constant values, one per channel.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiMulC_8u_C4RSfs_Ctx**(const *Npp8u* *pSrc1, int nSrc1Step, const *Npp8u* aConstants[4], *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Four 8-bit unsigned char channel image multiply by constant, scale, then clamp to saturated value.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **aConstants** – fixed size host memory array of constant values, one per channel.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiMulDeviceC_8u_C4RSfs_Ctx**(const *Npp8u* *pSrc1, int nSrc1Step, const *Npp8u* *pConstants, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Four 8-bit unsigned char channel image multiply by constant, scale, then clamp to saturated value.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **pConstants** – fixed size device memory array of constant values, one per channel.

- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiMulC_8u_C4IRSfs_Ctx**(const *Npp8u* aConstants[4], *Npp8u* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Four 8-bit unsigned char channel in place image multiply by constant, scale, then clamp to saturated value.

Parameters

- **aConstants** – fixed size host memory array of constant values, one per channel.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiMulDeviceC_8u_C4IRSfs_Ctx**(const *Npp8u* *pConstants, *Npp8u* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Four 8-bit unsigned char channel in place image multiply by constant, scale, then clamp to saturated value.

Parameters

- **pConstants** – fixed size device memory array of constant values, one per channel.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiMulC_16u_C1RSfs_Ctx**(const *Npp16u* *pSrc1, int nSrc1Step, const *Npp16u* nConstant, *Npp16u* *pDst, int nDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

One 16-bit unsigned short channel image multiply by constant, scale, then clamp to saturated value.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **nConstant** – host memory constant.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiMulDeviceC_16u_C1RSfs_Ctx**(const *Npp16u* *pSrc1, int nSrc1Step, const *Npp16u* *pConstant, *Npp16u* *pDst, int nDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

One 16-bit unsigned short channel image multiply by constant, scale, then clamp to saturated value.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **pConstant** – device memory constant.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiMulC_16u_C1IRSfs_Ctx**(const *Npp16u* nConstant, *Npp16u* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

One 16-bit unsigned short channel in place image multiply by constant, scale, then clamp to saturated value.

Parameters

- **nConstant** – host memory constant.

- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiMulDeviceC_16u_C1IRSfs_Ctx**(const *Npp16u* *pConstant, *Npp16u* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

One 16-bit unsigned short channel in place image multiply by constant, scale, then clamp to saturated value.

Parameters

- **pConstant** – device memory constant.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiMulC_16u_C3RSfs_Ctx**(const *Npp16u* *pSrc1, int nSrc1Step, const *Npp16u* aConstants[3], *Npp16u* *pDst, int nDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Three 16-bit unsigned short channel image multiply by constant, scale, then clamp to saturated value.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **aConstants** – fixed size host memory array of constant values, one per channel.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiMulDeviceC_16u_C3RSfs_Ctx**(const *Npp16u* *pSrc1, int nSrc1Step, const *Npp16u* *pConstants, *Npp16u* *pDst, int nDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Three 16-bit unsigned short channel image multiply by constant, scale, then clamp to saturated value.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **pConstants** – fixed size device memory array of constant values, one per channel.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiMulC_16u_C3IRSfs_Ctx**(const *Npp16u* aConstants[3], *Npp16u* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Three 16-bit unsigned short channel in place image multiply by constant, scale, then clamp to saturated value.

Parameters

- **aConstants** – fixed size host memory array of constant values, one per channel.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiMulDeviceC_16u_C3IRSfs_Ctx**(const *Npp16u* *pConstants, *Npp16u* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Three 16-bit unsigned short channel in place image multiply by constant, scale, then clamp to saturated value.

Parameters

- **pConstants** – fixed size device memory array of constant values, one per channel.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiMulC_16u_AC4RSfs_Ctx**(const *Npp16u* *pSrc1, int nSrc1Step, const *Npp16u* aConstants[3], *Npp16u* *pDst, int nDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Four 16-bit unsigned short channel with unmodified alpha image multiply by constant, scale, then clamp to saturated value.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **aConstants** – fixed size host memory array of constant values, one per channel.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiMulDeviceC_16u_AC4RSfs_Ctx**(const *Npp16u* *pSrc1, int nSrc1Step, const *Npp16u* *pConstants, *Npp16u* *pDst, int nDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Four 16-bit unsigned short channel with unmodified alpha image multiply by constant, scale, then clamp to saturated value.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **pConstants** – fixed size device memory array of constant values, one per channel.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.

- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiMulC_16u_AC4IRSfs_Ctx**(const *Npp16u* aConstants[3], *Npp16u* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Four 16-bit unsigned short channel with unmodified alpha in place image multiply by constant, scale, then clamp to saturated value.

Parameters

- **aConstants** – fixed size host memory array of constant values, one per channel.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiMulDeviceC_16u_AC4IRSfs_Ctx**(const *Npp16u* *pConstants, *Npp16u* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Four 16-bit unsigned short channel with unmodified alpha in place image multiply by constant, scale, then clamp to saturated value.

Parameters

- **pConstants** – fixed size device memory array of constant values, one per channel.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiMulC_16u_C4RSfs_Ctx**(const *Npp16u* *pSrc1, int nSrc1Step, const *Npp16u* aConstants[4], *Npp16u* *pDst, int nDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Four 16-bit unsigned short channel image multiply by constant, scale, then clamp to saturated value.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **aConstants** – fixed size host memory array of constant values, one per channel.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiMulDeviceC_16u_C4RSfs_Ctx**(const *Npp16u* *pSrc1, int nSrc1Step, const *Npp16u* *pConstants, *Npp16u* *pDst, int nDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Four 16-bit unsigned short channel image multiply by constant, scale, then clamp to saturated value.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **pConstants** – fixed size device memory array of constant values, one per channel.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiMulC_16u_C4IRSfs_Ctx**(const *Npp16u* aConstants[4], *Npp16u* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Four 16-bit unsigned short channel in place image multiply by constant, scale, then clamp to saturated value.

Parameters

- **aConstants** – fixed size host memory array of constant values, one per channel.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiMulDeviceC_16u_C4IRSfs_Ctx**(const *Npp16u* *pConstants, *Npp16u* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Four 16-bit unsigned short channel in place image multiply by constant, scale, then clamp to saturated value.

Parameters

- **pConstants** – fixed size device memory array of constant values, one per channel.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiMulC_16s_C1RSfs_Ctx**(const *Npp16s* *pSrc1, int nSrc1Step, const *Npp16s* nConstant, *Npp16s* *pDst, int nDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

One 16-bit signed short channel image multiply by constant, scale, then clamp to saturated value.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **nConstant** – host memory constant.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiMulDeviceC_16s_C1RSfs_Ctx**(const *Npp16s* *pSrc1, int nSrc1Step, const *Npp16s* *pConstant, *Npp16s* *pDst, int nDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

One 16-bit signed short channel image multiply by constant, scale, then clamp to saturated value.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **pConstant** – device memory constant.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiMulC_16s_C1IRSfs_Ctx**(const *Npp16s* nConstant, *Npp16s* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

One 16-bit signed short channel in place image multiply by constant, scale, then clamp to saturated value.

Parameters

- **nConstant** – host memory constant.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiMulDeviceC_16s_C1IRSfs_Ctx**(const *Npp16s* *pConstant, *Npp16s* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

One 16-bit signed short channel in place image multiply by constant, scale, then clamp to saturated value.

Parameters

- **pConstant** – device memory constant.
- **pSrcDst** – *In-Place Image Pointer*.

- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiMulC_16s_C3RSfs_Ctx**(const *Npp16s* *pSrc1, int nSrc1Step, const *Npp16s* aConstants[3], *Npp16s* *pDst, int nDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Three 16-bit signed short channel image multiply by constant, scale, then clamp to saturated value.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **aConstants** – fixed size host memory array of constant values, one per channel.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiMulDeviceC_16s_C3RSfs_Ctx**(const *Npp16s* *pSrc1, int nSrc1Step, const *Npp16s* *pConstants, *Npp16s* *pDst, int nDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Three 16-bit signed short channel image multiply by constant, scale, then clamp to saturated value.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **pConstants** – fixed size device memory array of constant values, one per channel.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiMulC_16s_C3IRSfs_Ctx**(const *Npp16s* aConstants[3], *Npp16s* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Three 16-bit signed short channel in place image multiply by constant, scale, then clamp to saturated value.

Parameters

- **aConstants** – fixed size host memory array of constant values, one per channel.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiMulDeviceC_16s_C3IRSfs_Ctx**(const *Npp16s* *pConstants, *Npp16s* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Three 16-bit signed short channel in place image multiply by constant, scale, then clamp to saturated value.

Parameters

- **pConstants** – fixed size device memory array of constant values, one per channel.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiMulC_16s_AC4RSfs_Ctx**(const *Npp16s* *pSrc1, int nSrc1Step, const *Npp16s* aConstants[3], *Npp16s* *pDst, int nDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Four 16-bit signed short channel with unmodified alpha image multiply by constant, scale, then clamp to saturated value.

Parameters

- **pSrc1** – *Source-Image Pointer*.

- **nSrc1Step** – *Source-Image Line Step*.
- **aConstants** – fixed size host memory array of constant values, one per channel.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiMulDeviceC_16s_AC4RSfs_Ctx**(const *Npp16s* *pSrc1, int nSrc1Step, const *Npp16s* *pConstants, *Npp16s* *pDst, int nDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Four 16-bit signed short channel with unmodified alpha image multiply by constant, scale, then clamp to saturated value.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **pConstants** – fixed size device memory array of constant values, one per channel.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiMulC_16s_AC4IRSfs_Ctx**(const *Npp16s* aConstants[3], *Npp16s* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Four 16-bit signed short channel with unmodified alpha in place image multiply by constant, scale, then clamp to saturated value.

Parameters

- **aConstants** – fixed size host memory array of constant values, one per channel.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.

- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiMulDeviceC_16s_AC4IRSfs_Ctx**(const *Npp16s* *pConstants, *Npp16s* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Four 16-bit signed short channel with unmodified alpha in place image multiply by constant, scale, then clamp to saturated value.

Parameters

- **pConstants** – fixed size device memory array of constant values, one per channel.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiMulC_16s_C4RSfs_Ctx**(const *Npp16s* *pSrc1, int nSrc1Step, const *Npp16s* aConstants[4], *Npp16s* *pDst, int nDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Four 16-bit signed short channel image multiply by constant, scale, then clamp to saturated value.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **aConstants** – fixed size host memory array of constant values, one per channel.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiMulDeviceC_16s_C4RSfs_Ctx**(const *Npp16s* *pSrc1, int nSrc1Step, const *Npp16s* *pConstants, *Npp16s* *pDst, int nDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Four 16-bit signed short channel image multiply by constant, scale, then clamp to saturated value.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **pConstants** – fixed size device memory array of constant values, one per channel.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiMulC_16s_C4IRSfs_Ctx**(const *Npp16s* aConstants[4], *Npp16s* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Four 16-bit signed short channel in place image multiply by constant, scale, then clamp to saturated value.

Parameters

- **aConstants** – fixed size host memory array of constant values, one per channel.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiMulDeviceC_16s_C4IRSfs_Ctx**(const *Npp16s* *pConstants, *Npp16s* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Four 16-bit signed short channel in place image multiply by constant, scale, then clamp to saturated value.

Parameters

- **pConstants** – fixed size device memory array of constant values, one per channel.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.

- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiMulC_16sc_C1RSfs_Ctx**(const *Npp16sc* *pSrc1, int nSrc1Step, const *Npp16sc* nConstant, *Npp16sc* *pDst, int nDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

One 16-bit signed short complex number (16-bit real, 16-bit imaginary) channel image multiply by constant, scale, then clamp to saturated value.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **nConstant** – host memory constant.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiMulC_16sc_C1IRSfs_Ctx**(const *Npp16sc* nConstant, *Npp16sc* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

One 16-bit signed short complex number (16-bit real, 16-bit imaginary) channel in place image multiply by constant, scale, then clamp to saturated value.

Parameters

- **nConstant** – host memory constant.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiMulC_16sc_C3RSfs_Ctx**(const *Npp16sc* *pSrc1, int nSrc1Step, const *Npp16sc* aConstants[3], *Npp16sc* *pDst, int nDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Three 16-bit signed short complex number (16-bit real, 16-bit imaginary) channel image multiply by constant, scale, then clamp to saturated value.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **aConstants** – fixed size array of host memory constant values, one per channel.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiMulC_16sc_C3IRSfs_Ctx**(const *Npp16sc* aConstants[3], *Npp16sc* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Three 16-bit signed short complex number (16-bit real, 16-bit imaginary) channel in place image multiply by constant, scale, then clamp to saturated value.

Parameters

- **aConstants** – fixed size array of host memory constant values, one per channel.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiMulC_16sc_AC4RSfs_Ctx**(const *Npp16sc* *pSrc1, int nSrc1Step, const *Npp16sc* aConstants[3], *Npp16sc* *pDst, int nDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Four 16-bit signed short complex number (16-bit real, 16-bit imaginary) channel with unmodified alpha image multiply by constant, scale, then clamp to saturated value.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **aConstants** – fixed size array of host memory constant values, one per channel.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.

- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiMulC_16sc_AC4IRSfs_Ctx**(const *Npp16sc* aConstants[3], *Npp16sc* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Four 16-bit signed short complex number (16-bit real, 16-bit imaginary) channel with unmodified alpha in place image multiply by constant, scale, then clamp to saturated value.

Parameters

- **aConstants** – fixed size array of host memory constant values, one per channel.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiMulC_32s_C1RSfs_Ctx**(const *Npp32s* *pSrc1, int nSrc1Step, const *Npp32s* nConstant, *Npp32s* *pDst, int nDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

One 32-bit signed integer channel image multiply by constant, scale, then clamp to saturated value.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **nConstant** – host memory constant.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiMulDeviceC_32s_C1RSfs_Ctx**(const *Npp32s* *pSrc1, int nSrc1Step, const *Npp32s* *pConstant, *Npp32s* *pDst, int nDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

One 32-bit signed integer channel image multiply by constant, scale, then clamp to saturated value.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **pConstant** – device memory constant.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiMulC_32s_C1IRSfs_Ctx**(const *Npp32s* nConstant, *Npp32s* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

One 32-bit signed integer channel in place image multiply by constant, scale, then clamp to saturated value.

Parameters

- **nConstant** – host memory constant.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiMulDeviceC_32s_C1IRSfs_Ctx**(const *Npp32s* *pConstant, *Npp32s* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

One 32-bit signed integer channel in place image multiply by constant, scale, then clamp to saturated value.

Parameters

- **pConstant** – device memory constant.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.

- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiMulC_32s_C3RSfs_Ctx**(const *Npp32s* *pSrc1, int nSrc1Step, const *Npp32s* aConstants[3], *Npp32s* *pDst, int nDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Three 32-bit signed integer channel image multiply by constant, scale, then clamp to saturated value.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **aConstants** – fixed size host memory array of constant values, one per channel.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiMulDeviceC_32s_C3RSfs_Ctx**(const *Npp32s* *pSrc1, int nSrc1Step, const *Npp32s* *pConstants, *Npp32s* *pDst, int nDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Three 32-bit signed integer channel image multiply by constant, scale, then clamp to saturated value.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **pConstants** – fixed size device memory array of constant values, one per channel.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiMulC_32s_C3IRSfs_Ctx**(const *Npp32s* aConstants[3], *Npp32s* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Three 32-bit signed integer channel in place image multiply by constant, scale, then clamp to saturated value.

Parameters

- **aConstants** – fixed size host memory array of constant values, one per channel.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiMulDeviceC_32s_C3IRSfs_Ctx**(const *Npp32s* *pConstants, *Npp32s* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Three 32-bit signed integer channel in place image multiply by constant, scale, then clamp to saturated value.

Parameters

- **pConstants** – fixed size device memory array of constant values, one per channel.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiMulC_32sc_C1RSfs_Ctx**(const *Npp32sc* *pSrc1, int nSrc1Step, const *Npp32sc* nConstant, *Npp32sc* *pDst, int nDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

One 32-bit signed complex integer (32-bit real, 32-bit imaginary) channel image multiply by constant, scale, then clamp to saturated value.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **nConstant** – host memory constant.

- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiMulC_32sc_C1IRSfs_Ctx**(const *Npp32sc* nConstant, *Npp32sc* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

One 32-bit signed complex integer (32-bit real, 32-bit imaginary) channel in place image multiply by constant, scale, then clamp to saturated value.

Parameters

- **nConstant** – host memory constant.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiMulC_32sc_C3RSfs_Ctx**(const *Npp32sc* *pSrc1, int nSrc1Step, const *Npp32sc* aConstants[3], *Npp32sc* *pDst, int nDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Three 32-bit signed complex integer (32-bit real, 32-bit imaginary) channel image multiply by constant, scale, then clamp to saturated value.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **aConstants** – fixed size array of host memory constant values, one per channel.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiMulC_32sc_C3IRSfs_Ctx**(const *Npp32sc* aConstants[3], *Npp32sc* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Three 32-bit signed complex integer (32-bit real, 32-bit imaginary) channel in place image multiply by constant, scale, then clamp to saturated value.

Parameters

- **aConstants** – fixed size array of host memory constant values, one per channel.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiMulC_32sc_AC4RSfs_Ctx**(const *Npp32sc* *pSrc1, int nSrc1Step, const *Npp32sc* aConstants[3], *Npp32sc* *pDst, int nDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Four 32-bit signed complex integer (32-bit real, 32-bit imaginary) channel with unmodified alpha image multiply by constant, scale, then clamp to saturated value.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **aConstants** – fixed size array of host memory constant values, one per channel.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiMulC_32sc_AC4IRSfs_Ctx**(const *Npp32sc* aConstants[3], *Npp32sc* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Four 32-bit signed complex integer (32-bit real, 32-bit imaginary) channel with unmodified alpha in place image multiply by constant, scale, then clamp to saturated value.

Parameters

- **aConstants** – fixed size array of host memory constant values, one per channel.

- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiMulC_16f_C1R_Ctx**(const *Npp16f* *pSrc1, int nSrc1Step, const *Npp32f* nConstant, *Npp16f* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

One 16-bit floating point channel image multiply by constant.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **nConstant** – 32-bit floating point host memory constant.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiMulDeviceC_16f_C1R_Ctx**(const *Npp16f* *pSrc1, int nSrc1Step, const *Npp32f* *pConstant, *Npp16f* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

One 16-bit floating point channel image multiply by constant.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **pConstant** – 32-bit floating point device memory constant.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiMulC_16f_C1IR_Ctx**(const *Npp32f* nConstant, *Npp16f* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

One 16-bit floating point channel in place image multiply by constant.

Parameters

- **nConstant** – 32-bit floating point host memory constant.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiMulDeviceC_16f_C1IR_Ctx**(const *Npp32f* *pConstant, *Npp16f* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

One 16-bit floating point channel in place image multiply by constant.

Parameters

- **pConstant** – 32-bit floating point device memory constant.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiMulC_16f_C3R_Ctx**(const *Npp16f* *pSrc1, int nSrc1Step, const *Npp32f* aConstants[3], *Npp16f* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Three 16-bit floating point channel image multiply by constant.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **aConstants** – fixed size host memory array of 32-bit floating point constant values, one per channel.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiMulDeviceC_16f_C3R_Ctx**(const *Npp16f* *pSrc1, int nSrc1Step, const *Npp32f* *pConstants, *Npp16f* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Three 16-bit floating point channel image multiply by constant.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **pConstants** – fixed size device memory array of 32-bit floating point constant values, one per channel.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiMulC_16f_C3IR_Ctx**(const *Npp32f* aConstants[3], *Npp16f* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Three 16-bit floating point channel in place image multiply by constant.

Parameters

- **aConstants** – fixed size host memory array of 32-bit floating point constant values, one per channel.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiMulDeviceC_16f_C3IR_Ctx**(const *Npp32f* *pConstants, *Npp16f* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Three 16-bit floating point channel in place image multiply by constant.

Parameters

- **pConstants** – fixed size device memory array of 32-bit floating point constant values, one per channel.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.

- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiMulC_16f_C4R_Ctx**(const *Npp16f* *pSrc1, int nSrc1Step, const *Npp32f* aConstants[4], *Npp16f* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four 16-bit floating point channel image multiply by constant.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **aConstants** – fixed size host memory array of 32-bit floating point constant values, one per channel.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiMulDeviceC_16f_C4R_Ctx**(const *Npp16f* *pSrc1, int nSrc1Step, const *Npp32f* *pConstants, *Npp16f* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four 16-bit floating point channel image multiply by constant.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **pConstants** – fixed size device memory array of 32-bit floating point constant values, one per channel.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiMulC_16f_C4IR_Ctx**(const *Npp32f* aConstants[4], *Npp16f* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four 16-bit floating point channel in place image multiply by constant.

Parameters

- **aConstants** – fixed size host memory array of 32-bit floating point constant values, one per channel.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiMulDeviceC_16f_C4IR_Ctx**(const *Npp32f* *pConstants, *Npp16f* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four 16-bit floating point channel in place image multiply by constant.

Parameters

- **pConstants** – fixed size device memory array of 32-bit floating point constant values, one per channel.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiMulC_32f_C1R_Ctx**(const *Npp32f* *pSrc1, int nSrc1Step, const *Npp32f* nConstant, *Npp32f* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

One 32-bit floating point channel image multiply by constant.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **nConstant** – host memory constant.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiMulDeviceC_32f_C1R_Ctx**(const *Npp32f* *pSrc1, int nSrc1Step, const *Npp32f* *pConstant, *Npp32f* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

One 32-bit floating point channel image multiply by constant.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **pConstant** – device memory constant.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiMulC_32f_C1IR_Ctx**(const *Npp32f* nConstant, *Npp32f* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

One 32-bit floating point channel in place image multiply by constant.

Parameters

- **nConstant** – host memory constant.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiMulDeviceC_32f_C1IR_Ctx**(const *Npp32f* *pConstant, *Npp32f* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

One 32-bit floating point channel in place image multiply by constant.

Parameters

- **pConstant** – device memory constant.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiMulC_32f_C3R_Ctx**(const *Npp32f* *pSrc1, int nSrc1Step, const *Npp32f* aConstants[3], *Npp32f* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Three 32-bit floating point channel image multiply by constant.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **aConstants** – fixed size host memory array of constant values, one per channel.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiMulDeviceC_32f_C3R_Ctx**(const *Npp32f* *pSrc1, int nSrc1Step, const *Npp32f* *pConstants, *Npp32f* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Three 32-bit floating point channel image multiply by constant.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **pConstants** – fixed size device memory array of constant values, one per channel.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiMulC_32f_C3IR_Ctx**(const *Npp32f* aConstants[3], *Npp32f* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Three 32-bit floating point channel in place image multiply by constant.

Parameters

- **aConstants** – fixed size host memory array of constant values, one per channel.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiMulDeviceC_32f_C3IR_Ctx**(const *Npp32f* *pConstants, *Npp32f* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Three 32-bit floating point channel in place image multiply by constant.

Parameters

- **pConstants** – fixed size device memory array of constant values, one per channel.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiMulC_32f_AC4R_Ctx**(const *Npp32f* *pSrc1, int nSrc1Step, const *Npp32f* aConstants[3], *Npp32f* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four 32-bit floating point channel with unmodified alpha image multiply by constant.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **aConstants** – fixed size host memory array of constant values, one per channel.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiMulDeviceC_32f_AC4R_Ctx**(const *Npp32f* *pSrc1, int nSrc1Step, const *Npp32f* *pConstants, *Npp32f* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four 32-bit floating point channel with unmodified alpha image multiply by constant.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **pConstants** – fixed size device memory array of constant values, one per channel.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.

- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiMulC_32f_AC4IR_Ctx**(const *Npp32f* aConstants[3], *Npp32f* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four 32-bit floating point channel with unmodified alpha in place image multiply by constant.

Parameters

- **aConstants** – fixed size host memory array of constant values, one per channel.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiMulDeviceC_32f_AC4IR_Ctx**(const *Npp32f* *pConstants, *Npp32f* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four 32-bit floating point channel with unmodified alpha in place image multiply by constant.

Parameters

- **pConstants** – fixed size device memory array of constant values, one per channel.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiMulC_32f_C4R_Ctx**(const *Npp32f* *pSrc1, int nSrc1Step, const *Npp32f* aConstants[4], *Npp32f* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four 32-bit floating point channel image multiply by constant.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **aConstants** – fixed size host memory array of constant values, one per channel.
- **pDst** – *Destination-Image Pointer*.

- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiMulDeviceC_32f_C4R_Ctx**(const *Npp32f* *pSrc1, int nSrc1Step, const *Npp32f* *pConstants, *Npp32f* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four 32-bit floating point channel image multiply by constant.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **pConstants** – fixed size device memory array of constant values, one per channel.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiMulC_32f_C4IR_Ctx**(const *Npp32f* aConstants[4], *Npp32f* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four 32-bit floating point channel in place image multiply by constant.

Parameters

- **aConstants** – fixed size host memory array of constant values, one per channel.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiMulDeviceC_32f_C4IR_Ctx**(const *Npp32f* *pConstants, *Npp32f* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four 32-bit floating point channel in place image multiply by constant.

Parameters

- **pConstants** – fixed size device memory array of constant values, one per channel.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiMulC_32fc_C1R_Ctx**(const *Npp32fc* *pSrc1, int nSrc1Step, const *Npp32fc* nConstant, *Npp32fc* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

One 32-bit complex floating point (32-bit floating point real, 32-bit floating point imaginary) channel image multiply by constant.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **nConstant** – host memory constant.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiMulC_32fc_C1IR_Ctx**(const *Npp32fc* nConstant, *Npp32fc* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

One 32-bit complex floating point (32-bit floating point real, 32-bit floating point imaginary) channel in place image multiply by constant.

Parameters

- **nConstant** – host memory constant.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiMulC_32fc_C3R_Ctx**(const *Npp32fc* *pSrc1, int nSrc1Step, const *Npp32fc* aConstants[3], *Npp32fc* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Three 32-bit complex floating point (32-bit floating point real, 32-bit floating point imaginary) channel image multiply by constant.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **aConstants** – fixed size array of host memory constant values, one per channel.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiMulC_32fc_C3IR_Ctx**(const *Npp32fc* aConstants[3], *Npp32fc* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Three 32-bit complex floating point (32-bit floating point real, 32-bit floating point imaginary) channel in place image multiply by constant.

Parameters

- **aConstants** – fixed size array of host memory constant values, one per channel.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiMulC_32fc_AC4R_Ctx**(const *Npp32fc* *pSrc1, int nSrc1Step, const *Npp32fc* aConstants[3], *Npp32fc* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four 32-bit complex floating point (32-bit floating point real, 32-bit floating point imaginary) channel with unmodified alpha image multiply by constant.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **aConstants** – fixed size array of host memory constant values, one per channel.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.

- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiMulC_32fc_AC4IR_Ctx**(const *Npp32fc* aConstants[3], *Npp32fc* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four 32-bit complex floating point (32-bit floating point real, 32-bit floating point imaginary) channel with unmodified alpha in place image multiply by constant.

Parameters

- **aConstants** – fixed size array of host memory constant values, one per channel.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiMulC_32fc_C4R_Ctx**(const *Npp32fc* *pSrc1, int nSrc1Step, const *Npp32fc* aConstants[4], *Npp32fc* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four 32-bit complex floating point (32-bit floating point real, 32-bit floating point imaginary) channel image multiply by constant.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **aConstants** – fixed size array of host memory constant values, one per channel.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiMulC_32fc_C4IR_Ctx**(const *Npp32fc* aConstants[4], *Npp32fc* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four 32-bit complex floating point (32-bit floating point real, 32-bit floating point imaginary) channel in place image multiply by constant.

Parameters

- **aConstants** – fixed size array of host memory constant values, one per channel.

- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

1.7.1.4 MulCScale

Multiplies each pixel of an image by a constant value then scales the result by the maximum value for the data bit width.

Note: If you use one of the device constant versions of these functions and the function called immediately preceeding that function generates that device constant you MUST either call cudaStreamSynchronize() or cudaDeviceSynchronize() before calling the device constant function.

Functions

NppStatus **nppiMulCScale_8u_C1R_Ctx**(const *Npp8u* *pSrc1, int nSrc1Step, const *Npp8u* nConstant, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

One 8-bit unsigned char channel image multiply by constant and scale by max bit width value.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **nConstant** – host memory constant.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiMulDeviceCScale_8u_C1R_Ctx**(const *Npp8u* *pSrc1, int nSrc1Step, const *Npp8u* *pConstant, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

One 8-bit unsigned char channel image multiply by constant and scale by max bit width value.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **pConstant** – device memory constant.

- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiMulCScale_8u_C1IR_Ctx**(const *Npp8u* nConstant, *Npp8u* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

One 8-bit unsigned char channel in place image multiply by constant and scale by max bit width value.

Parameters

- **nConstant** – host memory constant.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiMulDeviceCScale_8u_C1IR_Ctx**(const *Npp8u* *pConstant, *Npp8u* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

One 8-bit unsigned char channel in place image multiply by constant and scale by max bit width value.

Parameters

- **pConstant** – device memory constant.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiMulCScale_8u_C3R_Ctx**(const *Npp8u* *pSrc1, int nSrc1Step, const *Npp8u* aConstants[3], *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Three 8-bit unsigned char channel image multiply by constant and scale by max bit width value.

Parameters

- **pSrc1** – *Source-Image Pointer*.

- **nSrc1Step** – *Source-Image Line Step*.
- **aConstants** – fixed size host memory array of constant values, one per channel.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiMulDeviceCScale_8u_C3R_Ctx**(const *Npp8u* *pSrc1, int nSrc1Step, const *Npp8u* *pConstants, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Three 8-bit unsigned char channel image multiply by constant and scale by max bit width value.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **pConstants** – fixed size device memory array of constant values, one per channel.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiMulCScale_8u_C3IR_Ctx**(const *Npp8u* aConstants[3], *Npp8u* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Three 8-bit unsigned char channel 8-bit unsigned char in place image multiply by constant and scale by max bit width value.

Parameters

- **aConstants** – fixed size host memory array of constant values, one per channel.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiMulDeviceCScale_8u_C3IR_Ctx**(const *Npp8u* *pConstants, *Npp8u* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Three 8-bit unsigned char channel 8-bit unsigned char in place image multiply by constant and scale by max bit width value.

Parameters

- **pConstants** – fixed size device memory array of constant values, one per channel.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiMulCScale_8u_AC4R_Ctx**(const *Npp8u* *pSrc1, int nSrc1Step, const *Npp8u* aConstants[3], *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four 8-bit unsigned char channel with unmodified alpha image multiply by constant and scale by max bit width value.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **aConstants** – fixed size host memory array of constant values, one per channel.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiMulDeviceCScale_8u_AC4R_Ctx**(const *Npp8u* *pSrc1, int nSrc1Step, const *Npp8u* *pConstants, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four 8-bit unsigned char channel with unmodified alpha image multiply by constant and scale by max bit width value.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.

- **pConstants** – fixed size device memory array of constant values, one per channel.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiMulCScale_8u_AC4IR_Ctx**(const *Npp8u* aConstants[3], *Npp8u* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four 8-bit unsigned char channel with unmodified alpha in place image multiply by constant, scale and scale by max bit width value.

Parameters

- **aConstants** – fixed size host memory array of constant values, one per channel.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiMulDeviceCScale_8u_AC4IR_Ctx**(const *Npp8u* *pConstants, *Npp8u* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four 8-bit unsigned char channel with unmodified alpha in place image multiply by constant, scale and scale by max bit width value.

Parameters

- **pConstants** – fixed size device memory array of constant values, one per channel.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiMulCScale_8u_C4R_Ctx**(const *Npp8u* *pSrc1, int nSrc1Step, const *Npp8u* aConstants[4], *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four 8-bit unsigned char channel image multiply by constant and scale by max bit width value.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **aConstants** – fixed size host memory array of constant values, one per channel.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiMulDeviceCScale_8u_C4R_Ctx**(const *Npp8u* *pSrc1, int nSrc1Step, const *Npp8u* *pConstants, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four 8-bit unsigned char channel image multiply by constant and scale by max bit width value.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **pConstants** – fixed size device memory array of constant values, one per channel.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiMulCScale_8u_C4IR_Ctx**(const *Npp8u* aConstants[4], *Npp8u* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four 8-bit unsigned char channel in place image multiply by constant and scale by max bit width value.

Parameters

- **aConstants** – fixed size host memory array of constant values, one per channel.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiMulDeviceCScale_8u_C4IR_Ctx**(const *Npp8u* *pConstants, *Npp8u* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four 8-bit unsigned char channel in place image multiply by constant and scale by max bit width value.

Parameters

- **pConstants** – fixed size device memory array of constant values, one per channel.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiMulCScale_16u_C1R_Ctx**(const *Npp16u* *pSrc1, int nSrc1Step, const *Npp16u* nConstant, *Npp16u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

One 16-bit unsigned short channel image multiply by constant and scale by max bit width value.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **nConstant** – host memory constant.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiMulDeviceCScale_16u_C1R_Ctx**(const *Npp16u* *pSrc1, int nSrc1Step, const *Npp16u* *pConstant, *Npp16u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

One 16-bit unsigned short channel image multiply by constant and scale by max bit width value.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.

- **pConstant** – device memory constant.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiMulCScale_16u_C1IR_Ctx**(const *Npp16u* nConstant, *Npp16u* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

One 16-bit unsigned short channel in place image multiply by constant and scale by max bit width value.

Parameters

- **nConstant** – host memory constant.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiMulDeviceCScale_16u_C1IR_Ctx**(const *Npp16u* *pConstant, *Npp16u* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

One 16-bit unsigned short channel in place image multiply by constant and scale by max bit width value.

Parameters

- **pConstant** – device memory constant.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiMulCScale_16u_C3R_Ctx**(const *Npp16u* *pSrc1, int nSrc1Step, const *Npp16u* aConstants[3], *Npp16u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Three 16-bit unsigned short channel image multiply by constant and scale by max bit width value.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **aConstants** – fixed size host memory array of constant values, one per channel.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiMulDeviceCScale_16u_C3R_Ctx**(const *Npp16u* *pSrc1, int nSrc1Step, const *Npp16u* *pConstants, *Npp16u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Three 16-bit unsigned short channel image multiply by constant and scale by max bit width value.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **pConstants** – fixed size device memory array of constant values, one per channel.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiMulCScale_16u_C3IR_Ctx**(const *Npp16u* aConstants[3], *Npp16u* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Three 16-bit unsigned short channel in place image multiply by constant and scale by max bit width value.

Parameters

- **aConstants** – fixed size host memory array of constant values, one per channel.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiMulDeviceCScale_16u_C3IR_Ctx**(const *Npp16u* *pConstants, *Npp16u* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Three 16-bit unsigned short channel in place image multiply by constant and scale by max bit width value.

Parameters

- **pConstants** – fixed size device memory array of constant values, one per channel.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiMulCScale_16u_AC4R_Ctx**(const *Npp16u* *pSrc1, int nSrc1Step, const *Npp16u* aConstants[3], *Npp16u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four 16-bit unsigned short channel with unmodified alpha image multiply by constant and scale by max bit width value.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **aConstants** – fixed size host memory array of constant values, one per channel.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiMulDeviceCScale_16u_AC4R_Ctx**(const *Npp16u* *pSrc1, int nSrc1Step, const *Npp16u* *pConstants, *Npp16u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four 16-bit unsigned short channel with unmodified alpha image multiply by constant and scale by max bit width value.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.

- **pConstants** – fixed size device memory array of constant values, one per channel.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiMulCScale_16u_AC4IR_Ctx**(const *Npp16u* aConstants[3], *Npp16u* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four 16-bit unsigned short channel with unmodified alpha in place image multiply by constant and scale by max bit width value.

Parameters

- **aConstants** – fixed size host memory array of constant values, one per channel.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiMulDeviceCScale_16u_AC4IR_Ctx**(const *Npp16u* *pConstants, *Npp16u* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four 16-bit unsigned short channel with unmodified alpha in place image multiply by constant and scale by max bit width value.

Parameters

- **pConstants** – fixed size device memory array of constant values, one per channel.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiMulCScale_16u_C4R_Ctx**(const *Npp16u* *pSrc1, int nSrc1Step, const *Npp16u* aConstants[4], *Npp16u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four 16-bit unsigned short channel image multiply by constant and scale by max bit width value.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **aConstants** – fixed size host memory array of constant values, one per channel.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiMulDeviceCScale_16u_C4R_Ctx**(const *Npp16u* *pSrc1, int nSrc1Step, const *Npp16u* *pConstants, *Npp16u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four 16-bit unsigned short channel image multiply by constant and scale by max bit width value.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **pConstants** – fixed size device memory array of constant values, one per channel.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiMulCScale_16u_C4IR_Ctx**(const *Npp16u* aConstants[4], *Npp16u* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four 16-bit unsigned short channel in place image multiply by constant and scale by max bit width value.

Parameters

- **aConstants** – fixed size host memory array of constant values, one per channel.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiMulDeviceCScale_16u_C4IR_Ctx**(const *Npp16u* *pConstants, *Npp16u* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four 16-bit unsigned short channel in place image multiply by constant and scale by max bit width value.

Parameters

- **pConstants** – fixed size device memory array of constant values, one per channel.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

1.7.1.5 SubC

Subtracts a constant value from each pixel of an image.

Note: If you use one of the device constant versions of these functions and the function called immediately preceeding that function generates that device constant you MUST either call cudaStreamSynchronize() or cudaDeviceSynchronize() before calling the device constant function.

Functions

NppStatus **nppiSubC_8u_C1RSfs_Ctx**(const *Npp8u* *pSrc1, int nSrc1Step, const *Npp8u* nConstant, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

One 8-bit unsigned char channel image subtract constant, scale, then clamp to saturated value.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **nConstant** – host memory constant.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiSubDeviceC_8u_C1RSfs_Ctx**(const *Npp8u* *pSrc1, int nSrc1Step, const *Npp8u* *pConstant, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

One 8-bit unsigned char channel image subtract constant, scale, then clamp to saturated value.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **pConstant** – device memory constant.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiSubC_8u_C1IRSfs_Ctx**(const *Npp8u* nConstant, *Npp8u* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

One 8-bit unsigned char channel in place image subtract constant, scale, then clamp to saturated value.

Parameters

- **nConstant** – host memory constant.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiSubDeviceC_8u_C1IRSfs_Ctx**(const *Npp8u* *pConstant, *Npp8u* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

One 8-bit unsigned char channel in place image subtract constant, scale, then clamp to saturated value.

Parameters

- **pConstant** – device memory constant.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiSubC_8u_C3RSfs_Ctx**(const *Npp8u* *pSrc1, int nSrc1Step, const *Npp8u* aConstants[3], *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Three 8-bit unsigned char channel image subtract constant, scale, then clamp to saturated value.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **aConstants** – fixed size host memory array of constant values, one per channel.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiSubDeviceC_8u_C3RSfs_Ctx**(const *Npp8u* *pSrc1, int nSrc1Step, const *Npp8u* *pConstants, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Three 8-bit unsigned char channel image subtract constant, scale, then clamp to saturated value.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **pConstants** – fixed size device memory array of constant values, one per channel.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.

- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiSubC_8u_C3IRSfs_Ctx**(const *Npp8u* aConstants[3], *Npp8u* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Three 8-bit unsigned char channel 8-bit unsigned char in place image subtract constant, scale, then clamp to saturated value.

Parameters

- **aConstants** – fixed size host memory array of constant values, one per channel.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiSubDeviceC_8u_C3IRSfs_Ctx**(const *Npp8u* *pConstants, *Npp8u* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Three 8-bit unsigned char channel 8-bit unsigned char in place image subtract constant, scale, then clamp to saturated value.

Parameters

- **pConstants** – fixed size device memory array of constant values, one per channel.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiSubC_8u_AC4RSfs_Ctx**(const *Npp8u* *pSrc1, int nSrc1Step, const *Npp8u* aConstants[3], *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Four 8-bit unsigned char channel with unmodified alpha image subtract constant, scale, then clamp to saturated value.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **aConstants** – fixed size host memory array of constant values, one per channel.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiSubDeviceC_8u_AC4RSfs_Ctx**(const *Npp8u* *pSrc1, int nSrc1Step, const *Npp8u* *pConstants, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Four 8-bit unsigned char channel with unmodified alpha image subtract constant, scale, then clamp to saturated value.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **pConstants** – fixed size device memory array of constant values, one per channel.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiSubC_8u_AC4IRSfs_Ctx**(const *Npp8u* aConstants[3], *Npp8u* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Four 8-bit unsigned char channel with unmodified alpha in place image subtract constant, scale, then clamp to saturated value.

Parameters

- **aConstants** – fixed size host memory array of constant values, one per channel.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.

- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiSubDeviceC_8u_AC4IRSfs_Ctx**(const *Npp8u* *pConstants, *Npp8u* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Four 8-bit unsigned char channel with unmodified alpha in place image subtract constant, scale, then clamp to saturated value.

Parameters

- **pConstants** – fixed size device memory array of constant values, one per channel.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiSubC_8u_C4RSfs_Ctx**(const *Npp8u* *pSrc1, int nSrc1Step, const *Npp8u* aConstants[4], *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Four 8-bit unsigned char channel image subtract constant, scale, then clamp to saturated value.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **aConstants** – fixed size host memory array of constant values, one per channel.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiSubDeviceC_8u_C4RSfs_Ctx**(const *Npp8u* *pSrc1, int nSrc1Step, const *Npp8u* *pConstants, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Four 8-bit unsigned char channel image subtract constant, scale, then clamp to saturated value.

Parameters

- **pSrc1** – *Source-Image Pointer*.
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- **pDst** – *Destination-Image Pointer*.
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- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiSubC_8u_C4IRSfs_Ctx**(const *Npp8u* aConstants[4], *Npp8u* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Four 8-bit unsigned char channel in place image subtract constant, scale, then clamp to saturated value.

Parameters

- **aConstants** – fixed size host memory array of constant values, one per channel.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
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Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiSubDeviceC_8u_C4IRSfs_Ctx**(const *Npp8u* *pConstants, *Npp8u* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Four 8-bit unsigned char channel in place image subtract constant, scale, then clamp to saturated value.

Parameters

- **pConstants** – fixed size device memory array of constant values, one per channel.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.

- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiSubC_16u_C1RSfs_Ctx**(const *Npp16u* *pSrc1, int nSrc1Step, const *Npp16u* nConstant, *Npp16u* *pDst, int nDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

One 16-bit unsigned short channel image subtract constant, scale, then clamp to saturated value.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **nConstant** – host memory constant.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
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Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiSubDeviceC_16u_C1RSfs_Ctx**(const *Npp16u* *pSrc1, int nSrc1Step, const *Npp16u* *pConstant, *Npp16u* *pDst, int nDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

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Image Data Related Error Codes, *ROI Related Error Codes*.

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One 16-bit unsigned short channel in place image subtract constant, scale, then clamp to saturated value.

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NppStatus **nppiSubDeviceC_16u_C1IRSfs_Ctx**(const *Npp16u* *pConstant, *Npp16u* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

One 16-bit unsigned short channel in place image subtract constant, scale, then clamp to saturated value.

Parameters

- **pConstant** – device memory constant.
- **pSrcDst** – *In-Place Image Pointer*.
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- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiSubC_16u_C3RSfs_Ctx**(const *Npp16u* *pSrc1, int nSrc1Step, const *Npp16u* aConstants[3], *Npp16u* *pDst, int nDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Three 16-bit unsigned short channel image subtract constant, scale, then clamp to saturated value.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **aConstants** – fixed size host memory array of constant values, one per channel.

- **pDst** – *Destination-Image Pointer*.
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Image Data Related Error Codes, *ROI Related Error Codes*.

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Three 16-bit unsigned short channel in place image subtract constant, scale, then clamp to saturated value.

Parameters

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- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiSubC_16u_AC4RSfs_Ctx**(const *Npp16u* *pSrc1, int nSrc1Step, const *Npp16u* aConstants[3], *Npp16u* *pDst, int nDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Four 16-bit unsigned short channel with unmodified alpha image subtract constant, scale, then clamp to saturated value.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **aConstants** – fixed size host memory array of constant values, one per channel.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
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Image Data Related Error Codes, *ROI Related Error Codes*.

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Four 16-bit unsigned short channel in place image subtract constant, scale, then clamp to saturated value.

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Four 16-bit unsigned short channel in place image subtract constant, scale, then clamp to saturated value.

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- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiSubC_16s_C1RSfs_Ctx**(const *Npp16s* *pSrc1, int nSrc1Step, const *Npp16s* nConstant, *Npp16s* *pDst, int nDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

One 16-bit signed short channel image subtract constant, scale, then clamp to saturated value.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **nConstant** – host memory constant.
- **pDst** – *Destination-Image Pointer*.

- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

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One 16-bit signed short channel in place image subtract constant, scale, then clamp to saturated value.

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- **nConstant** – host memory constant.
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Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiSubDeviceC_16s_C1IRSfs_Ctx**(const *Npp16s* *pConstant, *Npp16s* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

One 16-bit signed short channel in place image subtract constant, scale, then clamp to saturated value.

Parameters

- **pConstant** – device memory constant.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiSubC_16s_C3RSfs_Ctx**(const *Npp16s* *pSrc1, int nSrc1Step, const *Npp16s* aConstants[3], *Npp16s* *pDst, int nDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Three 16-bit signed short channel image subtract constant, scale, then clamp to saturated value.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **aConstants** – fixed size host memory array of constant values, one per channel.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
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- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiSubDeviceC_16s_C3RSfs_Ctx**(const *Npp16s* *pSrc1, int nSrc1Step, const *Npp16s* *pConstants, *Npp16s* *pDst, int nDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Three 16-bit signed short channel image subtract constant, scale, then clamp to saturated value.

Parameters

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- **nSrc1Step** – *Source-Image Line Step*.

- **pConstants** – fixed size device memory array of constant values, one per channel.
- **pDst** – *Destination-Image Pointer*.
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NppStatus **nppiSubC_16s_AC4RSfs_Ctx**(const *Npp16s* *pSrc1, int nSrc1Step, const *Npp16s* aConstants[3], *Npp16s* *pDst, int nDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Four 16-bit signed short channel with unmodified alpha image subtract constant, scale, then clamp to saturated value.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **aConstants** – fixed size host memory array of constant values, one per channel.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiSubDeviceC_16s_AC4RSfs_Ctx**(const *Npp16s* *pSrc1, int nSrc1Step, const *Npp16s* *pConstants, *Npp16s* *pDst, int nDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Four 16-bit signed short channel with unmodified alpha image subtract constant, scale, then clamp to saturated value.

Parameters

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Image Data Related Error Codes, *ROI Related Error Codes*.

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Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiSubDeviceC_16s_AC4IRSfs_Ctx**(const *Npp16s* *pConstants, *Npp16s* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Four 16-bit signed short channel with unmodified alpha in place image subtract constant, scale, then clamp to saturated value.

Parameters

- **pConstants** – fixed size device memory array of constant values, one per channel.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiSubC_16s_C4RSfs_Ctx**(const *Npp16s* *pSrc1, int nSrc1Step, const *Npp16s* aConstants[4], *Npp16s* *pDst, int nDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Four 16-bit signed short channel image subtract constant, scale, then clamp to saturated value.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **aConstants** – fixed size host memory array of constant values, one per channel.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.

- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiSubDeviceC_16s_C4RSfs_Ctx**(const *Npp16s* *pSrc1, int nSrc1Step, const *Npp16s* *pConstants, *Npp16s* *pDst, int nDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Four 16-bit signed short channel image subtract constant, scale, then clamp to saturated value.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **pConstants** – fixed size device memory array of constant values, one per channel.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiSubC_16s_C4IRSfs_Ctx**(const *Npp16s* aConstants[4], *Npp16s* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Four 16-bit signed short channel in place image subtract constant, scale, then clamp to saturated value.

Parameters

- **aConstants** – fixed size host memory array of constant values, one per channel.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiSubDeviceC_16s_C4IRSfs_Ctx**(const *Npp16s* *pConstants, *Npp16s* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Four 16-bit signed short channel in place image subtract constant, scale, then clamp to saturated value.

Parameters

- **pConstants** – fixed size device memory array of constant values, one per channel.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiSubC_16sc_C1RSfs_Ctx**(const *Npp16sc* *pSrc1, int nSrc1Step, const *Npp16sc* nConstant, *Npp16sc* *pDst, int nDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

One 16-bit signed short complex number (16-bit real, 16-bit imaginary) channel image subtract constant, scale, then clamp to saturated value.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **nConstant** – host memory constant.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiSubC_16sc_C1IRSfs_Ctx**(const *Npp16sc* nConstant, *Npp16sc* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

One 16-bit signed short complex number (16-bit real, 16-bit imaginary) channel in place image subtract constant, scale, then clamp to saturated value.

Parameters

- **nConstant** – host memory constant.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.

- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiSubC_16sc_C3RSfs_Ctx**(const *Npp16sc* *pSrc1, int nSrc1Step, const *Npp16sc* aConstants[3], *Npp16sc* *pDst, int nDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Three 16-bit signed short complex number (16-bit real, 16-bit imaginary) channel image subtract constant, scale, then clamp to saturated value.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **aConstants** – fixed size array of host memory constant values, one per channel.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiSubC_16sc_C3IRSfs_Ctx**(const *Npp16sc* aConstants[3], *Npp16sc* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Three 16-bit signed short complex number (16-bit real, 16-bit imaginary) channel in place image subtract constant, scale, then clamp to saturated value.

Parameters

- **aConstants** – fixed size array of host memory constant values, one per channel.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiSubC_16sc_AC4RSfs_Ctx**(const *Npp16sc* *pSrc1, int nSrc1Step, const *Npp16sc* aConstants[3], *Npp16sc* *pDst, int nDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Four 16-bit signed short complex number (16-bit real, 16-bit imaginary) channel with unmodified alpha image subtract constant, scale, then clamp to saturated value.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **aConstants** – fixed size array of host memory constant values, one per channel.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiSubC_16sc_AC4IRSfs_Ctx**(const *Npp16sc* aConstants[3], *Npp16sc* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Four 16-bit signed short complex number (16-bit real, 16-bit imaginary) channel with unmodified alpha in place image subtract constant, scale, then clamp to saturated value.

Parameters

- **aConstants** – fixed size array of host memory constant values, one per channel.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiSubC_32s_C1RSfs_Ctx**(const *Npp32s* *pSrc1, int nSrc1Step, const *Npp32s* nConstant, *Npp32s* *pDst, int nDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

One 32-bit signed integer channel image subtract constant, scale, then clamp to saturated value.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **nConstant** – host memory constant.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.

- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiSubDeviceC_32s_C1RSfs_Ctx**(const *Npp32s* *pSrc1, int nSrc1Step, const *Npp32s* *pConstant, *Npp32s* *pDst, int nDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

One 32-bit signed integer channel image subtract constant, scale, then clamp to saturated value.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **pConstant** – device memory constant.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiSubC_32s_C1IRSfs_Ctx**(const *Npp32s* nConstant, *Npp32s* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

One 32-bit signed integer channel in place image subtract constant, scale, then clamp to saturated value.

Parameters

- **nConstant** – host memory constant.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiSubDeviceC_32s_C1IRSfs_Ctx**(const *Npp32s* *pConstant, *Npp32s* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

One 32-bit signed integer channel in place image subtract constant, scale, then clamp to saturated value.

Parameters

- **pConstant** – device memory constant.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiSubC_32s_C3RSfs_Ctx**(const *Npp32s* *pSrc1, int nSrc1Step, const *Npp32s* aConstants[3], *Npp32s* *pDst, int nDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Three 32-bit signed integer channel image subtract constant, scale, then clamp to saturated value.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **aConstants** – fixed size host memory array of constant values, one per channel.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiSubDeviceC_32s_C3RSfs_Ctx**(const *Npp32s* *pSrc1, int nSrc1Step, const *Npp32s* *pConstants, *Npp32s* *pDst, int nDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Three 32-bit signed integer channel image subtract constant, scale, then clamp to saturated value.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **pConstants** – fixed size device memory array of constant values, one per channel.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.

- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiSubC_32s_C3IRSfs_Ctx**(const *Npp32s* aConstants[3], *Npp32s* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Three 32-bit signed integer channel in place image subtract constant, scale, then clamp to saturated value.

Parameters

- **aConstants** – fixed size host memory array of constant values, one per channel.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiSubDeviceC_32s_C3IRSfs_Ctx**(const *Npp32s* *pConstants, *Npp32s* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Three 32-bit signed integer channel in place image subtract constant, scale, then clamp to saturated value.

Parameters

- **pConstants** – fixed size device memory array of constant values, one per channel.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiSubC_32sc_C1RSfs_Ctx**(const *Npp32sc* *pSrc1, int nSrc1Step, const *Npp32sc* nConstant, *Npp32sc* *pDst, int nDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

One 32-bit signed complex integer (32-bit real, 32-bit imaginary) channel image subtract constant, scale, then clamp to saturated value.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **nConstant** – host memory constant.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiSubC_32sc_C1IRSfs_Ctx**(const *Npp32sc* nConstant, *Npp32sc* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

One 32-bit signed complex integer (32-bit real, 32-bit imaginary) channel in place image subtract constant, scale, then clamp to saturated value.

Parameters

- **nConstant** – host memory constant.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiSubC_32sc_C3RSfs_Ctx**(const *Npp32sc* *pSrc1, int nSrc1Step, const *Npp32sc* aConstants[3], *Npp32sc* *pDst, int nDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Three 32-bit signed complex integer (32-bit real, 32-bit imaginary) channel image subtract constant, scale, then clamp to saturated value.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **aConstants** – fixed size array of host memory constant values, one per channel.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.

- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiSubC_32sc_C3IRSfs_Ctx**(const *Npp32sc* aConstants[3], *Npp32sc* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Three 32-bit signed complex integer (32-bit real, 32-bit imaginary) channel in place image subtract constant, scale, then clamp to saturated value.

Parameters

- **aConstants** – fixed size array of host memory constant values, one per channel.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiSubC_32sc_AC4RSfs_Ctx**(const *Npp32sc* *pSrc1, int nSrc1Step, const *Npp32sc* aConstants[3], *Npp32sc* *pDst, int nDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Four 32-bit signed complex integer (32-bit real, 32-bit imaginary) channel with unmodified alpha image subtract constant, scale, then clamp to saturated value.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **aConstants** – fixed size array of host memory constant values, one per channel.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiSubC_32sc_AC4IRSfs_Ctx**(const *Npp32sc* aConstants[3], *Npp32sc* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Four 32-bit signed complex integer (32-bit real, 32-bit imaginary) channel with unmodified alpha in place image subtract constant, scale, then clamp to saturated value.

Parameters

- **aConstants** – fixed size array of host memory constant values, one per channel.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiSubC_16f_C1R_Ctx**(const *Npp16f* *pSrc1, int nSrc1Step, const *Npp32f* nConstant, *Npp16f* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

One 16-bit floating point channel image subtract constant.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **nConstant** – host memory 32-bit floating point constant.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiSubDeviceC_16f_C1R_Ctx**(const *Npp16f* *pSrc1, int nSrc1Step, const *Npp32f* *pConstant, *Npp16f* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

One 16-bit floating point channel image subtract constant.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **pConstant** – device memory 32-bit floating point constant.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.

- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiSubC_16f_C1IR_Ctx**(const *Npp32f* nConstant, *Npp16f* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

One 16-bit floating point channel in place image subtract constant.

Parameters

- **nConstant** – host memory 32-bit floating point constant.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiSubDeviceC_16f_C1IR_Ctx**(const *Npp32f* *pConstant, *Npp16f* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

One 16-bit floating point channel in place image subtract constant.

Parameters

- **pConstant** – device memory 32-bit floating point constant.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiSubC_16f_C3R_Ctx**(const *Npp16f* *pSrc1, int nSrc1Step, const *Npp32f* aConstants[3], *Npp16f* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Three 16-bit floating point channel image subtract constant.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **aConstants** – fixed size host memory array of 32-bit floating point constant values, one per channel.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.

- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiSubDeviceC_16f_C3R_Ctx**(const *Npp16f* *pSrc1, int nSrc1Step, const *Npp32f* *pConstants, *Npp16f* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Three 16-bit floating point channel image subtract constant.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **pConstants** – fixed size device memory array of 32-bit floating point constant values, one per channel.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiSubC_16f_C3IR_Ctx**(const *Npp32f* aConstants[3], *Npp16f* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Three 16-bit floating point channel in place image subtract constant.

Parameters

- **aConstants** – fixed size host memory array of 32-bit floating point constant values, one per channel.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiSubDeviceC_16f_C3IR_Ctx**(const *Npp32f* *pConstants, *Npp16f* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Three 16-bit floating point channel in place image subtract constant.

Parameters

- **pConstants** – fixed size device memory array of 32-bit floating point constant values, one per channel.

- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiSubC_16f_C4R_Ctx**(const *Npp16f* *pSrc1, int nSrc1Step, const *Npp32f* aConstants[4], *Npp16f* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four 16-bit floating point channel image subtract constant.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **aConstants** – fixed size host memory array of 32-bit floating point constant values, one per channel.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiSubDeviceC_16f_C4R_Ctx**(const *Npp16f* *pSrc1, int nSrc1Step, const *Npp32f* *pConstants, *Npp16f* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four 16-bit floating point channel image subtract constant.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **pConstants** – fixed size device memory array of 32-bit floating point constant values, one per channel.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiSubC_16f_C4IR_Ctx**(const *Npp32f* aConstants[4], *Npp16f* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four 16-bit floating point channel in place image subtract constant.

Parameters

- **aConstants** – fixed size host memory array of 32-bit floating point constant values, one per channel.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiSubDeviceC_16f_C4IR_Ctx**(const *Npp32f* *pConstants, *Npp16f* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four 16-bit floating point channel in place image subtract constant.

Parameters

- **pConstants** – fixed size device memory array of 32-bit floating point constant values, one per channel.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiSubC_32f_C1R_Ctx**(const *Npp32f* *pSrc1, int nSrc1Step, const *Npp32f* nConstant, *Npp32f* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

One 32-bit floating point channel image subtract constant.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **nConstant** – host memory constant.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiSubDeviceC_32f_C1R_Ctx**(const *Npp32f* *pSrc1, int nSrc1Step, const *Npp32f* *pConstant, *Npp32f* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

One 32-bit floating point channel image subtract constant.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **pConstant** – device memory constant.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiSubC_32f_C1IR_Ctx**(const *Npp32f* nConstant, *Npp32f* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

One 32-bit floating point channel in place image subtract constant.

Parameters

- **nConstant** – host memory constant.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiSubDeviceC_32f_C1IR_Ctx**(const *Npp32f* *pConstant, *Npp32f* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

One 32-bit floating point channel in place image subtract constant.

Parameters

- **pConstant** – device memory constant.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiSubC_32f_C3R_Ctx**(const *Npp32f* *pSrc1, int nSrc1Step, const *Npp32f* aConstants[3], *Npp32f* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Three 32-bit floating point channel image subtract constant.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **aConstants** – fixed size host memory array of constant values, one per channel.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiSubDeviceC_32f_C3R_Ctx**(const *Npp32f* *pSrc1, int nSrc1Step, const *Npp32f* *pConstants, *Npp32f* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Three 32-bit floating point channel image subtract constant.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **pConstants** – fixed size device memory array of constant values, one per channel.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiSubC_32f_C3IR_Ctx**(const *Npp32f* aConstants[3], *Npp32f* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Three 32-bit floating point channel in place image subtract constant.

Parameters

- **aConstants** – fixed size host memory array of constant values, one per channel.
- **pSrcDst** – *In-Place Image Pointer*.

- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiSubDeviceC_32f_C3IR_Ctx**(const *Npp32f* *pConstants, *Npp32f* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Three 32-bit floating point channel in place image subtract constant.

Parameters

- **pConstants** – fixed size device memory array of constant values, one per channel.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiSubC_32f_AC4R_Ctx**(const *Npp32f* *pSrc1, int nSrc1Step, const *Npp32f* aConstants[3], *Npp32f* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four 32-bit floating point channel with unmodified alpha image subtract constant.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **aConstants** – fixed size host memory array of constant values, one per channel.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiSubDeviceC_32f_AC4R_Ctx**(const *Npp32f* *pSrc1, int nSrc1Step, const *Npp32f* *pConstants, *Npp32f* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four 32-bit floating point channel with unmodified alpha image subtract constant.

Parameters

- **pSrc1** – *Source-Image Pointer*.

- **nSrc1Step** – *Source-Image Line Step*.
- **pConstants** – fixed size device memory array of constant values, one per channel.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiSubC_32f_AC4IR_Ctx**(const *Npp32f* aConstants[3], *Npp32f* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four 32-bit floating point channel with unmodified alpha in place image subtract constant.

Parameters

- **aConstants** – fixed size host memory array of constant values, one per channel.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiSubDeviceC_32f_AC4IR_Ctx**(const *Npp32f* *pConstants, *Npp32f* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four 32-bit floating point channel with unmodified alpha in place image subtract constant.

Parameters

- **pConstants** – fixed size device memory array of constant values, one per channel.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiSubC_32f_C4R_Ctx**(const *Npp32f* *pSrc1, int nSrc1Step, const *Npp32f* aConstants[4], *Npp32f* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four 32-bit floating point channel image subtract constant.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **aConstants** – fixed size host memory array of constant values, one per channel.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiSubDeviceC_32f_C4R_Ctx**(const *Npp32f* *pSrc1, int nSrc1Step, const *Npp32f* *pConstants, *Npp32f* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four 32-bit floating point channel image subtract constant.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **pConstants** – fixed size device memory array of constant values, one per channel.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiSubC_32f_C4IR_Ctx**(const *Npp32f* aConstants[4], *Npp32f* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four 32-bit floating point channel in place image subtract constant.

Parameters

- **aConstants** – fixed size host memory array of constant values, one per channel.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiSubDeviceC_32f_C4IR_Ctx**(const *Npp32f* *pConstants, *Npp32f* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four 32-bit floating point channel in place image subtract constant.

Parameters

- **pConstants** – fixed size device memory array of constant values, one per channel.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiSubC_32fc_C1R_Ctx**(const *Npp32fc* *pSrc1, int nSrc1Step, const *Npp32fc* nConstant, *Npp32fc* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

One 32-bit complex floating point (32-bit floating point real, 32-bit floating point imaginary) channel image subtract constant.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **nConstant** – host memory constant.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiSubC_32fc_C1IR_Ctx**(const *Npp32fc* nConstant, *Npp32fc* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

One 32-bit complex floating point (32-bit floating point real, 32-bit floating point imaginary) channel in place image subtract constant.

Parameters

- **nConstant** – host memory constant.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.

- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiSubC_32fc_C3R_Ctx**(const *Npp32fc* *pSrc1, int nSrc1Step, const *Npp32fc* aConstants[3], *Npp32fc* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Three 32-bit complex floating point (32-bit floating point real, 32-bit floating point imaginary) channel image subtract constant.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **aConstants** – fixed size host memory array of constant values, one per channel.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiSubC_32fc_C3IR_Ctx**(const *Npp32fc* aConstants[3], *Npp32fc* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Three 32-bit complex floating point (32-bit floating point real, 32-bit floating point imaginary) channel in place image subtract constant.

Parameters

- **aConstants** – fixed size host memory array of constant values, one per channel.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiSubC_32fc_AC4R_Ctx**(const *Npp32fc* *pSrc1, int nSrc1Step, const *Npp32fc* aConstants[3], *Npp32fc* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four 32-bit complex floating point (32-bit floating point real, 32-bit floating point imaginary) channel with unmodified alpha image subtract constant.

Parameters

- **pSrc1** – *Source-Image Pointer*.

- **nSrc1Step** – *Source-Image Line Step*.
- **aConstants** – fixed size host memory array of constant values, one per channel.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiSubC_32fc_AC4IR_Ctx**(const *Npp32fc* aConstants[3], *Npp32fc* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four 32-bit complex floating point (32-bit floating point real, 32-bit floating point imaginary) channel with unmodified alpha in place image subtract constant.

Parameters

- **aConstants** – fixed size host memory array of constant values, one per channel.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiSubC_32fc_C4R_Ctx**(const *Npp32fc* *pSrc1, int nSrc1Step, const *Npp32fc* aConstants[4], *Npp32fc* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four 32-bit complex floating point (32-bit floating point real, 32-bit floating point imaginary) channel image subtract constant.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **aConstants** – fixed size array of host memory constant values, one per channel.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiSubC_32fc_C4IR_Ctx**(const *Npp32fc* aConstants[4], *Npp32fc* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four 32-bit complex floating point (32-bit floating point real, 32-bit floating point imaginary) channel in place image subtract constant.

Parameters

- **aConstants** – fixed size array of host memory constant values, one per channel.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

1.7.1.6 DivC

Divides each pixel of an image by a constant value.

Note: If you use one of the device constant versions of these functions and the function called immediately preceeding that function generates that device constant you MUST either call cudaStreamSynchronize() or cudaDeviceSynchronize() before calling the device constant function.

Functions

NppStatus **nppiDivC_8u_C1RSfs_Ctx**(const *Npp8u* *pSrc1, int nSrc1Step, const *Npp8u* nConstant, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

One 8-bit unsigned char channel image divided by constant, scale, then clamp to saturated value.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **nConstant** – host memory constant.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiDivDeviceC_8u_C1RSfs_Ctx**(const *Npp8u* *pSrc1, int nSrc1Step, const *Npp8u* *pConstant, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

One 8-bit unsigned char channel image divided by constant, scale, then clamp to saturated value.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **pConstant** – device memory constant.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiDivC_8u_C1IRSfs_Ctx**(const *Npp8u* nConstant, *Npp8u* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

One 8-bit unsigned char channel in place image divided by constant, scale, then clamp to saturated value.

Parameters

- **nConstant** – host memory constant.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiDivDeviceC_8u_C1IRSfs_Ctx**(const *Npp8u* *pConstant, *Npp8u* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

One 8-bit unsigned char channel in place image divided by constant, scale, then clamp to saturated value.

Parameters

- **pConstant** – device memory constant.
- **pSrcDst** – *In-Place Image Pointer*.

- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiDivC_8u_C3RSfs_Ctx**(const *Npp8u* *pSrc1, int nSrc1Step, const *Npp8u* aConstants[3], *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Three 8-bit unsigned char channel image divided by constant, scale, then clamp to saturated value.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **aConstants** – fixed size host memory array of constant values, one per channel.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiDivDeviceC_8u_C3RSfs_Ctx**(const *Npp8u* *pSrc1, int nSrc1Step, const *Npp8u* *pConstants, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Three 8-bit unsigned char channel image divided by constant, scale, then clamp to saturated value.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **pConstants** – fixed size device memory array of constant values, one per channel.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiDivC_8u_C3IRSfs_Ctx**(const *Npp8u* aConstants[3], *Npp8u* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Three 8-bit unsigned char channel 8-bit unsigned char in place image divided by constant, scale, then clamp to saturated value.

Parameters

- **aConstants** – fixed size host memory array of constant values, one per channel.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiDivDeviceC_8u_C3IRSfs_Ctx**(const *Npp8u* *pConstants, *Npp8u* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Three 8-bit unsigned char channel 8-bit unsigned char in place image divided by constant, scale, then clamp to saturated value.

Parameters

- **pConstants** – fixed size device memory array of constant values, one per channel.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiDivC_8u_AC4RSfs_Ctx**(const *Npp8u* *pSrc1, int nSrc1Step, const *Npp8u* aConstants[3], *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Four 8-bit unsigned char channel with unmodified alpha image divided by constant, scale, then clamp to saturated value.

Parameters

- **pSrc1** – *Source-Image Pointer*.

- **nSrc1Step** – *Source-Image Line Step*.
- **aConstants** – fixed size host memory array of constant values, one per channel.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiDivDeviceC_8u_AC4RSfs_Ctx**(const *Npp8u* *pSrc1, int nSrc1Step, const *Npp8u* *pConstants, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Four 8-bit unsigned char channel with unmodified alpha image divided by constant, scale, then clamp to saturated value.

Parameters

- **pSrc1** – *Source-Image Pointer*.
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Image Data Related Error Codes, *ROI Related Error Codes*.

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Four 8-bit unsigned char channel with unmodified alpha in place image divided by constant, scale, then clamp to saturated value.

Parameters

- **aConstants** – fixed size host memory array of constant values, one per channel.
- **pSrcDst** – *In-Place Image Pointer*.
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Four 8-bit unsigned char channel in place image divided by constant, scale, then clamp to saturated value.

Parameters

- **aConstants** – fixed size host memory array of constant values, one per channel.
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- **pConstants** – fixed size device memory array of constant values, one per channel.
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- **nScaleFactor** – *Integer Result Scaling*.

- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiDivC_16u_C1RSfs_Ctx**(const *Npp16u* *pSrc1, int nSrc1Step, const *Npp16u* nConstant, *Npp16u* *pDst, int nDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

One 16-bit unsigned short channel image divided by constant, scale, then clamp to saturated value.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **nConstant** – host memory constant.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
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One 16-bit unsigned short channel in place image divided by constant, scale, then clamp to saturated value.

Parameters

- **nConstant** – host memory constant.
- **pSrcDst** – *In-Place Image Pointer*.
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One 16-bit unsigned short channel in place image divided by constant, scale, then clamp to saturated value.

Parameters

- **pConstant** – device memory constant.
- **pSrcDst** – *In-Place Image Pointer*.
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- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiDivC_16u_C3RSfs_Ctx**(const *Npp16u* *pSrc1, int nSrc1Step, const *Npp16u* aConstants[3], *Npp16u* *pDst, int nDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Three 16-bit unsigned short channel image divided by constant, scale, then clamp to saturated value.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **aConstants** – fixed size host memory array of constant values, one per channel.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.

- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
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Image Data Related Error Codes, *ROI Related Error Codes*.

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Parameters

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Three 16-bit unsigned short channel in place image divided by constant, scale, then clamp to saturated value.

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- **aConstants** – fixed size host memory array of constant values, one per channel.
- **pSrcDst** – *In-Place Image Pointer*.
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Three 16-bit unsigned short channel in place image divided by constant, scale, then clamp to saturated value.

Parameters

- **pConstants** – fixed size device memory array of constant values, one per channel.
- **pSrcDst** – *In-Place Image Pointer*.
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- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiDivC_16u_AC4RSfs_Ctx**(const *Npp16u* *pSrc1, int nSrc1Step, const *Npp16u* aConstants[3], *Npp16u* *pDst, int nDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Four 16-bit unsigned short channel with unmodified alpha image divided by constant, scale, then clamp to saturated value.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **aConstants** – fixed size host memory array of constant values, one per channel.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiDivDeviceC_16u_AC4RSfs_Ctx**(const *Npp16u* *pSrc1, int nSrc1Step, const *Npp16u* *pConstants, *Npp16u* *pDst, int nDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Four 16-bit unsigned short channel with unmodified alpha image divided by constant, scale, then clamp to saturated value.

Parameters

- **pSrc1** – *Source-Image Pointer*.
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Parameters

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Four 16-bit unsigned short channel in place image divided by constant, scale, then clamp to saturated value.

Parameters

- **aConstants** – fixed size host memory array of constant values, one per channel.
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Four 16-bit unsigned short channel in place image divided by constant, scale, then clamp to saturated value.

Parameters

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- **pSrcDst** – *In-Place Image Pointer*.
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- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiDivC_16s_C1RSfs_Ctx**(const *Npp16s* *pSrc1, int nSrc1Step, const *Npp16s* nConstant, *Npp16s* *pDst, int nDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

One 16-bit signed short channel image divided by constant, scale, then clamp to saturated value.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **nConstant** – host memory constant.
- **pDst** – *Destination-Image Pointer*.

- **nDstStep** – *Destination-Image Line Step*.
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- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiDivC_16s_C3RSfs_Ctx**(const *Npp16s* *pSrc1, int nSrc1Step, const *Npp16s* aConstants[3], *Npp16s* *pDst, int nDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Three 16-bit signed short channel image divided by constant, scale, then clamp to saturated value.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **aConstants** – fixed size host memory array of constant values, one per channel.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiDivDeviceC_16s_C3RSfs_Ctx**(const *Npp16s* *pSrc1, int nSrc1Step, const *Npp16s* *pConstants, *Npp16s* *pDst, int nDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Three 16-bit signed short channel image divided by constant, scale, then clamp to saturated value.

Parameters

- **pSrc1** – *Source-Image Pointer*.

- **nSrc1Step** – *Source-Image Line Step*.
- **pConstants** – fixed size device memory array of constant values, one per channel.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiDivC_16s_C3IRSfs_Ctx**(const *Npp16s* aConstants[3], *Npp16s* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Three 16-bit signed short channel in place image divided by constant, scale, then clamp to saturated value.

Parameters

- **aConstants** – fixed size host memory array of constant values, one per channel.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiDivDeviceC_16s_C3IRSfs_Ctx**(const *Npp16s* *pConstants, *Npp16s* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Three 16-bit signed short channel in place image divided by constant, scale, then clamp to saturated value.

Parameters

- **pConstants** – fixed size device memory array of constant values, one per channel.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiDivC_16s_AC4RSfs_Ctx**(const *Npp16s* *pSrc1, int nSrc1Step, const *Npp16s* aConstants[3], *Npp16s* *pDst, int nDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Four 16-bit signed short channel with unmodified alpha image divided by constant, scale, then clamp to saturated value.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **aConstants** – fixed size host memory array of constant values, one per channel.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiDivDeviceC_16s_AC4RSfs_Ctx**(const *Npp16s* *pSrc1, int nSrc1Step, const *Npp16s* *pConstants, *Npp16s* *pDst, int nDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Four 16-bit signed short channel with unmodified alpha image divided by constant, scale, then clamp to saturated value.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **pConstants** – fixed size device memory array of constant values, one per channel.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiDivC_16s_AC4IRSfs_Ctx**(const *Npp16s* aConstants[3], *Npp16s* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Four 16-bit signed short channel with unmodified alpha in place image divided by constant, scale, then clamp to saturated value.

Parameters

- **aConstants** – fixed size host memory array of constant values, one per channel.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiDivDeviceC_16s_AC4IRSfs_Ctx**(const *Npp16s* *pConstants, *Npp16s* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Four 16-bit signed short channel with unmodified alpha in place image divided by constant, scale, then clamp to saturated value.

Parameters

- **pConstants** – fixed size device memory array of constant values, one per channel.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiDivC_16s_C4RSfs_Ctx**(const *Npp16s* *pSrc1, int nSrc1Step, const *Npp16s* aConstants[4], *Npp16s* *pDst, int nDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Four 16-bit signed short channel image divided by constant, scale, then clamp to saturated value.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **aConstants** – fixed size host memory array of constant values, one per channel.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.

- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiDivDeviceC_16s_C4RSfs_Ctx**(const *Npp16s* *pSrc1, int nSrc1Step, const *Npp16s* *pConstants, *Npp16s* *pDst, int nDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Four 16-bit signed short channel image divided by constant, scale, then clamp to saturated value.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **pConstants** – fixed size device memory array of constant values, one per channel.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiDivC_16s_C4IRSfs_Ctx**(const *Npp16s* aConstants[4], *Npp16s* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Four 16-bit signed short channel in place image divided by constant, scale, then clamp to saturated value.

Parameters

- **aConstants** – fixed size host memory array of constant values, one per channel.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiDivDeviceC_16s_C4IRSfs_Ctx**(const *Npp16s* *pConstants, *Npp16s* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Four 16-bit signed short channel in place image divided by constant, scale, then clamp to saturated value.

Parameters

- **pConstants** – fixed size device memory array of constant values, one per channel.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiDivC_16sc_C1RSfs_Ctx**(const *Npp16sc* *pSrc1, int nSrc1Step, const *Npp16sc* nConstant, *Npp16sc* *pDst, int nDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

One 16-bit signed short complex number (16-bit real, 16-bit imaginary) channel image divided by constant, scale, then clamp to saturated value.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **nConstant** – host memory constant.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiDivC_16sc_C1IRSfs_Ctx**(const *Npp16sc* nConstant, *Npp16sc* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

One 16-bit signed short complex number (16-bit real, 16-bit imaginary) channel in place image divided by constant, scale, then clamp to saturated value.

Parameters

- **nConstant** – host memory constant.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.

- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiDivC_16sc_C3RSfs_Ctx**(const *Npp16sc* *pSrc1, int nSrc1Step, const *Npp16sc* aConstants[3], *Npp16sc* *pDst, int nDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Three 16-bit signed short complex number (16-bit real, 16-bit imaginary) channel image divided by constant, scale, then clamp to saturated value.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **aConstants** – fixed size array of host memory constant values, one per channel.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiDivC_16sc_C3IRSfs_Ctx**(const *Npp16sc* aConstants[3], *Npp16sc* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Three 16-bit signed short complex number (16-bit real, 16-bit imaginary) channel in place image divided by constant, scale, then clamp to saturated value.

Parameters

- **aConstants** – fixed size array of host memory constant values, one per channel.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiDivC_16sc_AC4RSfs_Ctx**(const *Npp16sc* *pSrc1, int nSrc1Step, const *Npp16sc* aConstants[3], *Npp16sc* *pDst, int nDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Four 16-bit signed short complex number (16-bit real, 16-bit imaginary) channel with unmodified alpha image divided by constant, scale, then clamp to saturated value.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **aConstants** – fixed size array of host memory constant values, one per channel.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiDivC_16sc_AC4IRSfs_Ctx**(const *Npp16sc* aConstants[3], *Npp16sc* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Four 16-bit signed short complex number (16-bit real, 16-bit imaginary) channel with unmodified alpha in place image divided by constant, scale, then clamp to saturated value.

Parameters

- **aConstants** – fixed size array of host memory constant values, one per channel.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiDivC_32s_C1RSfs_Ctx**(const *Npp32s* *pSrc1, int nSrc1Step, const *Npp32s* nConstant, *Npp32s* *pDst, int nDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

One 32-bit signed integer channel image divided by constant, scale, then clamp to saturated value.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **nConstant** – host memory constant.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.

- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiDivC_32s_C1RSfs**(const *Npp32s* *pSrc1, int nSrc1Step, const *Npp32s* nConstant, *Npp32s* *pDst, int nDstStep, *NppiSize* oSizeROI, int nScaleFactor)

One 32-bit signed integer channel image divided by constant, scale, then clamp to saturated value.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **nConstant** – host memory constant.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiDivDeviceC_32s_C1RSfs_Ctx**(const *Npp32s* *pSrc1, int nSrc1Step, const *Npp32s* *pConstant, *Npp32s* *pDst, int nDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

One 32-bit signed integer channel image divided by constant, scale, then clamp to saturated value.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **pConstant** – device memory constant.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiDivC_32s_C1IRSfs_Ctx**(const *Npp32s* nConstant, *Npp32s* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

One 32-bit signed integer channel in place image divided by constant, scale, then clamp to saturated value.

Parameters

- **nConstant** – host memory constant.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiDivDeviceC_32s_C1IRSfs_Ctx**(const *Npp32s* *pConstant, *Npp32s* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

One 32-bit signed integer channel in place image divided by constant, scale, then clamp to saturated value.

Parameters

- **pConstant** – device memory constant.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiDivC_32s_C3RSfs_Ctx**(const *Npp32s* *pSrc1, int nSrc1Step, const *Npp32s* aConstants[3], *Npp32s* *pDst, int nDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Three 32-bit signed integer channel image divided by constant, scale, then clamp to saturated value.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **aConstants** – fixed size host memory array of constant values, one per channel.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.

- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiDivDeviceC_32s_C3RSfs_Ctx**(const *Npp32s* *pSrc1, int nSrc1Step, const *Npp32s* *pConstants, *Npp32s* *pDst, int nDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Three 32-bit signed integer channel image divided by constant, scale, then clamp to saturated value.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **pConstants** – fixed size device memory array of constant values, one per channel.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiDivC_32s_C3IRSfs_Ctx**(const *Npp32s* aConstants[3], *Npp32s* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Three 32-bit signed integer channel in place image divided by constant, scale, then clamp to saturated value.

Parameters

- **aConstants** – fixed size host memory array of constant values, one per channel.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiDivDeviceC_32s_C3IRSfs_Ctx**(const *Npp32s* *pConstants, *Npp32s* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Three 32-bit signed integer channel in place image divided by constant, scale, then clamp to saturated value.

Parameters

- **pConstants** – fixed size device memory array of constant values, one per channel.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiDivC_32sc_C1RSfs_Ctx**(const *Npp32sc* *pSrc1, int nSrc1Step, const *Npp32sc* nConstant, *Npp32sc* *pDst, int nDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

One 32-bit signed complex integer (32-bit real, 32-bit imaginary) channel image divided by constant, scale, then clamp to saturated value.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **nConstant** – host memory constant.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiDivC_32sc_C1IRSfs_Ctx**(const *Npp32sc* nConstant, *Npp32sc* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

One 32-bit signed complex integer (32-bit real, 32-bit imaginary) channel in place image divided by constant, scale, then clamp to saturated value.

Parameters

- **nConstant** – host memory constant.

- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiDivC_32sc_C3RSfs_Ctx**(const *Npp32sc* *pSrc1, int nSrc1Step, const *Npp32sc* aConstants[3], *Npp32sc* *pDst, int nDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Three 32-bit signed complex integer (32-bit real, 32-bit imaginary) channel image divided by constant, scale, then clamp to saturated value.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **aConstants** – fixed size host memory array of constant values, one per channel.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiDivC_32sc_C3IRSfs_Ctx**(const *Npp32sc* aConstants[3], *Npp32sc* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Three 32-bit signed complex integer (32-bit real, 32-bit imaginary) channel in place image divided by constant, scale, then clamp to saturated value.

Parameters

- **aConstants** – fixed size host memory array of constant values, one per channel.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiDivC_32sc_AC4RSfs_Ctx**(const *Npp32sc* *pSrc1, int nSrc1Step, const *Npp32sc* aConstants[3], *Npp32sc* *pDst, int nDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Four 32-bit signed complex integer (32-bit real, 32-bit imaginary) channel with unmodified alpha image divided by constant, scale, then clamp to saturated value.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **aConstants** – fixed size array of host memory constant values, one per channel.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiDivC_32sc_AC4IRSfs_Ctx**(const *Npp32sc* aConstants[3], *Npp32sc* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Four 32-bit signed complex integer (32-bit real, 32-bit imaginary) channel with unmodified alpha in place image divided by constant, scale, then clamp to saturated value.

Parameters

- **aConstants** – fixed size array of host memory constant values, one per channel.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiDivC_16f_C1R_Ctx**(const *Npp16f* *pSrc1, int nSrc1Step, const *Npp32f* nConstant, *Npp16f* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

One 16-bit floating point channel image divided by constant.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.

- **nConstant** – host memory 32-bit floating point constant.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiDivDeviceC_16f_C1R_Ctx**(const *Npp16f* *pSrc1, int nSrc1Step, const *Npp32f* *pConstant, *Npp16f* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

One 16-bit floating point channel image divided by constant.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **pConstant** – device memory 32-bit floating point constant.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiDivC_16f_C1IR_Ctx**(const *Npp32f* nConstant, *Npp16f* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

One 16-bit floating point channel in place image divided by constant.

Parameters

- **nConstant** – host memory 32-bit floating point constant.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiDivDeviceC_16f_C1IR_Ctx**(const *Npp32f* *pConstant, *Npp16f* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

One 16-bit floating point channel in place image divided by constant.

Parameters

- **pConstant** – device memory 32-bit floating point constant.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiDivC_16f_C3R_Ctx**(const *Npp16f* *pSrc1, int nSrc1Step, const *Npp32f* aConstants[3], *Npp16f* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Three 16-bit floating point channel image divided by constant.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **aConstants** – fixed size host memory array of 32-bit floating point constant values, one per channel.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiDivDeviceC_16f_C3R_Ctx**(const *Npp16f* *pSrc1, int nSrc1Step, const *Npp32f* *pConstants, *Npp16f* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Three 16-bit floating point channel image divided by constant.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **pConstants** – fixed size device memory array of 32-bit floating point constant values, one per channel.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiDivC_16f_C3IR_Ctx**(const *Npp32f* aConstants[3], *Npp16f* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Three 16-bit floating point channel in place image divided by constant.

Parameters

- **aConstants** – fixed size host memory array of 32-bit floating point constant values, one per channel.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiDivDeviceC_16f_C3IR_Ctx**(const *Npp32f* *pConstants, *Npp16f* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Three 16-bit floating point channel in place image divided by constant.

Parameters

- **pConstants** – fixed size device memory array of 32-bit floating point constant values, one per channel.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiDivC_16f_C4R_Ctx**(const *Npp16f* *pSrc1, int nSrc1Step, const *Npp32f* aConstants[4], *Npp16f* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four 16-bit floating point channel image divided by constant.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **aConstants** – fixed size host memory array of 32-bit floating point constant values, one per channel.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.

- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiDivDeviceC_16f_C4R_Ctx**(const *Npp16f* *pSrc1, int nSrc1Step, const *Npp32f* *pConstants, *Npp16f* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four 16-bit floating point channel image divided by constant.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **pConstants** – fixed size device memory array of 32-bit floating point constant values, one per channel.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiDivC_16f_C4IR_Ctx**(const *Npp32f* aConstants[4], *Npp16f* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four 16-bit floating point channel in place image divided by constant.

Parameters

- **aConstants** – fixed size host memory array of 32-bit floating point constant values, one per channel.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiDivDeviceC_16f_C4IR_Ctx**(const *Npp32f* *pConstants, *Npp16f* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four 16-bit floating point channel in place image divided by constant.

Parameters

- **pConstants** – fixed size device memory array of 32-bit floating point constant values, one per channel.

- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiDivC_32f_C1R_Ctx**(const *Npp32f* *pSrc1, int nSrc1Step, const *Npp32f* nConstant, *Npp32f* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

One 32-bit floating point channel image divided by constant.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **nConstant** – host memory constant.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiDivDeviceC_32f_C1R_Ctx**(const *Npp32f* *pSrc1, int nSrc1Step, const *Npp32f* *pConstant, *Npp32f* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

One 32-bit floating point channel image divided by constant.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **pConstant** – device memory constant.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiDivC_32f_C1IR_Ctx**(const *Npp32f* nConstant, *Npp32f* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

One 32-bit floating point channel in place image divided by constant.

Parameters

- **nConstant** – host memory constant.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiDivDeviceC_32f_C1IR_Ctx**(const *Npp32f* *pConstant, *Npp32f* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

One 32-bit floating point channel in place image divided by constant.

Parameters

- **pConstant** – device memory constant.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiDivC_32f_C3R_Ctx**(const *Npp32f* *pSrc1, int nSrc1Step, const *Npp32f* aConstants[3], *Npp32f* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Three 32-bit floating point channel image divided by constant.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **aConstants** – fixed size host memory array of constant values, one per channel.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiDivDeviceC_32f_C3R_Ctx**(const *Npp32f* *pSrc1, int nSrc1Step, const *Npp32f* *pConstants, *Npp32f* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Three 32-bit floating point channel image divided by constant.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **pConstants** – fixed size device memory array of constant values, one per channel.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiDivC_32f_C3IR_Ctx**(const *Npp32f* aConstants[3], *Npp32f* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Three 32-bit floating point channel in place image divided by constant.

Parameters

- **aConstants** – fixed size host memory array of constant values, one per channel.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiDivDeviceC_32f_C3IR_Ctx**(const *Npp32f* *pConstants, *Npp32f* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Three 32-bit floating point channel in place image divided by constant.

Parameters

- **pConstants** – fixed size device memory array of constant values, one per channel.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiDivC_32f_AC4R_Ctx**(const *Npp32f* *pSrc1, int nSrc1Step, const *Npp32f* aConstants[3], *Npp32f* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four 32-bit floating point channel with unmodified alpha image divided by constant.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **aConstants** – fixed size host memory array of constant values, one per channel.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiDivDeviceC_32f_AC4R_Ctx**(const *Npp32f* *pSrc1, int nSrc1Step, const *Npp32f* *pConstants, *Npp32f* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four 32-bit floating point channel with unmodified alpha image divided by constant.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **pConstants** – fixed size device memory array of constant values, one per channel.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiDivC_32f_AC4IR_Ctx**(const *Npp32f* aConstants[3], *Npp32f* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four 32-bit floating point channel with unmodified alpha in place image divided by constant.

Parameters

- **aConstants** – fixed size host memory array of constant values, one per channel.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.

- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiDivDeviceC_32f_AC4IR_Ctx**(const *Npp32f* *pConstants, *Npp32f* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four 32-bit floating point channel with unmodified alpha in place image divided by constant.

Parameters

- **pConstants** – fixed size device memory array of constant values, one per channel.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiDivC_32f_C4R_Ctx**(const *Npp32f* *pSrc1, int nSrc1Step, const *Npp32f* aConstants[4], *Npp32f* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four 32-bit floating point channel image divided by constant.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **aConstants** – fixed size host memory array of constant values, one per channel.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiDivDeviceC_32f_C4R_Ctx**(const *Npp32f* *pSrc1, int nSrc1Step, const *Npp32f* *pConstants, *Npp32f* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four 32-bit floating point channel image divided by constant.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.

- **pConstants** – fixed size device memory array of constant values, one per channel.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiDivC_32f_C4IR_Ctx**(const *Npp32f* aConstants[4], *Npp32f* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four 32-bit floating point channel in place image divided by constant.

Parameters

- **aConstants** – fixed size host memory array of constant values, one per channel.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiDivDeviceC_32f_C4IR_Ctx**(const *Npp32f* *pConstants, *Npp32f* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four 32-bit floating point channel in place image divided by constant.

Parameters

- **pConstants** – fixed size device memory array of constant values, one per channel.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiDivC_32fc_C1R_Ctx**(const *Npp32fc* *pSrc1, int nSrc1Step, const *Npp32fc* nConstant, *Npp32fc* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

One 32-bit complex floating point (32-bit floating point real, 32-bit floating point imaginary) channel image divided by constant.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **nConstant** – host memory constant.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiDivC_32fc_C1IR_Ctx**(const *Npp32fc* nConstant, *Npp32fc* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

One 32-bit complex floating point (32-bit floating point real, 32-bit floating point imaginary) channel in place image divided by constant.

Parameters

- **nConstant** – host memory constant.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiDivC_32fc_C3R_Ctx**(const *Npp32fc* *pSrc1, int nSrc1Step, const *Npp32fc* aConstants[3], *Npp32fc* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Three 32-bit complex floating point (32-bit floating point real, 32-bit floating point imaginary) channel image divided by constant.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **aConstants** – fixed size array of host memory constant values, one per channel.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiDivC_32fc_C3IR_Ctx**(const *Npp32fc* aConstants[3], *Npp32fc* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Three 32-bit complex floating point (32-bit floating point real, 32-bit floating point imaginary) channel in place image divided by constant.

Parameters

- **aConstants** – fixed size array of host memory constant values, one per channel.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiDivC_32fc_AC4R_Ctx**(const *Npp32fc* *pSrc1, int nSrc1Step, const *Npp32fc* aConstants[3], *Npp32fc* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four 32-bit complex floating point (32-bit floating point real, 32-bit floating point imaginary) channel with unmodified alpha image divided by constant.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **aConstants** – fixed size array of host memory constant values, one per channel.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiDivC_32fc_AC4IR_Ctx**(const *Npp32fc* aConstants[3], *Npp32fc* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four 32-bit complex floating point (32-bit floating point real, 32-bit floating point imaginary) channel with unmodified alpha in place image divided by constant.

Parameters

- **aConstants** – fixed size array of host memory constant values, one per channel.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.

- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiDivC_32fc_C4R_Ctx**(const *Npp32fc* *pSrc1, int nSrc1Step, const *Npp32fc* aConstants[4], *Npp32fc* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four 32-bit complex floating point (32-bit floating point real, 32-bit floating point imaginary) channel image divided by constant.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **aConstants** – fixed size array of host memory constant values, one per channel.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiDivC_32fc_C4IR_Ctx**(const *Npp32fc* aConstants[4], *Npp32fc* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four 32-bit complex floating point (32-bit floating point real, 32-bit floating point imaginary) channel in place image divided by constant.

Parameters

- **aConstants** – fixed size array of host memory constant values, one per channel.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

1.7.1.7 AbsDiffC

Determines absolute difference between each pixel of an image and a constant value.

Note: If you use one of the device constant versions of these functions and the function called immediately preceeding that function generates that device constant you MUST either call cudaStreamSynchronize() or cudaDeviceSynchronize() before calling the device constant function.

Functions

NppStatus **nppiAbsDiffC_8u_C1R_Ctx**(const *Npp8u* *pSrc1, int nSrc1Step, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, *Npp8u* nConstant, *NppStreamContext* nppStreamCtx)

One 8-bit unsigned char channel image absolute difference with constant.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **nConstant** – host memory constant.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiAbsDiffDeviceC_8u_C1R_Ctx**(const *Npp8u* *pSrc1, int nSrc1Step, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, *Npp8u* *pConstant, *NppStreamContext* nppStreamCtx)

One 8-bit unsigned char channel image absolute difference with constant.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **pConstant** – device memory constant.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiAbsDiffC_16u_C1R_Ctx**(const *Npp16u* *pSrc1, int nSrc1Step, *Npp16u* *pDst, int nDstStep, *NppiSize* oSizeROI, *Npp16u* nConstant, *NppStreamContext* nppStreamCtx)

One 16-bit unsigned short channel image absolute difference with constant.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **nConstant** – host memory constant.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiAbsDiffDeviceC_16u_C1R_Ctx**(const *Npp16u* *pSrc1, int nSrc1Step, *Npp16u* *pDst, int nDstStep, *NppiSize* oSizeROI, *Npp16u* *pConstant, *NppStreamContext* nppStreamCtx)

One 16-bit unsigned short channel image absolute difference with constant.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **pConstant** – device memory constant.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiAbsDiffC_32f_C1R_Ctx**(const *Npp32f* *pSrc1, int nSrc1Step, *Npp32f* *pDst, int nDstStep, *NppiSize* oSizeROI, *Npp32f* nConstant, *NppStreamContext* nppStreamCtx)

One 32-bit floating point channel image absolute difference with constant.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **nConstant** – host memory constant.
- **pDst** – *Destination-Image Pointer*.

- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiAbsDiffDeviceC_32f_C1R_Ctx**(const *Npp32f* *pSrc1, int nSrc1Step, *Npp32f* *pDst, int nDstStep, *NppiSize* oSizeROI, *Npp32f* *pConstant, *NppStreamContext* nppStreamCtx)

One 32-bit floating point channel image absolute difference with constant.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **pConstant** – device memory constant.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

1.7.1.8 Add

Pixel by pixel addition of two images.

Functions

NppStatus **nppiAdd_8u_C1RSfs_Ctx**(const *Npp8u* *pSrc1, int nSrc1Step, const *Npp8u* *pSrc2, int nSrc2Step, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

One 8-bit unsigned char channel image addition, scale by $2^{(} - nScaleFactor)$, then clamp to saturated value.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **pSrc2** – *Source-Image Pointer*.
- **nSrc2Step** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.

- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiAdd_8u_C1IRSfs_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *Npp8u* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

One 8-bit unsigned char channel in place image addition, scale by $2^{(} - nScaleFactor)$, then clamp to saturated value.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiAdd_8u_C3RSfs_Ctx**(const *Npp8u* *pSrc1, int nSrc1Step, const *Npp8u* *pSrc2, int nSrc2Step, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Three 8-bit unsigned char channel image addition, scale by $2^{(} - nScaleFactor)$, then clamp to saturated value.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **pSrc2** – *Source-Image Pointer*.
- **nSrc2Step** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiAdd_8u_C3IRSfs_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *Npp8u* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Three 8-bit unsigned char channel in place image addition, scale by $2^{(}-nScaleFactor)$, then clamp to saturated value.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiAdd_8u_AC4RSfs_Ctx**(const *Npp8u* *pSrc1, int nSrc1Step, const *Npp8u* *pSrc2, int nSrc2Step, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Four 8-bit unsigned char channel with unmodified alpha image addition, scale by $2^{(}-nScaleFactor)$, then clamp to saturated value.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **pSrc2** – *Source-Image Pointer*.
- **nSrc2Step** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiAdd_8u_AC4IRSfs_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *Npp8u* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Four 8-bit unsigned char channel with unmodified alpha in place image addition, scale by $2^{(}-nScaleFactor)$, then clamp to saturated value.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiAdd_8u_C4RSfs_Ctx**(const *Npp8u* *pSrc1, int nSrc1Step, const *Npp8u* *pSrc2, int nSrc2Step, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Four 8-bit unsigned char channel image addition, scale by $2^(-nScaleFactor)$, then clamp to saturated value.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **pSrc2** – *Source-Image Pointer*.
- **nSrc2Step** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiAdd_8u_C4IRSfs_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *Npp8u* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Four 8-bit unsigned char channel in place image addition, scale by $2^(-nScaleFactor)$, then clamp to saturated value.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.

- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiAdd_16u_C1RSfs_Ctx**(const *Npp16u* *pSrc1, int nSrc1Step, const *Npp16u* *pSrc2, int nSrc2Step, *Npp16u* *pDst, int nDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

One 16-bit unsigned short channel image addition, scale by $2^{(} - nScaleFactor)$, then clamp to saturated value.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **pSrc2** – *Source-Image Pointer*.
- **nSrc2Step** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiAdd_16u_C1IRSfs_Ctx**(const *Npp16u* *pSrc, int nSrcStep, *Npp16u* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

One 16-bit unsigned short channel in place image addition, scale by $2^{(} - nScaleFactor)$, then clamp to saturated value.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiAdd_16u_C3RSfs_Ctx**(const *Npp16u* *pSrc1, int nSrc1Step, const *Npp16u* *pSrc2, int nSrc2Step, *Npp16u* *pDst, int nDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Three 16-bit unsigned short channel image addition, scale by $2^{(} - nScaleFactor)$, then clamp to saturated value.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **pSrc2** – *Source-Image Pointer*.
- **nSrc2Step** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiAdd_16u_C3IRSfs_Ctx**(const *Npp16u* *pSrc, int nSrcStep, *Npp16u* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Three 16-bit unsigned short channel in place image addition, scale by $2^{(} - nScaleFactor)$, then clamp to saturated value.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiAdd_16u_AC4RSfs_Ctx**(const *Npp16u* *pSrc1, int nSrc1Step, const *Npp16u* *pSrc2, int nSrc2Step, *Npp16u* *pDst, int nDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Four 16-bit unsigned short channel with unmodified alpha image addition, scale by $2^{(} - nScaleFactor)$, then clamp to saturated value.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **pSrc2** – *Source-Image Pointer*.
- **nSrc2Step** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiAdd_16u_AC4IRSfs_Ctx**(const *Npp16u* *pSrc, int nSrcStep, *Npp16u* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Four 16-bit unsigned short channel with unmodified alpha in place image addition, scale by $2^{(} - nScaleFactor)$, then clamp to saturated value.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiAdd_16u_C4RSfs_Ctx**(const *Npp16u* *pSrc1, int nSrc1Step, const *Npp16u* *pSrc2, int nSrc2Step, *Npp16u* *pDst, int nDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Four 16-bit unsigned short channel image addition, scale by $2^{(} - nScaleFactor)$, then clamp to saturated value.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **pSrc2** – *Source-Image Pointer*.

- **nSrc2Step** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiAdd_16u_C4IRSfs_Ctx**(const *Npp16u* *pSrc, int nSrcStep, *Npp16u* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Four 16-bit unsigned short channel in place image addition, scale by $2^{(} - nScaleFactor)$, then clamp to saturated value.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiAdd_16s_C1RSfs_Ctx**(const *Npp16s* *pSrc1, int nSrc1Step, const *Npp16s* *pSrc2, int nSrc2Step, *Npp16s* *pDst, int nDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

One 16-bit signed short channel image addition, scale by $2^{(} - nScaleFactor)$, then clamp to saturated value.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **pSrc2** – *Source-Image Pointer*.
- **nSrc2Step** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.

- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiAdd_16s_C1IRSfs_Ctx**(const *Npp16s* *pSrc, int nSrcStep, *Npp16s* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

One 16-bit signed short channel in place image addition, scale by $2^{(} - nScaleFactor)$, then clamp to saturated value.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiAdd_16s_C3RSfs_Ctx**(const *Npp16s* *pSrc1, int nSrc1Step, const *Npp16s* *pSrc2, int nSrc2Step, *Npp16s* *pDst, int nDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Three 16-bit signed short channel image addition, scale by $2^{(} - nScaleFactor)$, then clamp to saturated value.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **pSrc2** – *Source-Image Pointer*.
- **nSrc2Step** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiAdd_16s_C3IRSfs_Ctx**(const *Npp16s* *pSrc, int nSrcStep, *Npp16s* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Three 16-bit signed short channel in place image addition, scale by $2^{(}-nScaleFactor)$, then clamp to saturated value.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiAdd_16s_AC4RSfs_Ctx**(const *Npp16s* *pSrc1, int nSrc1Step, const *Npp16s* *pSrc2, int nSrc2Step, *Npp16s* *pDst, int nDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Four 16-bit signed short channel with unmodified alpha image addition, scale by $2^{(}-nScaleFactor)$, then clamp to saturated value.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **pSrc2** – *Source-Image Pointer*.
- **nSrc2Step** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiAdd_16s_AC4IRSfs_Ctx**(const *Npp16s* *pSrc, int nSrcStep, *Npp16s* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Four 16-bit signed short channel with unmodified alpha in place image addition, scale by $2^{(}-nScaleFactor)$, then clamp to saturated value.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiAdd_16s_C4RSfs_Ctx**(const *Npp16s* *pSrc1, int nSrc1Step, const *Npp16s* *pSrc2, int nSrc2Step, *Npp16s* *pDst, int nDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Four 16-bit signed short channel image addition, scale by $2^{(} - nScaleFactor)$, then clamp to saturated value.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **pSrc2** – *Source-Image Pointer*.
- **nSrc2Step** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiAdd_16s_C4IRSfs_Ctx**(const *Npp16s* *pSrc, int nSrcStep, *Npp16s* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Four 16-bit signed short channel in place image addition, scale by $2^{(} - nScaleFactor)$, then clamp to saturated value.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pSrcDst** – *In-Place Image Pointer*.

- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiAdd_16sc_C1RSfs_Ctx**(const *Npp16sc* *pSrc1, int nSrc1Step, const *Npp16sc* *pSrc2, int nSrc2Step, *Npp16sc* *pDst, int nDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

One 16-bit signed short complex number (16-bit real, 16-bit imaginary) channel image addition, scale by $2^(- nScaleFactor)$, then clamp to saturated value.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **pSrc2** – *Source-Image Pointer*.
- **nSrc2Step** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiAdd_16sc_C1IRSfs_Ctx**(const *Npp16sc* *pSrc, int nSrcStep, *Npp16sc* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

One 16-bit signed short complex number (16-bit real, 16-bit imaginary) channel in place image addition, scale by $2^(- nScaleFactor)$, then clamp to saturated value.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiAdd_16sc_C3RSfs_Ctx**(const *Npp16sc* *pSrc1, int nSrc1Step, const *Npp16sc* *pSrc2, int nSrc2Step, *Npp16sc* *pDst, int nDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Three 16-bit signed short complex number (16-bit real, 16-bit imaginary) channel image addition, scale by $2^{(} - nScaleFactor)$, then clamp to saturated value.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **pSrc2** – *Source-Image Pointer*.
- **nSrc2Step** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiAdd_16sc_C3IRSfs_Ctx**(const *Npp16sc* *pSrc, int nSrcStep, *Npp16sc* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Three 16-bit signed short complex number (16-bit real, 16-bit imaginary) channel in place image addition, scale by $2^{(} - nScaleFactor)$, then clamp to saturated value.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiAdd_16sc_AC4RSfs_Ctx**(const *Npp16sc* *pSrc1, int nSrc1Step, const *Npp16sc* *pSrc2, int nSrc2Step, *Npp16sc* *pDst, int nDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Four 16-bit signed short complex number (16-bit real, 16-bit imaginary) channel with unmodified alpha image addition, scale by $2^{(} - nScaleFactor)$, then clamp to saturated value.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **pSrc2** – *Source-Image Pointer*.
- **nSrc2Step** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiAdd_16sc_AC4RSfs**(const *Npp16sc* *pSrc1, int nSrc1Step, const *Npp16sc* *pSrc2, int nSrc2Step, *Npp16sc* *pDst, int nDstStep, *NppiSize* oSizeROI, int nScaleFactor)

Four 16-bit signed short complex number (16-bit real, 16-bit imaginary) channel with unmodified alpha image addition, scale by $2^{(} - nScaleFactor)$, then clamp to saturated value.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **pSrc2** – *Source-Image Pointer*.
- **nSrc2Step** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiAdd_16sc_AC4IRSfs_Ctx**(const *Npp16sc* *pSrc, int nSrcStep, *Npp16sc* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Four 16-bit signed short complex number (16-bit real, 16-bit imaginary) channel with unmodified alpha in place image addition, scale by $2^{(} - nScaleFactor)$, then clamp to saturated value.

Parameters

- **pSrc** – *Source-Image Pointer*.

- **nSrcStep** – *Source-Image Line Step*.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiAdd_32s_C1RSfs_Ctx**(const *Npp32s* *pSrc1, int nSrc1Step, const *Npp32s* *pSrc2, int nSrc2Step, *Npp32s* *pDst, int nDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

One 32-bit signed integer channel image addition, scale by $2^{(} - nScaleFactor)$, then clamp to saturated value.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **pSrc2** – *Source-Image Pointer*.
- **nSrc2Step** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiAdd_32s_C1R_Ctx**(const *Npp32s* *pSrc1, int nSrc1Step, const *Npp32s* *pSrc2, int nSrc2Step, *Npp32s* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Note: This function is to be deprecated in future NPP releases, use the function above with a scale factor of 0 instead.

32-bit image add. Add the pixel values of corresponding pixels in the ROI and write them to the output image.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **pSrc2** – *Source-Image Pointer*.
- **nSrc2Step** – *Source-Image Line Step*.

- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiAdd_32s_C1IRSfs_Ctx**(const *Npp32s* *pSrc, int nSrcStep, *Npp32s* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

One 32-bit signed integer channel in place image addition, scale by $2^{(-nScaleFactor)}$, then clamp to saturated value.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiAdd_32s_C3RSfs_Ctx**(const *Npp32s* *pSrc1, int nSrc1Step, const *Npp32s* *pSrc2, int nSrc2Step, *Npp32s* *pDst, int nDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Three 32-bit signed integer channel image addition, scale by $2^{(-nScaleFactor)}$, then clamp to saturated value.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **pSrc2** – *Source-Image Pointer*.
- **nSrc2Step** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiAdd_32s_C3IRSfs_Ctx**(const *Npp32s* *pSrc, int nSrcStep, *Npp32s* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Three 32-bit signed integer channel in place image addition, scale by $2^{(} - nScaleFactor)$, then clamp to saturated value.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiAdd_32sc_C1RSfs_Ctx**(const *Npp32sc* *pSrc1, int nSrc1Step, const *Npp32sc* *pSrc2, int nSrc2Step, *Npp32sc* *pDst, int nDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

One 32-bit signed integer complex number (32-bit real, 32-bit imaginary) channel image addition, scale by $2^{(} - nScaleFactor)$, then clamp to saturated value.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **pSrc2** – *Source-Image Pointer*.
- **nSrc2Step** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiAdd_32sc_C1IRSfs_Ctx**(const *Npp32sc* *pSrc, int nSrcStep, *Npp32sc* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

One 32-bit signed integer complex number (32-bit real, 32-bit imaginary) channel in place image addition, scale by $2^{(} - nScaleFactor)$, then clamp to saturated value.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiAdd_32sc_C3RSfs_Ctx**(const *Npp32sc* *pSrc1, int nSrc1Step, const *Npp32sc* *pSrc2, int nSrc2Step, *Npp32sc* *pDst, int nDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Three 32-bit signed integer complex number (32-bit real, 32-bit imaginary) channel image addition, scale by $2^{(} - nScaleFactor)$, then clamp to saturated value.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **pSrc2** – *Source-Image Pointer*.
- **nSrc2Step** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiAdd_32sc_C3IRSfs_Ctx**(const *Npp32sc* *pSrc, int nSrcStep, *Npp32sc* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Three 32-bit signed integer complex number (32-bit real, 32-bit imaginary) channel in place image addition, scale by $2^{(} - nScaleFactor)$, then clamp to saturated value.

Parameters

- **pSrc** – *Source-Image Pointer*.

- **nSrcStep** – *Source-Image Line Step*.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiAdd_32sc_AC4RSfs_Ctx**(const *Npp32sc* *pSrc1, int nSrc1Step, const *Npp32sc* *pSrc2, int nSrc2Step, *Npp32sc* *pDst, int nDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Four 32-bit signed integer complex number (32-bit real, 32-bit imaginary) channel with unmodified alpha image addition, scale by $2^{(} - nScaleFactor)$, then clamp to saturated value.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **pSrc2** – *Source-Image Pointer*.
- **nSrc2Step** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiAdd_32sc_AC4IRSfs_Ctx**(const *Npp32sc* *pSrc, int nSrcStep, *Npp32sc* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Four 32-bit signed integer complex number (32-bit real, 32-bit imaginary) channel with unmodified alpha in place image addition, scale by $2^{(} - nScaleFactor)$, then clamp to saturated value.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.

- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiAdd_16f_C1R_Ctx**(const *Npp16f* *pSrc1, int nSrc1Step, const *Npp16f* *pSrc2, int nSrc2Step, *Npp16f* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

One 16-bit floating point channel image addition.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **pSrc2** – *Source-Image Pointer*.
- **nSrc2Step** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiAdd_16f_C1IR_Ctx**(const *Npp16f* *pSrc, int nSrcStep, *Npp16f* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

One 16-bit floating point channel in place image addition.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiAdd_16f_C3R_Ctx**(const *Npp16f* *pSrc1, int nSrc1Step, const *Npp16f* *pSrc2, int nSrc2Step, *Npp16f* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Three 16-bit floating point channel image addition.

Parameters

- **pSrc1** – *Source-Image Pointer*.

- **nSrc1Step** – *Source-Image Line Step*.
- **pSrc2** – *Source-Image Pointer*.
- **nSrc2Step** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiAdd_16f_C3IR_Ctx**(const *Npp16f* *pSrc, int nSrcStep, *Npp16f* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Three 16-bit floating point channel in place image addition.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiAdd_16f_C4R_Ctx**(const *Npp16f* *pSrc1, int nSrc1Step, const *Npp16f* *pSrc2, int nSrc2Step, *Npp16f* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four 16-bit floating point channel image addition.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **pSrc2** – *Source-Image Pointer*.
- **nSrc2Step** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiAdd_16f_C4IR_Ctx**(const *Npp16f* *pSrc, int nSrcStep, *Npp16f* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four 16-bit floating point channel in place image addition.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiAdd_32f_C1R_Ctx**(const *Npp32f* *pSrc1, int nSrc1Step, const *Npp32f* *pSrc2, int nSrc2Step, *Npp32f* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

One 32-bit floating point channel image addition.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **pSrc2** – *Source-Image Pointer*.
- **nSrc2Step** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiAdd_32f_C1IR_Ctx**(const *Npp32f* *pSrc, int nSrcStep, *Npp32f* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

One 32-bit floating point channel in place image addition.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.

- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiAdd_32f_C3R_Ctx**(const *Npp32f* *pSrc1, int nSrc1Step, const *Npp32f* *pSrc2, int nSrc2Step, *Npp32f* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Three 32-bit floating point channel image addition.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **pSrc2** – *Source-Image Pointer*.
- **nSrc2Step** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiAdd_32f_C3IR_Ctx**(const *Npp32f* *pSrc, int nSrcStep, *Npp32f* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Three 32-bit floating point channel in place image addition.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiAdd_32f_AC4R_Ctx**(const *Npp32f* *pSrc1, int nSrc1Step, const *Npp32f* *pSrc2, int nSrc2Step, *Npp32f* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four 32-bit floating point channel with unmodified alpha image addition.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **pSrc2** – *Source-Image Pointer*.
- **nSrc2Step** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiAdd_32f_AC4IR_Ctx**(const *Npp32f* *pSrc, int nSrcStep, *Npp32f* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four 32-bit floating point channel with unmodified alpha in place image addition.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiAdd_32f_C4R_Ctx**(const *Npp32f* *pSrc1, int nSrc1Step, const *Npp32f* *pSrc2, int nSrc2Step, *Npp32f* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four 32-bit floating point channel image addition.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **pSrc2** – *Source-Image Pointer*.
- **nSrc2Step** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiAdd_32f_C4IR_Ctx**(const *Npp32f* *pSrc, int nSrcStep, *Npp32f* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four 32-bit floating point channel in place image addition.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiAdd_32fc_C1R_Ctx**(const *Npp32fc* *pSrc1, int nSrc1Step, const *Npp32fc* *pSrc2, int nSrc2Step, *Npp32fc* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

One 32-bit floating point complex number (32-bit real, 32-bit imaginary) channel image addition.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **pSrc2** – *Source-Image Pointer*.
- **nSrc2Step** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiAdd_32fc_C1IR_Ctx**(const *Npp32fc* *pSrc, int nSrcStep, *Npp32fc* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

One 32-bit floating point complex number (32-bit real, 32-bit imaginary) channel in place image addition.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.

- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiAdd_32fc_C3R_Ctx**(const *Npp32fc* *pSrc1, int nSrc1Step, const *Npp32fc* *pSrc2, int nSrc2Step, *Npp32fc* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Three 32-bit floating point complex number (32-bit real, 32-bit imaginary) channel image addition.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **pSrc2** – *Source-Image Pointer*.
- **nSrc2Step** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiAdd_32fc_C3IR_Ctx**(const *Npp32fc* *pSrc, int nSrcStep, *Npp32fc* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Three 32-bit floating point complex number (32-bit real, 32-bit imaginary) channel in place image addition.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiAdd_32fc_AC4R_Ctx**(const *Npp32fc* *pSrc1, int nSrc1Step, const *Npp32fc* *pSrc2, int nSrc2Step, *Npp32fc* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four 32-bit floating point complex number (32-bit real, 32-bit imaginary) channel with unmodified alpha image addition.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **pSrc2** – *Source-Image Pointer*.
- **nSrc2Step** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiAdd_32fc_AC4IR_Ctx**(const *Npp32fc* *pSrc, int nSrcStep, *Npp32fc* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four 32-bit floating point complex number (32-bit real, 32-bit imaginary) channel with unmodified alpha in place image addition.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiAdd_32fc_C4R_Ctx**(const *Npp32fc* *pSrc1, int nSrc1Step, const *Npp32fc* *pSrc2, int nSrc2Step, *Npp32fc* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four 32-bit floating point complex number (32-bit real, 32-bit imaginary) channel image addition.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **pSrc2** – *Source-Image Pointer*.
- **nSrc2Step** – *Source-Image Line Step*.

- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiAdd_32fc_C4IR_Ctx**(const *Npp32fc* *pSrc, int nSrcStep, *Npp32fc* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four 32-bit floating point complex number (32-bit real, 32-bit imaginary) channel in place image addition.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

1.7.1.9 AddSquare

Pixel by pixel addition of squared pixels from source image to floating point pixel values of destination image.

Functions

NppStatus **nppiAddSquare_8u32f_C1IMR_Ctx**(const *Npp8u* *pSrc, int nSrcStep, const *Npp8u* *pMask, int nMaskStep, *Npp32f* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

One 8-bit unsigned char channel image squared then added to in place floating point destination image using filter mask (updates destination when mask is non-zero).

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pMask** – *Mask-Image Pointer*.
- **nMaskStep** – *Mask-Image Line Step*.
- **pSrcDst** – *In-Place Image Pointer*.

- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiAddSquare_8u32f_C1IR_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *Npp32f* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

One 8-bit unsigned char channel image squared then added to in place floating point destination image.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiAddSquare_16u32f_C1IMR_Ctx**(const *Npp16u* *pSrc, int nSrcStep, const *Npp8u* *pMask, int nMaskStep, *Npp32f* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

One 16-bit unsigned short channel image squared then added to in place floating point destination image using filter mask (updates destination when mask is non-zero).

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pMask** – *Mask-Image Pointer*.
- **nMaskStep** – *Mask-Image Line Step*.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiAddSquare_16u32f_C1IR_Ctx**(const *Npp16u* *pSrc, int nSrcStep, *Npp32f* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

One 16-bit unsigned short channel image squared then added to in place floating point destination image.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiAddSquare_32f_C1IMR_Ctx**(const *Npp32f* *pSrc, int nSrcStep, const *Npp8u* *pMask, int nMaskStep, *Npp32f* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

One 32-bit floating point channel image squared then added to in place floating point destination image using filter mask (updates destination when mask is non-zero).

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pMask** – *Mask-Image Pointer*.
- **nMaskStep** – *Mask-Image Line Step*.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiAddSquare_32f_C1IR_Ctx**(const *Npp32f* *pSrc, int nSrcStep, *Npp32f* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

One 32-bit floating point channel image squared then added to in place floating point destination image.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pSrcDst** – *In-Place Image Pointer*.

- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

1.7.1.10 AddProduct

Pixel by pixel addition of product of pixels from two source images to floating point pixel values of destination image.

Functions

NppStatus **nppiAddProduct_8u32f_C1IMR_Ctx**(const *Npp8u* *pSrc1, int nSrc1Step, const *Npp8u* *pSrc2, int nSrc2Step, const *Npp8u* *pMask, int nMaskStep, *Npp32f* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

One 8-bit unsigned char channel image product added to in place floating point destination image using filter mask (updates destination when mask is non-zero).

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **pSrc2** – *Source-Image Pointer*.
- **nSrc2Step** – *Source-Image Line Step*.
- **pMask** – *Mask-Image Pointer*.
- **nMaskStep** – *Mask-Image Line Step*.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiAddProduct_8u32f_C1IR_Ctx**(const *Npp8u* *pSrc1, int nSrc1Step, const *Npp8u* *pSrc2, int nSrc2Step, *Npp32f* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

One 8-bit unsigned char channel image product added to in place floating point destination image.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **pSrc2** – *Source-Image Pointer*.
- **nSrc2Step** – *Source-Image Line Step*.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiAddProduct_16u32f_C1IMR_Ctx**(const *Npp16u* *pSrc1, int nSrc1Step, const *Npp16u* *pSrc2, int nSrc2Step, const *Npp8u* *pMask, int nMaskStep, *Npp32f* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

One 16-bit unsigned short channel image product added to in place floating point destination image using filter mask (updates destination when mask is non-zero).

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **pSrc2** – *Source-Image Pointer*.
- **nSrc2Step** – *Source-Image Line Step*.
- **pMask** – *Mask-Image Pointer*.
- **nMaskStep** – *Mask-Image Line Step*.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiAddProduct_16u32f_C1IR_Ctx**(const *Npp16u* *pSrc1, int nSrc1Step, const *Npp16u* *pSrc2, int nSrc2Step, *Npp32f* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

One 16-bit unsigned short channel image product added to in place floating point destination image.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.

- **pSrc2** – *Source-Image Pointer*.
- **nSrc2Step** – *Source-Image Line Step*.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiAddProduct_32f_C1IMR_Ctx**(const *Npp32f* *pSrc1, int nSrc1Step, const *Npp32f* *pSrc2, int nSrc2Step, const *Npp8u* *pMask, int nMaskStep, *Npp32f* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

One 32-bit floating point channel image product added to in place floating point destination image using filter mask (updates destination when mask is non-zero).

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **pSrc2** – *Source-Image Pointer*.
- **nSrc2Step** – *Source-Image Line Step*.
- **pMask** – *Mask-Image Pointer*.
- **nMaskStep** – *Mask-Image Line Step*.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiAddProduct_32f_C1IR_Ctx**(const *Npp32f* *pSrc1, int nSrc1Step, const *Npp32f* *pSrc2, int nSrc2Step, *Npp32f* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

One 32-bit floating point channel image product added to in place floating point destination image.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **pSrc2** – *Source-Image Pointer*.
- **nSrc2Step** – *Source-Image Line Step*.

- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiAddProduct_16f_C1IR_Ctx**(const *Npp16f* *pSrc1, int nSrc1Step, const *Npp16f* *pSrc2, int nSrc2Step, *Npp16f* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

One 16-bit floating point channel image product added to in place floating point destination image.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **pSrc2** – *Source-Image Pointer*.
- **nSrc2Step** – *Source-Image Line Step*.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

1.7.1.11 AddWeighted

Pixel by pixel addition of alpha weighted pixel values from a source image to floating point pixel values of destination image.

Functions

NppStatus **nppiAddWeighted_8u32f_C1IMR_Ctx**(const *Npp8u* *pSrc, int nSrcStep, const *Npp8u* *pMask, int nMaskStep, *Npp32f* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, *Npp32f* nAlpha, *NppStreamContext* nppStreamCtx)

One 8-bit unsigned char channel alpha weighted image added to in place floating point destination image using filter mask (updates destination when mask is non-zero).

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.

- **pMask** – *Mask-Image Pointer*.
- **nMaskStep** – *Mask-Image Line Step*.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nAlpha** – Alpha weight to be applied to source image pixels (0.0F to 1.0F)
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiAddWeighted_8u32f_C1IR_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *Npp32f* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, *Npp32f* nAlpha, *NppStreamContext* nppStreamCtx)

One 8-bit unsigned char channel alpha weighted image added to in place floating point destination image.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nAlpha** – Alpha weight to be applied to source image pixels (0.0F to 1.0F)
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiAddWeighted_16u32f_C1IMR_Ctx**(const *Npp16u* *pSrc, int nSrcStep, const *Npp8u* *pMask, int nMaskStep, *Npp32f* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, *Npp32f* nAlpha, *NppStreamContext* nppStreamCtx)

One 16-bit unsigned short channel alpha weighted image added to in place floating point destination image using filter mask (updates destination when mask is non-zero).

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pMask** – *Mask-Image Pointer*.
- **nMaskStep** – *Mask-Image Line Step*.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.

- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nAlpha** – Alpha weight to be applied to source image pixels (0.0F to 1.0F)
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiAddWeighted_16u32f_C1IR_Ctx**(const *Npp16u* *pSrc, int nSrcStep, *Npp32f* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, *Npp32f* nAlpha, *NppStreamContext* nppStreamCtx)

One 16-bit unsigned short channel alpha weighted image added to in place floating point destination image.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nAlpha** – Alpha weight to be applied to source image pixels (0.0F to 1.0F)
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiAddWeighted_32f_C1IMR_Ctx**(const *Npp32f* *pSrc, int nSrcStep, const *Npp8u* *pMask, int nMaskStep, *Npp32f* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, *Npp32f* nAlpha, *NppStreamContext* nppStreamCtx)

One 32-bit floating point channel alpha weighted image added to in place floating point destination image using filter mask (updates destination when mask is non-zero).

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pMask** – *Mask-Image Pointer*.
- **nMaskStep** – *Mask-Image Line Step*.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nAlpha** – Alpha weight to be applied to source image pixels (0.0F to 1.0F)
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiAddWeighted_32f_C1IR_Ctx**(const *Npp32f* *pSrc, int nSrcStep, *Npp32f* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, *Npp32f* nAlpha, *NppStreamContext* nppStreamCtx)

One 32-bit floating point channel alpha weighted image added to in place floating point destination image.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nAlpha** – Alpha weight to be applied to source image pixels (0.0F to 1.0F)
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

1.7.1.12 Mul

Pixel by pixel multiply of two images.

Functions

NppStatus **nppiMul_8u_C1RSfs_Ctx**(const *Npp8u* *pSrc1, int nSrc1Step, const *Npp8u* *pSrc2, int nSrc2Step, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

One 8-bit unsigned char channel image multiplication, scale by $2^{(}-nScaleFactor)$, then clamp to saturated value.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **pSrc2** – *Source-Image Pointer*.
- **nSrc2Step** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiMul_8u_C1IRSfs_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *Npp8u* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

One 8-bit unsigned char channel in place image multiplication, scale by $2^(- nScaleFactor)$, then clamp to saturated value.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiMul_8u_C3RSfs_Ctx**(const *Npp8u* *pSrc1, int nSrc1Step, const *Npp8u* *pSrc2, int nSrc2Step, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Three 8-bit unsigned char channel image multiplication, scale by $2^(- nScaleFactor)$, then clamp to saturated value.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **pSrc2** – *Source-Image Pointer*.
- **nSrc2Step** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiMul_8u_C3IRSfs_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *Npp8u* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Three 8-bit unsigned char channel in place image multiplication, scale by $2^(- nScaleFactor)$, then clamp to saturated value.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiMul_8u_AC4RSfs_Ctx**(const *Npp8u* *pSrc1, int nSrc1Step, const *Npp8u* *pSrc2, int nSrc2Step, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Four 8-bit unsigned char channel with unmodified alpha image multiplication, scale by $2^{(} - nScaleFactor)$, then clamp to saturated value.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **pSrc2** – *Source-Image Pointer*.
- **nSrc2Step** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiMul_8u_AC4IRSfs_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *Npp8u* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Four 8-bit unsigned char channel with unmodified alpha in place image multiplication, scale by $2^{(} - nScaleFactor)$, then clamp to saturated value.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.

- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiMul_8u_C4RSfs_Ctx**(const *Npp8u* *pSrc1, int nSrc1Step, const *Npp8u* *pSrc2, int nSrc2Step, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Four 8-bit unsigned char channel image multiplication, scale by $2^{(} - nScaleFactor)$, then clamp to saturated value.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **pSrc2** – *Source-Image Pointer*.
- **nSrc2Step** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiMul_8u_C4IRSfs_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *Npp8u* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Four 8-bit unsigned char channel in place image multiplication, scale by $2^{(} - nScaleFactor)$, then clamp to saturated value.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiMul_16u_C1RSfs_Ctx**(const *Npp16u* *pSrc1, int nSrc1Step, const *Npp16u* *pSrc2, int nSrc2Step, *Npp16u* *pDst, int nDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

One 16-bit unsigned short channel image multiplication, scale by $2^{(} - nScaleFactor)$, then clamp to saturated value.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **pSrc2** – *Source-Image Pointer*.
- **nSrc2Step** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiMul_16u_C1IRSfs_Ctx**(const *Npp16u* *pSrc, int nSrcStep, *Npp16u* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

One 16-bit unsigned short channel in place image multiplication, scale by $2^{(} - nScaleFactor)$, then clamp to saturated value.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiMul_16u_C3RSfs_Ctx**(const *Npp16u* *pSrc1, int nSrc1Step, const *Npp16u* *pSrc2, int nSrc2Step, *Npp16u* *pDst, int nDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Three 16-bit unsigned short channel image multiplication, scale by $2^{(} - nScaleFactor)$, then clamp to saturated value.

Parameters

- **pSrc1** – *Source-Image Pointer*.

- **nSrc1Step** – *Source-Image Line Step*.
- **pSrc2** – *Source-Image Pointer*.
- **nSrc2Step** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiMul_16u_C3IRSfs_Ctx**(const *Npp16u* *pSrc, int nSrcStep, *Npp16u* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Three 16-bit unsigned short channel in place image multiplication, scale by $2^(- nScaleFactor)$, then clamp to saturated value.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiMul_16u_AC4RSfs_Ctx**(const *Npp16u* *pSrc1, int nSrc1Step, const *Npp16u* *pSrc2, int nSrc2Step, *Npp16u* *pDst, int nDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Four 16-bit unsigned short channel with unmodified alpha image multiplication, scale by $2^(- nScaleFactor)$, then clamp to saturated value.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **pSrc2** – *Source-Image Pointer*.
- **nSrc2Step** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.

- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiMul_16u_AC4IRSfs_Ctx**(const *Npp16u* *pSrc, int nSrcStep, *Npp16u* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Four 16-bit unsigned short channel with unmodified alpha in place image multiplication, scale by $2^{(} - nScaleFactor)$, then clamp to saturated value.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiMul_16u_C4RSfs_Ctx**(const *Npp16u* *pSrc1, int nSrc1Step, const *Npp16u* *pSrc2, int nSrc2Step, *Npp16u* *pDst, int nDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Four 16-bit unsigned short channel image multiplication, scale by $2^{(} - nScaleFactor)$, then clamp to saturated value.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **pSrc2** – *Source-Image Pointer*.
- **nSrc2Step** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiMul_16u_C4IRSfs_Ctx**(const *Npp16u* *pSrc, int nSrcStep, *Npp16u* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Four 16-bit unsigned short channel in place image multiplication, scale by $2^{(} - nScaleFactor)$, then clamp to saturated value.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiMul_16s_C1RSfs_Ctx**(const *Npp16s* *pSrc1, int nSrc1Step, const *Npp16s* *pSrc2, int nSrc2Step, *Npp16s* *pDst, int nDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

One 16-bit signed short channel image multiplication, scale by $2^{(} - nScaleFactor)$, then clamp to saturated value.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **pSrc2** – *Source-Image Pointer*.
- **nSrc2Step** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiMul_16s_C1IRSfs_Ctx**(const *Npp16s* *pSrc, int nSrcStep, *Npp16s* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

One 16-bit signed short channel in place image multiplication, scale by $2^{(} - nScaleFactor)$, then clamp to saturated value.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiMul_16s_C3RSfs_Ctx**(const *Npp16s* *pSrc1, int nSrc1Step, const *Npp16s* *pSrc2, int nSrc2Step, *Npp16s* *pDst, int nDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Three 16-bit signed short channel image multiplication, scale by $2^(- nScaleFactor)$, then clamp to saturated value.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **pSrc2** – *Source-Image Pointer*.
- **nSrc2Step** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiMul_16s_C3IRSfs_Ctx**(const *Npp16s* *pSrc, int nSrcStep, *Npp16s* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Three 16-bit signed short channel in place image multiplication, scale by $2^(- nScaleFactor)$, then clamp to saturated value.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pSrcDst** – *In-Place Image Pointer*.

- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiMul_16s_AC4RSfs_Ctx**(const *Npp16s* *pSrc1, int nSrc1Step, const *Npp16s* *pSrc2, int nSrc2Step, *Npp16s* *pDst, int nDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Four 16-bit signed short channel with unmodified alpha image multiplication, scale by $2^{(} - nScaleFactor)$, then clamp to saturated value.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **pSrc2** – *Source-Image Pointer*.
- **nSrc2Step** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiMul_16s_AC4IRSfs_Ctx**(const *Npp16s* *pSrc, int nSrcStep, *Npp16s* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Four 16-bit signed short channel with unmodified alpha in place image multiplication, scale by $2^{(} - nScaleFactor)$, then clamp to saturated value.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiMul_16s_C4RSfs_Ctx**(const *Npp16s* *pSrc1, int nSrc1Step, const *Npp16s* *pSrc2, int nSrc2Step, *Npp16s* *pDst, int nDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Four 16-bit signed short channel image multiplication, scale by $2^{(}-nScaleFactor)$, then clamp to saturated value.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **pSrc2** – *Source-Image Pointer*.
- **nSrc2Step** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiMul_16s_C4IRSfs_Ctx**(const *Npp16s* *pSrc, int nSrcStep, *Npp16s* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Four 16-bit signed short channel in place image multiplication, scale by $2^{(}-nScaleFactor)$, then clamp to saturated value.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiMul_16sc_C1RSfs_Ctx**(const *Npp16sc* *pSrc1, int nSrc1Step, const *Npp16sc* *pSrc2, int nSrc2Step, *Npp16sc* *pDst, int nDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

One 16-bit signed short complex number (16-bit real, 16-bit imaginary) channel image multiplication, scale by $2^{(} - nScaleFactor)$, then clamp to saturated value.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **pSrc2** – *Source-Image Pointer*.
- **nSrc2Step** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiMul_16sc_C1IRSfs_Ctx**(const *Npp16sc* *pSrc, int nSrcStep, *Npp16sc* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

One 16-bit signed short complex number (16-bit real, 16-bit imaginary) channel in place image multiplication, scale by $2^{(} - nScaleFactor)$, then clamp to saturated value.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiMul_16sc_C3RSfs_Ctx**(const *Npp16sc* *pSrc1, int nSrc1Step, const *Npp16sc* *pSrc2, int nSrc2Step, *Npp16sc* *pDst, int nDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Three 16-bit signed short complex number (16-bit real, 16-bit imaginary) channel image multiplication, scale by $2^{(} - nScaleFactor)$, then clamp to saturated value.

Parameters

- **pSrc1** – *Source-Image Pointer*.

- **nSrc1Step** – *Source-Image Line Step*.
- **pSrc2** – *Source-Image Pointer*.
- **nSrc2Step** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiMul_16sc_C3IRSfs_Ctx**(const *Npp16sc* *pSrc, int nSrcStep, *Npp16sc* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Three 16-bit signed short complex number (16-bit real, 16-bit imaginary) channel in place image multiplication, scale by $2^{(} - nScaleFactor)$, then clamp to saturated value.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiMul_16sc_AC4RSfs_Ctx**(const *Npp16sc* *pSrc1, int nSrc1Step, const *Npp16sc* *pSrc2, int nSrc2Step, *Npp16sc* *pDst, int nDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Four 16-bit signed short complex number (16-bit real, 16-bit imaginary) channel with unmodified alpha image multiplication, scale by $2^{(} - nScaleFactor)$, then clamp to saturated value.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **pSrc2** – *Source-Image Pointer*.
- **nSrc2Step** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.

- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiMul_16sc_AC4IRSfs_Ctx**(const *Npp16sc* *pSrc, int nSrcStep, *Npp16sc* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Four 16-bit signed short complex number (16-bit real, 16-bit imaginary) channel with unmodified alpha in place image multiplication, scale by $2^{(} - nScaleFactor)$, then clamp to saturated value.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiMul_32s_C1RSfs_Ctx**(const *Npp32s* *pSrc1, int nSrc1Step, const *Npp32s* *pSrc2, int nSrc2Step, *Npp32s* *pDst, int nDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

One 32-bit signed integer channel image multiplication, scale by $2^{(} - nScaleFactor)$, then clamp to saturated value.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **pSrc2** – *Source-Image Pointer*.
- **nSrc2Step** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiMul_32s_C1R_Ctx**(const *Npp32s* *pSrc1, int nSrc1Step, const *Npp32s* *pSrc2, int nSrc2Step, *Npp32s* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Note: This function is to be deprecated in future NPP releases, use the function above with a scale factor of 0 instead.

1 channel 32-bit image multiplication. Multiply corresponding pixels in ROI.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **pSrc2** – *Source-Image Pointer*.
- **nSrc2Step** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiMul_32s_C1IRSfs_Ctx**(const *Npp32s* *pSrc, int nSrcStep, *Npp32s* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

One 32-bit signed integer channel in place image multiplication, scale by $2^(-nScaleFactor)$, then clamp to saturated value.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiMul_32s_C3RSfs_Ctx**(const *Npp32s* *pSrc1, int nSrc1Step, const *Npp32s* *pSrc2, int nSrc2Step, *Npp32s* *pDst, int nDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Three 32-bit signed integer channel image multiplication, scale by $2^(-nScaleFactor)$, then clamp to saturated value.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **pSrc2** – *Source-Image Pointer*.
- **nSrc2Step** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiMul_32s_C3IRSfs_Ctx**(const *Npp32s* *pSrc, int nSrcStep, *Npp32s* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Three 32-bit signed integer channel in place image multiplication, scale by $2^{(} - nScaleFactor)$, then clamp to saturated value.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiMul_32sc_C1RSfs_Ctx**(const *Npp32sc* *pSrc1, int nSrc1Step, const *Npp32sc* *pSrc2, int nSrc2Step, *Npp32sc* *pDst, int nDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

One 32-bit signed integer complex number (32-bit real, 32-bit imaginary) channel image multiplication, scale by $2^{(} - nScaleFactor)$, then clamp to saturated value.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **pSrc2** – *Source-Image Pointer*.

- **nSrc2Step** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiMul_32sc_C1IRSfs_Ctx**(const *Npp32sc* *pSrc, int nSrcStep, *Npp32sc* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

One 32-bit signed integer complex number (32-bit real, 32-bit imaginary) channel in place image multiplication, scale by $2^{(} - nScaleFactor)$, then clamp to saturated value.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiMul_32sc_C3RSfs_Ctx**(const *Npp32sc* *pSrc1, int nSrc1Step, const *Npp32sc* *pSrc2, int nSrc2Step, *Npp32sc* *pDst, int nDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Three 32-bit signed integer complex number (32-bit real, 32-bit imaginary) channel image multiplication, scale by $2^{(} - nScaleFactor)$, then clamp to saturated value.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **pSrc2** – *Source-Image Pointer*.
- **nSrc2Step** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.

- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiMul_32sc_C3IRSfs_Ctx**(const *Npp32sc* *pSrc, int nSrcStep, *Npp32sc* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Three 32-bit signed integer complex number (32-bit real, 32-bit imaginary) channel in place image multiplication, scale by $2^{(} - nScaleFactor)$, then clamp to saturated value.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiMul_32sc_AC4RSfs_Ctx**(const *Npp32sc* *pSrc1, int nSrc1Step, const *Npp32sc* *pSrc2, int nSrc2Step, *Npp32sc* *pDst, int nDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Four 32-bit signed integer complex number (32-bit real, 32-bit imaginary) channel with unmodified alpha image multiplication, scale by $2^{(} - nScaleFactor)$, then clamp to saturated value.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **pSrc2** – *Source-Image Pointer*.
- **nSrc2Step** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiMul_32sc_AC4IRSfs_Ctx**(const *Npp32sc* *pSrc, int nSrcStep, *Npp32sc* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Four 32-bit signed integer complex number (32-bit real, 32-bit imaginary) channel with unmodified alpha in place image multiplication, scale by $2^{(} - nScaleFactor)$, then clamp to saturated value.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiMul_16f_C1R_Ctx**(const *Npp16f* *pSrc1, int nSrc1Step, const *Npp16f* *pSrc2, int nSrc2Step, *Npp16f* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

One 16-bit floating point channel image multiplication.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **pSrc2** – *Source-Image Pointer*.
- **nSrc2Step** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiMul_16f_C1IR_Ctx**(const *Npp16f* *pSrc, int nSrcStep, *Npp16f* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

One 16-bit floating point channel in place image multiplication.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pSrcDst** – *In-Place Image Pointer*.

- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiMul_16f_C3R_Ctx**(const *Npp16f* *pSrc1, int nSrc1Step, const *Npp16f* *pSrc2, int nSrc2Step, *Npp16f* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Three 16-bit floating point channel image multiplication.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **pSrc2** – *Source-Image Pointer*.
- **nSrc2Step** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiMul_16f_C3IR_Ctx**(const *Npp16f* *pSrc, int nSrcStep, *Npp16f* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Three 16-bit floating point channel in place image multiplication.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiMul_16f_C4R_Ctx**(const *Npp16f* *pSrc1, int nSrc1Step, const *Npp16f* *pSrc2, int nSrc2Step, *Npp16f* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four 16-bit floating point channel image multiplication.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **pSrc2** – *Source-Image Pointer*.
- **nSrc2Step** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiMul_16f_C4IR_Ctx**(const *Npp16f* *pSrc, int nSrcStep, *Npp16f* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four 16-bit floating point channel in place image multiplication.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiMul_32f_C1R_Ctx**(const *Npp32f* *pSrc1, int nSrc1Step, const *Npp32f* *pSrc2, int nSrc2Step, *Npp32f* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

One 32-bit floating point channel image multiplication.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **pSrc2** – *Source-Image Pointer*.
- **nSrc2Step** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiMul_32f_C1IR_Ctx**(const *Npp32f* *pSrc, int nSrcStep, *Npp32f* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

One 32-bit floating point channel in place image multiplication.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiMul_32f_C3R_Ctx**(const *Npp32f* *pSrc1, int nSrc1Step, const *Npp32f* *pSrc2, int nSrc2Step, *Npp32f* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Three 32-bit floating point channel image multiplication.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **pSrc2** – *Source-Image Pointer*.
- **nSrc2Step** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiMul_32f_C3IR_Ctx**(const *Npp32f* *pSrc, int nSrcStep, *Npp32f* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Three 32-bit floating point channel in place image multiplication.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.

- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiMul_32f_AC4R_Ctx**(const *Npp32f* *pSrc1, int nSrc1Step, const *Npp32f* *pSrc2, int nSrc2Step, *Npp32f* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four 32-bit floating point channel with unmodified alpha image multiplication.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **pSrc2** – *Source-Image Pointer*.
- **nSrc2Step** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiMul_32f_AC4IR_Ctx**(const *Npp32f* *pSrc, int nSrcStep, *Npp32f* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four 32-bit floating point channel with unmodified alpha in place image multiplication.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiMul_32f_C4R_Ctx**(const *Npp32f* *pSrc1, int nSrc1Step, const *Npp32f* *pSrc2, int nSrc2Step, *Npp32f* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four 32-bit floating point channel image multiplication.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **pSrc2** – *Source-Image Pointer*.
- **nSrc2Step** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiMul_32f_C4IR_Ctx**(const *Npp32f* *pSrc, int nSrcStep, *Npp32f* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four 32-bit floating point channel in place image multiplication.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiMul_32fc_C1R_Ctx**(const *Npp32fc* *pSrc1, int nSrc1Step, const *Npp32fc* *pSrc2, int nSrc2Step, *Npp32fc* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

One 32-bit floating point complex number (32-bit real, 32-bit imaginary) channel image multiplication.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **pSrc2** – *Source-Image Pointer*.
- **nSrc2Step** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.

- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiMul_32fc_C1IR_Ctx**(const *Npp32fc* *pSrc, int nSrcStep, *Npp32fc* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

One 32-bit floating point complex number (32-bit real, 32-bit imaginary) channel in place image multiplication.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiMul_32fc_C3R_Ctx**(const *Npp32fc* *pSrc1, int nSrc1Step, const *Npp32fc* *pSrc2, int nSrc2Step, *Npp32fc* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Three 32-bit floating point complex number (32-bit real, 32-bit imaginary) channel image multiplication.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **pSrc2** – *Source-Image Pointer*.
- **nSrc2Step** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiMul_32fc_C3IR_Ctx**(const *Npp32fc* *pSrc, int nSrcStep, *Npp32fc* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Three 32-bit floating point complex number (32-bit real, 32-bit imaginary) channel in place image multiplication.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiMul_32fc_AC4R_Ctx**(const *Npp32fc* *pSrc1, int nSrc1Step, const *Npp32fc* *pSrc2, int nSrc2Step, *Npp32fc* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four 32-bit floating point complex number (32-bit real, 32-bit imaginary) channel with unmodified alpha image multiplication.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **pSrc2** – *Source-Image Pointer*.
- **nSrc2Step** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiMul_32fc_AC4IR_Ctx**(const *Npp32fc* *pSrc, int nSrcStep, *Npp32fc* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four 32-bit floating point complex number (32-bit real, 32-bit imaginary) channel with unmodified alpha in place image multiplication.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiMul_32fc_C4R_Ctx**(const *Npp32fc* *pSrc1, int nSrc1Step, const *Npp32fc* *pSrc2, int nSrc2Step, *Npp32fc* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four 32-bit floating point complex number (32-bit real, 32-bit imaginary) channel image multiplication.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **pSrc2** – *Source-Image Pointer*.
- **nSrc2Step** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiMul_32fc_C4IR_Ctx**(const *Npp32fc* *pSrc, int nSrcStep, *Npp32fc* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four 32-bit floating point complex number (32-bit real, 32-bit imaginary) channel in place image multiplication.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

1.7.1.13 MulScale

Pixel by pixel multiplies each pixel of two images then scales the result by the maximum value for the data bit width.

Functions

NppStatus **nppiMulScale_8u_C1R_Ctx**(const *Npp8u* *pSrc1, int nSrc1Step, const *Npp8u* *pSrc2, int nSrc2Step, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

One 8-bit unsigned char channel image multiplication then scale by maximum value for pixel bit width.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **pSrc2** – *Source-Image Pointer*.
- **nSrc2Step** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiMulScale_8u_C1IR_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *Npp8u* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

One 8-bit unsigned char channel in place image multiplication then scale by maximum value for pixel bit width.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiMulScale_8u_C3R_Ctx**(const *Npp8u* *pSrc1, int nSrc1Step, const *Npp8u* *pSrc2, int nSrc2Step, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Three 8-bit unsigned char channel image multiplication then scale by maximum value for pixel bit width.

Parameters

- **pSrc1** – *Source-Image Pointer*.

- **nSrc1Step** – *Source-Image Line Step*.
- **pSrc2** – *Source-Image Pointer*.
- **nSrc2Step** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiMulScale_8u_C3IR_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *Npp8u* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Three 8-bit unsigned char channel in place image multiplication then scale by maximum value for pixel bit width.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiMulScale_8u_AC4R_Ctx**(const *Npp8u* *pSrc1, int nSrc1Step, const *Npp8u* *pSrc2, int nSrc2Step, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four 8-bit unsigned char channel with unmodified alpha image multiplication then scale by maximum value for pixel bit width.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **pSrc2** – *Source-Image Pointer*.
- **nSrc2Step** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiMulScale_8u_AC4IR_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *Npp8u* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four 8-bit unsigned char channel with unmodified alpha in place image multiplication then scale by maximum value for pixel bit width.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiMulScale_8u_C4R_Ctx**(const *Npp8u* *pSrc1, int nSrc1Step, const *Npp8u* *pSrc2, int nSrc2Step, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four 8-bit unsigned char channel image multiplication then scale by maximum value for pixel bit width.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **pSrc2** – *Source-Image Pointer*.
- **nSrc2Step** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiMulScale_8u_C4IR_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *Npp8u* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four 8-bit unsigned char channel in place image multiplication then scale by maximum value for pixel bit width.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiMulScale_16u_C1R_Ctx**(const *Npp16u* *pSrc1, int nSrc1Step, const *Npp16u* *pSrc2, int nSrc2Step, *Npp16u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

One 16-bit unsigned short channel image multiplication then scale by maximum value for pixel bit width.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **pSrc2** – *Source-Image Pointer*.
- **nSrc2Step** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiMulScale_16u_C1IR_Ctx**(const *Npp16u* *pSrc, int nSrcStep, *Npp16u* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

One 16-bit unsigned short channel in place image multiplication then scale by maximum value for pixel bit width.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiMulScale_16u_C3R_Ctx**(const *Npp16u* *pSrc1, int nSrc1Step, const *Npp16u* *pSrc2, int nSrc2Step, *Npp16u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Three 16-bit unsigned short channel image multiplication then scale by maximum value for pixel bit width.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **pSrc2** – *Source-Image Pointer*.
- **nSrc2Step** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiMulScale_16u_C3IR_Ctx**(const *Npp16u* *pSrc, int nSrcStep, *Npp16u* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Three 16-bit unsigned short channel in place image multiplication then scale by maximum value for pixel bit width.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiMulScale_16u_AC4R_Ctx**(const *Npp16u* *pSrc1, int nSrc1Step, const *Npp16u* *pSrc2, int nSrc2Step, *Npp16u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four 16-bit unsigned short channel with unmodified alpha image multiplication then scale by maximum value for pixel bit width.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.

- **pSrc2** – *Source-Image Pointer*.
- **nSrc2Step** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiMulScale_16u_AC4IR_Ctx**(const *Npp16u* *pSrc, int nSrcStep, *Npp16u* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four 16-bit unsigned short channel with unmodified alpha in place image multiplication then scale by maximum value for pixel bit width.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiMulScale_16u_C4R_Ctx**(const *Npp16u* *pSrc1, int nSrc1Step, const *Npp16u* *pSrc2, int nSrc2Step, *Npp16u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four 16-bit unsigned short channel image multiplication then scale by maximum value for pixel bit width.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **pSrc2** – *Source-Image Pointer*.
- **nSrc2Step** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiMulScale_16u_C4IR_Ctx**(const *Npp16u* *pSrc, int nSrcStep, *Npp16u* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four 16-bit unsigned short channel in place image multiplication then scale by maximum value for pixel bit width.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

1.7.1.14 Sub

Pixel by pixel subtraction of two images.

Functions

NppStatus **nppiSub_8u_C1RSfs_Ctx**(const *Npp8u* *pSrc1, int nSrc1Step, const *Npp8u* *pSrc2, int nSrc2Step, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

One 8-bit unsigned char channel image subtraction, scale by $2^{(} - nScaleFactor)$, then clamp to saturated value.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **pSrc2** – *Source-Image Pointer*.
- **nSrc2Step** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiSub_8u_C1IRSfs_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *Npp8u* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

One 8-bit unsigned char channel in place image subtraction, scale by $2^{(} - nScaleFactor)$, then clamp to saturated value.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiSub_8u_C3RSfs_Ctx**(const *Npp8u* *pSrc1, int nSrc1Step, const *Npp8u* *pSrc2, int nSrc2Step, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Three 8-bit unsigned char channel image subtraction, scale by $2^{(} - nScaleFactor)$, then clamp to saturated value.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **pSrc2** – *Source-Image Pointer*.
- **nSrc2Step** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiSub_8u_C3IRSfs_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *Npp8u* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Three 8-bit unsigned char channel in place image subtraction, scale by $2^{(} - nScaleFactor)$, then clamp to saturated value.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiSub_8u_AC4RSfs_Ctx**(const *Npp8u* *pSrc1, int nSrc1Step, const *Npp8u* *pSrc2, int nSrc2Step, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Four 8-bit unsigned char channel with unmodified alpha image subtraction, scale by $2^{(} - nScaleFactor)$, then clamp to saturated value.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **pSrc2** – *Source-Image Pointer*.
- **nSrc2Step** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiSub_8u_AC4IRSfs_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *Npp8u* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Four 8-bit unsigned char channel with unmodified alpha in place image subtraction, scale by $2^{(} - nScaleFactor)$, then clamp to saturated value.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.

- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiSub_8u_C4RSfs_Ctx**(const *Npp8u* *pSrc1, int nSrc1Step, const *Npp8u* *pSrc2, int nSrc2Step, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Four 8-bit unsigned char channel image subtraction, scale by $2^{(} - nScaleFactor)$, then clamp to saturated value.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **pSrc2** – *Source-Image Pointer*.
- **nSrc2Step** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiSub_8u_C4IRSfs_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *Npp8u* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Four 8-bit unsigned char channel in place image subtraction, scale by $2^{(} - nScaleFactor)$, then clamp to saturated value.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiSub_16u_C1RSfs_Ctx**(const *Npp16u* *pSrc1, int nSrc1Step, const *Npp16u* *pSrc2, int nSrc2Step, *Npp16u* *pDst, int nDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

One 16-bit unsigned short channel image subtraction, scale by $2^{(}-nScaleFactor)$, then clamp to saturated value.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **pSrc2** – *Source-Image Pointer*.
- **nSrc2Step** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiSub_16u_C1IRSfs_Ctx**(const *Npp16u* *pSrc, int nSrcStep, *Npp16u* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

One 16-bit unsigned short channel in place image subtraction, scale by $2^{(}-nScaleFactor)$, then clamp to saturated value.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiSub_16u_C3RSfs_Ctx**(const *Npp16u* *pSrc1, int nSrc1Step, const *Npp16u* *pSrc2, int nSrc2Step, *Npp16u* *pDst, int nDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Three 16-bit unsigned short channel image subtraction, scale by $2^{(}-nScaleFactor)$, then clamp to saturated value.

Parameters

- **pSrc1** – *Source-Image Pointer*.

- **nSrc1Step** – *Source-Image Line Step*.
- **pSrc2** – *Source-Image Pointer*.
- **nSrc2Step** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiSub_16u_C3IRSfs_Ctx**(const *Npp16u* *pSrc, int nSrcStep, *Npp16u* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Three 16-bit unsigned short channel in place image subtraction, scale by $2^{(}-nScaleFactor)$, then clamp to saturated value.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiSub_16u_AC4RSfs_Ctx**(const *Npp16u* *pSrc1, int nSrc1Step, const *Npp16u* *pSrc2, int nSrc2Step, *Npp16u* *pDst, int nDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Four 16-bit unsigned short channel with unmodified alpha image subtraction, scale by $2^{(}-nScaleFactor)$, then clamp to saturated value.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **pSrc2** – *Source-Image Pointer*.
- **nSrc2Step** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.

- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiSub_16u_AC4IRSfs_Ctx**(const *Npp16u* *pSrc, int nSrcStep, *Npp16u* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Four 16-bit unsigned short channel with unmodified alpha in place image subtraction, scale by $2^{(} - nScaleFactor)$, then clamp to saturated value.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiSub_16u_C4RSfs_Ctx**(const *Npp16u* *pSrc1, int nSrc1Step, const *Npp16u* *pSrc2, int nSrc2Step, *Npp16u* *pDst, int nDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Four 16-bit unsigned short channel image subtraction, scale by $2^{(} - nScaleFactor)$, then clamp to saturated value.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **pSrc2** – *Source-Image Pointer*.
- **nSrc2Step** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiSub_16u_C4IRSfs_Ctx**(const *Npp16u* *pSrc, int nSrcStep, *Npp16u* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Four 16-bit unsigned short channel in place image subtraction, scale by $2^{(} - nScaleFactor)$, then clamp to saturated value.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiSub_16s_C1RSfs_Ctx**(const *Npp16s* *pSrc1, int nSrc1Step, const *Npp16s* *pSrc2, int nSrc2Step, *Npp16s* *pDst, int nDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

One 16-bit signed short channel image subtraction, scale by $2^{(} - nScaleFactor)$, then clamp to saturated value.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **pSrc2** – *Source-Image Pointer*.
- **nSrc2Step** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiSub_16s_C1IRSfs_Ctx**(const *Npp16s* *pSrc, int nSrcStep, *Npp16s* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

One 16-bit signed short channel in place image subtraction, scale by $2^{(} - nScaleFactor)$, then clamp to saturated value.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiSub_16s_C3RSfs_Ctx**(const *Npp16s* *pSrc1, int nSrc1Step, const *Npp16s* *pSrc2, int nSrc2Step, *Npp16s* *pDst, int nDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Three 16-bit signed short channel image subtraction, scale by $2^{(} - nScaleFactor)$, then clamp to saturated value.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **pSrc2** – *Source-Image Pointer*.
- **nSrc2Step** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiSub_16s_C3IRSfs_Ctx**(const *Npp16s* *pSrc, int nSrcStep, *Npp16s* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Three 16-bit signed short channel in place image subtraction, scale by $2^{(} - nScaleFactor)$, then clamp to saturated value.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pSrcDst** – *In-Place Image Pointer*.

- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiSub_16s_AC4RSfs_Ctx**(const *Npp16s* *pSrc1, int nSrc1Step, const *Npp16s* *pSrc2, int nSrc2Step, *Npp16s* *pDst, int nDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Four 16-bit signed short channel with unmodified alpha image subtraction, scale by $2^{(} - nScaleFactor)$, then clamp to saturated value.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **pSrc2** – *Source-Image Pointer*.
- **nSrc2Step** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiSub_16s_AC4IRSfs_Ctx**(const *Npp16s* *pSrc, int nSrcStep, *Npp16s* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Four 16-bit signed short channel with unmodified alpha in place image subtraction, scale by $2^{(} - nScaleFactor)$, then clamp to saturated value.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiSub_16s_C4RSfs_Ctx**(const *Npp16s* *pSrc1, int nSrc1Step, const *Npp16s* *pSrc2, int nSrc2Step, *Npp16s* *pDst, int nDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Four 16-bit signed short channel image subtraction, scale by $2^{(} - nScaleFactor)$, then clamp to saturated value.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **pSrc2** – *Source-Image Pointer*.
- **nSrc2Step** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiSub_16s_C4IRSfs_Ctx**(const *Npp16s* *pSrc, int nSrcStep, *Npp16s* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Four 16-bit signed short channel in place image subtraction, scale by $2^{(} - nScaleFactor)$, then clamp to saturated value.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiSub_16sc_C1RSfs_Ctx**(const *Npp16sc* *pSrc1, int nSrc1Step, const *Npp16sc* *pSrc2, int nSrc2Step, *Npp16sc* *pDst, int nDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

One 16-bit signed short complex number (16-bit real, 16-bit imaginary) channel image subtraction, scale by $2^{(} - nScaleFactor)$, then clamp to saturated value.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **pSrc2** – *Source-Image Pointer*.
- **nSrc2Step** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiSub_16sc_C1IRSfs_Ctx**(const *Npp16sc* *pSrc, int nSrcStep, *Npp16sc* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

One 16-bit signed short complex number (16-bit real, 16-bit imaginary) channel in place image subtraction, scale by $2^{(} - nScaleFactor)$, then clamp to saturated value.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiSub_16sc_C3RSfs_Ctx**(const *Npp16sc* *pSrc1, int nSrc1Step, const *Npp16sc* *pSrc2, int nSrc2Step, *Npp16sc* *pDst, int nDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Three 16-bit signed short complex number (16-bit real, 16-bit imaginary) channel image subtraction, scale by $2^{(} - nScaleFactor)$, then clamp to saturated value.

Parameters

- **pSrc1** – *Source-Image Pointer*.

- **nSrc1Step** – *Source-Image Line Step*.
- **pSrc2** – *Source-Image Pointer*.
- **nSrc2Step** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiSub_16sc_C3IRSfs_Ctx**(const *Npp16sc* *pSrc, int nSrcStep, *Npp16sc* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Three 16-bit signed short complex number (16-bit real, 16-bit imaginary) channel in place image subtraction, scale by $2^{(} - nScaleFactor)$, then clamp to saturated value.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiSub_16sc_AC4RSfs_Ctx**(const *Npp16sc* *pSrc1, int nSrc1Step, const *Npp16sc* *pSrc2, int nSrc2Step, *Npp16sc* *pDst, int nDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Four 16-bit signed short complex number (16-bit real, 16-bit imaginary) channel with unmodified alpha image subtraction, scale by $2^{(} - nScaleFactor)$, then clamp to saturated value.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **pSrc2** – *Source-Image Pointer*.
- **nSrc2Step** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.

- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiSub_16sc_AC4IRSfs_Ctx**(const *Npp16sc* *pSrc, int nSrcStep, *Npp16sc* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Four 16-bit signed short complex number (16-bit real, 16-bit imaginary) channel with unmodified alpha in place image subtraction, scale by $2^{(} - nScaleFactor)$, then clamp to saturated value.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiSub_32s_C1RSfs_Ctx**(const *Npp32s* *pSrc1, int nSrc1Step, const *Npp32s* *pSrc2, int nSrc2Step, *Npp32s* *pDst, int nDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

One 32-bit signed integer channel image subtraction, scale by $2^{(} - nScaleFactor)$, then clamp to saturated value.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **pSrc2** – *Source-Image Pointer*.
- **nSrc2Step** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiSub_32s_C1R_Ctx**(const *Npp32s* *pSrc1, int nSrc1Step, const *Npp32s* *pSrc2, int nSrc2Step, *Npp32s* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Note: This function is to be deprecated in future NPP releases, use the function above with a scale factor of 0 instead.

32-bit image subtraction. Subtract pSrc1's pixels from corresponding pixels in pSrc2.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **pSrc2** – *Source-Image Pointer*.
- **nSrc2Step** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiSub_32s_C1IRSfs_Ctx**(const *Npp32s* *pSrc, int nSrcStep, *Npp32s* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

One 32-bit signed integer channel in place image subtraction, scale by $2^{(} - nScaleFactor)$, then clamp to saturated value.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiSub_32s_C3RSfs_Ctx**(const *Npp32s* *pSrc1, int nSrc1Step, const *Npp32s* *pSrc2, int nSrc2Step, *Npp32s* *pDst, int nDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Three 32-bit signed integer channel image subtraction, scale by $2^{(} - nScaleFactor)$, then clamp to saturated value.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **pSrc2** – *Source-Image Pointer*.
- **nSrc2Step** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiSub_32s_C3IRSfs_Ctx**(const *Npp32s* *pSrc, int nSrcStep, *Npp32s* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Three 32-bit signed integer channel in place image subtraction, scale by $2^{(}-nScaleFactor)$, then clamp to saturated value.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiSub_32s_C4RSfs_Ctx**(const *Npp32s* *pSrc1, int nSrc1Step, const *Npp32s* *pSrc2, int nSrc2Step, *Npp32s* *pDst, int nDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Four 32-bit signed integer channel image subtraction, scale by $2^{(}-nScaleFactor)$, then clamp to saturated value.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **pSrc2** – *Source-Image Pointer*.

- **nSrc2Step** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiSub_32s_C4IRSfs_Ctx**(const *Npp32s* *pSrc, int nSrcStep, *Npp32s* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Four 32-bit signed integer channel in place image subtraction, scale by $2^{(} - nScaleFactor)$, then clamp to saturated value.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiSub_32sc_C1RSfs_Ctx**(const *Npp32sc* *pSrc1, int nSrc1Step, const *Npp32sc* *pSrc2, int nSrc2Step, *Npp32sc* *pDst, int nDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

One 32-bit signed integer complex number (32-bit real, 32-bit imaginary) channel image subtraction, scale by $2^{(} - nScaleFactor)$, then clamp to saturated value.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **pSrc2** – *Source-Image Pointer*.
- **nSrc2Step** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.

- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiSub_32sc_C1IRSfs_Ctx**(const *Npp32sc* *pSrc, int nSrcStep, *Npp32sc* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

One 32-bit signed integer complex number (32-bit real, 32-bit imaginary) channel in place image subtraction, scale by $2^{(} - nScaleFactor)$, then clamp to saturated value.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiSub_32sc_C3RSfs_Ctx**(const *Npp32sc* *pSrc1, int nSrc1Step, const *Npp32sc* *pSrc2, int nSrc2Step, *Npp32sc* *pDst, int nDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Three 32-bit signed integer complex number (32-bit real, 32-bit imaginary) channel image subtraction, scale by $2^{(} - nScaleFactor)$, then clamp to saturated value.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **pSrc2** – *Source-Image Pointer*.
- **nSrc2Step** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiSub_32sc_C3IRSfs_Ctx**(const *Npp32sc* *pSrc, int nSrcStep, *Npp32sc* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Three 32-bit signed integer complex number (32-bit real, 32-bit imaginary) channel in place image subtraction, scale by $2^{(} - nScaleFactor)$, then clamp to saturated value.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiSub_32sc_AC4RSfs_Ctx**(const *Npp32sc* *pSrc1, int nSrc1Step, const *Npp32sc* *pSrc2, int nSrc2Step, *Npp32sc* *pDst, int nDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Four 32-bit signed integer complex number (32-bit real, 32-bit imaginary) channel with unmodified alpha image subtraction, scale by $2^{(} - nScaleFactor)$, then clamp to saturated value.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **pSrc2** – *Source-Image Pointer*.
- **nSrc2Step** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiSub_32sc_AC4IRSfs_Ctx**(const *Npp32sc* *pSrc, int nSrcStep, *Npp32sc* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Four 32-bit signed integer complex number (32-bit real, 32-bit imaginary) channel with unmodified alpha in place image subtraction, scale by $2^{(} - nScaleFactor)$, then clamp to saturated value.

Parameters

- **pSrc** – *Source-Image Pointer*.

- **nSrcStep** – *Source-Image Line Step*.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiSub_16f_C1R_Ctx**(const *Npp16f* *pSrc1, int nSrc1Step, const *Npp16f* *pSrc2, int nSrc2Step, *Npp16f* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

One 16-bit floating point channel image subtraction.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **pSrc2** – *Source-Image Pointer*.
- **nSrc2Step** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiSub_16f_C1IR_Ctx**(const *Npp16f* *pSrc, int nSrcStep, *Npp16f* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

One 16-bit floating point channel in place image subtraction.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiSub_16f_C3R_Ctx**(const *Npp16f* *pSrc1, int nSrc1Step, const *Npp16f* *pSrc2, int nSrc2Step, *Npp16f* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Three 16-bit floating point channel image subtraction.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **pSrc2** – *Source-Image Pointer*.
- **nSrc2Step** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiSub_16f_C3IR_Ctx**(const *Npp16f* *pSrc, int nSrcStep, *Npp16f* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Three 16-bit floating point channel in place image subtraction.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiSub_16f_C4R_Ctx**(const *Npp16f* *pSrc1, int nSrc1Step, const *Npp16f* *pSrc2, int nSrc2Step, *Npp16f* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four 16-bit floating point channel image subtraction.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **pSrc2** – *Source-Image Pointer*.
- **nSrc2Step** – *Source-Image Line Step*.

- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiSub_16f_C4IR_Ctx**(const *Npp16f* *pSrc, int nSrcStep, *Npp16f* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four 16-bit floating point channel in place image subtraction.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiSub_32f_C1R_Ctx**(const *Npp32f* *pSrc1, int nSrc1Step, const *Npp32f* *pSrc2, int nSrc2Step, *Npp32f* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

One 32-bit floating point channel image subtraction.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **pSrc2** – *Source-Image Pointer*.
- **nSrc2Step** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiSub_32f_C1IR_Ctx**(const *Npp32f* *pSrc, int nSrcStep, *Npp32f* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

One 32-bit floating point channel in place image subtraction.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiSub_32f_C3R_Ctx**(const *Npp32f* *pSrc1, int nSrc1Step, const *Npp32f* *pSrc2, int nSrc2Step, *Npp32f* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Three 32-bit floating point channel image subtraction.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **pSrc2** – *Source-Image Pointer*.
- **nSrc2Step** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiSub_32f_C3IR_Ctx**(const *Npp32f* *pSrc, int nSrcStep, *Npp32f* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Three 32-bit floating point channel in place image subtraction.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiSub_32f_AC4R_Ctx**(const *Npp32f* *pSrc1, int nSrc1Step, const *Npp32f* *pSrc2, int nSrc2Step, *Npp32f* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four 32-bit floating point channel with unmodified alpha image subtraction.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **pSrc2** – *Source-Image Pointer*.
- **nSrc2Step** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiSub_32f_AC4IR_Ctx**(const *Npp32f* *pSrc, int nSrcStep, *Npp32f* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four 32-bit floating point channel with unmodified alpha in place image subtraction.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiSub_32f_C4R_Ctx**(const *Npp32f* *pSrc1, int nSrc1Step, const *Npp32f* *pSrc2, int nSrc2Step, *Npp32f* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four 32-bit floating point channel image subtraction.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **pSrc2** – *Source-Image Pointer*.
- **nSrc2Step** – *Source-Image Line Step*.

- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiSub_32f_C4IR_Ctx**(const *Npp32f* *pSrc, int nSrcStep, *Npp32f* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four 32-bit floating point channel in place image subtraction.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiSub_32fc_C1R_Ctx**(const *Npp32fc* *pSrc1, int nSrc1Step, const *Npp32fc* *pSrc2, int nSrc2Step, *Npp32fc* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

One 32-bit floating point complex number (32-bit real, 32-bit imaginary) channel image subtraction.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **pSrc2** – *Source-Image Pointer*.
- **nSrc2Step** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiSub_32fc_C1IR_Ctx**(const *Npp32fc* *pSrc, int nSrcStep, *Npp32fc* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

One 32-bit floating point complex number (32-bit real, 32-bit imaginary) channel in place image subtraction.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiSub_32fc_C3R_Ctx**(const *Npp32fc* *pSrc1, int nSrc1Step, const *Npp32fc* *pSrc2, int nSrc2Step, *Npp32fc* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Three 32-bit floating point complex number (32-bit real, 32-bit imaginary) channel image subtraction.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **pSrc2** – *Source-Image Pointer*.
- **nSrc2Step** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiSub_32fc_C3IR_Ctx**(const *Npp32fc* *pSrc, int nSrcStep, *Npp32fc* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Three 32-bit floating point complex number (32-bit real, 32-bit imaginary) channel in place image subtraction.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.

- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiSub_32fc_AC4R_Ctx**(const *Npp32fc* *pSrc1, int nSrc1Step, const *Npp32fc* *pSrc2, int nSrc2Step, *Npp32fc* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four 32-bit floating point complex number (32-bit real, 32-bit imaginary) channel with unmodified alpha image subtraction.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **pSrc2** – *Source-Image Pointer*.
- **nSrc2Step** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiSub_32fc_AC4IR_Ctx**(const *Npp32fc* *pSrc, int nSrcStep, *Npp32fc* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four 32-bit floating point complex number (32-bit real, 32-bit imaginary) channel with unmodified alpha in place image subtraction.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiSub_32fc_C4R_Ctx**(const *Npp32fc* *pSrc1, int nSrc1Step, const *Npp32fc* *pSrc2, int nSrc2Step, *Npp32fc* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four 32-bit floating point complex number (32-bit real, 32-bit imaginary) channel image subtraction.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **pSrc2** – *Source-Image Pointer*.
- **nSrc2Step** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiSub_32fc_C4IR_Ctx**(const *Npp32fc* *pSrc, int nSrcStep, *Npp32fc* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four 32-bit floating point complex number (32-bit real, 32-bit imaginary) channel in place image subtraction.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

1.7.1.15 Div

Pixel by pixel division of two images.

Functions

NppStatus **nppiDiv_8u_C1RSfs_Ctx**(const *Npp8u* *pSrc1, int nSrc1Step, const *Npp8u* *pSrc2, int nSrc2Step, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

One 8-bit unsigned char channel image division, scale by $2^{(} - nScaleFactor)$, then clamp to saturated value.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **pSrc2** – *Source-Image Pointer*.
- **nSrc2Step** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiDiv_8u_C1IRSfs_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *Npp8u* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

One 8-bit unsigned char channel in place image division, scale by $2^{(} - nScaleFactor)$, then clamp to saturated value.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiDiv_8u_C3RSfs_Ctx**(const *Npp8u* *pSrc1, int nSrc1Step, const *Npp8u* *pSrc2, int nSrc2Step, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Three 8-bit unsigned char channel image division, scale by $2^{(} - nScaleFactor)$, then clamp to saturated value.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **pSrc2** – *Source-Image Pointer*.
- **nSrc2Step** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.

- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiDiv_8u_C3IRSfs_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *Npp8u* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Three 8-bit unsigned char channel in place image division, scale by $2^{(}-nScaleFactor)$, then clamp to saturated value.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiDiv_8u_AC4RSfs_Ctx**(const *Npp8u* *pSrc1, int nSrc1Step, const *Npp8u* *pSrc2, int nSrc2Step, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Four 8-bit unsigned char channel with unmodified alpha image division, scale by $2^{(}-nScaleFactor)$, then clamp to saturated value.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **pSrc2** – *Source-Image Pointer*.
- **nSrc2Step** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiDiv_8u_AC4IRSfs_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *Npp8u* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Four 8-bit unsigned char channel with unmodified alpha in place image division, scale by $2^{(} - nScaleFactor)$, then clamp to saturated value.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiDiv_8u_C4RSfs_Ctx**(const *Npp8u* *pSrc1, int nSrc1Step, const *Npp8u* *pSrc2, int nSrc2Step, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Four 8-bit unsigned char channel image division, scale by $2^{(} - nScaleFactor)$, then clamp to saturated value.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **pSrc2** – *Source-Image Pointer*.
- **nSrc2Step** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiDiv_8u_C4IRSfs_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *Npp8u* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Four 8-bit unsigned char channel in place image division, scale by $2^{(} - nScaleFactor)$, then clamp to saturated value.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiDiv_16u_C1RSfs_Ctx**(const *Npp16u* *pSrc1, int nSrc1Step, const *Npp16u* *pSrc2, int nSrc2Step, *Npp16u* *pDst, int nDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

One 16-bit unsigned short channel image division, scale by $2^(- nScaleFactor)$, then clamp to saturated value.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **pSrc2** – *Source-Image Pointer*.
- **nSrc2Step** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiDiv_16u_C1RSfs**(const *Npp16u* *pSrc1, int nSrc1Step, const *Npp16u* *pSrc2, int nSrc2Step, *Npp16u* *pDst, int nDstStep, *NppiSize* oSizeROI, int nScaleFactor)

One 16-bit unsigned short channel image division, scale by $2^(- nScaleFactor)$, then clamp to saturated value.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **pSrc2** – *Source-Image Pointer*.
- **nSrc2Step** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.

- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiDiv_16u_C1IRSfs_Ctx**(const *Npp16u* *pSrc, int nSrcStep, *Npp16u* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

One 16-bit unsigned short channel in place image division, scale by $2^{(}-nScaleFactor)$, then clamp to saturated value.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiDiv_16u_C3RSfs_Ctx**(const *Npp16u* *pSrc1, int nSrc1Step, const *Npp16u* *pSrc2, int nSrc2Step, *Npp16u* *pDst, int nDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Three 16-bit unsigned short channel image division, scale by $2^{(} - nScaleFactor)$, then clamp to saturated value.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **pSrc2** – *Source-Image Pointer*.
- **nSrc2Step** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiDiv_16u_C3IRSfs_Ctx**(const *Npp16u* *pSrc, int nSrcStep, *Npp16u* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Three 16-bit unsigned short channel in place image division, scale by $2^{(} - nScaleFactor)$, then clamp to saturated value.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiDiv_16u_AC4RSfs_Ctx**(const *Npp16u* *pSrc1, int nSrc1Step, const *Npp16u* *pSrc2, int nSrc2Step, *Npp16u* *pDst, int nDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Four 16-bit unsigned short channel with unmodified alpha image division, scale by $2^{(} - nScaleFactor)$, then clamp to saturated value.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **pSrc2** – *Source-Image Pointer*.
- **nSrc2Step** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiDiv_16u_AC4IRSfs_Ctx**(const *Npp16u* *pSrc, int nSrcStep, *Npp16u* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Four 16-bit unsigned short channel with unmodified alpha in place image division, scale by $2^{(} - nScaleFactor)$, then clamp to saturated value.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiDiv_16u_C4RSfs_Ctx**(const *Npp16u* *pSrc1, int nSrc1Step, const *Npp16u* *pSrc2, int nSrc2Step, *Npp16u* *pDst, int nDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Four 16-bit unsigned short channel image division, scale by $2^{(} - nScaleFactor)$, then clamp to saturated value.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **pSrc2** – *Source-Image Pointer*.
- **nSrc2Step** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiDiv_16u_C4IRSfs_Ctx**(const *Npp16u* *pSrc, int nSrcStep, *Npp16u* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Four 16-bit unsigned short channel in place image division, scale by $2^{(-nScaleFactor)}$, then clamp to saturated value.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pSrcDst** – *In-Place Image Pointer*.

- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiDiv_16s_C1RSfs_Ctx**(const *Npp16s* *pSrc1, int nSrc1Step, const *Npp16s* *pSrc2, int nSrc2Step, *Npp16s* *pDst, int nDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

One 16-bit signed short channel image division, scale by $2^{(} - nScaleFactor)$, then clamp to saturated value.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **pSrc2** – *Source-Image Pointer*.
- **nSrc2Step** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiDiv_16s_C1IRSfs_Ctx**(const *Npp16s* *pSrc, int nSrcStep, *Npp16s* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

One 16-bit signed short channel in place image division, scale by $2^{(} - nScaleFactor)$, then clamp to saturated value.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiDiv_16s_C3RSfs_Ctx**(const *Npp16s* *pSrc1, int nSrc1Step, const *Npp16s* *pSrc2, int nSrc2Step, *Npp16s* *pDst, int nDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Three 16-bit signed short channel image division, scale by $2^(- nScaleFactor)$, then clamp to saturated value.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **pSrc2** – *Source-Image Pointer*.
- **nSrc2Step** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiDiv_16s_C3IRSfs_Ctx**(const *Npp16s* *pSrc, int nSrcStep, *Npp16s* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Three 16-bit signed short channel in place image division, scale by $2^(- nScaleFactor)$, then clamp to saturated value.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiDiv_16s_AC4RSfs_Ctx**(const *Npp16s* *pSrc1, int nSrc1Step, const *Npp16s* *pSrc2, int nSrc2Step, *Npp16s* *pDst, int nDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Four 16-bit signed short channel with unmodified alpha image division, scale by $2^{(} - nScaleFactor)$, then clamp to saturated value.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **pSrc2** – *Source-Image Pointer*.
- **nSrc2Step** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiDiv_16s_AC4IRSfs_Ctx**(const *Npp16s* *pSrc, int nSrcStep, *Npp16s* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Four 16-bit signed short channel with unmodified alpha in place image division, scale by $2^{(} - nScaleFactor)$, then clamp to saturated value.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiDiv_16s_C4RSfs_Ctx**(const *Npp16s* *pSrc1, int nSrc1Step, const *Npp16s* *pSrc2, int nSrc2Step, *Npp16s* *pDst, int nDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Four 16-bit signed short channel image division, scale by $2^{(} - nScaleFactor)$, then clamp to saturated value.

Parameters

- **pSrc1** – *Source-Image Pointer*.

- **nSrc1Step** – *Source-Image Line Step*.
- **pSrc2** – *Source-Image Pointer*.
- **nSrc2Step** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiDiv_16s_C4IRSfs_Ctx**(const *Npp16s* *pSrc, int nSrcStep, *Npp16s* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Four 16-bit signed short channel in place image division, scale by $2^{(} - nScaleFactor)$, then clamp to saturated value.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiDiv_16sc_C1RSfs_Ctx**(const *Npp16sc* *pSrc1, int nSrc1Step, const *Npp16sc* *pSrc2, int nSrc2Step, *Npp16sc* *pDst, int nDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

One 16-bit signed short complex number (16-bit real, 16-bit imaginary) channel image division, scale by $2^{(} - nScaleFactor)$, then clamp to saturated value.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **pSrc2** – *Source-Image Pointer*.
- **nSrc2Step** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.

- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiDiv_16sc_C1IRSfs_Ctx**(const *Npp16sc* *pSrc, int nSrcStep, *Npp16sc* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

One 16-bit signed short complex number (16-bit real, 16-bit imaginary) channel in place image division, scale by $2^{(} - nScaleFactor)$, then clamp to saturated value.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiDiv_16sc_C3RSfs_Ctx**(const *Npp16sc* *pSrc1, int nSrc1Step, const *Npp16sc* *pSrc2, int nSrc2Step, *Npp16sc* *pDst, int nDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Three 16-bit signed short complex number (16-bit real, 16-bit imaginary) channel image division, scale by $2^{(} - nScaleFactor)$, then clamp to saturated value.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **pSrc2** – *Source-Image Pointer*.
- **nSrc2Step** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiDiv_16sc_C3IRSfs_Ctx**(const *Npp16sc* *pSrc, int nSrcStep, *Npp16sc* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Three 16-bit signed short complex number (16-bit real, 16-bit imaginary) channel in place image division, scale by $2^{(} - nScaleFactor)$, then clamp to saturated value.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiDiv_16sc_AC4RSfs_Ctx**(const *Npp16sc* *pSrc1, int nSrc1Step, const *Npp16sc* *pSrc2, int nSrc2Step, *Npp16sc* *pDst, int nDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Four 16-bit signed short complex number (16-bit real, 16-bit imaginary) channel with unmodified alpha image division, scale by $2^{(} - nScaleFactor)$, then clamp to saturated value.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **pSrc2** – *Source-Image Pointer*.
- **nSrc2Step** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiDiv_16sc_AC4IRSfs_Ctx**(const *Npp16sc* *pSrc, int nSrcStep, *Npp16sc* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Four 16-bit signed short complex number (16-bit real, 16-bit imaginary) channel with unmodified alpha in place image division, scale by $2^{(} - nScaleFactor)$, then clamp to saturated value.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiDiv_32s_C1RSfs_Ctx**(const *Npp32s* *pSrc1, int nSrc1Step, const *Npp32s* *pSrc2, int nSrc2Step, *Npp32s* *pDst, int nDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

One 32-bit signed integer channel image division, scale by $2^{(} - nScaleFactor)$, then clamp to saturated value.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **pSrc2** – *Source-Image Pointer*.
- **nSrc2Step** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiDiv_32s_C1R_Ctx**(const *Npp32s* *pSrc1, int nSrc1Step, const *Npp32s* *pSrc2, int nSrc2Step, *Npp32s* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Note: This function is to be deprecated in future NPP releases, use the function above with a scale factor of 0 instead.

32-bit image division. Divide pixels in pSrc2 by pSrc1's pixels.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **pSrc2** – *Source-Image Pointer*.
- **nSrc2Step** – *Source-Image Line Step*.

- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiDiv_32s_C1IRSfs_Ctx**(const *Npp32s* *pSrc, int nSrcStep, *Npp32s* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

One 32-bit signed integer channel in place image division, scale by $2^{(-nScaleFactor)}$, then clamp to saturated value.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiDiv_32s_C3RSfs_Ctx**(const *Npp32s* *pSrc1, int nSrc1Step, const *Npp32s* *pSrc2, int nSrc2Step, *Npp32s* *pDst, int nDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Three 32-bit signed integer channel image division, scale by $2^{(-nScaleFactor)}$, then clamp to saturated value.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **pSrc2** – *Source-Image Pointer*.
- **nSrc2Step** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiDiv_32s_C3IRSfs_Ctx**(const *Npp32s* *pSrc, int nSrcStep, *Npp32s* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Three 32-bit signed integer channel in place image division, scale by $2^{(} - nScaleFactor)$, then clamp to saturated value.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiDiv_32sc_C1RSfs_Ctx**(const *Npp32sc* *pSrc1, int nSrc1Step, const *Npp32sc* *pSrc2, int nSrc2Step, *Npp32sc* *pDst, int nDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

One 32-bit signed integer complex number (32-bit real, 32-bit imaginary) channel image division, scale by $2^{(} - nScaleFactor)$, then clamp to saturated value.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **pSrc2** – *Source-Image Pointer*.
- **nSrc2Step** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiDiv_32sc_C1IRSfs_Ctx**(const *Npp32sc* *pSrc, int nSrcStep, *Npp32sc* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

One 32-bit signed integer complex number (32-bit real, 32-bit imaginary) channel in place image division, scale by $2^{(} - nScaleFactor)$, then clamp to saturated value.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiDiv_32sc_C3RSfs_Ctx**(const *Npp32sc* *pSrc1, int nSrc1Step, const *Npp32sc* *pSrc2, int nSrc2Step, *Npp32sc* *pDst, int nDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Three 32-bit signed integer complex number (32-bit real, 32-bit imaginary) channel image division, scale by $2^{(} - nScaleFactor)$, then clamp to saturated value.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **pSrc2** – *Source-Image Pointer*.
- **nSrc2Step** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiDiv_32sc_C3IRSfs_Ctx**(const *Npp32sc* *pSrc, int nSrcStep, *Npp32sc* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Three 32-bit signed integer complex number (32-bit real, 32-bit imaginary) channel in place image division, scale by $2^{(} - nScaleFactor)$, then clamp to saturated value.

Parameters

- **pSrc** – *Source-Image Pointer*.

- **nSrcStep** – *Source-Image Line Step*.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiDiv_32sc_AC4RSfs_Ctx**(const *Npp32sc* *pSrc1, int nSrc1Step, const *Npp32sc* *pSrc2, int nSrc2Step, *Npp32sc* *pDst, int nDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Four 32-bit signed integer complex number (32-bit real, 32-bit imaginary) channel with unmodified alpha image division, scale by $2^{(} - nScaleFactor)$, then clamp to saturated value.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **pSrc2** – *Source-Image Pointer*.
- **nSrc2Step** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiDiv_32sc_AC4IRSfs_Ctx**(const *Npp32sc* *pSrc, int nSrcStep, *Npp32sc* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Four 32-bit signed integer complex number (32-bit real, 32-bit imaginary) channel with unmodified alpha in place image division, scale by $2^{(} - nScaleFactor)$, then clamp to saturated value.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.

- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiDiv_16f_C1R_Ctx**(const *Npp16f* *pSrc1, int nSrc1Step, const *Npp16f* *pSrc2, int nSrc2Step, *Npp16f* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

One 16-bit floating point channel image division.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **pSrc2** – *Source-Image Pointer*.
- **nSrc2Step** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiDiv_16f_C1IR_Ctx**(const *Npp16f* *pSrc, int nSrcStep, *Npp16f* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

One 16-bit floating point channel in place image division.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiDiv_16f_C3R_Ctx**(const *Npp16f* *pSrc1, int nSrc1Step, const *Npp16f* *pSrc2, int nSrc2Step, *Npp16f* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Three 16-bit floating point channel image division.

Parameters

- **pSrc1** – *Source-Image Pointer*.

- **nSrc1Step** – *Source-Image Line Step*.
- **pSrc2** – *Source-Image Pointer*.
- **nSrc2Step** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiDiv_16f_C3IR_Ctx**(const *Npp16f* *pSrc, int nSrcStep, *Npp16f* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Three 16-bit floating point channel in place image division.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiDiv_16f_C4R_Ctx**(const *Npp16f* *pSrc1, int nSrc1Step, const *Npp16f* *pSrc2, int nSrc2Step, *Npp16f* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four 16-bit floating point channel image division.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **pSrc2** – *Source-Image Pointer*.
- **nSrc2Step** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiDiv_16f_C4IR_Ctx**(const *Npp16f* *pSrc, int nSrcStep, *Npp16f* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four 16-bit floating point channel in place image division.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiDiv_32f_C1R_Ctx**(const *Npp32f* *pSrc1, int nSrc1Step, const *Npp32f* *pSrc2, int nSrc2Step, *Npp32f* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

One 32-bit floating point channel image division.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **pSrc2** – *Source-Image Pointer*.
- **nSrc2Step** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiDiv_32f_C1IR_Ctx**(const *Npp32f* *pSrc, int nSrcStep, *Npp32f* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

One 32-bit floating point channel in place image division.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.

- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiDiv_32f_C3R_Ctx**(const *Npp32f* *pSrc1, int nSrc1Step, const *Npp32f* *pSrc2, int nSrc2Step, *Npp32f* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Three 32-bit floating point channel image division.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **pSrc2** – *Source-Image Pointer*.
- **nSrc2Step** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiDiv_32f_C3IR_Ctx**(const *Npp32f* *pSrc, int nSrcStep, *Npp32f* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Three 32-bit floating point channel in place image division.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiDiv_32f_AC4R_Ctx**(const *Npp32f* *pSrc1, int nSrc1Step, const *Npp32f* *pSrc2, int nSrc2Step, *Npp32f* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four 32-bit floating point channel with unmodified alpha image division.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **pSrc2** – *Source-Image Pointer*.
- **nSrc2Step** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiDiv_32f_AC4IR_Ctx**(const *Npp32f* *pSrc, int nSrcStep, *Npp32f* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four 32-bit floating point channel with unmodified alpha in place image division.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiDiv_32f_C4R_Ctx**(const *Npp32f* *pSrc1, int nSrc1Step, const *Npp32f* *pSrc2, int nSrc2Step, *Npp32f* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four 32-bit floating point channel image division.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **pSrc2** – *Source-Image Pointer*.
- **nSrc2Step** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiDiv_32f_C4IR_Ctx**(const *Npp32f* *pSrc, int nSrcStep, *Npp32f* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four 32-bit floating point channel in place image division.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiDiv_32fc_C1R_Ctx**(const *Npp32fc* *pSrc1, int nSrc1Step, const *Npp32fc* *pSrc2, int nSrc2Step, *Npp32fc* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

One 32-bit floating point complex number (32-bit real, 32-bit imaginary) channel image division.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **pSrc2** – *Source-Image Pointer*.
- **nSrc2Step** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiDiv_32fc_C1IR_Ctx**(const *Npp32fc* *pSrc, int nSrcStep, *Npp32fc* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

One 32-bit floating point complex number (32-bit real, 32-bit imaginary) channel in place image division.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.

- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiDiv_32fc_C3R_Ctx**(const *Npp32fc* *pSrc1, int nSrc1Step, const *Npp32fc* *pSrc2, int nSrc2Step, *Npp32fc* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Three 32-bit floating point complex number (32-bit real, 32-bit imaginary) channel image division.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **pSrc2** – *Source-Image Pointer*.
- **nSrc2Step** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiDiv_32fc_C3IR_Ctx**(const *Npp32fc* *pSrc, int nSrcStep, *Npp32fc* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Three 32-bit floating point complex number (32-bit real, 32-bit imaginary) channel in place image division.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiDiv_32fc_AC4R_Ctx**(const *Npp32fc* *pSrc1, int nSrc1Step, const *Npp32fc* *pSrc2, int nSrc2Step, *Npp32fc* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four 32-bit floating point complex number (32-bit real, 32-bit imaginary) channel with unmodified alpha image division.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **pSrc2** – *Source-Image Pointer*.
- **nSrc2Step** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiDiv_32fc_AC4IR_Ctx**(const *Npp32fc* *pSrc, int nSrcStep, *Npp32fc* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four 32-bit floating point complex number (32-bit real, 32-bit imaginary) channel with unmodified alpha in place image division.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiDiv_32fc_C4R_Ctx**(const *Npp32fc* *pSrc1, int nSrc1Step, const *Npp32fc* *pSrc2, int nSrc2Step, *Npp32fc* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four 32-bit floating point complex number (32-bit real, 32-bit imaginary) channel image division.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **pSrc2** – *Source-Image Pointer*.
- **nSrc2Step** – *Source-Image Line Step*.

- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiDiv_32fc_C4IR_Ctx**(const *Npp32fc* *pSrc, int nSrcStep, *Npp32fc* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four 32-bit floating point complex number (32-bit real, 32-bit imaginary) channel in place image division.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

1.7.1.16 Div_Round

Pixel by pixel division of two images using result rounding modes.

Functions

NppStatus **nppiDiv_Round_8u_C1RSfs_Ctx**(const *Npp8u* *pSrc1, int nSrc1Step, const *Npp8u* *pSrc2, int nSrc2Step, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppRoundMode* rndMode, int nScaleFactor, *NppStreamContext* nppStreamCtx)

One 8-bit unsigned char channel image division, scale by $2^{(} - nScaleFactor)$, then clamp to saturated value.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **pSrc2** – *Source-Image Pointer*.
- **nSrc2Step** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.

- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **rndMode** – Result Rounding mode to be used (NPP_RND_ZERO, NPP_RND_NEAR, or NP_RND_FINANCIAL).
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiDiv_Round_8u_C1IRSfs_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *Npp8u* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, *NppRoundMode* rndMode, int nScaleFactor, *NppStreamContext* nppStreamCtx)

One 8-bit unsigned char channel in place image division, scale by $2^(- nScaleFactor)$, then clamp to saturated value.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **rndMode** – Result Rounding mode to be used (NPP_RND_ZERO, NPP_RND_NEAR, or NP_RND_FINANCIAL).
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiDiv_Round_8u_C3RSfs_Ctx**(const *Npp8u* *pSrc1, int nSrc1Step, const *Npp8u* *pSrc2, int nSrc2Step, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppRoundMode* rndMode, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Three 8-bit unsigned char channel image division, scale by $2^(- nScaleFactor)$, then clamp to saturated value.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **pSrc2** – *Source-Image Pointer*.
- **nSrc2Step** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.

- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **rndMode** – Result Rounding mode to be used (NPP_RND_ZERO, NPP_RND_NEAR, or NP_RND_FINANCIAL).
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiDiv_Round_8u_C3IRSfs_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *Npp8u* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, *NppRoundMode* rndMode, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Three 8-bit unsigned char channel in place image division, scale by $2^{(}-nScaleFactor)$, then clamp to saturated value.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **rndMode** – Result Rounding mode to be used (NPP_RND_ZERO, NPP_RND_NEAR, or NP_RND_FINANCIAL).
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiDiv_Round_8u_AC4RSfs_Ctx**(const *Npp8u* *pSrc1, int nSrc1Step, const *Npp8u* *pSrc2, int nSrc2Step, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppRoundMode* rndMode, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Four 8-bit unsigned char channel image division with unmodified alpha, scale by $2^{(}-nScaleFactor)$, then clamp to saturated value.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **pSrc2** – *Source-Image Pointer*.
- **nSrc2Step** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.

- **rndMode** – Result Rounding mode to be used (NPP_RND_ZERO, NPP_RND_NEAR, or NP_RND_FINANCIAL).
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiDiv_Round_8u_AC4IRSfs_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *Npp8u* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, *NppRoundMode* rndMode, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Four 8-bit unsigned char channel in place image division with unmodified alpha, scale by $2^(- nScaleFactor)$, then clamp to saturated value.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **rndMode** – Result Rounding mode to be used (NPP_RND_ZERO, NPP_RND_NEAR, or NP_RND_FINANCIAL).
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiDiv_Round_8u_C4RSfs_Ctx**(const *Npp8u* *pSrc1, int nSrc1Step, const *Npp8u* *pSrc2, int nSrc2Step, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppRoundMode* rndMode, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Four 8-bit unsigned char channel image division, scale by $2^(- nScaleFactor)$, then clamp to saturated value.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **pSrc2** – *Source-Image Pointer*.
- **nSrc2Step** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.

- **rndMode** – Result Rounding mode to be used (NPP_RND_ZERO, NPP_RND_NEAR, or NP_RND_FINANCIAL).
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiDiv_Round_8u_C4IRSfs_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *Npp8u* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, *NppRoundMode* rndMode, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Four 8-bit unsigned char channel in place image division, scale by $2^(- nScaleFactor)$, then clamp to saturated value.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **rndMode** – Result Rounding mode to be used (NPP_RND_ZERO, NPP_RND_NEAR, or NP_RND_FINANCIAL).
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiDiv_Round_16u_C1RSfs_Ctx**(const *Npp16u* *pSrc1, int nSrc1Step, const *Npp16u* *pSrc2, int nSrc2Step, *Npp16u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppRoundMode* rndMode, int nScaleFactor, *NppStreamContext* nppStreamCtx)

One 16-bit unsigned short channel image division, scale by $2^(- nScaleFactor)$, then clamp to saturated value.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **pSrc2** – *Source-Image Pointer*.
- **nSrc2Step** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.

- **rndMode** – Result Rounding mode to be used (NPP_RND_ZERO, NPP_RND_NEAR, or NP_RND_FINANCIAL).
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiDiv_Round_16u_C1IRSfs_Ctx**(const *Npp16u* *pSrc, int nSrcStep, *Npp16u* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, *NppRoundMode* rndMode, int nScaleFactor, *NppStreamContext* nppStreamCtx)

One 16-bit unsigned short channel in place image division, scale by $2^{(}-nScaleFactor)$, then clamp to saturated value.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **rndMode** – Result Rounding mode to be used (NPP_RND_ZERO, NPP_RND_NEAR, or NP_RND_FINANCIAL).
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiDiv_Round_16u_C3RSfs_Ctx**(const *Npp16u* *pSrc1, int nSrc1Step, const *Npp16u* *pSrc2, int nSrc2Step, *Npp16u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppRoundMode* rndMode, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Three 16-bit unsigned short channel image division, scale by $2^{(} - nScaleFactor)$, then clamp to saturated value.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **pSrc2** – *Source-Image Pointer*.
- **nSrc2Step** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.

- **rndMode** – Result Rounding mode to be used (NPP_RND_ZERO, NPP_RND_NEAR, or NP_RND_FINANCIAL).
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiDiv_Round_16u_C3IRSfs_Ctx**(const *Npp16u* *pSrc, int nSrcStep, *Npp16u* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, *NppRoundMode* rndMode, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Three 16-bit unsigned short channel in place image division, scale by $2^(- nScaleFactor)$, then clamp to saturated value.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **rndMode** – Result Rounding mode to be used (NPP_RND_ZERO, NPP_RND_NEAR, or NP_RND_FINANCIAL).
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiDiv_Round_16u_AC4RSfs_Ctx**(const *Npp16u* *pSrc1, int nSrc1Step, const *Npp16u* *pSrc2, int nSrc2Step, *Npp16u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppRoundMode* rndMode, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Four 16-bit unsigned short channel image division with unmodified alpha, scale by $2^(- nScaleFactor)$, then clamp to saturated value.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **pSrc2** – *Source-Image Pointer*.
- **nSrc2Step** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.

- **rndMode** – Result Rounding mode to be used (NPP_RND_ZERO, NPP_RND_NEAR, or NP_RND_FINANCIAL)
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiDiv_Round_16u_AC4IRSfs_Ctx**(const *Npp16u* *pSrc, int nSrcStep, *Npp16u* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, *NppRoundMode* rndMode, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Four 16-bit unsigned short channel in place image division with unmodified alpha, scale by $2^{(} - nScaleFactor)$, then clamp to saturated value.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **rndMode** – Result Rounding mode to be used (NPP_RND_ZERO, NPP_RND_NEAR, or NP_RND_FINANCIAL)
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiDiv_Round_16u_C4RSfs_Ctx**(const *Npp16u* *pSrc1, int nSrc1Step, const *Npp16u* *pSrc2, int nSrc2Step, *Npp16u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppRoundMode* rndMode, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Four 16-bit unsigned short channel image division, scale by $2^{(} - nScaleFactor)$, then clamp to saturated value.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **pSrc2** – *Source-Image Pointer*.
- **nSrc2Step** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.

- **rndMode** – Result Rounding mode to be used (NPP_RND_ZERO, NPP_RND_NEAR, or NP_RND_FINANCIAL)
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiDiv_Round_16u_C4IRSfs_Ctx**(const *Npp16u* *pSrc, int nSrcStep, *Npp16u* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, *NppRoundMode* rndMode, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Four 16-bit unsigned short channel in place image division, scale by $2^{(-nScaleFactor)}$, then clamp to saturated value.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **rndMode** – Result Rounding mode to be used (NPP_RND_ZERO, NPP_RND_NEAR, or NP_RND_FINANCIAL)
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiDiv_Round_16s_C1RSfs_Ctx**(const *Npp16s* *pSrc1, int nSrc1Step, const *Npp16s* *pSrc2, int nSrc2Step, *Npp16s* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppRoundMode* rndMode, int nScaleFactor, *NppStreamContext* nppStreamCtx)

One 16-bit signed short channel image division, scale by $2^{(-nScaleFactor)}$, then clamp to saturated value.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **pSrc2** – *Source-Image Pointer*.
- **nSrc2Step** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.

- **rndMode** – Result Rounding mode to be used (NPP_RND_ZERO, NPP_RND_NEAR, or NP_RND_FINANCIAL)
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiDiv_Round_16s_C1IRSfs_Ctx**(const *Npp16s* *pSrc, int nSrcStep, *Npp16s* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, *NppRoundMode* rndMode, int nScaleFactor, *NppStreamContext* nppStreamCtx)

One 16-bit signed short channel in place image division, scale by $2^(- nScaleFactor)$, then clamp to saturated value.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **rndMode** – Result Rounding mode to be used (NPP_RND_ZERO, NPP_RND_NEAR, or NP_RND_FINANCIAL)
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiDiv_Round_16s_C3RSfs_Ctx**(const *Npp16s* *pSrc1, int nSrc1Step, const *Npp16s* *pSrc2, int nSrc2Step, *Npp16s* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppRoundMode* rndMode, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Three 16-bit signed short channel image division, scale by $2^(- nScaleFactor)$, then clamp to saturated value.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **pSrc2** – *Source-Image Pointer*.
- **nSrc2Step** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.

- **rndMode** – Result Rounding mode to be used (NPP_RND_ZERO, NPP_RND_NEAR, or NP_RND_FINANCIAL)
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiDiv_Round_16s_C3IRSfs_Ctx**(const *Npp16s* *pSrc, int nSrcStep, *Npp16s* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, *NppRoundMode* rndMode, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Three 16-bit signed short channel in place image division, scale by $2^{(}-nScaleFactor)$, then clamp to saturated value.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **rndMode** – Result Rounding mode to be used (NPP_RND_ZERO, NPP_RND_NEAR, or NP_RND_FINANCIAL)
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiDiv_Round_16s_AC4RSfs_Ctx**(const *Npp16s* *pSrc1, int nSrc1Step, const *Npp16s* *pSrc2, int nSrc2Step, *Npp16s* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppRoundMode* rndMode, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Four 16-bit signed short channel image division with unmodified alpha, scale by $2^{(}-nScaleFactor)$, then clamp to saturated value.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **pSrc2** – *Source-Image Pointer*.
- **nSrc2Step** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.

- **rndMode** – Result Rounding mode to be used (NPP_RND_ZERO, NPP_RND_NEAR, or NP_RND_FINANCIAL)
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiDiv_Round_16s_AC4IRSfs_Ctx**(const *Npp16s* *pSrc, int nSrcStep, *Npp16s* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, *NppRoundMode* rndMode, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Four 16-bit signed short channel in place image division with unmodified alpha, scale by $2^(- nScaleFactor)$, then clamp to saturated value.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **rndMode** – Result Rounding mode to be used (NPP_RND_ZERO, NPP_RND_NEAR, or NP_RND_FINANCIAL).
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiDiv_Round_16s_C4RSfs_Ctx**(const *Npp16s* *pSrc1, int nSrc1Step, const *Npp16s* *pSrc2, int nSrc2Step, *Npp16s* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppRoundMode* rndMode, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Four 16-bit signed short channel image division, scale by $2^(- nScaleFactor)$, then clamp to saturated value.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **pSrc2** – *Source-Image Pointer*.
- **nSrc2Step** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.

- **rndMode** – Result Rounding mode to be used (NPP_RND_ZERO, NPP_RND_NEAR, or NP_RND_FINANCIAL).
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiDiv_Round_16s_C4IRSfs_Ctx**(const *Npp16s* *pSrc, int nSrcStep, *Npp16s* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, *NppRoundMode* rndMode, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Four 16-bit signed short channel in place image division, scale by $2^{(} - nScaleFactor)$, then clamp to saturated value.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **rndMode** – Result Rounding mode to be used (NPP_RND_ZERO, NPP_RND_NEAR, or NP_RND_FINANCIAL).
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

1.7.1.17 Abs

Absolute value of each pixel value in an image.

Functions

NppStatus **nppiAbs_16s_C1R_Ctx**(const *Npp16s* *pSrc, int nSrcStep, *Npp16s* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

One 16-bit signed short channel image absolute value.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.

- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiAbs_16s_C1IR_Ctx**(*Npp16s* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

One 16-bit signed short channel in place image absolute value.

Parameters

- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiAbs_16s_C3R_Ctx**(const *Npp16s* *pSrc, int nSrcStep, *Npp16s* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Three 16-bit signed short channel image absolute value.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiAbs_16s_C3IR_Ctx**(*Npp16s* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Three 16-bit signed short channel in place image absolute value.

Parameters

- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiAbs_16s_AC4R_Ctx**(const *Npp16s* *pSrc, int nSrcStep, *Npp16s* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four 16-bit signed short channel image absolute value with unmodified alpha.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiAbs_16s_AC4IR_Ctx**(*Npp16s* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four 16-bit signed short channel in place image absolute value with unmodified alpha.

Parameters

- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiAbs_16s_C4R_Ctx**(const *Npp16s* *pSrc, int nSrcStep, *Npp16s* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four 16-bit signed short channel image absolute value.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiAbs_16s_C4IR_Ctx**(*Npp16s* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four 16-bit signed short channel in place image absolute value.

Parameters

- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiAbs_16f_C1R_Ctx**(const *Npp16f* *pSrc, int nSrcStep, *Npp16f* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

One 16-bit floating point channel image absolute value.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiAbs_16f_C1IR_Ctx**(*Npp16f* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

One 16-bit floating point channel in place image absolute value.

Parameters

- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiAbs_16f_C3R_Ctx**(const *Npp16f* *pSrc, int nSrcStep, *Npp16f* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Three 16-bit floating point channel image absolute value.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.

- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiAbs_16f_C3IR_Ctx**(*Npp16f* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Three 16-bit floating point channel in place image absolute value.

Parameters

- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiAbs_16f_C4R_Ctx**(const *Npp16f* *pSrc, int nSrcStep, *Npp16f* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four 16-bit floating point channel image absolute value.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiAbs_16f_C4IR_Ctx**(*Npp16f* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four 16-bit floating point channel in place image absolute value.

Parameters

- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiAbs_32f_C1R_Ctx**(const *Npp32f* *pSrc, int nSrcStep, *Npp32f* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

One 32-bit floating point channel image absolute value.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiAbs_32f_C1IR_Ctx**(*Npp32f* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

One 32-bit floating point channel in place image absolute value.

Parameters

- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiAbs_32f_C3R_Ctx**(const *Npp32f* *pSrc, int nSrcStep, *Npp32f* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Three 32-bit floating point channel image absolute value.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiAbs_32f_C3IR_Ctx**(*Npp32f* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Three 32-bit floating point channel in place image absolute value.

Parameters

- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiAbs_32f_AC4R_Ctx**(const *Npp32f* *pSrc, int nSrcStep, *Npp32f* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four 32-bit floating point channel image absolute value with unmodified alpha.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiAbs_32f_AC4IR_Ctx**(*Npp32f* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four 32-bit floating point channel in place image absolute value with unmodified alpha.

Parameters

- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiAbs_32f_C4R_Ctx**(const *Npp32f* *pSrc, int nSrcStep, *Npp32f* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four 32-bit floating point channel image absolute value.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.

- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiAbs_32f_C4IR_Ctx**(*Npp32f* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four 32-bit floating point channel in place image absolute value.

Parameters

- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

1.7.1.18 AbsDiff

Pixel by pixel absolute difference between two images.

Functions

NppStatus **nppiAbsDiff_8u_C1R_Ctx**(const *Npp8u* *pSrc1, int nSrc1Step, const *Npp8u* *pSrc2, int nSrc2Step, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

One 8-bit unsigned char channel absolute difference of image1 minus image2.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **pSrc2** – *Source-Image Pointer*.
- **nSrc2Step** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiAbsDiff_8u_C3R_Ctx**(const *Npp8u* *pSrc1, int nSrc1Step, const *Npp8u* *pSrc2, int nSrc2Step, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Three 8-bit unsigned char channels absolute difference of image1 minus image2.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **pSrc2** – *Source-Image Pointer*.
- **nSrc2Step** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiAbsDiff_8u_C4R_Ctx**(const *Npp8u* *pSrc1, int nSrc1Step, const *Npp8u* *pSrc2, int nSrc2Step, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four 8-bit unsigned char channels absolute difference of image1 minus image2.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **pSrc2** – *Source-Image Pointer*.
- **nSrc2Step** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiAbsDiff_16u_C1R_Ctx**(const *Npp16u* *pSrc1, int nSrc1Step, const *Npp16u* *pSrc2, int nSrc2Step, *Npp16u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

One 16-bit unsigned short channel absolute difference of image1 minus image2.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.

- **pSrc2** – *Source-Image Pointer*.
- **nSrc2Step** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiAbsDiff_16f_C1R_Ctx**(const *Npp16f* *pSrc1, int nSrc1Step, const *Npp16f* *pSrc2, int nSrc2Step, *Npp16f* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

One 16-bit floating point channel absolute difference of image1 minus image2.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **pSrc2** – *Source-Image Pointer*.
- **nSrc2Step** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiAbsDiff_32f_C1R_Ctx**(const *Npp32f* *pSrc1, int nSrc1Step, const *Npp32f* *pSrc2, int nSrc2Step, *Npp32f* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

One 32-bit floating point channel absolute difference of image1 minus image2.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **pSrc2** – *Source-Image Pointer*.
- **nSrc2Step** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

1.7.1.19 Sqr

Square each pixel in an image.

Functions

NppStatus **nppiSqr_8u_C1RSfs_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

One 8-bit unsigned char channel image squared, scale by $2^{(} - nScaleFactor)$, then clamp to saturated value.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiSqr_8u_C1IRSfs_Ctx**(*Npp8u* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

One 8-bit unsigned char channel in place image squared, scale by $2^{(} - nScaleFactor)$, then clamp to saturated value.

Parameters

- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiSqr_8u_C3RSfs_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Three 8-bit unsigned char channel image squared, scale by $2^{(} - nScaleFactor)$, then clamp to saturated value.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiSqr_8u_C3IRSfs_Ctx**(*Npp8u* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Three 8-bit unsigned char channel in place image squared, scale by $2^{(} - nScaleFactor)$, then clamp to saturated value.

Parameters

- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiSqr_8u_AC4RSfs_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Four 8-bit unsigned char channel image squared with unmodified alpha, scale by $2^{(} - nScaleFactor)$, then clamp to saturated value.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.

- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiSqr_8u_AC4IRSfs_Ctx**(*Npp8u* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Four 8-bit unsigned char channel in place image squared with unmodified alpha, scale by $2^{(} - nScaleFactor)$, then clamp to saturated value.

Parameters

- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiSqr_8u_C4RSfs_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Four 8-bit unsigned char channel image squared, scale by $2^{(} - nScaleFactor)$, then clamp to saturated value.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiSqr_8u_C4IRSfs_Ctx**(*Npp8u* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Four 8-bit unsigned char channel in place image squared, scale by $2^{(} - nScaleFactor)$, then clamp to saturated value.

Parameters

- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.

- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiSqr_16u_C1RSfs_Ctx**(const *Npp16u* *pSrc, int nSrcStep, *Npp16u* *pDst, int nDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

One 16-bit unsigned short channel image squared, scale by $2^{(} - nScaleFactor)$, then clamp to saturated value.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiSqr_16u_C1IRSfs_Ctx**(*Npp16u* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

One 16-bit unsigned short channel in place image squared, scale by $2^{(} - nScaleFactor)$, then clamp to saturated value.

Parameters

- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiSqr_16u_C3RSfs_Ctx**(const *Npp16u* *pSrc, int nSrcStep, *Npp16u* *pDst, int nDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Three 16-bit unsigned short channel image squared, scale by $2^{(} - nScaleFactor)$, then clamp to saturated value.

Parameters

- **pSrc** – *Source-Image Pointer*.

- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiSqr_16u_C3IRSfs_Ctx**(*Npp16u* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Three 16-bit unsigned short channel in place image squared, scale by $2^(- nScaleFactor)$, then clamp to saturated value.

Parameters

- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiSqr_16u_AC4RSfs_Ctx**(const *Npp16u* *pSrc, int nSrcStep, *Npp16u* *pDst, int nDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Four 16-bit unsigned short channel image squared with unmodified alpha, scale by $2^(- nScaleFactor)$, then clamp to saturated value.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiSqr_16u_AC4IRSfs_Ctx**(*Npp16u* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Four 16-bit unsigned short channel in place image squared with unmodified alpha, scale by $2^{(} - nScaleFactor)$, then clamp to saturated value.

Parameters

- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiSqr_16u_C4RSfs_Ctx**(const *Npp16u* *pSrc, int nSrcStep, *Npp16u* *pDst, int nDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Four 16-bit unsigned short channel image squared, scale by $2^{(} - nScaleFactor)$, then clamp to saturated value.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiSqr_16u_C4IRSfs_Ctx**(*Npp16u* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Four 16-bit unsigned short channel in place image squared, scale by $2^{(} - nScaleFactor)$, then clamp to saturated value.

Parameters

- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiSqr_16s_C1RSfs_Ctx**(const *Npp16s* *pSrc, int nSrcStep, *Npp16s* *pDst, int nDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

One 16-bit signed short channel image squared, scale by $2^{(} - nScaleFactor)$, then clamp to saturated value.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiSqr_16s_C1IRSfs_Ctx**(*Npp16s* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

One 16-bit signed short channel in place image squared, scale by $2^{(} - nScaleFactor)$, then clamp to saturated value.

Parameters

- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiSqr_16s_C3RSfs_Ctx**(const *Npp16s* *pSrc, int nSrcStep, *Npp16s* *pDst, int nDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Three 16-bit signed short channel image squared, scale by $2^{(} - nScaleFactor)$, then clamp to saturated value.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.

- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiSqr_16s_C3IRSfs_Ctx**(*Npp16s* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Three 16-bit signed short channel in place image squared, scale by $2^{(}-nScaleFactor)$, then clamp to saturated value.

Parameters

- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiSqr_16s_AC4RSfs_Ctx**(const *Npp16s* *pSrc, int nSrcStep, *Npp16s* *pDst, int nDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Four 16-bit signed short channel image squared with unmodified alpha, scale by $2^{(}-nScaleFactor)$, then clamp to saturated value.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiSqr_16s_AC4IRSfs_Ctx**(*Npp16s* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Four 16-bit signed short channel in place image squared with unmodified alpha, scale by $2^{(}-nScaleFactor)$, then clamp to saturated value.

Parameters

- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiSqr_16s_C4RSfs_Ctx**(const *Npp16s* *pSrc, int nSrcStep, *Npp16s* *pDst, int nDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Four 16-bit signed short channel image squared, scale by $2^{(} - nScaleFactor)$, then clamp to saturated value.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiSqr_16s_C4IRSfs_Ctx**(*Npp16s* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Four 16-bit signed short channel in place image squared, scale by $2^{(} - nScaleFactor)$, then clamp to saturated value.

Parameters

- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiSqr_16f_C1R_Ctx**(const *Npp16f* *pSrc, int nSrcStep, *Npp16f* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

One 16-bit floating point channel image squared.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiSqr_16f_C1IR_Ctx**(*Npp16f* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

One 16-bit floating point channel in place image squared.

Parameters

- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiSqr_16f_C3R_Ctx**(const *Npp16f* *pSrc, int nSrcStep, *Npp16f* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Three 16-bit floating point channel image squared.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiSqr_16f_C3IR_Ctx**(*Npp16f* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Three 16-bit floating point channel in place image squared.

Parameters

- **pSrcDst** – *In-Place Image Pointer*.

- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiSqr_16f_C4R_Ctx**(const *Npp16f* *pSrc, int nSrcStep, *Npp16f* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four 16-bit floating point channel image squared.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiSqr_16f_C4IR_Ctx**(*Npp16f* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four 16-bit floating point channel in place image squared.

Parameters

- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiSqr_32f_C1R_Ctx**(const *Npp32f* *pSrc, int nSrcStep, *Npp32f* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

One 32-bit floating point channel image squared.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.

- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiSqr_32f_C1IR_Ctx**(*Npp32f* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

One 32-bit floating point channel in place image squared.

Parameters

- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiSqr_32f_C3R_Ctx**(const *Npp32f* *pSrc, int nSrcStep, *Npp32f* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Three 32-bit floating point channel image squared.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiSqr_32f_C3IR_Ctx**(*Npp32f* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Three 32-bit floating point channel in place image squared.

Parameters

- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiSqr_32f_AC4R_Ctx**(const *Npp32f* *pSrc, int nSrcStep, *Npp32f* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four 32-bit floating point channel image squared with unmodified alpha.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiSqr_32f_AC4IR_Ctx**(*Npp32f* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four 32-bit floating point channel in place image squared with unmodified alpha.

Parameters

- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiSqr_32f_C4R_Ctx**(const *Npp32f* *pSrc, int nSrcStep, *Npp32f* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four 32-bit floating point channel image squared.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiSqr_32f_C4IR_Ctx**(*Npp32f* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four 32-bit floating point channel in place image squared.

Parameters

- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

1.7.1.20 Sqrt

Pixel by pixel square root of each pixel in an image.

Functions

NppStatus **nppiSqrt_8u_C1RSfs_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

One 8-bit unsigned char channel image square root, scale by $2^{(} - nScaleFactor)$, then clamp to saturated value.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiSqrt_8u_C1IRSfs_Ctx**(*Npp8u* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

One 8-bit unsigned char channel in place image square root, scale by $2^{(} - nScaleFactor)$, then clamp to saturated value.

Parameters

- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.

- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiSqrt_8u_C3RSfs_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Three 8-bit unsigned char channel image square root, scale by $2^{(} - nScaleFactor)$, then clamp to saturated value.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiSqrt_8u_C3IRSfs_Ctx**(*Npp8u* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Three 8-bit unsigned char channel in place image square root, scale by $2^{(} - nScaleFactor)$, then clamp to saturated value.

Parameters

- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiSqrt_8u_AC4RSfs_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Four 8-bit unsigned char channel image square root with unmodified alpha, scale by $2^{(} - nScaleFactor)$, then clamp to saturated value.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.

- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiSqrt_8u_AC4IRSfs_Ctx**(*Npp8u* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Four 8-bit unsigned char channel in place image square root with unmodified alpha, scale by $2^{(} - nScaleFactor)$, then clamp to saturated value.

Parameters

- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiSqrt_16u_C1RSfs_Ctx**(const *Npp16u* *pSrc, int nSrcStep, *Npp16u* *pDst, int nDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

One 16-bit unsigned short channel image square root, scale by $2^{(} - nScaleFactor)$, then clamp to saturated value.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiSqrt_16u_C1IRSfs_Ctx**(*Npp16u* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

One 16-bit unsigned short channel in place image square root, scale by $2^{(} - nScaleFactor)$, then clamp to saturated value.

Parameters

- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiSqrt_16u_C3RSfs_Ctx**(const *Npp16u* *pSrc, int nSrcStep, *Npp16u* *pDst, int nDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Three 16-bit unsigned short channel image square root, scale by $2^{(} - nScaleFactor)$, then clamp to saturated value.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiSqrt_16u_C3IRSfs_Ctx**(*Npp16u* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Three 16-bit unsigned short channel in place image square root, scale by $2^{(} - nScaleFactor)$, then clamp to saturated value.

Parameters

- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiSqrt_16u_AC4RSfs_Ctx**(const *Npp16u* *pSrc, int nSrcStep, *Npp16u* *pDst, int nDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Four 16-bit unsigned short channel image square root with unmodified alpha, scale by $2^{(} - nScaleFactor)$, then clamp to saturated value.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiSqrt_16u_AC4IRSfs_Ctx**(*Npp16u* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Four 16-bit unsigned short channel in place image square root with unmodified alpha, scale by $2^{(} - nScaleFactor)$, then clamp to saturated value.

Parameters

- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiSqrt_16s_C1RSfs_Ctx**(const *Npp16s* *pSrc, int nSrcStep, *Npp16s* *pDst, int nDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

One 16-bit signed short channel image square root, scale by $2^{(} - nScaleFactor)$, then clamp to saturated value.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.

- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiSqrt_16s_C1IRSfs_Ctx**(*Npp16s* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

One 16-bit signed short channel in place image square root, scale by $2^{(} - nScaleFactor)$, then clamp to saturated value.

Parameters

- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiSqrt_16s_C3RSfs_Ctx**(const *Npp16s* *pSrc, int nSrcStep, *Npp16s* *pDst, int nDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Three 16-bit signed short channel image square root, scale by $2^{(} - nScaleFactor)$, then clamp to saturated value.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiSqrt_16s_C3IRSfs_Ctx**(*Npp16s* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Three 16-bit signed short channel in place image square root, scale by $2^{(} - nScaleFactor)$, then clamp to saturated value.

Parameters

- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.

- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiSqrt_16s_AC4RSfs_Ctx**(const *Npp16s* *pSrc, int nSrcStep, *Npp16s* *pDst, int nDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Four 16-bit signed short channel image square root with unmodified alpha, scale by $2^{(} - nScaleFactor)$, then clamp to saturated value.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiSqrt_16s_AC4IRSfs_Ctx**(*Npp16s* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Four 16-bit signed short channel in place image square root with unmodified alpha, scale by $2^{(} - nScaleFactor)$, then clamp to saturated value.

Parameters

- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiSqrt_16f_C1R_Ctx**(const *Npp16f* *pSrc, int nSrcStep, *Npp16f* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

One 16-bit floating point channel image square root.

Parameters

- **pSrc** – *Source-Image Pointer*.

- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiSqrt_16f_C1IR_Ctx**(*Npp16f* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

One 16-bit floating point channel in place image square root.

Parameters

- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiSqrt_16f_C3R_Ctx**(const *Npp16f* *pSrc, int nSrcStep, *Npp16f* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Three 16-bit floating point channel image square root.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiSqrt_16f_C3IR_Ctx**(*Npp16f* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Three 16-bit floating point channel in place image square root.

Parameters

- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.

- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiSqrt_16f_C4R_Ctx**(const *Npp16f* *pSrc, int nSrcStep, *Npp16f* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four 16-bit floating point channel image square root.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiSqrt_16f_C4IR_Ctx**(*Npp16f* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four 16-bit floating point channel in place image square root.

Parameters

- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiSqrt_32f_C1R_Ctx**(const *Npp32f* *pSrc, int nSrcStep, *Npp32f* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

One 32-bit floating point channel image square root.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiSqrt_32f_C1IR_Ctx**(*Npp32f* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

One 32-bit floating point channel in place image square root.

Parameters

- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiSqrt_32f_C3R_Ctx**(const *Npp32f* *pSrc, int nSrcStep, *Npp32f* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Three 32-bit floating point channel image square root.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiSqrt_32f_C3IR_Ctx**(*Npp32f* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Three 32-bit floating point channel in place image square root.

Parameters

- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiSqrt_32f_AC4R_Ctx**(const *Npp32f* *pSrc, int nSrcStep, *Npp32f* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four 32-bit floating point channel image square root with unmodified alpha.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiSqrt_32f_AC4IR_Ctx**(*Npp32f* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four 32-bit floating point channel in place image square root with unmodified alpha.

Parameters

- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiSqrt_32f_C4R_Ctx**(const *Npp32f* *pSrc, int nSrcStep, *Npp32f* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four 32-bit floating point channel image square root.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiSqrt_32f_C4IR_Ctx**(*Npp32f* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four 32-bit floating point channel in place image square root.

Parameters

- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.

- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

1.7.1.21 Ln

Pixel by pixel natural logarithm of each pixel in an image.

Functions

NppStatus **nppiLn_8u_C1RSfs_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

One 8-bit unsigned char channel image natural logarithm, scale by $2^(-nScaleFactor)$, then clamp to saturated value.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiLn_8u_C1IRSfs_Ctx**(*Npp8u* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

One 8-bit unsigned char channel in place image natural logarithm, scale by $2^(- nScaleFactor)$, then clamp to saturated value.

Parameters

- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiLn_8u_C3RSfs_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Three 8-bit unsigned char channel image natural logarithm, scale by $2^{(} - nScaleFactor)$, then clamp to saturated value.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiLn_8u_C3IRSfs_Ctx**(*Npp8u* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Three 8-bit unsigned char channel in place image natural logarithm, scale by $2^{(} - nScaleFactor)$, then clamp to saturated value.

Parameters

- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiLn_16u_C1RSfs_Ctx**(const *Npp16u* *pSrc, int nSrcStep, *Npp16u* *pDst, int nDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

One 16-bit unsigned short channel image natural logarithm, scale by $2^{(} - nScaleFactor)$, then clamp to saturated value.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.

- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiLn_16u_C1IRSfs_Ctx**(*Npp16u* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

One 16-bit unsigned short channel in place image natural logarithm, scale by $2^{(} - nScaleFactor)$, then clamp to saturated value.

Parameters

- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiLn_16u_C3RSfs_Ctx**(const *Npp16u* *pSrc, int nSrcStep, *Npp16u* *pDst, int nDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Three 16-bit unsigned short channel image natural logarithm, scale by $2^{(} - nScaleFactor)$, then clamp to saturated value.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiLn_16u_C3IRSfs_Ctx**(*Npp16u* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Three 16-bit unsigned short channel in place image natural logarithm, scale by $2^{(} - nScaleFactor)$, then clamp to saturated value.

Parameters

- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.

- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiLn_16s_C1RSfs_Ctx**(const *Npp16s* *pSrc, int nSrcStep, *Npp16s* *pDst, int nDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

One 16-bit signed short channel image natural logarithm, scale by $2^{(}-nScaleFactor)$, then clamp to saturated value.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiLn_16s_C1IRSfs_Ctx**(*Npp16s* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

One 16-bit signed short channel in place image natural logarithm, scale by $2^{(}-nScaleFactor)$, then clamp to saturated value.

Parameters

- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiLn_16s_C3RSfs_Ctx**(const *Npp16s* *pSrc, int nSrcStep, *Npp16s* *pDst, int nDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Three 16-bit signed short channel image natural logarithm, scale by $2^{(}-nScaleFactor)$, then clamp to saturated value.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiLn_16s_C3IRSfs_Ctx**(*Npp16s* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Three 16-bit signed short channel in place image natural logarithm, scale by $2^(- nScaleFactor)$, then clamp to saturated value.

Parameters

- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiLn_16f_C1R_Ctx**(const *Npp16f* *pSrc, int nSrcStep, *Npp16f* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

One 16-bit floating point channel image natural logarithm.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiLn_16f_C1IR_Ctx**(*Npp16f* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

One 16-bit floating point channel in place image natural logarithm.

Parameters

- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiLn_16f_C3R_Ctx**(const *Npp16f* *pSrc, int nSrcStep, *Npp16f* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Three 16-bit floating point channel image natural logarithm.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiLn_16f_C3IR_Ctx**(*Npp16f* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Three 16-bit floating point channel in place image natural logarithm.

Parameters

- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiLn_32f_C1R_Ctx**(const *Npp32f* *pSrc, int nSrcStep, *Npp32f* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

One 32-bit floating point channel image natural logarithm.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.

- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiLn_32f_C1IR_Ctx**(*Npp32f* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

One 32-bit floating point channel in place image natural logarithm.

Parameters

- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiLn_32f_C3R_Ctx**(const *Npp32f* *pSrc, int nSrcStep, *Npp32f* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Three 32-bit floating point channel image natural logarithm.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiLn_32f_C3IR_Ctx**(*Npp32f* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Three 32-bit floating point channel in place image natural logarithm.

Parameters

- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

1.7.1.22 Exp

Exponential value of each pixel in an image.

Functions

NppStatus **nppiExp_8u_C1RSfs_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

One 8-bit unsigned char channel image exponential, scale by $2^(- nScaleFactor)$, then clamp to saturated value.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiExp_8u_C1IRSfs_Ctx**(*Npp8u* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

One 8-bit unsigned char channel in place image exponential, scale by $2^(- nScaleFactor)$, then clamp to saturated value.

Parameters

- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiExp_8u_C3RSfs_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Three 8-bit unsigned char channel image exponential, scale by $2^(- nScaleFactor)$, then clamp to saturated value.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiExp_8u_C3IRSfs_Ctx**(*Npp8u* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Three 8-bit unsigned char channel in place image exponential, scale by $2^{(} - nScaleFactor)$, then clamp to saturated value.

Parameters

- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiExp_16u_C1RSfs_Ctx**(const *Npp16u* *pSrc, int nSrcStep, *Npp16u* *pDst, int nDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

One 16-bit unsigned short channel image exponential, scale by $2^{(} - nScaleFactor)$, then clamp to saturated value.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiExp_16u_C1IRSfs_Ctx**(*Npp16u* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

One 16-bit unsigned short channel in place image exponential, scale by $2^(- nScaleFactor)$, then clamp to saturated value.

Parameters

- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiExp_16u_C3RSfs_Ctx**(const *Npp16u* *pSrc, int nSrcStep, *Npp16u* *pDst, int nDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Three 16-bit unsigned short channel image exponential, scale by $2^(- nScaleFactor)$, then clamp to saturated value.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiExp_16u_C3IRSfs_Ctx**(*Npp16u* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Three 16-bit unsigned short channel in place image exponential, scale by $2^(- nScaleFactor)$, then clamp to saturated value.

Parameters

- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiExp_16s_C1RSfs_Ctx**(const *Npp16s* *pSrc, int nSrcStep, *Npp16s* *pDst, int nDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

One 16-bit signed short channel image exponential, scale by $2^{(} - nScaleFactor)$, then clamp to saturated value.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiExp_16s_C1IRSfs_Ctx**(*Npp16s* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

One 16-bit signed short channel in place image exponential, scale by $2^{(} - nScaleFactor)$, then clamp to saturated value.

Parameters

- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiExp_16s_C3RSfs_Ctx**(const *Npp16s* *pSrc, int nSrcStep, *Npp16s* *pDst, int nDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Three 16-bit signed short channel image exponential, scale by $2^{(} - nScaleFactor)$, then clamp to saturated value.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.

- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiExp_16s_C3IRSfs_Ctx**(*Npp16s* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Three 16-bit signed short channel in place image exponential, scale by $2^{(} - nScaleFactor)$, then clamp to saturated value.

Parameters

- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiExp_32f_C1R_Ctx**(const *Npp32f* *pSrc, int nSrcStep, *Npp32f* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

One 32-bit floating point channel image exponential.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiExp_32f_C1IR_Ctx**(*Npp32f* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

One 32-bit floating point channel in place image exponential.

Parameters

- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.

- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiExp_32f_C3R_Ctx**(const *Npp32f* *pSrc, int nSrcStep, *Npp32f* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Three 32-bit floating point channel image exponential.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiExp_32f_C3IR_Ctx**(*Npp32f* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Three 32-bit floating point channel in place image exponential.

Parameters

- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

1.7.2. Logical Operations

1.7.2.1 Logical Operations

The set of image processing logical operations available in the library.

1.7.2.2 AndC

Pixel by pixel logical and of an image with a constant.

Functions

NppStatus **nppiAndC_8u_C1R_Ctx**(const *Npp8u* *pSrc1, int nSrc1Step, const *Npp8u* nConstant, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

One 8-bit unsigned char channel image logical and with constant.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **nConstant** – Constant.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiAndC_8u_C1IR_Ctx**(const *Npp8u* nConstant, *Npp8u* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

One 8-bit unsigned char channel in place image logical and with constant.

Parameters

- **nConstant** – Constant.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiAndC_8u_C3R_Ctx**(const *Npp8u* *pSrc1, int nSrc1Step, const *Npp8u* aConstants[3], *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Three 8-bit unsigned char channel image logical and with constant.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.

- **aConstants** – fixed size array of constant values, one per channel.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiAndC_8u_C3IR_Ctx**(const *Npp8u* aConstants[3], *Npp8u* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Three 8-bit unsigned char channel in place image logical and with constant.

Parameters

- **aConstants** – fixed size array of constant values, one per channel.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiAndC_8u_AC4R_Ctx**(const *Npp8u* *pSrc1, int nSrc1Step, const *Npp8u* aConstants[3], *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four 8-bit unsigned char channel image logical and with constant with unmodified alpha.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **aConstants** – fixed size array of constant values, one per channel.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiAndC_8u_AC4IR_Ctx**(const *Npp8u* aConstants[3], *Npp8u* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four 8-bit unsigned char channel in place image logical and with constant with unmodified alpha.

Parameters

- **aConstants** – fixed size array of constant values, one per channel.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiAndC_8u_C4R_Ctx**(const *Npp8u* *pSrc1, int nSrc1Step, const *Npp8u* aConstants[4], *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four 8-bit unsigned char channel image logical and with constant.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **aConstants** – fixed size array of constant values, one per channel.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiAndC_8u_C4IR_Ctx**(const *Npp8u* aConstants[4], *Npp8u* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four 8-bit unsigned char channel in place image logical and with constant.

Parameters

- **aConstants** – fixed size array of constant values, one per channel.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiAndC_16u_C1R_Ctx**(const *Npp16u* *pSrc1, int nSrc1Step, const *Npp16u* nConstant, *Npp16u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

One 16-bit unsigned short channel image logical and with constant.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **nConstant** – Constant.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiAndC_16u_C1IR_Ctx**(const *Npp16u* nConstant, *Npp16u* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

One 16-bit unsigned short channel in place image logical and with constant.

Parameters

- **nConstant** – Constant.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiAndC_16u_C3R_Ctx**(const *Npp16u* *pSrc1, int nSrc1Step, const *Npp16u* aConstants[3], *Npp16u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Three 16-bit unsigned short channel image logical and with constant.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **aConstants** – fixed size array of constant values, one per channel.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiAndC_16u_C3IR_Ctx**(const *Npp16u* aConstants[3], *Npp16u* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Three 16-bit unsigned short channel in place image logical and with constant.

Parameters

- **aConstants** – fixed size array of constant values, one per channel.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiAndC_16u_AC4R_Ctx**(const *Npp16u* *pSrc1, int nSrc1Step, const *Npp16u* aConstants[3], *Npp16u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four 16-bit unsigned short channel image logical and with constant with unmodified alpha.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **aConstants** – fixed size array of constant values, one per channel.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiAndC_16u_AC4IR_Ctx**(const *Npp16u* aConstants[3], *Npp16u* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four 16-bit unsigned short channel in place image logical and with constant with unmodified alpha.

Parameters

- **aConstants** – fixed size array of constant values, one per channel.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiAndC_16u_C4R_Ctx**(const *Npp16u* *pSrc1, int nSrc1Step, const *Npp16u* aConstants[4], *Npp16u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four 16-bit unsigned short channel image logical and with constant.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **aConstants** – fixed size array of constant values, one per channel.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiAndC_16u_C4IR_Ctx**(const *Npp16u* aConstants[4], *Npp16u* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four 16-bit unsigned short channel in place image logical and with constant.

Parameters

- **aConstants** – fixed size array of constant values, one per channel.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiAndC_32s_C1R_Ctx**(const *Npp32s* *pSrc1, int nSrc1Step, const *Npp32s* nConstant, *Npp32s* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

One 32-bit signed integer channel image logical and with constant.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **nConstant** – Constant.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.

- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiAndC_32s_C1IR_Ctx**(const *Npp32s* nConstant, *Npp32s* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

One 32-bit signed integer channel in place image logical and with constant.

Parameters

- **nConstant** – Constant.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiAndC_32s_C3R_Ctx**(const *Npp32s* *pSrc1, int nSrc1Step, const *Npp32s* aConstants[3], *Npp32s* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Three 32-bit signed integer channel image logical and with constant.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **aConstants** – fixed size array of constant values, one per channel.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiAndC_32s_C3IR_Ctx**(const *Npp32s* aConstants[3], *Npp32s* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Three 32-bit signed integer channel in place image logical and with constant.

Parameters

- **aConstants** – fixed size array of constant values, one per channel.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.

- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiAndC_32s_AC4R_Ctx**(const *Npp32s* *pSrc1, int nSrc1Step, const *Npp32s* aConstants[3], *Npp32s* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four 32-bit signed integer channel image logical and with constant with unmodified alpha.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **aConstants** – fixed size array of constant values, one per channel.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiAndC_32s_AC4IR_Ctx**(const *Npp32s* aConstants[3], *Npp32s* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four 32-bit signed integer channel in place image logical and with constant with unmodified alpha.

Parameters

- **aConstants** – fixed size array of constant values, one per channel.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiAndC_32s_C4R_Ctx**(const *Npp32s* *pSrc1, int nSrc1Step, const *Npp32s* aConstants[4], *Npp32s* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four 32-bit signed integer channel image logical and with constant.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **aConstants** – fixed size array of constant values, one per channel.

- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiAndC_32s_C4IR_Ctx**(const *Npp32s* aConstants[4], *Npp32s* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four 32-bit signed integer channel in place image logical and with constant.

Parameters

- **aConstants** – fixed size array of constant values, one per channel.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

1.7.2.3 OrC

Pixel by pixel logical or of an image with a constant.

Functions

NppStatus **nppiOrC_8u_C1R_Ctx**(const *Npp8u* *pSrc1, int nSrc1Step, const *Npp8u* nConstant, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

One 8-bit unsigned char channel image logical or with constant.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **nConstant** – Constant.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiOrC_8u_C1IR_Ctx**(const *Npp8u* nConstant, *Npp8u* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

One 8-bit unsigned char channel in place image logical or with constant.

Parameters

- **nConstant** – Constant.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiOrC_8u_C3R_Ctx**(const *Npp8u* *pSrc1, int nSrc1Step, const *Npp8u* aConstants[3], *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Three 8-bit unsigned char channel image logical or with constant.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **aConstants** – fixed size array of constant values, one per channel.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiOrC_8u_C3IR_Ctx**(const *Npp8u* aConstants[3], *Npp8u* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Three 8-bit unsigned char channel in place image logical or with constant.

Parameters

- **aConstants** – fixed size array of constant values, one per channel.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiOrC_8u_AC4R_Ctx**(const *Npp8u* *pSrc1, int nSrc1Step, const *Npp8u* aConstants[3], *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four 8-bit unsigned char channel image logical or with constant with unmodified alpha.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **aConstants** – fixed size array of constant values, one per channel.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiOrC_8u_AC4IR_Ctx**(const *Npp8u* aConstants[3], *Npp8u* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four 8-bit unsigned char channel in place image logical or with constant with unmodified alpha.

Parameters

- **aConstants** – fixed size array of constant values, one per channel.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiOrC_8u_C4R_Ctx**(const *Npp8u* *pSrc1, int nSrc1Step, const *Npp8u* aConstants[4], *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four 8-bit unsigned char channel image logical or with constant.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **aConstants** – fixed size array of constant values, one per channel.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiOrC_8u_C4IR_Ctx**(const *Npp8u* aConstants[4], *Npp8u* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four 8-bit unsigned char channel in place image logical or with constant.

Parameters

- **aConstants** – fixed size array of constant values, one per channel.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiOrC_16u_C1R_Ctx**(const *Npp16u* *pSrc1, int nSrc1Step, const *Npp16u* nConstant, *Npp16u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

One 16-bit unsigned short channel image logical or with constant.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **nConstant** – Constant.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiOrC_16u_C1IR_Ctx**(const *Npp16u* nConstant, *Npp16u* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

One 16-bit unsigned short channel in place image logical or with constant.

Parameters

- **nConstant** – Constant.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiOrC_16u_C3R_Ctx**(const *Npp16u* *pSrc1, int nSrc1Step, const *Npp16u* aConstants[3], *Npp16u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Three 16-bit unsigned short channel image logical or with constant.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **aConstants** – fixed size array of constant values, one per channel.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiOrC_16u_C3IR_Ctx**(const *Npp16u* aConstants[3], *Npp16u* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Three 16-bit unsigned short channel in place image logical or with constant.

Parameters

- **aConstants** – fixed size array of constant values, one per channel.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiOrC_16u_AC4R_Ctx**(const *Npp16u* *pSrc1, int nSrc1Step, const *Npp16u* aConstants[3], *Npp16u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four 16-bit unsigned short channel image logical or with constant with unmodified alpha.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **aConstants** – fixed size array of constant values, one per channel.
- **pDst** – *Destination-Image Pointer*.

- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiOrC_16u_AC4IR_Ctx**(const *Npp16u* aConstants[3], *Npp16u* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four 16-bit unsigned short channel in place image logical or with constant with unmodified alpha.

Parameters

- **aConstants** – fixed size array of constant values, one per channel.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiOrC_16u_C4R_Ctx**(const *Npp16u* *pSrc1, int nSrc1Step, const *Npp16u* aConstants[4], *Npp16u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four 16-bit unsigned short channel image logical or with constant.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **aConstants** – fixed size array of constant values, one per channel.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiOrC_16u_C4IR_Ctx**(const *Npp16u* aConstants[4], *Npp16u* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four 16-bit unsigned short channel in place image logical or with constant.

Parameters

- **aConstants** – fixed size array of constant values, one per channel.

- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiOrC_32s_C1R_Ctx**(const *Npp32s* *pSrc1, int nSrc1Step, const *Npp32s* nConstant, *Npp32s* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

One 32-bit signed integer channel image logical or with constant.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **nConstant** – Constant.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiOrC_32s_C1IR_Ctx**(const *Npp32s* nConstant, *Npp32s* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

One 32-bit signed integer channel in place image logical or with constant.

Parameters

- **nConstant** – Constant.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiOrC_32s_C3R_Ctx**(const *Npp32s* *pSrc1, int nSrc1Step, const *Npp32s* aConstants[3], *Npp32s* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Three 32-bit signed integer channel image logical or with constant.

Parameters

- **pSrc1** – *Source-Image Pointer*.

- **nSrc1Step** – *Source-Image Line Step*.
- **aConstants** – fixed size array of constant values, one per channel.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiOrC_32s_C3IR_Ctx**(const *Npp32s* aConstants[3], *Npp32s* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Three 32-bit signed integer channel in place image logical or with constant.

Parameters

- **aConstants** – fixed size array of constant values, one per channel.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiOrC_32s_AC4R_Ctx**(const *Npp32s* *pSrc1, int nSrc1Step, const *Npp32s* aConstants[3], *Npp32s* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four 32-bit signed integer channel image logical or with constant with unmodified alpha.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **aConstants** – fixed size array of constant values, one per channel.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiOrC_32s_AC4IR_Ctx**(const *Npp32s* aConstants[3], *Npp32s* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four 32-bit signed integer channel in place image logical or with constant with unmodified alpha.

Parameters

- **aConstants** – fixed size array of constant values, one per channel.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiOrC_32s_C4R_Ctx**(const *Npp32s* *pSrc1, int nSrc1Step, const *Npp32s* aConstants[4], *Npp32s* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four 32-bit signed integer channel image logical or with constant.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **aConstants** – fixed size array of constant values, one per channel.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiOrC_32s_C4IR_Ctx**(const *Npp32s* aConstants[4], *Npp32s* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four 32-bit signed integer channel in place image logical or with constant.

Parameters

- **aConstants** – fixed size array of constant values, one per channel.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

1.7.2.4 XorC

Pixel by pixel logical exclusive or of an image with a constant.

Functions

NppStatus **nppiXorC_8u_C1R_Ctx**(const *Npp8u* *pSrc1, int nSrc1Step, const *Npp8u* nConstant, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

One 8-bit unsigned char channel image logical exclusive or with constant.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **nConstant** – Constant.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiXorC_8u_C1IR_Ctx**(const *Npp8u* nConstant, *Npp8u* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

One 8-bit unsigned char channel in place image logical exclusive or with constant.

Parameters

- **nConstant** – Constant.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiXorC_8u_C3R_Ctx**(const *Npp8u* *pSrc1, int nSrc1Step, const *Npp8u* aConstants[3], *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Three 8-bit unsigned char channel image logical exclusive or with constant.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.

- **aConstants** – fixed size array of constant values, one per channel.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiXorC_8u_C3IR_Ctx**(const *Npp8u* aConstants[3], *Npp8u* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Three 8-bit unsigned char channel in place image logical exclusive or with constant.

Parameters

- **aConstants** – fixed size array of constant values, one per channel.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiXorC_8u_AC4R_Ctx**(const *Npp8u* *pSrc1, int nSrc1Step, const *Npp8u* aConstants[3], *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four 8-bit unsigned char channel image logical exclusive or with constant with unmodified alpha.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **aConstants** – fixed size array of constant values, one per channel.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiXorC_8u_AC4IR_Ctx**(const *Npp8u* aConstants[3], *Npp8u* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four 8-bit unsigned char channel in place image logical exclusive or with constant with unmodified alpha.

Parameters

- **aConstants** – fixed size array of constant values, one per channel.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiXorC_8u_C4R_Ctx**(const *Npp8u* *pSrc1, int nSrc1Step, const *Npp8u* aConstants[4], *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four 8-bit unsigned char channel image logical exclusive or with constant.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **aConstants** – fixed size array of constant values, one per channel.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiXorC_8u_C4IR_Ctx**(const *Npp8u* aConstants[4], *Npp8u* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four 8-bit unsigned char channel in place image logical exclusive or with constant.

Parameters

- **aConstants** – fixed size array of constant values, one per channel.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiXorC_16u_C1R_Ctx**(const *Npp16u* *pSrc1, int nSrc1Step, const *Npp16u* nConstant, *Npp16u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

One 16-bit unsigned short channel image logical exclusive or with constant.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **nConstant** – Constant.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiXorC_16u_C1IR_Ctx**(const *Npp16u* nConstant, *Npp16u* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

One 16-bit unsigned short channel in place image logical exclusive or with constant.

Parameters

- **nConstant** – Constant.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiXorC_16u_C3R_Ctx**(const *Npp16u* *pSrc1, int nSrc1Step, const *Npp16u* aConstants[3], *Npp16u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Three 16-bit unsigned short channel image logical exclusive or with constant.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **aConstants** – fixed size array of constant values, one per channel.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiXorC_16u_C3IR_Ctx**(const *Npp16u* aConstants[3], *Npp16u* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Three 16-bit unsigned short channel in place image logical exclusive or with constant.

Parameters

- **aConstants** – fixed size array of constant values, one per channel.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiXorC_16u_AC4R_Ctx**(const *Npp16u* *pSrc1, int nSrc1Step, const *Npp16u* aConstants[3], *Npp16u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four 16-bit unsigned short channel image logical exclusive or with constant with unmodified alpha.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **aConstants** – fixed size array of constant values, one per channel.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiXorC_16u_AC4IR_Ctx**(const *Npp16u* aConstants[3], *Npp16u* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four 16-bit unsigned short channel in place image logical exclusive or with constant with unmodified alpha.

Parameters

- **aConstants** – fixed size array of constant values, one per channel.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiXorC_16u_C4R_Ctx**(const *Npp16u* *pSrc1, int nSrc1Step, const *Npp16u* aConstants[4], *Npp16u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four 16-bit unsigned short channel image logical exclusive or with constant.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **aConstants** – fixed size array of constant values, one per channel.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiXorC_16u_C4IR_Ctx**(const *Npp16u* aConstants[4], *Npp16u* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four 16-bit unsigned short channel in place image logical exclusive or with constant.

Parameters

- **aConstants** – fixed size array of constant values, one per channel.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiXorC_32s_C1R_Ctx**(const *Npp32s* *pSrc1, int nSrc1Step, const *Npp32s* nConstant, *Npp32s* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

One 32-bit signed integer channel image logical exclusive or with constant.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **nConstant** – Constant.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.

- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiXorC_32s_C1IR_Ctx**(const *Npp32s* nConstant, *Npp32s* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

One 32-bit signed integer channel in place image logical exclusive or with constant.

Parameters

- **nConstant** – Constant.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiXorC_32s_C3R_Ctx**(const *Npp32s* *pSrc1, int nSrc1Step, const *Npp32s* aConstants[3], *Npp32s* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Three 32-bit signed integer channel image logical exclusive or with constant.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **aConstants** – fixed size array of constant values, one per channel.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiXorC_32s_C3IR_Ctx**(const *Npp32s* aConstants[3], *Npp32s* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Three 32-bit signed integer channel in place image logical exclusive or with constant.

Parameters

- **aConstants** – fixed size array of constant values, one per channel.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.

- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiXorC_32s_AC4R_Ctx**(const *Npp32s* *pSrc1, int nSrc1Step, const *Npp32s* aConstants[3], *Npp32s* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four 32-bit signed integer channel image logical exclusive or with constant with unmodified alpha.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **aConstants** – fixed size array of constant values, one per channel.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiXorC_32s_AC4IR_Ctx**(const *Npp32s* aConstants[3], *Npp32s* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four 32-bit signed integer channel in place image logical exclusive or with constant with unmodified alpha.

Parameters

- **aConstants** – fixed size array of constant values, one per channel.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiXorC_32s_C4R_Ctx**(const *Npp32s* *pSrc1, int nSrc1Step, const *Npp32s* aConstants[4], *Npp32s* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four 32-bit signed integer channel image logical exclusive or with constant.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.

- **aConstants** – fixed size array of constant values, one per channel.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiXorC_32s_C4IR_Ctx**(const *Npp32s* aConstants[4], *Npp32s* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four 32-bit signed integer channel in place image logical exclusive or with constant.

Parameters

- **aConstants** – fixed size array of constant values, one per channel.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

1.7.2.5 RShiftC

Pixel by pixel right shift of an image by a constant value.

Functions

NppStatus **nppiRShiftC_8u_C1R_Ctx**(const *Npp8u* *pSrc1, int nSrc1Step, const *Npp32u* nConstant, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

One 8-bit unsigned char channel image right shift by constant.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **nConstant** – Constant.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiRShiftC_8u_C1IR_Ctx**(const *Npp32u* nConstant, *Npp8u* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

One 8-bit unsigned char channel in place image right shift by constant.

Parameters

- **nConstant** – Constant.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiRShiftC_8u_C3R_Ctx**(const *Npp8u* *pSrc1, int nSrc1Step, const *Npp32u* aConstants[3], *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Three 8-bit unsigned char channel image right shift by constant.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **aConstants** – fixed size array of constant values, one per channel.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiRShiftC_8u_C3IR_Ctx**(const *Npp32u* aConstants[3], *Npp8u* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Three 8-bit unsigned char channel in place image right shift by constant.

Parameters

- **aConstants** – fixed size array of constant values, one per channel.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.

- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiRShiftC_8u_AC4R_Ctx**(const *Npp8u* *pSrc1, int nSrc1Step, const *Npp32u* aConstants[3], *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four 8-bit unsigned char channel image right shift by constant with unmodified alpha.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **aConstants** – fixed size array of constant values, one per channel.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiRShiftC_8u_AC4IR_Ctx**(const *Npp32u* aConstants[3], *Npp8u* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four 8-bit unsigned char channel in place image right shift by constant with unmodified alpha.

Parameters

- **aConstants** – fixed size array of constant values, one per channel.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiRShiftC_8u_C4R_Ctx**(const *Npp8u* *pSrc1, int nSrc1Step, const *Npp32u* aConstants[4], *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four 8-bit unsigned char channel image right shift by constant.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **aConstants** – fixed size array of constant values, one per channel.

- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiRShiftC_8u_C4IR_Ctx**(const *Npp32u* aConstants[4], *Npp8u* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four 8-bit unsigned char channel in place image right shift by constant.

Parameters

- **aConstants** – fixed size array of constant values, one per channel.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiRShiftC_8s_C1R_Ctx**(const *Npp8s* *pSrc1, int nSrc1Step, const *Npp32u* nConstant, *Npp8s* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

One 8-bit signed char channel image right shift by constant.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **nConstant** – Constant.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiRShiftC_8s_C1IR_Ctx**(const *Npp32u* nConstant, *Npp8s* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

One 8-bit signed char channel in place image right shift by constant.

Parameters

- **nConstant** – Constant.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiRShiftC_8s_C3R_Ctx**(const *Npp8s* *pSrc1, int nSrc1Step, const *Npp32u* aConstants[3], *Npp8s* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Three 8-bit signed char channel image right shift by constant.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **aConstants** – fixed size array of constant values, one per channel.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiRShiftC_8s_C3IR_Ctx**(const *Npp32u* aConstants[3], *Npp8s* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Three 8-bit signed char channel in place image right shift by constant.

Parameters

- **aConstants** – fixed size array of constant values, one per channel.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiRShiftC_8s_AC4R_Ctx**(const *Npp8s* *pSrc1, int nSrc1Step, const *Npp32u* aConstants[3], *Npp8s* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four 8-bit signed char channel image right shift by constant with unmodified alpha.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **aConstants** – fixed size array of constant values, one per channel.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiRShiftC_8s_AC4IR_Ctx**(const *Npp32u* aConstants[3], *Npp8s* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four 8-bit signed char channel in place image right shift by constant with unmodified alpha.

Parameters

- **aConstants** – fixed size array of constant values, one per channel.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiRShiftC_8s_C4R_Ctx**(const *Npp8s* *pSrc1, int nSrc1Step, const *Npp32u* aConstants[4], *Npp8s* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four 8-bit signed char channel image right shift by constant.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **aConstants** – fixed size array of constant values, one per channel.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiRShiftC_8s_C4IR_Ctx**(const *Npp32u* aConstants[4], *Npp8s* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four 8-bit signed char channel in place image right shift by constant.

Parameters

- **aConstants** – fixed size array of constant values, one per channel.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiRShiftC_16u_C1R_Ctx**(const *Npp16u* *pSrc1, int nSrc1Step, const *Npp32u* nConstant, *Npp16u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

One 16-bit unsigned short channel image right shift by constant.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **nConstant** – Constant.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiRShiftC_16u_C1IR_Ctx**(const *Npp32u* nConstant, *Npp16u* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

One 16-bit unsigned short channel in place image right shift by constant.

Parameters

- **nConstant** – Constant.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiRShiftC_16u_C3R_Ctx**(const *Npp16u* *pSrc1, int nSrc1Step, const *Npp32u* aConstants[3], *Npp16u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Three 16-bit unsigned short channel image right shift by constant.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **aConstants** – fixed size array of constant values, one per channel.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiRShiftC_16u_C3IR_Ctx**(const *Npp32u* aConstants[3], *Npp16u* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Three 16-bit unsigned short channel in place image right shift by constant.

Parameters

- **aConstants** – fixed size array of constant values, one per channel.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiRShiftC_16u_AC4R_Ctx**(const *Npp16u* *pSrc1, int nSrc1Step, const *Npp32u* aConstants[3], *Npp16u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four 16-bit unsigned short channel image right shift by constant with unmodified alpha.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **aConstants** – fixed size array of constant values, one per channel.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.

- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiRShiftC_16u_AC4IR_Ctx**(const *Npp32u* aConstants[3], *Npp16u* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four 16-bit unsigned short channel in place image right shift by constant with unmodified alpha.

Parameters

- **aConstants** – fixed size array of constant values, one per channel.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiRShiftC_16u_C4R_Ctx**(const *Npp16u* *pSrc1, int nSrc1Step, const *Npp32u* aConstants[4], *Npp16u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four 16-bit unsigned short channel image right shift by constant.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **aConstants** – fixed size array of constant values, one per channel.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiRShiftC_16u_C4IR_Ctx**(const *Npp32u* aConstants[4], *Npp16u* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four 16-bit unsigned short channel in place image right shift by constant.

Parameters

- **aConstants** – fixed size array of constant values, one per channel.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.

- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiRShiftC_16s_C1R_Ctx**(const *Npp16s* *pSrc1, int nSrc1Step, const *Npp32u* nConstant, *Npp16s* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

One 16-bit signed short channel image right shift by constant.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **nConstant** – Constant.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiRShiftC_16s_C1IR_Ctx**(const *Npp32u* nConstant, *Npp16s* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

One 16-bit signed short channel in place image right shift by constant.

Parameters

- **nConstant** – Constant.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiRShiftC_16s_C3R_Ctx**(const *Npp16s* *pSrc1, int nSrc1Step, const *Npp32u* aConstants[3], *Npp16s* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Three 16-bit signed short channel image right shift by constant.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.

- **aConstants** – fixed size array of constant values, one per channel.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiRShiftC_16s_C3IR_Ctx**(const *Npp32u* aConstants[3], *Npp16s* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Three 16-bit signed short channel in place image right shift by constant.

Parameters

- **aConstants** – fixed size array of constant values, one per channel.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiRShiftC_16s_AC4R_Ctx**(const *Npp16s* *pSrc1, int nSrc1Step, const *Npp32u* aConstants[3], *Npp16s* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four 16-bit signed short channel image right shift by constant with unmodified alpha.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **aConstants** – fixed size array of constant values, one per channel.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiRShiftC_16s_AC4IR_Ctx**(const *Npp32u* aConstants[3], *Npp16s* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four 16-bit signed short channel in place image right shift by constant with unmodified alpha.

Parameters

- **aConstants** – fixed size array of constant values, one per channel.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiRShiftC_16s_C4R_Ctx**(const *Npp16s* *pSrc1, int nSrc1Step, const *Npp32u* aConstants[4], *Npp16s* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four 16-bit signed short channel image right shift by constant.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **aConstants** – fixed size array of constant values, one per channel.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiRShiftC_16s_C4IR_Ctx**(const *Npp32u* aConstants[4], *Npp16s* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four 16-bit signed short channel in place image right shift by constant.

Parameters

- **aConstants** – fixed size array of constant values, one per channel.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiRShiftC_32s_C1R_Ctx**(const *Npp32s* *pSrc1, int nSrc1Step, const *Npp32u* nConstant, *Npp32s* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

One 32-bit signed integer channel image right shift by constant.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **nConstant** – Constant.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiRShiftC_32s_C1IR_Ctx**(const *Npp32u* nConstant, *Npp32s* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

One 32-bit signed integer channel in place image right shift by constant.

Parameters

- **nConstant** – Constant.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiRShiftC_32s_C3R_Ctx**(const *Npp32s* *pSrc1, int nSrc1Step, const *Npp32u* aConstants[3], *Npp32s* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Three 32-bit signed integer channel image right shift by constant.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **aConstants** – fixed size array of constant values, one per channel.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiRShiftC_32s_C3IR_Ctx**(const *Npp32u* aConstants[3], *Npp32s* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Three 32-bit signed integer channel in place image right shift by constant.

Parameters

- **aConstants** – fixed size array of constant values, one per channel.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiRShiftC_32s_AC4R_Ctx**(const *Npp32s* *pSrc1, int nSrc1Step, const *Npp32u* aConstants[3], *Npp32s* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four 32-bit signed integer channel image right shift by constant with unmodified alpha.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **aConstants** – fixed size array of constant values, one per channel.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiRShiftC_32s_AC4IR_Ctx**(const *Npp32u* aConstants[3], *Npp32s* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four 32-bit signed integer channel in place image right shift by constant with unmodified alpha.

Parameters

- **aConstants** – fixed size array of constant values, one per channel.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiRShiftC_32s_C4R_Ctx**(const *Npp32s* *pSrc1, int nSrc1Step, const *Npp32u* aConstants[4], *Npp32s* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four 32-bit signed integer channel image right shift by constant.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **aConstants** – fixed size array of constant values, one per channel.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiRShiftC_32s_C4IR_Ctx**(const *Npp32u* aConstants[4], *Npp32s* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four 32-bit signed integer channel in place image right shift by constant.

Parameters

- **aConstants** – fixed size array of constant values, one per channel.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

1.7.2.6 LShiftC

Pixel by pixel left shift of an image by a constant value.

Functions

NppStatus **nppiLShiftC_8u_C1R_Ctx**(const *Npp8u* *pSrc1, int nSrc1Step, const *Npp32u* nConstant, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

One 8-bit unsigned char channel image left shift by constant.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **nConstant** – Constant.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiLShiftC_8u_C1IR_Ctx**(const *Npp32u* nConstant, *Npp8u* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

One 8-bit unsigned char channel in place image left shift by constant.

Parameters

- **nConstant** – Constant.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiLShiftC_8u_C3R_Ctx**(const *Npp8u* *pSrc1, int nSrc1Step, const *Npp32u* aConstants[3], *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Three 8-bit unsigned char channel image left shift by constant.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **aConstants** – fixed size array of constant values, one per channel.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiLShiftC_8u_C3IR_Ctx**(const *Npp32u* aConstants[3], *Npp8u* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Three 8-bit unsigned char channel in place image left shift by constant.

Parameters

- **aConstants** – fixed size array of constant values, one per channel.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiLShiftC_8u_AC4R_Ctx**(const *Npp8u* *pSrc1, int nSrc1Step, const *Npp32u* aConstants[3], *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four 8-bit unsigned char channel image left shift by constant with unmodified alpha.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **aConstants** – fixed size array of constant values, one per channel.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiLShiftC_8u_AC4IR_Ctx**(const *Npp32u* aConstants[3], *Npp8u* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four 8-bit unsigned char channel in place image left shift by constant with unmodified alpha.

Parameters

- **aConstants** – fixed size array of constant values, one per channel.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiLShiftC_8u_C4R_Ctx**(const *Npp8u* *pSrc1, int nSrc1Step, const *Npp32u* aConstants[4], *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four 8-bit unsigned char channel image left shift by constant.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **aConstants** – fixed size array of constant values, one per channel.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiLShiftC_8u_C4IR_Ctx**(const *Npp32u* aConstants[4], *Npp8u* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four 8-bit unsigned char channel in place image left shift by constant.

Parameters

- **aConstants** – fixed size array of constant values, one per channel.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiLShiftC_16u_C1R_Ctx**(const *Npp16u* *pSrc1, int nSrc1Step, const *Npp32u* nConstant, *Npp16u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

One 16-bit unsigned short channel image left shift by constant.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **nConstant** – Constant
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.

- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiLShiftC_16u_C1IR_Ctx**(const *Npp32u* nConstant, *Npp16u* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

One 16-bit unsigned short channel in place image left shift by constant.

Parameters

- **nConstant** – Constant.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiLShiftC_16u_C3R_Ctx**(const *Npp16u* *pSrc1, int nSrc1Step, const *Npp32u* aConstants[3], *Npp16u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Three 16-bit unsigned short channel image left shift by constant.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **aConstants** – fixed size array of constant values, one per channel.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiLShiftC_16u_C3IR_Ctx**(const *Npp32u* aConstants[3], *Npp16u* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Three 16-bit unsigned short channel in place image left shift by constant.

Parameters

- **aConstants** – fixed size array of constant values, one per channel.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.

- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiLShiftC_16u_AC4R_Ctx**(const *Npp16u* *pSrc1, int nSrc1Step, const *Npp32u* aConstants[3], *Npp16u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four 16-bit unsigned short channel image left shift by constant with unmodified alpha.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **aConstants** – fixed size array of constant values, one per channel.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiLShiftC_16u_AC4IR_Ctx**(const *Npp32u* aConstants[3], *Npp16u* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four 16-bit unsigned short channel in place image left shift by constant with unmodified alpha.

Parameters

- **aConstants** – fixed size array of constant values, one per channel.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiLShiftC_16u_C4R_Ctx**(const *Npp16u* *pSrc1, int nSrc1Step, const *Npp32u* aConstants[4], *Npp16u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four 16-bit unsigned short channel image left shift by constant.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.

- **aConstants** – fixed size array of constant values, one per channel.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiLShiftC_16u_C4IR_Ctx**(const *Npp32u* aConstants[4], *Npp16u* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four 16-bit unsigned short channel in place image left shift by constant.

Parameters

- **aConstants** – fixed size array of constant values, one per channel.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiLShiftC_32s_C1R_Ctx**(const *Npp32s* *pSrc1, int nSrc1Step, const *Npp32u* nConstant, *Npp32s* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

One 32-bit signed integer channel image left shift by constant.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **nConstant** – Constant.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiLShiftC_32s_C1IR_Ctx**(const *Npp32u* nConstant, *Npp32s* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

One 32-bit signed integer channel in place image left shift by constant.

Parameters

- **nConstant** – Constant.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiLShiftC_32s_C3R_Ctx**(const *Npp32s* *pSrc1, int nSrc1Step, const *Npp32u* aConstants[3], *Npp32s* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Three 32-bit signed integer channel image left shift by constant.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **aConstants** – fixed size array of constant values, one per channel.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiLShiftC_32s_C3IR_Ctx**(const *Npp32u* aConstants[3], *Npp32s* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Three 32-bit signed integer channel in place image left shift by constant.

Parameters

- **aConstants** – fixed size array of constant values, one per channel.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiLShiftC_32s_AC4R_Ctx**(const *Npp32s* *pSrc1, int nSrc1Step, const *Npp32u* aConstants[3], *Npp32s* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four 32-bit signed integer channel image left shift by constant with unmodified alpha.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **aConstants** – fixed size array of constant values, one per channel.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiLShiftC_32s_AC4IR_Ctx**(const *Npp32u* aConstants[3], *Npp32s* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four 32-bit signed integer channel in place image left shift by constant with unmodified alpha.

Parameters

- **aConstants** – fixed size array of constant values, one per channel.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiLShiftC_32s_C4R_Ctx**(const *Npp32s* *pSrc1, int nSrc1Step, const *Npp32u* aConstants[4], *Npp32s* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four 32-bit signed integer channel image left shift by constant.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **aConstants** – fixed size array of constant values, one per channel.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiLShiftC_32s_C4IR_Ctx**(const *Npp32u* aConstants[4], *Npp32s* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four 32-bit signed integer channel in place image left shift by constant.

Parameters

- **aConstants** – fixed size array of constant values, one per channel.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

1.7.2.7 And

Pixel by pixel logical and of images.

Functions

NppStatus **nppiAnd_8u_C1R_Ctx**(const *Npp8u* *pSrc1, int nSrc1Step, const *Npp8u* *pSrc2, int nSrc2Step, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

One 8-bit unsigned char channel image logical and.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **pSrc2** – *Source-Image Pointer*.
- **nSrc2Step** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiAnd_8u_C1IR_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *Npp8u* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

One 8-bit unsigned char channel in place image logical and.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiAnd_8u_C3R_Ctx**(const *Npp8u* *pSrc1, int nSrc1Step, const *Npp8u* *pSrc2, int nSrc2Step, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Three 8-bit unsigned char channel image logical and.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **pSrc2** – *Source-Image Pointer*.
- **nSrc2Step** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiAnd_8u_C3IR_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *Npp8u* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Three 8-bit unsigned char channel in place image logical and.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiAnd_8u_AC4R_Ctx**(const *Npp8u* *pSrc1, int nSrc1Step, const *Npp8u* *pSrc2, int nSrc2Step, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four 8-bit unsigned char channel image logical and with unmodified alpha.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **pSrc2** – *Source-Image Pointer*.
- **nSrc2Step** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiAnd_8u_AC4IR_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *Npp8u* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four 8-bit unsigned char channel in place image logical and with unmodified alpha.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiAnd_8u_C4R_Ctx**(const *Npp8u* *pSrc1, int nSrc1Step, const *Npp8u* *pSrc2, int nSrc2Step, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four 8-bit unsigned char channel image logical and.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **pSrc2** – *Source-Image Pointer*.
- **nSrc2Step** – *Source-Image Line Step*.

- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiAnd_8u_C4IR_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *Npp8u* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four 8-bit unsigned char channel in place image logical and.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiAnd_16u_C1R_Ctx**(const *Npp16u* *pSrc1, int nSrc1Step, const *Npp16u* *pSrc2, int nSrc2Step, *Npp16u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

One 16-bit unsigned short channel image logical and.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **pSrc2** – *Source-Image Pointer*.
- **nSrc2Step** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiAnd_16u_C1IR_Ctx**(const *Npp16u* *pSrc, int nSrcStep, *Npp16u* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

One 16-bit unsigned short channel in place image logical and.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiAnd_16u_C3R_Ctx**(const *Npp16u* *pSrc1, int nSrc1Step, const *Npp16u* *pSrc2, int nSrc2Step, *Npp16u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Three 16-bit unsigned short channel image logical and.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **pSrc2** – *Source-Image Pointer*.
- **nSrc2Step** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiAnd_16u_C3IR_Ctx**(const *Npp16u* *pSrc, int nSrcStep, *Npp16u* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Three 16-bit unsigned short channel in place image logical and.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiAnd_16u_AC4R_Ctx**(const *Npp16u* *pSrc1, int nSrc1Step, const *Npp16u* *pSrc2, int nSrc2Step, *Npp16u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four 16-bit unsigned short channel image logical and with unmodified alpha.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **pSrc2** – *Source-Image Pointer*.
- **nSrc2Step** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiAnd_16u_AC4IR_Ctx**(const *Npp16u* *pSrc, int nSrcStep, *Npp16u* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four 16-bit unsigned short channel in place image logical and with unmodified alpha.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiAnd_16u_C4R_Ctx**(const *Npp16u* *pSrc1, int nSrc1Step, const *Npp16u* *pSrc2, int nSrc2Step, *Npp16u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four 16-bit unsigned short channel image logical and.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **pSrc2** – *Source-Image Pointer*.
- **nSrc2Step** – *Source-Image Line Step*.

- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiAnd_16u_C4IR_Ctx**(const *Npp16u* *pSrc, int nSrcStep, *Npp16u* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four 16-bit unsigned short channel in place image logical and.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiAnd_32s_C1R_Ctx**(const *Npp32s* *pSrc1, int nSrc1Step, const *Npp32s* *pSrc2, int nSrc2Step, *Npp32s* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

One 32-bit signed integer channel image logical and.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **pSrc2** – *Source-Image Pointer*.
- **nSrc2Step** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiAnd_32s_C1IR_Ctx**(const *Npp32s* *pSrc, int nSrcStep, *Npp32s* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

One 32-bit signed integer channel in place image logical and.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiAnd_32s_C3R_Ctx**(const *Npp32s* *pSrc1, int nSrc1Step, const *Npp32s* *pSrc2, int nSrc2Step, *Npp32s* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Three 32-bit signed integer channel image logical and.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **pSrc2** – *Source-Image Pointer*.
- **nSrc2Step** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiAnd_32s_C3IR_Ctx**(const *Npp32s* *pSrc, int nSrcStep, *Npp32s* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Three 32-bit signed integer channel in place image logical and.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiAnd_32s_AC4R_Ctx**(const *Npp32s* *pSrc1, int nSrc1Step, const *Npp32s* *pSrc2, int nSrc2Step, *Npp32s* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four 32-bit signed integer channel image logical and with unmodified alpha.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **pSrc2** – *Source-Image Pointer*.
- **nSrc2Step** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiAnd_32s_AC4IR_Ctx**(const *Npp32s* *pSrc, int nSrcStep, *Npp32s* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four 32-bit signed integer channel in place image logical and with unmodified alpha.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiAnd_32s_C4R_Ctx**(const *Npp32s* *pSrc1, int nSrc1Step, const *Npp32s* *pSrc2, int nSrc2Step, *Npp32s* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four 32-bit signed integer channel image logical and.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **pSrc2** – *Source-Image Pointer*.
- **nSrc2Step** – *Source-Image Line Step*.

- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiAnd_32s_C4IR_Ctx**(const *Npp32s* *pSrc, int nSrcStep, *Npp32s* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four 32-bit signed integer channel in place image logical and.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

1.7.2.8 Or

Pixel by pixel logical or of images.

Functions

NppStatus **nppiOr_8u_C1R_Ctx**(const *Npp8u* *pSrc1, int nSrc1Step, const *Npp8u* *pSrc2, int nSrc2Step, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

One 8-bit unsigned char channel image logical or.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **pSrc2** – *Source-Image Pointer*.
- **nSrc2Step** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.

- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiOr_8u_C1IR_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *Npp8u* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

One 8-bit unsigned char channel in place image logical or.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiOr_8u_C3R_Ctx**(const *Npp8u* *pSrc1, int nSrc1Step, const *Npp8u* *pSrc2, int nSrc2Step, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Three 8-bit unsigned char channel image logical or.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **pSrc2** – *Source-Image Pointer*.
- **nSrc2Step** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiOr_8u_C3IR_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *Npp8u* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Three 8-bit unsigned char channel in place image logical or.

Parameters

- **pSrc** – *Source-Image Pointer*.

- **nSrcStep** – *Source-Image Line Step*.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiOr_8u_AC4R_Ctx**(const *Npp8u* *pSrc1, int nSrc1Step, const *Npp8u* *pSrc2, int nSrc2Step, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four 8-bit unsigned char channel image logical or with unmodified alpha.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **pSrc2** – *Source-Image Pointer*.
- **nSrc2Step** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiOr_8u_AC4IR_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *Npp8u* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four 8-bit unsigned char channel in place image logical or with unmodified alpha.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiOr_8u_C4R_Ctx**(const *Npp8u* *pSrc1, int nSrc1Step, const *Npp8u* *pSrc2, int nSrc2Step, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four 8-bit unsigned char channel image logical or.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **pSrc2** – *Source-Image Pointer*.
- **nSrc2Step** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiOr_8u_C4IR_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *Npp8u* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four 8-bit unsigned char channel in place image logical or.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiOr_16u_C1R_Ctx**(const *Npp16u* *pSrc1, int nSrc1Step, const *Npp16u* *pSrc2, int nSrc2Step, *Npp16u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

One 16-bit unsigned short channel image logical or.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **pSrc2** – *Source-Image Pointer*.
- **nSrc2Step** – *Source-Image Line Step*.

- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiOr_16u_C1IR_Ctx**(const *Npp16u* *pSrc, int nSrcStep, *Npp16u* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

One 16-bit unsigned short channel in place image logical or.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiOr_16u_C3R_Ctx**(const *Npp16u* *pSrc1, int nSrc1Step, const *Npp16u* *pSrc2, int nSrc2Step, *Npp16u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Three 16-bit unsigned short channel image logical or.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **pSrc2** – *Source-Image Pointer*.
- **nSrc2Step** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiOr_16u_C3IR_Ctx**(const *Npp16u* *pSrc, int nSrcStep, *Npp16u* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Three 16-bit unsigned short channel in place image logical or.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiOr_16u_AC4R_Ctx**(const *Npp16u* *pSrc1, int nSrc1Step, const *Npp16u* *pSrc2, int nSrc2Step, *Npp16u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four 16-bit unsigned short channel image logical or with unmodified alpha.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **pSrc2** – *Source-Image Pointer*.
- **nSrc2Step** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiOr_16u_AC4IR_Ctx**(const *Npp16u* *pSrc, int nSrcStep, *Npp16u* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four 16-bit unsigned short channel in place image logical or with unmodified alpha.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiOr_16u_C4R_Ctx**(const *Npp16u* *pSrc1, int nSrc1Step, const *Npp16u* *pSrc2, int nSrc2Step, *Npp16u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four 16-bit unsigned short channel image logical or.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **pSrc2** – *Source-Image Pointer*.
- **nSrc2Step** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiOr_16u_C4IR_Ctx**(const *Npp16u* *pSrc, int nSrcStep, *Npp16u* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four 16-bit unsigned short channel in place image logical or.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiOr_32s_C1R_Ctx**(const *Npp32s* *pSrc1, int nSrc1Step, const *Npp32s* *pSrc2, int nSrc2Step, *Npp32s* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

One 32-bit signed integer channel image logical or.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **pSrc2** – *Source-Image Pointer*.
- **nSrc2Step** – *Source-Image Line Step*.

- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiOr_32s_C1IR_Ctx**(const *Npp32s* *pSrc, int nSrcStep, *Npp32s* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

One 32-bit signed integer channel in place image logical or.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiOr_32s_C3R_Ctx**(const *Npp32s* *pSrc1, int nSrc1Step, const *Npp32s* *pSrc2, int nSrc2Step, *Npp32s* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Three 32-bit signed integer channel image logical or.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **pSrc2** – *Source-Image Pointer*.
- **nSrc2Step** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiOr_32s_C3IR_Ctx**(const *Npp32s* *pSrc, int nSrcStep, *Npp32s* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Three 32-bit signed integer channel in place image logical or.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiOr_32s_AC4R_Ctx**(const *Npp32s* *pSrc1, int nSrc1Step, const *Npp32s* *pSrc2, int nSrc2Step, *Npp32s* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four 32-bit signed integer channel image logical or with unmodified alpha.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **pSrc2** – *Source-Image Pointer*.
- **nSrc2Step** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiOr_32s_AC4IR_Ctx**(const *Npp32s* *pSrc, int nSrcStep, *Npp32s* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four 32-bit signed integer channel in place image logical or with unmodified alpha.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiOr_32s_C4R_Ctx**(const *Npp32s* *pSrc1, int nSrc1Step, const *Npp32s* *pSrc2, int nSrc2Step, *Npp32s* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four 32-bit signed integer channel image logical or.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **pSrc2** – *Source-Image Pointer*.
- **nSrc2Step** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiOr_32s_C4IR_Ctx**(const *Npp32s* *pSrc, int nSrcStep, *Npp32s* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four 32-bit signed integer channel in place image logical or.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

1.7.2.9 Xor

Pixel by pixel logical exclusive or of images.

Functions

NppStatus **nppiXor_8u_C1R_Ctx**(const *Npp8u* *pSrc1, int nSrc1Step, const *Npp8u* *pSrc2, int nSrc2Step, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

One 8-bit unsigned char channel image logical exclusive or.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **pSrc2** – *Source-Image Pointer*.
- **nSrc2Step** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiXor_8u_C1IR_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *Npp8u* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

One 8-bit unsigned char channel in place image logical exclusive or.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiXor_8u_C3R_Ctx**(const *Npp8u* *pSrc1, int nSrc1Step, const *Npp8u* *pSrc2, int nSrc2Step, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Three 8-bit unsigned char channel image logical exclusive or.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **pSrc2** – *Source-Image Pointer*.

- **nSrc2Step** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiXor_8u_C3IR_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *Npp8u* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Three 8-bit unsigned char channel in place image logical exclusive or.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiXor_8u_AC4R_Ctx**(const *Npp8u* *pSrc1, int nSrc1Step, const *Npp8u* *pSrc2, int nSrc2Step, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four 8-bit unsigned char channel image logical exclusive or with unmodified alpha.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **pSrc2** – *Source-Image Pointer*.
- **nSrc2Step** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiXor_8u_AC4IR_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *Npp8u* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four 8-bit unsigned char channel in place image logical exclusive or with unmodified alpha.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiXor_8u_C4R_Ctx**(const *Npp8u* *pSrc1, int nSrc1Step, const *Npp8u* *pSrc2, int nSrc2Step, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four 8-bit unsigned char channel image logical exclusive or.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **pSrc2** – *Source-Image Pointer*.
- **nSrc2Step** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiXor_8u_C4IR_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *Npp8u* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four 8-bit unsigned char channel in place image logical exclusive or.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.

- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiXor_16u_C1R_Ctx**(const *Npp16u* *pSrc1, int nSrc1Step, const *Npp16u* *pSrc2, int nSrc2Step, *Npp16u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

One 16-bit unsigned short channel image logical exclusive or.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **pSrc2** – *Source-Image Pointer*.
- **nSrc2Step** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiXor_16u_C1IR_Ctx**(const *Npp16u* *pSrc, int nSrcStep, *Npp16u* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

One 16-bit unsigned short channel in place image logical exclusive or.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiXor_16u_C3R_Ctx**(const *Npp16u* *pSrc1, int nSrc1Step, const *Npp16u* *pSrc2, int nSrc2Step, *Npp16u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Three 16-bit unsigned short channel image logical exclusive or.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **pSrc2** – *Source-Image Pointer*.
- **nSrc2Step** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiXor_16u_C3IR_Ctx**(const *Npp16u* *pSrc, int nSrcStep, *Npp16u* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Three 16-bit unsigned short channel in place image logical exclusive or.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiXor_16u_AC4R_Ctx**(const *Npp16u* *pSrc1, int nSrc1Step, const *Npp16u* *pSrc2, int nSrc2Step, *Npp16u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four 16-bit unsigned short channel image logical exclusive or with unmodified alpha.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **pSrc2** – *Source-Image Pointer*.
- **nSrc2Step** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiXor_16u_AC4IR_Ctx**(const *Npp16u* *pSrc, int nSrcStep, *Npp16u* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four 16-bit unsigned short channel in place image logical exclusive or with unmodified alpha.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiXor_16u_C4R_Ctx**(const *Npp16u* *pSrc1, int nSrc1Step, const *Npp16u* *pSrc2, int nSrc2Step, *Npp16u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four 16-bit unsigned short channel image logical exclusive or.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **pSrc2** – *Source-Image Pointer*.
- **nSrc2Step** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiXor_16u_C4IR_Ctx**(const *Npp16u* *pSrc, int nSrcStep, *Npp16u* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four 16-bit unsigned short channel in place image logical exclusive or.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.

- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiXor_32s_C1R_Ctx**(const *Npp32s* *pSrc1, int nSrc1Step, const *Npp32s* *pSrc2, int nSrc2Step, *Npp32s* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

One 32-bit signed integer channel image logical exclusive or.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **pSrc2** – *Source-Image Pointer*.
- **nSrc2Step** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiXor_32s_C1IR_Ctx**(const *Npp32s* *pSrc, int nSrcStep, *Npp32s* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

One 32-bit signed integer channel in place image logical exclusive or.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiXor_32s_C3R_Ctx**(const *Npp32s* *pSrc1, int nSrc1Step, const *Npp32s* *pSrc2, int nSrc2Step, *Npp32s* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Three 32-bit signed integer channel image logical exclusive or.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **pSrc2** – *Source-Image Pointer*.
- **nSrc2Step** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiXor_32s_C3IR_Ctx**(const *Npp32s* *pSrc, int nSrcStep, *Npp32s* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Three 32-bit signed integer channel in place image logical exclusive or.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiXor_32s_AC4R_Ctx**(const *Npp32s* *pSrc1, int nSrc1Step, const *Npp32s* *pSrc2, int nSrc2Step, *Npp32s* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four 32-bit signed integer channel image logical exclusive or with unmodified alpha.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **pSrc2** – *Source-Image Pointer*.
- **nSrc2Step** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.

- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiXor_32s_AC4IR_Ctx**(const *Npp32s* *pSrc, int nSrcStep, *Npp32s* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four 32-bit signed integer channel in place image logical exclusive or with unmodified alpha.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiXor_32s_C4R_Ctx**(const *Npp32s* *pSrc1, int nSrc1Step, const *Npp32s* *pSrc2, int nSrc2Step, *Npp32s* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four 32-bit signed integer channel image logical exclusive or.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **pSrc2** – *Source-Image Pointer*.
- **nSrc2Step** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiXor_32s_C4IR_Ctx**(const *Npp32s* *pSrc, int nSrcStep, *Npp32s* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four 32-bit signed integer channel in place image logical exclusive or.

Parameters

- **pSrc** – *Source-Image Pointer*.

- **nSrcStep** – *Source-Image Line Step*.
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

1.7.2.10 Not

Pixel by pixel logical not of image.

Functions

NppStatus **nppiNot_8u_C1R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

One 8-bit unsigned char channel image logical not.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiNot_8u_C1IR_Ctx**(*Npp8u* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

One 8-bit unsigned char channel in place image logical not.

Parameters

- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiNot_8u_C3R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Three 8-bit unsigned char channel image logical not.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiNot_8u_C3IR_Ctx**(*Npp8u* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Three 8-bit unsigned char channel in place image logical not.

Parameters

- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiNot_8u_AC4R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four 8-bit unsigned char channel image logical not with unmodified alpha.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiNot_8u_AC4IR_Ctx**(*Npp8u* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four 8-bit unsigned char channel in place image logical not with unmodified alpha.

Parameters

- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiNot_8u_C4R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four 8-bit unsigned char channel image logical not.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiNot_8u_C4IR_Ctx**(*Npp8u* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four 8-bit unsigned char channel in place image logical not.

Parameters

- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

1.7.3. Image Alpha Composition Operations

1.7.3.1 AlphaCompC

Composite two images using constant alpha values.

Functions

NppStatus **nppiAlphaCompC_8u_C1R_Ctx**(const *Npp8u* *pSrc1, int nSrc1Step, *Npp8u* nAlpha1, const *Npp8u* *pSrc2, int nSrc2Step, *Npp8u* nAlpha2, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppiAlphaOp* eAlphaOp, *NppStreamContext* nppStreamCtx)

One 8-bit unsigned char channel image composition using constant alpha.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **nAlpha1** – Image alpha opacity (0 - max channel pixel value).
- **pSrc2** – *Source-Image Pointer*.
- **nSrc2Step** – *Source-Image Line Step*.
- **nAlpha2** – Image alpha opacity (0 - max channel pixel value).
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **eAlphaOp** – alpha-blending operation.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiAlphaCompC_8u_C3R_Ctx**(const *Npp8u* *pSrc1, int nSrc1Step, *Npp8u* nAlpha1, const *Npp8u* *pSrc2, int nSrc2Step, *Npp8u* nAlpha2, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppiAlphaOp* eAlphaOp, *NppStreamContext* nppStreamCtx)

Three 8-bit unsigned char channel image composition using constant alpha.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **nAlpha1** – Image alpha opacity (0 - max channel pixel value).
- **pSrc2** – *Source-Image Pointer*.

- **nSrc2Step** – *Source-Image Line Step*.
- **nAlpha2** – Image alpha opacity (0 - max channel pixel value).
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **eAlphaOp** – alpha-blending operation.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiAlphaCompC_8u_C4R_Ctx**(const *Npp8u* *pSrc1, int nSrc1Step, *Npp8u* nAlpha1, const *Npp8u* *pSrc2, int nSrc2Step, *Npp8u* nAlpha2, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppiAlphaOp* eAlphaOp, *NppStreamContext* nppStreamCtx)

Four 8-bit unsigned char channel image composition using constant alpha.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **nAlpha1** – Image alpha opacity (0 - max channel pixel value).
- **pSrc2** – *Source-Image Pointer*.
- **nSrc2Step** – *Source-Image Line Step*.
- **nAlpha2** – Image alpha opacity (0 - max channel pixel value).
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **eAlphaOp** – alpha-blending operation.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiAlphaCompC_8u_AC4R_Ctx**(const *Npp8u* *pSrc1, int nSrc1Step, *Npp8u* nAlpha1, const *Npp8u* *pSrc2, int nSrc2Step, *Npp8u* nAlpha2, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppiAlphaOp* eAlphaOp, *NppStreamContext* nppStreamCtx)

Four 8-bit unsigned char channel image composition with alpha using constant source alpha.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.

- **nAlpha1** – Image alpha opacity (0 - max channel pixel value).
- **pSrc2** – *Source-Image Pointer*.
- **nSrc2Step** – *Source-Image Line Step*.
- **nAlpha2** – Image alpha opacity (0 - max channel pixel value).
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **eAlphaOp** – alpha-blending operation.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiAlphaCompC_8s_C1R_Ctx**(const *Npp8s* *pSrc1, int nSrc1Step, *Npp8s* nAlpha1, const *Npp8s* *pSrc2, int nSrc2Step, *Npp8s* nAlpha2, *Npp8s* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppiAlphaOp* eAlphaOp, *NppStreamContext* nppStreamCtx)

One 8-bit signed char channel image composition using constant alpha.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **nAlpha1** – Image alpha opacity (0 - max channel pixel value).
- **pSrc2** – *Source-Image Pointer*.
- **nSrc2Step** – *Source-Image Line Step*.
- **nAlpha2** – Image alpha opacity (0 - max channel pixel value).
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **eAlphaOp** – alpha-blending operation.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiAlphaCompC_16u_C1R_Ctx**(const *Npp16u* *pSrc1, int nSrc1Step, *Npp16u* nAlpha1, const *Npp16u* *pSrc2, int nSrc2Step, *Npp16u* nAlpha2, *Npp16u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppiAlphaOp* eAlphaOp, *NppStreamContext* nppStreamCtx)

One 16-bit unsigned short channel image composition using constant alpha.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **nAlpha1** – Image alpha opacity (0 - max channel pixel value).
- **pSrc2** – *Source-Image Pointer*.
- **nSrc2Step** – *Source-Image Line Step*.
- **nAlpha2** – Image alpha opacity (0 - max channel pixel value).
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **eAlphaOp** – alpha-blending operation.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiAlphaCompC_16u_C3R_Ctx**(const *Npp16u* *pSrc1, int nSrc1Step, *Npp16u* nAlpha1, const *Npp16u* *pSrc2, int nSrc2Step, *Npp16u* nAlpha2, *Npp16u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppiAlphaOp* eAlphaOp, *NppStreamContext* nppStreamCtx)

Three 16-bit unsigned short channel image composition using constant alpha.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **nAlpha1** – Image alpha opacity (0 - max channel pixel value).
- **pSrc2** – *Source-Image Pointer*.
- **nSrc2Step** – *Source-Image Line Step*.
- **nAlpha2** – Image alpha opacity (0 - max channel pixel value).
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **eAlphaOp** – alpha-blending operation.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiAlphaCompC_16u_C4R_Ctx**(const *Npp16u* *pSrc1, int nSrc1Step, *Npp16u* nAlpha1, const *Npp16u* *pSrc2, int nSrc2Step, *Npp16u* nAlpha2, *Npp16u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppiAlphaOp* eAlphaOp, *NppStreamContext* nppStreamCtx)

Four 16-bit unsigned short channel image composition using constant alpha.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **nAlpha1** – Image alpha opacity (0 - max channel pixel value).
- **pSrc2** – *Source-Image Pointer*.
- **nSrc2Step** – *Source-Image Line Step*.
- **nAlpha2** – Image alpha opacity (0 - max channel pixel value).
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **eAlphaOp** – alpha-blending operation.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiAlphaCompC_16u_AC4R_Ctx**(const *Npp16u* *pSrc1, int nSrc1Step, *Npp16u* nAlpha1, const *Npp16u* *pSrc2, int nSrc2Step, *Npp16u* nAlpha2, *Npp16u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppiAlphaOp* eAlphaOp, *NppStreamContext* nppStreamCtx)

Four 16-bit unsigned short channel image composition with alpha using constant source alpha.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **nAlpha1** – Image alpha opacity (0 - max channel pixel value).
- **pSrc2** – *Source-Image Pointer*.
- **nSrc2Step** – *Source-Image Line Step*.
- **nAlpha2** – Image alpha opacity (0 - max channel pixel value).
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **eAlphaOp** – alpha-blending operation.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiAlphaCompC_16s_C1R_Ctx**(const *Npp16s* *pSrc1, int nSrc1Step, *Npp16s* nAlpha1, const *Npp16s* *pSrc2, int nSrc2Step, *Npp16s* nAlpha2, *Npp16s* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppiAlphaOp* eAlphaOp, *NppStreamContext* nppStreamCtx)

One 16-bit signed short channel image composition using constant alpha.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **nAlpha1** – Image alpha opacity (0 - max channel pixel value).
- **pSrc2** – *Source-Image Pointer*.
- **nSrc2Step** – *Source-Image Line Step*.
- **nAlpha2** – Image alpha opacity (0 - max channel pixel value).
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **eAlphaOp** – alpha-blending operation.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiAlphaCompC_32u_C1R_Ctx**(const *Npp32u* *pSrc1, int nSrc1Step, *Npp32u* nAlpha1, const *Npp32u* *pSrc2, int nSrc2Step, *Npp32u* nAlpha2, *Npp32u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppiAlphaOp* eAlphaOp, *NppStreamContext* nppStreamCtx)

One 32-bit unsigned integer channel image composition using constant alpha.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **nAlpha1** – Image alpha opacity (0 - max channel pixel value).
- **pSrc2** – *Source-Image Pointer*.
- **nSrc2Step** – *Source-Image Line Step*.
- **nAlpha2** – Image alpha opacity (0 - max channel pixel value).
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **eAlphaOp** – alpha-blending operation.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiAlphaCompC_32s_C1R_Ctx**(const *Npp32s* *pSrc1, int nSrc1Step, *Npp32s* nAlpha1, const *Npp32s* *pSrc2, int nSrc2Step, *Npp32s* nAlpha2, *Npp32s* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppiAlphaOp* eAlphaOp, *NppStreamContext* nppStreamCtx)

One 32-bit signed integer channel image composition using constant alpha.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **nAlpha1** – Image alpha opacity (0 - max channel pixel value).
- **pSrc2** – *Source-Image Pointer*.
- **nSrc2Step** – *Source-Image Line Step*.
- **nAlpha2** – Image alpha opacity (0 - max channel pixel value).
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **eAlphaOp** – alpha-blending operation.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiAlphaCompC_32f_C1R_Ctx**(const *Npp32f* *pSrc1, int nSrc1Step, *Npp32f* nAlpha1, const *Npp32f* *pSrc2, int nSrc2Step, *Npp32f* nAlpha2, *Npp32f* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppiAlphaOp* eAlphaOp, *NppStreamContext* nppStreamCtx)

One 32-bit floating point channel image composition using constant alpha.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **nAlpha1** – Image alpha opacity (0.0 - 1.0).
- **pSrc2** – *Source-Image Pointer*.
- **nSrc2Step** – *Source-Image Line Step*.
- **nAlpha2** – Image alpha opacity (0.0 - 1.0).
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **eAlphaOp** – alpha-blending operation.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

Premultiplies pixels of an image using a constant alpha value.

Functions

NppStatus **nppiAlphaPremulC_8u_C1R_Ctx**(const *Npp8u* *pSrc1, int nSrc1Step, *Npp8u* nAlpha1, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

One 8-bit unsigned char channel image premultiplication using constant alpha.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **nAlpha1** – Image alpha opacity (0 - max channel pixel value).
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiAlphaPremulC_8u_C1IR_Ctx**(*Npp8u* nAlpha1, *Npp8u* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

One 8-bit unsigned char channel in place image premultiplication using constant alpha.

Parameters

- **nAlpha1** – Image alpha opacity (0 - max channel pixel value).
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiAlphaPremulC_8u_C3R_Ctx**(const *Npp8u* *pSrc1, int nSrc1Step, *Npp8u* nAlpha1, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Three 8-bit unsigned char channel image premultiplication using constant alpha.

Parameters

- **pSrc1** – *Source-Image Pointer*.

- **nSrc1Step** – *Source-Image Line Step*.
- **nAlpha1** – Image alpha opacity (0 - max channel pixel value).
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiAlphaPremulC_8u_C3IR_Ctx**(*Npp8u* nAlpha1, *Npp8u* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Three 8-bit unsigned char channel in place image premultiplication using constant alpha.

Parameters

- **nAlpha1** – Image alpha opacity (0 - max channel pixel value).
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiAlphaPremulC_8u_C4R_Ctx**(const *Npp8u* *pSrc1, int nSrc1Step, *Npp8u* nAlpha1, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four 8-bit unsigned char channel image premultiplication using constant alpha.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **nAlpha1** – Image alpha opacity (0 - max channel pixel value).
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiAlphaPremulC_8u_C4IR_Ctx**(*Npp8u* nAlpha1, *Npp8u* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four 8-bit unsigned char channel in place image premultiplication using constant alpha.

Parameters

- **nAlpha1** – Image alpha opacity (0 - max channel pixel value).
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiAlphaPremulC_8u_AC4R_Ctx**(const *Npp8u* *pSrc1, int nSrc1Step, *Npp8u* nAlpha1, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four 8-bit unsigned char channel image premultiplication with alpha using constant alpha.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **nAlpha1** – Image alpha opacity (0 - max channel pixel value).
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiAlphaPremulC_8u_AC4IR_Ctx**(*Npp8u* nAlpha1, *Npp8u* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four 8-bit unsigned char channel in place image premultiplication with alpha using constant alpha.

Parameters

- **nAlpha1** – Image alpha opacity (0 - max channel pixel value).
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiAlphaPremulC_16u_C1R_Ctx**(const *Npp16u* *pSrc1, int nSrc1Step, *Npp16u* nAlpha1, *Npp16u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

One 16-bit unsigned short channel image premultiplication using constant alpha.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **nAlpha1** – Image alpha opacity (0 - max channel pixel value).
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiAlphaPremulC_16u_C1IR_Ctx**(*Npp16u* nAlpha1, *Npp16u* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

One 16-bit unsigned short channel in place image premultiplication using constant alpha.

Parameters

- **nAlpha1** – Image alpha opacity (0 - max channel pixel value).
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiAlphaPremulC_16u_C3R_Ctx**(const *Npp16u* *pSrc1, int nSrc1Step, *Npp16u* nAlpha1, *Npp16u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Three 16-bit unsigned short channel image premultiplication using constant alpha.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **nAlpha1** – Image alpha opacity (0 - max channel pixel value).
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.

- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiAlphaPremulC_16u_C3IR_Ctx**(*Npp16u* nAlpha1, *Npp16u* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Three 16-bit unsigned short channel in place image premultiplication using constant alpha.

Parameters

- **nAlpha1** – Image alpha opacity (0 - max channel pixel value).
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiAlphaPremulC_16u_C4R_Ctx**(const *Npp16u* *pSrc1, int nSrc1Step, *Npp16u* nAlpha1, *Npp16u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four 16-bit unsigned short channel image premultiplication using constant alpha.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **nAlpha1** – Image alpha opacity (0 - max channel pixel value).
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiAlphaPremulC_16u_C4IR_Ctx**(*Npp16u* nAlpha1, *Npp16u* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four 16-bit unsigned short channel in place image premultiplication using constant alpha.

Parameters

- **nAlpha1** – Image alpha opacity (0 - max channel pixel value).
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.

- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiAlphaPremulC_16u_AC4R_Ctx**(const *Npp16u* *pSrc1, int nSrc1Step, *Npp16u* nAlpha1, *Npp16u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four 16-bit unsigned short channel image premultiplication with alpha using constant alpha.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **nAlpha1** – Image alpha opacity (0 - max channel pixel value).
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiAlphaPremulC_16u_AC4IR_Ctx**(*Npp16u* nAlpha1, *Npp16u* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four 16-bit unsigned short channel in place image premultiplication with alpha using constant alpha.

Parameters

- **nAlpha1** – Image alpha opacity (0 - max channel pixel value).
- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

1.7.3.2 AlphaComp

Composite two images using alpha opacity values contained in each image.

Functions

NppStatus **nppiAlphaComp_8u_AC1R_Ctx**(const *Npp8u* *pSrc1, int nSrc1Step, const *Npp8u* *pSrc2, int nSrc2Step, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppiAlphaOp* eAlphaOp, *NppStreamContext* nppStreamCtx)

One 8-bit unsigned char channel image composition using image alpha values (0 - max channel pixel value).

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **pSrc2** – *Source-Image Pointer*.
- **nSrc2Step** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **eAlphaOp** – alpha-blending operation.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiAlphaComp_8u_AC4R_Ctx**(const *Npp8u* *pSrc1, int nSrc1Step, const *Npp8u* *pSrc2, int nSrc2Step, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppiAlphaOp* eAlphaOp, *NppStreamContext* nppStreamCtx)

Four 8-bit unsigned char channel image composition using image alpha values (0 - max channel pixel value).

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **pSrc2** – *Source-Image Pointer*.
- **nSrc2Step** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **eAlphaOp** – alpha-blending operation.

- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiAlphaComp_8s_AC1R_Ctx**(const *Npp8s* *pSrc1, int nSrc1Step, const *Npp8s* *pSrc2, int nSrc2Step, *Npp8s* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppiAlphaOp* eAlphaOp, *NppStreamContext* nppStreamCtx)

One 8-bit signed char channel image composition using image alpha values (0 - max channel pixel value).

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **pSrc2** – *Source-Image Pointer*.
- **nSrc2Step** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **eAlphaOp** – alpha-blending operation.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiAlphaComp_16u_AC1R_Ctx**(const *Npp16u* *pSrc1, int nSrc1Step, const *Npp16u* *pSrc2, int nSrc2Step, *Npp16u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppiAlphaOp* eAlphaOp, *NppStreamContext* nppStreamCtx)

One 16-bit unsigned short channel image composition using image alpha values (0 - max channel pixel value).

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **pSrc2** – *Source-Image Pointer*.
- **nSrc2Step** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **eAlphaOp** – alpha-blending operation.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiAlphaComp_16u_AC4R_Ctx**(const *Npp16u* *pSrc1, int nSrc1Step, const *Npp16u* *pSrc2, int nSrc2Step, *Npp16u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppiAlphaOp* eAlphaOp, *NppStreamContext* nppStreamCtx)

Four 16-bit unsigned short channel image composition using image alpha values (0 - max channel pixel value).

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **pSrc2** – *Source-Image Pointer*.
- **nSrc2Step** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **eAlphaOp** – alpha-blending operation.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiAlphaComp_16s_AC1R_Ctx**(const *Npp16s* *pSrc1, int nSrc1Step, const *Npp16s* *pSrc2, int nSrc2Step, *Npp16s* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppiAlphaOp* eAlphaOp, *NppStreamContext* nppStreamCtx)

One 16-bit signed short channel image composition using image alpha values (0 - max channel pixel value).

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **pSrc2** – *Source-Image Pointer*.
- **nSrc2Step** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **eAlphaOp** – alpha-blending operation.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiAlphaComp_32u_AC1R_Ctx**(const *Npp32u* *pSrc1, int nSrc1Step, const *Npp32u* *pSrc2, int nSrc2Step, *Npp32u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppiAlphaOp* eAlphaOp, *NppStreamContext* nppStreamCtx)

One 32-bit unsigned integer channel image composition using image alpha values (0 - max channel pixel value).

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **pSrc2** – *Source-Image Pointer*.
- **nSrc2Step** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **eAlphaOp** – alpha-blending operation.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiAlphaComp_32u_AC4R_Ctx**(const *Npp32u* *pSrc1, int nSrc1Step, const *Npp32u* *pSrc2, int nSrc2Step, *Npp32u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppiAlphaOp* eAlphaOp, *NppStreamContext* nppStreamCtx)

Four 32-bit unsigned integer channel image composition using image alpha values (0 - max channel pixel value).

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **pSrc2** – *Source-Image Pointer*.
- **nSrc2Step** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **eAlphaOp** – alpha-blending operation.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiAlphaComp_32s_AC1R_Ctx**(const *Npp32s* *pSrc1, int nSrc1Step, const *Npp32s* *pSrc2, int nSrc2Step, *Npp32s* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppiAlphaOp* eAlphaOp, *NppStreamContext* nppStreamCtx)

One 32-bit signed integer channel image composition using image alpha values (0 - max channel pixel value).

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **pSrc2** – *Source-Image Pointer*.
- **nSrc2Step** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **eAlphaOp** – alpha-blending operation.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiAlphaComp_32s_AC4R_Ctx**(const *Npp32s* *pSrc1, int nSrc1Step, const *Npp32s* *pSrc2, int nSrc2Step, *Npp32s* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppiAlphaOp* eAlphaOp, *NppStreamContext* nppStreamCtx)

Four 32-bit signed integer channel image composition using image alpha values (0 - max channel pixel value).

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **pSrc2** – *Source-Image Pointer*.
- **nSrc2Step** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **eAlphaOp** – alpha-blending operation.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiAlphaComp_32f_AC1R_Ctx**(const *Npp32f* *pSrc1, int nSrc1Step, const *Npp32f* *pSrc2, int nSrc2Step, *Npp32f* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppiAlphaOp* eAlphaOp, *NppStreamContext* nppStreamCtx)

One 32-bit floating point channel image composition using image alpha values (0.0 - 1.0).

Parameters

- **pSrc1** – *Source-Image Pointer*.

- **nSrc1Step** – *Source-Image Line Step*.
- **pSrc2** – *Source-Image Pointer*.
- **nSrc2Step** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **eAlphaOp** – alpha-blending operation.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiAlphaComp_32f_AC4R_Ctx**(const *Npp32f* *pSrc1, int nSrc1Step, const *Npp32f* *pSrc2, int nSrc2Step, *Npp32f* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppiAlphaOp* eAlphaOp, *NppStreamContext* nppStreamCtx)

Four 32-bit floating point channel image composition using image alpha values (0.0 - 1.0).

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **pSrc2** – *Source-Image Pointer*.
- **nSrc2Step** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **eAlphaOp** – alpha-blending operation.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

Premultiplies image pixels by image alpha opacity values.

Functions

NppStatus **nppiAlphaPremul_8u_AC4R_Ctx**(const *Npp8u* *pSrc1, int nSrc1Step, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four 8-bit unsigned char channel image premultiplication with pixel alpha (0 - max channel pixel value).

Parameters

- **pSrc1** – *Source-Image Pointer*.

- **nSrc1Step** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiAlphaPremul_8u_AC4IR_Ctx**(*Npp8u* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four 8-bit unsigned char channel in place image premultiplication with pixel alpha (0 - max channel pixel value).

Parameters

- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiAlphaPremul_16u_AC4R_Ctx**(const *Npp16u* *pSrc1, int nSrc1Step, *Npp16u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four 16-bit unsigned short channel image premultiplication with pixel alpha (0 - max channel pixel value).

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiAlphaPremul_16u_AC4IR_Ctx**(*Npp16u* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four 16-bit unsigned short channel in place image premultiplication with pixel alpha (0 - max channel pixel value).

Parameters

- **pSrcDst** – *In-Place Image Pointer*.

- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

1.8. Image Color Conversion Functions

Routines manipulating an image's color model and sampling format.

These functions can be found in the nppicc library. Linking to only the sub-libraries that you use can significantly save link time, application load time, and CUDA runtime startup time when using dynamic libraries.

1.8.1. Color Processing Functions

Routines for performing image color manipulation.

RGBToYUVColorTwist

Normally, color twist is a 3-channel operation that takes place on RGB data.

The following functions also perform the color twist operation, but while converting between image formats: RGBToYUV420, RGBToYUV422, and RGBToNV12.

To recap color twist pixel processing: Color twist consists of applying the following formula to each image pixel using coefficients from the user supplied color twist host matrix array as follows where dst[x] and src[x] represent destination pixel and source pixel channel or plane x. The full sized coefficient matrix should be sent for all pixel channel sizes, the function will process the appropriate coefficients and channels for the corresponding pixel size.

This is how the matrix works for a RGB->YUV420/YUV422/NV12 forward transform:

```
dst[0] = aTwist[0][0] * src[0] + aTwist[0][1] * src[1] + aTwist[0][2] * src[2] +
↪aTwist[0][3]
dst[1] = aTwist[1][0] * src[0] + aTwist[1][1] * src[1] + aTwist[1][2] * src[2] +
↪aTwist[1][3]
dst[2] = aTwist[2][0] * src[0] + aTwist[2][1] * src[1] + aTwist[2][2] * src[2] +
↪aTwist[2][3]
```

NppStatus **nppiRGBToYUV420_8u_ColorTwist32f_P3R_Ctx**(const *Npp8u* *const pSrc[3], int aSrcStep[3], *Npp8u* *pDst[3], int aDstStep[3], *NppiSize* oSizeROI, const *Npp32f* aTwist[3][4], *NppStreamContext* nppStreamCtx)

Three channel 8-bit unsigned planar RGB convertion to three channel 8-bit unsigned planar YUV 4:2:0, using a Color Twist to compute the exact color space arithmetic.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **aSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **aDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **aTwist** – Host memory array containing the color twist matrix with floating-point coefficient values.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiRGBToYUV420_16u_ColorTwist32f_P3R_Ctx**(const *Npp16u* *const pSrc[3], int aSrcStep[3], *Npp16u* *pDst[3], int aDstStep[3], *NppiSize* oSizeROI, const *Npp32f* aTwist[3][4], *NppStreamContext* nppStreamCtx)

Three channel 16-bit unsigned planar RGB convertion to three channel 16-bit unsigned planar YUV 4:2:0, using a Color Twist to compute the exact color space arithmetic.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **aSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **aDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **aTwist** – Host memory array containing the color twist matrix with floating-point coefficient values.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiRGBToYUV420_8u_ColorTwist32f_C3P3R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *Npp8u* *pDst[3], int aDstStep[3], *NppiSize* oSizeROI, const *Npp32f* aTwist[3][4], *NppStreamContext* nppStreamCtx)

Three channel 8-bit unsigned packed RGB convertion to three channel 8-bit unsigned planar YUV 4:2:0, using a Color Twist to compute the exact color space arithmetic.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.

- **pDst** – *Destination-Image Pointer*.
- **aDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **aTwist** – Host memory array containing the color twist matrix with floating-point coefficient values.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiRGBToYUV420_16u_ColorTwist32f_C3P3R_Ctx**(const *Npp16u* *pSrc, int nSrcStep, *Npp16u* *pDst[3], int aDstStep[3], *NppiSize* oSizeROI, const *Npp32f* aTwist[3][4], *NppStreamContext* nppStreamCtx)

Three channel 16-bit unsigned packed RGB convertion to three channel 16-bit unsigned planar YUV 4:2:0, using a Color Twist to compute the exact color space arithmetic.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **aDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **aTwist** – Host memory array containing the color twist matrix with floating-point coefficient values.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiRGBToYUV422_8u_ColorTwist32f_P3R_Ctx**(const *Npp8u* *const pSrc[3], int aSrcStep[3], *Npp8u* *pDst[3], int aDstStep[3], *NppiSize* oSizeROI, const *Npp32f* aTwist[3][4], *NppStreamContext* nppStreamCtx)

Three channel 8-bit unsigned planar RGB convertion to three channel 8-bit unsigned planar YUV 4:2:2, using a Color Twist to compute the exact color space arithmetic.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **aSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **aDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.

- **aTwist** – Host memory array containing the color twist matrix with floating-point coefficient values.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiRGBToYUV422_16u_ColorTwist32f_P3R_Ctx**(const *Npp16u* *const pSrc[3], int aSrcStep[3], *Npp16u* *pDst[3], int aDstStep[3], *NppiSize* oSizeROI, const *Npp32f* aTwist[3][4], *NppStreamContext* nppStreamCtx)

Three channel 16-bit unsigned planar RGB convertion to three channel 16-bit unsigned planar YUV 4:2:2, using a Color Twist to compute the exact color space arithmetic.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **aSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **aDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **aTwist** – Host memory array containing the color twist matrix with floating-point coefficient values.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiRGBToYUV422_8u_ColorTwist32f_C3C2R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp32f* aTwist[3][4], *NppStreamContext* nppStreamCtx)

Three channel 8-bit unsigned packed RGB convertion to two channel 8-bit unsigned packed YUV 4:2:2, using a Color Twist to compute the exact color space arithmetic.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **aTwist** – Host memory array containing the color twist matrix with floating-point coefficient values.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiRGBToYUV422_16u_ColorTwist32f_C3C2R_Ctx**(const *Npp16u* *pSrc, int nSrcStep, *Npp16u* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp32f* aTwist[3][4], *NppStreamContext* nppStreamCtx)

Three channel 16-bit unsigned packed RGB convertion to two channel 16-bit unsigned packed YUV 4:2:2, using a Color Twist to compute the exact color space arithmetic.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **aTwist** – Host memory array containing the color twist matrix with floating-point coefficient values.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiRGBToYUV422_8u_ColorTwist32f_C3P3R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *Npp8u* *pDst[3], int aDstStep[3], *NppiSize* oSizeROI, const *Npp32f* aTwist[3][4], *NppStreamContext* nppStreamCtx)

Three channel 8-bit unsigned packed RGB convertion to three channel 8-bit unsigned planar YUV 4:2:2, using a Color Twist to compute the exact color space arithmetic.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **aDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **aTwist** – Host memory array containing the color twist matrix with floating-point coefficient values.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiRGBToYUV422_16u_ColorTwist32f_C3P3R_Ctx**(const *Npp16u* *pSrc, int nSrcStep, *Npp16u* *pDst[3], int aDstStep[3], *NppiSize* oSizeROI, const *Npp32f* aTwist[3][4], *NppStreamContext* nppStreamCtx)

Three channel 16-bit unsigned packed RGB convertion to three channel 16-bit unsigned planar YUV 4:2:2, using a Color Twist to compute the exact color space arithmetic.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **aDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **aTwist** – Host memory array containing the color twist matrix with floating-point coefficient values.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiRGBToNV12_8u_ColorTwist32f_C3P2R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *Npp8u* *pDst[2], int aDstStep[2], *NppiSize* oSizeROI, const *Npp32f* aTwist[3][4], *NppStreamContext* nppStreamCtx)

Three channel 8-bit unsigned packed RGB convertion to two channel 8-bit unsigned planar NV12, using a Color Twist to compute the exact color space arithmetic.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **aDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **aTwist** – Host memory array containing the color twist matrix with floating-point coefficient values.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiRGBToNV12_16u_ColorTwist32f_C3P2R_Ctx**(const *Npp16u* *pSrc, int nSrcStep, *Npp16u* *pDst[2], int aDstStep[2], *NppiSize* oSizeROI, const *Npp32f* aTwist[3][4], *NppStreamContext* nppStreamCtx)

Three channel 16-bit unsigned packed RGB convertion to two channel 16-bit unsigned planar NV12, using a Color Twist to compute the exact color space arithmetic.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **aDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **aTwist** – Host memory array containing the color twist matrix with floating-point coefficient values.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiRGBToNV12_8u_ColorTwist32f_P3P2R_Ctx**(const *Npp8u* *const pSrc[3], int aSrcStep[3], *Npp8u* *pDst[2], int aDstStep[2], *NppiSize* oSizeROI, const *Npp32f* aTwist[3][4], *NppStreamContext* nppStreamCtx)

Three channel 8-bit unsigned planar RGB convertion to two channel 8-bit unsigned planar NV12, using a Color Twist to compute the exact color space arithmetic.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **aSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **aDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **aTwist** – Host memory array containing the color twist matrix with floating-point coefficient values.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiRGBToNV12_16u_ColorTwist32f_P3P2R_Ctx**(const *Npp16u* *const pSrc[3], int aSrcStep[3], *Npp16u* *pDst[2], int aDstStep[2], *NppiSize* oSizeROI, const *Npp32f* aTwist[3][4], *NppStreamContext* nppStreamCtx)

Three channel 16-bit unsigned planar RGB convertion to two channel 16-bit unsigned planar NV12, using a Color Twist to compute the exact color space arithmetic.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **aSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **aDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **aTwist** – Host memory array containing the color twist matrix with floating-point coefficient values.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

YUVToRGBColorTwist

This is the inverse color twist, a 3-channel operation that takes place on YUV/NV12 data to produce RGB data, supporting the following conversions: YUV420ToRGB, YUV422ToRGB, and NV12ToRGB.

The INVERSE Color twist consists of applying the following formula to each image pixel using coefficients from the user supplied color twist host matrix array as follows where dst[x] and src[x] represent destination pixel and source pixel channel or plane x. The full sized coefficient matrix should be sent for all pixel channel sizes, the function will process the appropriate coefficients and channels for the corresponding pixel size.

This is how the matrix works for the YUV420/YUV/422/NV12->RGB INVERSE transform:

(note- do the offsets first):

```
src[0]' = src[0] + aTwist[0][3]
src[1]' = src[1] + aTwist[1][3]
src[2]' = src[2] + aTwist[2][3]
```

And then the remaining 3x3 twist matrix is applied using those modified values:

```
dst[0] = aTwist[0][0] * src[0]' + aTwist[0][1] * src[1]' + aTwist[0][2] * src[2]'
dst[1] = aTwist[1][0] * src[0]' + aTwist[1][1] * src[1]' + aTwist[1][2] * src[2]'
dst[2] = aTwist[2][0] * src[0]' + aTwist[2][1] * src[1]' + aTwist[2][2] * src[2]'
```

Since the 4th column of the matrix is the offsets (either 0 or half-max to shift the values to be positive), as they're applied last in the forward transform (to YUV), they need to be applied FIRST in the inverse transform (back to RGB). This does mean that +-16384 has to be used for 16u images where there was a +-128 for 8u images in both forward and inverse cases.

NppStatus **nppiYUV420ToRGB_8u_ColorTwist32f_P3R_Ctx**(const *Npp8u* *const pSrc[3], int aSrcStep[3], *Npp8u* *pDst[3], int aDstStep[3], *NppiSize* oSizeROI, const *Npp32f* aTwist[3][4], *NppStreamContext* nppStreamCtx)

Three channel 8-bit unsigned planar YUV4:2:0 convertion to three channel 8-bit unsigned planar RGB, using a Color Twist to compute the exact color space arithmetic.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **aSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **aDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **aTwist** – Host memory array containing the color twist matrix with floating-point coefficient values.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiYUV420ToRGB_16u_ColorTwist32f_P3R_Ctx**(const *Npp16u* *const pSrc[3], int aSrcStep[3], *Npp16u* *pDst[3], int aDstStep[3], *NppiSize* oSizeROI, const *Npp32f* aTwist[3][4], *NppStreamContext* nppStreamCtx)

Three channel 16-bit unsigned planar YUV4:2:0 convertion to three channel 16-bit unsigned planar RGB, using a Color Twist to compute the exact color space arithmetic.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **aSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **aDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **aTwist** – Host memory array containing the color twist matrix with floating-point coefficient values.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiYUV420ToRGB_8u_ColorTwist32f_P3C3R_Ctx**(const *Npp8u* *const pSrc[3], int aSrcStep[3], *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp32f* aTwist[3][4], *NppStreamContext* nppStreamCtx)

Three channel 8-bit unsigned planar YUV4:2:0 convertion to three channel 8-bit unsigned packed RGB, using a Color Twist to compute the exact color space arithmetic.

Parameters

- **pSrc** – *Source-Image Pointer*.

- **aSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **aTwist** – Host memory array containing the color twist matrix with floating-point coefficient values.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiYUV420ToRGB_16u_ColorTwist32f_P3C3R_Ctx**(const *Npp16u* *const pSrc[3], int aSrcStep[3], *Npp16u* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp32f* aTwist[3][4], *NppStreamContext* nppStreamCtx)

Three channel 16-bit unsigned planar YUV4:2:0 convertion to three channel 16-bit unsigned packed RGB, using a Color Twist to compute the exact color space arithmetic.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **aSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **aTwist** – Host memory array containing the color twist matrix with floating-point coefficient values.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiYUV420ToRGB_8u_ColorTwist32f_P3C4R_Ctx**(const *Npp8u* *const pSrc[3], int aSrcStep[3], *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp32f* aTwist[3][4], *NppStreamContext* nppStreamCtx)

Three channel 8-bit unsigned planar YUV4:2:0 convertion to four channel 8-bit unsigned packed RGB, using a Color Twist to compute the exact color space arithmetic, with constant alpha (0xFF).

Parameters

- **pSrc** – *Source-Image Pointer*.
- **aSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.

- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **aTwist** – Host memory array containing the color twist matrix with floating-point coefficient values.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiYUV420ToRGB_16u_ColorTwist32f_P3C4R_Ctx**(const *Npp16u* *const pSrc[3], int aSrcStep[3], *Npp16u* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp32f* aTwist[3][4], *NppStreamContext* nppStreamCtx)

Three channel 16-bit unsigned planar YUV4:2:0 convertion to four channel 16-bit unsigned packed RGB, using a Color Twist to compute the exact color space arithmetic, with constant alpha (0xFFFF).

Parameters

- **pSrc** – *Source-Image Pointer*.
- **aSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **aTwist** – Host memory array containing the color twist matrix with floating-point coefficient values.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiYUV420ToRGB_8u_ColorTwist32f_P3AC4R_Ctx**(const *Npp8u* *const pSrc[3], int aSrcStep[3], *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp32f* aTwist[3][4], const *Npp8u* nAlpha, *NppStreamContext* nppStreamCtx)

Three channel 8-bit unsigned planar YUV4:2:0 convertion to four channel 8-bit unsigned packed RGB, using a Color Twist to compute the exact color space arithmetic, with user set alpha.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **aSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.

- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **aTwist** – Host memory array containing the color twist matrix with floating-point coefficient values.
- **nAlpha** – 8-bit unsigned alpha constant.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiYUV420ToRGB_16u_ColorTwist32f_P3AC4R_Ctx**(const *Npp16u* *const pSrc[3], int aSrcStep[3], *Npp16u* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp32f* aTwist[3][4], const *Npp16u* nAlpha, *NppStreamContext* nppStreamCtx)

Three channel 16-bit unsigned planar YUV4:2:0 convertion to four channel 16-bit unsigned packed RGB, using a Color Twist to compute the exact color space arithmetic, with user set alpha.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **aSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **aTwist** – Host memory array containing the color twist matrix with floating-point coefficient values.
- **nAlpha** – 16-bit unsigned alpha constant.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiYUV422ToRGB_8u_ColorTwist32f_C2C3R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp32f* aTwist[3][4], *NppStreamContext* nppStreamCtx)

Two channel 8-bit unsigned packed YUV4:2:2 convertion to three channel 8-bit unsigned packed RGB, using a Color Twist to compute the exact color space arithmetic.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.

- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **aTwist** – Host memory array containing the color twist matrix with floating-point coefficient values.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiYUV422ToRGB_16u_ColorTwist32f_C2C3R_Ctx**(const *Npp16u* *pSrc, int nSrcStep, *Npp16u* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp32f* aTwist[3][4], *NppStreamContext* nppStreamCtx)

Two channel 16-bit unsigned packed YUV4:2:2 convertion to three channel 16-bit unsigned packed RGB, using a Color Twist to compute the exact color space arithmetic.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **aTwist** – Host memory array containing the color twist matrix with floating-point coefficient values.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiYUV422ToRGB_8u_ColorTwist32f_P3R_Ctx**(const *Npp8u* *const pSrc[3], int aSrcStep[3], *Npp8u* *pDst[3], int aDstStep[3], *NppiSize* oSizeROI, const *Npp32f* aTwist[3][4], *NppStreamContext* nppStreamCtx)

Three channel 8-bit unsigned planar YUV4:2:2 convertion to three channel 8-bit unsigned planar RGB, using a Color Twist to compute the exact color space arithmetic.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **aSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **aDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **aTwist** – Host memory array containing the color twist matrix with floating-point coefficient values.

- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiYUV422ToRGB_16u_ColorTwist32f_P3R_Ctx**(const *Npp16u* *const pSrc[3], int aSrcStep[3], *Npp16u* *pDst[3], int aDstStep[3], *NppiSize* oSizeROI, const *Npp32f* aTwist[3][4], *NppStreamContext* nppStreamCtx)

Three channel 16-bit unsigned planar YUV4:2:2 convertion to three channel 16-bit unsigned planar RGB, using a Color Twist to compute the exact color space arithmetic.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **aSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **aDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **aTwist** – Host memory array containing the color twist matrix with floating-point coefficient values.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiYUV422ToRGB_8u_ColorTwist32f_P3C3R_Ctx**(const *Npp8u* *const pSrc[3], int aSrcStep[3], *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp32f* aTwist[3][4], *NppStreamContext* nppStreamCtx)

Three channel 8-bit unsigned planar YUV4:2:2 convertion to three channel 8-bit unsigned packed RGB, using a Color Twist to compute the exact color space arithmetic.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **aSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **aTwist** – Host memory array containing the color twist matrix with floating-point coefficient values.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiYUV422ToRGB_16u_ColorTwist32f_P3C3R_Ctx**(const *Npp16u* *const pSrc[3], int aSrcStep[3], *Npp16u* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp32f* aTwist[3][4], *NppStreamContext* nppStreamCtx)

Three channel 8-bit unsigned planar YUV4:2:2 convertion to three channel 8-bit unsigned packed RGB, using a Color Twist to compute the exact color space arithmetic.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **aSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **aTwist** – Host memory array containing the color twist matrix with floating-point coefficient values.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiYUV422ToRGB_8u_ColorTwist32f_P3AC4R_Ctx**(const *Npp8u* *const pSrc[3], int aSrcStep[3], *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp32f* aTwist[3][4], const *Npp8u* nAlpha, *NppStreamContext* nppStreamCtx)

Three channel 8-bit unsigned planar YUV4:2:2 convertion to three channel 8-bit unsigned packed RGB, using a Color Twist to compute the exact color space arithmetic, with user set alpha.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **aSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **aTwist** – Host memory array containing the color twist matrix with floating-point coefficient values.
- **nAlpha** – 8-bit unsigned alpha constant.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiYUV422ToRGB_16u_ColorTwist32f_P3AC4R_Ctx**(const *Npp16u* *const pSrc[3], int aSrcStep[3], *Npp16u* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp32f* aTwist[3][4], const *Npp16u* nAlpha, *NppStreamContext* nppStreamCtx)

Three channel 16-bit unsigned planar YUV4:2:2 convertion to three channel 16-bit unsigned packed RGB, using a Color Twist to compute the exact color space arithmetic, with user set alpha.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **aSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **aTwist** – Host memory array containing the color twist matrix with floating-point coefficient values.
- **nAlpha** – 16-bit unsigned alpha constant.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiNV12ToRGB_8u_ColorTwist32f_P2C3R_Ctx**(const *Npp8u* *const pSrc[2], int aSrcStep[2], *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp32f* aTwist[3][4], *NppStreamContext* nppStreamCtx)

Two channel 8-bit unsigned planar NV12 convertion to three channel 8-bit unsigned packed RGB, using a Color Twist to compute the exact color space arithmetic.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **aSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **aTwist** – Host memory array containing the color twist matrix with floating-point coefficient values.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiNV12ToRGB_16u_ColorTwist32f_P2C3R_Ctx**(const *Npp16u* *const pSrc[2], int aSrcStep[2], *Npp16u* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp32f* aTwist[3][4], *NppStreamContext* nppStreamCtx)

Two channel 16-bit unsigned planar NV12 convertion to three channel 16-bit unsigned packed RGB, using a Color Twist to compute the exact color space arithmetic.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **aSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **aTwist** – Host memory array containing the color twist matrix with floating-point coefficient values.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

RGBToUYVP Conversion

Three unsigned 8-bit packed RGB channels color space conversion to three channel unsigned packed 10-bit UYVP pixel.

param pSrc
Source-Image Pointer.

param aSrcStep
Source-Image Line Step.

param oSrcOffset
pSrc pixel offset relative to image origin, currently must be 0,0.

param pDst
Destination-Image Pointer.

param aDstStep
Destination-Image Line Step.

param oSizeROI
Region-Of-Interest (ROI).

param eColorSpace
The input color space.

param nppStreamCtx
Application Managed Stream Context.

return
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiRGB_8u_ToUYVP_10u_C3C3R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *NppiPoint* oSrcOffset, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, NppiColorSpace eColorSpace, *NppStreamContext* nppStreamCtx)

NppStatus **nppiRGB_8u_ToUYVP_10u_P3C3R_Ctx**(const *Npp8u* *const pSrc[3], const int nSrcStep, *NppiPoint* oSrcOffset, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, NppiColorSpace eColorSpace, *NppStreamContext* nppStreamCtx)

NppStatus **nppiRGB_8u_ToUYVP_10u_C3P3R_Ctx**(const *Npp8u* *const pSrc, const int nSrcStep, *NppiPoint* oSrcOffset, *Npp8u* *pDst[3], int nDstStep, *NppiSize* oSizeROI, NppiColorSpace eColorSpace, *NppStreamContext* nppStreamCtx)

NppStatus **nppiRGBA_8u_ToUYVP_10u_AC4C3R_Ctx**(const *Npp8u* *const pSrc, const int nSrcStep, *NppiPoint* oSrcOffset, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, NppiColorSpace eColorSpace, *NppStreamContext* nppStreamCtx)

NppStatus **nppiRGB_16u_ToUYVP_10u_C3C3R_Ctx**(const *Npp16u* *pSrc, int nSrcStep, *NppiPoint* oSrcOffset, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, NppiColorSpace eColorSpace, *NppStreamContext* nppStreamCtx)

NppStatus **nppiRGB_16u_ToUYVP_10u_P3C3R_Ctx**(const *Npp16u* *const pSrc[3], const int nSrcStep, *NppiPoint* oSrcOffset, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, NppiColorSpace eColorSpace, *NppStreamContext* nppStreamCtx)

NppStatus **nppiRGBA_16u_ToUYVP_10u_AC4C3R_Ctx**(const *Npp16u* *const pSrc, const int nSrcStep, *NppiPoint* oSrcOffset, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, NppiColorSpace eColorSpace, *NppStreamContext* nppStreamCtx)

NppStatus **nppiRGB_16f_ToUYVP_10u_C3C3R_Ctx**(const *Npp16f* *pSrc, int nSrcStep, *NppiPoint* oSrcOffset, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, NppiColorSpace eColorSpace, *NppStreamContext* nppStreamCtx)

NppStatus **nppiRGB_16f_ToUYVP_10u_P3C3R_Ctx**(const *Npp16f* *const pSrc[3], const int nSrcStep, *NppiPoint* oSrcOffset, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, NppiColorSpace eColorSpace, *NppStreamContext* nppStreamCtx)

NppStatus **nppiRGBA_16f_ToUYVP_10u_AC4C3R_Ctx**(const *Npp16f* *pSrc, int nSrcStep, *NppiPoint* oSrcOffset, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, NppiColorSpace eColorSpace, *NppStreamContext* nppStreamCtx)

UYVPToRGB Conversion

Three channel unsigned packed 10-bit UYVP pixel color space conversion to three unsigned packed 8-bit channels RGB.

param pSrc
Source-Image Pointer.

param aSrcStep
Source-Image Line Step.

param oSrcOffset
pSrc pixel offset relative to image origin, currently must be 0,0.

param pDst
Destination-Image Pointer.

param aDstStep
Destination-Image Line Step.

param oSizeROI
Region-Of-Interest (ROI).

param eColorSpace
The output color space.

param nppStreamCtx
Application Managed Stream Context.

return
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiUYVP_10u_ToRGB_8u_C3C3R_Ctx**(const *Npp8u* *pSrc, int srcStep, *NppiPoint* oSrcOffset, *Npp8u* *pDst, int dstStep, *NppiSize* oSizeROI, NppiColorSpace eColorSpace, *NppStreamContext* nppStreamCtx)

NppStatus **nppiUYVP_10u_ToRGB_8u_C3AC4R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *NppiPoint* oSrcOffset, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, NppiColorSpace eColorSpace, *Npp8u* alpha, *NppStreamContext* nppStreamCtx)

NppStatus **nppiUYVP_10u_ToRGB_8u_C3P3R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *NppiPoint* oSrcOffset, *Npp8u* *pDst[3], const int nDstStep, *NppiSize* oSizeROI, NppiColorSpace eColorSpace, *NppStreamContext* nppStreamCtx)

NppStatus **nppiUYVP_10u_ToRGB_16u_C3C3R_Ctx**(const *Npp8u* *pSrc, int srcStep, *NppiPoint* oSrcOffset, *Npp16u* *pDst, int dstStep, *NppiSize* oSizeROI, NppiColorSpace eColorSpace, *NppStreamContext* nppStreamCtx)

NppStatus **nppiUYVP_10u_ToRGB_16u_C3AC4R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *NppiPoint* oSrcOffset, *Npp16u* *pDst, int nDstStep, *NppiSize* oSizeROI, NppiColorSpace eColorSpace, *Npp16u* alpha, *NppStreamContext* nppStreamCtx)

NppStatus **nppiUYVP_10u_ToRGB_16u_C3P3R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *NppiPoint* oSrcOffset, *Npp16u* *pDst[3], const int nDstStep, *NppiSize* oSizeROI, NppiColorSpace eColorSpace, *NppStreamContext* nppStreamCtx)

NppStatus **nppiUYVP_10u_ToRGB_16f_C3C3R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *NppiPoint* oSrcOffset, *Npp16f* *pDst, int nDstStep, *NppiSize* oSizeROI, NppiColorSpace eColorSpace, *NppStreamContext* nppStreamCtx)

NppStatus **nppiUYVP_10u_ToRGBA_16f_C3AC4R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *NppiPoint* oSrcOffset, *Npp16f* *pDst, int nDstStep, *NppiSize* oSizeROI, NppiColorSpace eColorSpace, *Npp32f* nAlphaValue, *NppStreamContext* nppStreamCtx)

NppStatus **nppiUYVP_10u_ToRGB_16f_C3P3R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *NppiPoint* oSrcOffset, *Npp16f* *const pDst[3], const int nDstStep, *NppiSize* oSizeROI, NppiColorSpace eColorSpace, *NppStreamContext* nppStreamCtx)

UYVPTranscoding

UYVP 10-bit packed YCbCr 4:2:2 transcoding to/from NV12, P010, P208, NV16, V210, P210, I444, YUV444, Y410.

NppStatus **nppiNV12_8u_ToUYVP_10u_P2C3R_Ctx**(const *Npp8u* *const pSrc[2], const int nSrcStep[2], *NppiPoint* oSrcOffset, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

4:2:0 conversions

NppStatus **nppiP010_16u_ToUYVP_10u_P3C3R_Ctx**(const *Npp16u* *const pSrc[3], const int nSrcStep, *NppiPoint* oSrcOffset, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

NppStatus **nppiUYVP_10u_ToP208_8u_C3C3R_Ctx**(const *Npp8u* *pSrc, int srcStep, *NppiPoint* oSrcOffset, *Npp8u* *pDst, int dstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

4:2:2 conversions

NppStatus **nppiUYVP_10u_ToNV16_8u_C3P2R_Ctx**(const *Npp8u* *const pSrc, const int nSrcStep, *NppiPoint* oSrcOffset, *Npp8u* *pDst[2], const int nDstStep[2], *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

NppStatus **nppiUYVP_10u_ToV210_10u_C3C3R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *NppiPoint* oSrcOffset, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

NppStatus **nppiP208_8u_ToUYVP_10u_C3C3R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *NppiPoint* oSrcOffset, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

NppStatus **nppiNV16_8u_ToUYVP_10u_P2C3R_Ctx**(const *Npp8u* *const pSrc[2], const int nSrcStep[2], *NppiPoint* oSrcOffset, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

NppStatus **nppiV210_10u_ToUYVP_10u_C3C3R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *NppiPoint* oSrcOffset, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

NppStatus **nppiP210_16u_ToUYVP_10u_P2C3R_Ctx**(const *Npp16u* *const pSrc[2], const int nSrcStep[2], *NppiPoint* oSrcOffset, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

NppStatus **nppiUYVP_10u_ToI444_8u_C3P3R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *NppiPoint* oSrcOffset, *Npp8u* *const pDst[3], const int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

4:4:4 conversions

NppStatus **nppiUYVP_10u_ToYUV444_8u_C3C3R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *NppiPoint* oSrcOffset, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

NppStatus **nppiUYVP_10u_ToY410_10u_C3C3R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *NppiPoint* oSrcOffset, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

NppStatus **nppiI444_8u_ToUYVP_10u_P3C3R_Ctx**(const *Npp8u* *const pSrc[3], const int nSrcStep, *NppiPoint* oSrcOffset, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

NppStatus **nppiYUV444_8u_ToUYVP_10u_C3C3R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *NppiPoint* oSrcOffset, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

NppStatus **nppiY410_10u_ToUYVP_10u_C3C3R_Ctx**(const *Npp16u* *pSrc, int nSrcStep, *NppiPoint* oSrcOffset, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

RGBToUYVY Conversion

NppStatus **nppiRGB_8u_ToUYVY_8u_C3C3R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *NppiPoint* oSrcOffset, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, NppiColorSpace eColorSpace, *NppStreamContext* nppStreamCtx)

NppStatus **nppiRGB_8u_ToUYVY_8u_P3C3R_Ctx**(const *Npp8u* *const pSrc[3], const int nSrcStep, *NppiPoint* oSrcOffset, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, NppiColorSpace eColorSpace, *NppStreamContext* nppStreamCtx)

NppStatus **nppiRGBA_8u_ToUYVY_8u_AC4C3R_Ctx**(const *Npp8u* *const pSrc, const int nSrcStep, *NppiPoint* oSrcOffset, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, NppiColorSpace eColorSpace, *NppStreamContext* nppStreamCtx)

NppStatus **nppiRGB_16u_ToUYVY16_16u_C3C3R_Ctx**(const *Npp16u* *pSrc, int nSrcStep, *NppiPoint* oSrcOffset, *Npp16u* *pDst, int nDstStep, *NppiSize* oSizeROI, NppiColorSpace eColorSpace, *NppStreamContext* nppStreamCtx)

NppStatus **nppiRGB_16u_ToUYVY16_16u_P3C3R_Ctx**(const *Npp16u* *const pSrc[3], const int nSrcStep, *NppiPoint* oSrcOffset, *Npp16u* *pDst, int nDstStep, *NppiSize* oSizeROI, NppiColorSpace eColorSpace, *NppStreamContext* nppStreamCtx)

NppStatus **nppiRGBA_16u_ToUYVY16_16u_AC4C3R_Ctx**(const *Npp16u* *const pSrc, const int nSrcStep, *NppiPoint* oSrcOffset, *Npp16u* *pDst, int nDstStep, *NppiSize* oSizeROI, NppiColorSpace eColorSpace, *NppStreamContext* nppStreamCtx)

UYVYToRGB Conversion

NppStatus **nppiUYVY_8u_ToRGB_8u_C3C3R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *NppiPoint* oSrcOffset, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, NppiColorSpace eColorSpace, *NppStreamContext* nppStreamCtx)

NppStatus **nppiUYVY_8u_ToRGB_8u_C3AC4R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *NppiPoint* oSrcOffset, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, NppiColorSpace eColorSpace, *Npp8u* nAlpha, *NppStreamContext* nppStreamCtx)

NppStatus **nppiUYVY_8u_ToRGB_8u_C3P3R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *NppiPoint* oSrcOffset, *Npp8u* *pDst[3], const int nDstStep, *NppiSize* oSizeROI, NppiColorSpace eColorSpace, *NppStreamContext* nppStreamCtx)

NppStatus **nppiUYVY16_16u_ToRGB_16u_C3C3R_Ctx**(const *Npp16u* *pSrc, int nSrcStep, *NppiPoint* oSrcOffset, *Npp16u* *pDst, int nDstStep, *NppiSize* oSizeROI, NppiColorSpace eColorSpace, *NppStreamContext* nppStreamCtx)

NppStatus **nppiUYVY16_16u_ToRGB_16u_C3AC4R_Ctx**(const *Npp16u* *pSrc, int nSrcStep, *NppiPoint* oSrcOffset, *Npp16u* *pDst, int nDstStep, *NppiSize* oSizeROI, NppiColorSpace eColorSpace, *Npp16u* nAlpha, *NppStreamContext* nppStreamCtx)

NppStatus **nppiUYVY16_16u_ToRGB_16u_C3P3R_Ctx**(const *Npp16u* *pSrc, int nSrcStep, *NppiPoint* oSrcOffset, *Npp16u* *pDst[3], const int nDstStep, *NppiSize* oSizeROI, NppiColorSpace eColorSpace, *NppStreamContext* nppStreamCtx)

NV12ToRGBAExt NV12 to RGB/BGR Extended Conversions

NppStatus **nppiNV12ToRGB_8u_P2C4R_Ctx**(const *Npp8u* *const pSrc[2], int nSrcStep, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, NppiColorSpace eColorSpace, *Npp8u* nAlpha, *NppStreamContext* nppStreamCtx)

NppStatus **nppiNV12ToBGR_8u_P2C4R_Ctx**(const *Npp8u* *const pSrc[2], int nSrcStep, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, NppiColorSpace eColorSpace, *Npp8u* nAlpha, *NppStreamContext* nppStreamCtx)

NppStatus **nppiNV12ToRGB_BT2020_8u_P2C3R_Ctx**(const *Npp8u* *const pSrc[2], int nSrcStep, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

NppStatus **nppiNV12ToBGR_BT2020_8u_P2C3R_Ctx**(const *Npp8u* *const pSrc[2], int nSrcStep, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

P010ToRGB P010 to RGB/RGBA Conversions

NppStatus **nppiP010ToRGB_8u_P2C3R_Ctx**(const *Npp16u* *const pSrc[2], int nSrcStep, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, NppiColorSpace eColorSpace, *NppStreamContext* nppStreamCtx)

NppStatus **nppiP010ToRGB_8u_P2C4R_Ctx**(const *Npp16u* *const pSrc[2], int nSrcStep, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, NppiColorSpace eColorSpace, *Npp8u* nAlpha, *NppStreamContext* nppStreamCtx)

NppStatus **nppiP010ToRGB_16u_P2C3R_Ctx**(const *Npp16u* *const pSrc[2], int nSrcStep, *Npp16u* *pDst, int nDstStep, *NppiSize* oSizeROI, NppiColorSpace eColorSpace, *NppStreamContext* nppStreamCtx)

NppStatus **nppiP010ToRGB_16u_P2C4R_Ctx**(const *Npp16u* *const pSrc[2], int nSrcStep, *Npp16u* *pDst, int nDstStep, *NppiSize* oSizeROI, NppiColorSpace eColorSpace, *Npp16u* nAlpha, *NppStreamContext* nppStreamCtx)

P016ToRGB P016 to RGB/RGBA Conversions

NppStatus **nppiP016ToRGB_16u_P2C3R_Ctx**(const *Npp16u* *const pSrc[2], int nSrcStep, *Npp16u* *pDst, int nDstStep, *NppiSize* oSizeROI, NppiColorSpace eColorSpace, *NppStreamContext* nppStreamCtx)

NppStatus **nppiP016ToRGB_16u_P2C4R_Ctx**(const *Npp16u* *const pSrc[2], int nSrcStep, *Npp16u* *pDst, int nDstStep, *NppiSize* oSizeROI, NppiColorSpace eColorSpace, *Npp16u* nAlpha, *NppStreamContext* nppStreamCtx)

RGBToNV12 RGB to NV12 Conversions

NppStatus **nppiRGBToNV12_8u_C3P2R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *Npp8u* *pDst[2], int nDstStep, *NppiSize* oSizeROI, NppiColorSpace eColorSpace, *NppStreamContext* nppStreamCtx)

NppStatus **nppiRGBToNV12_8u_P3P2R_Ctx**(const *Npp8u* *const pSrc[3], int nSrcStep, *Npp8u* *pDst[2], int nDstStep, *NppiSize* oSizeROI, NppiColorSpace eColorSpace, *NppStreamContext* nppStreamCtx)

YUV420ToNV12 YUV420 to NV12 Format Repack

NppStatus **nppiYUV420ToNV12_8u_P3P2R_Ctx**(const *Npp8u* *const pSrc[3], const int aSrcStep[3], *Npp8u* *pDst[2], int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

1.8.1.1 Color To Gray Conversion

Routines for converting color images to grayscale.

RGBToGray

RGB to CCIR601 Gray conversion.

Here is how NPP converts gamma corrected RGB to CCIR601 Gray.

```
nGray =  0.299F * R + 0.587F * G + 0.114F * B;
```

NppStatus **nppiRGBToGray_8u_C3C1R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

3 channel 8-bit unsigned packed RGB to 1 channel 8-bit unsigned packed Gray conversion.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiRGBToGray_8u_AC4C1R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

4 channel 8-bit unsigned packed RGB with alpha to 1 channel 8-bit unsigned packed Gray conversion.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.

- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiRGBToGray_16u_C3C1R_Ctx**(const *Npp16u* *pSrc, int nSrcStep, *Npp16u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

3 channel 16-bit unsigned packed RGB to 1 channel 16-bit unsigned packed Gray conversion.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiRGBToGray_16u_AC4C1R_Ctx**(const *Npp16u* *pSrc, int nSrcStep, *Npp16u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

4 channel 16-bit unsigned packed RGB with alpha to 1 channel 16-bit unsigned packed Gray conversion.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiRGBToGray_16s_C3C1R_Ctx**(const *Npp16s* *pSrc, int nSrcStep, *Npp16s* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

3 channel 16-bit signed packed RGB to 1 channel 16-bit signed packed Gray conversion.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.

- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiRGBToGray_16s_AC4C1R_Ctx**(const *Npp16s* *pSrc, int nSrcStep, *Npp16s* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

4 channel 16-bit signed packed RGB with alpha to 1 channel 16-bit signed packed Gray conversion.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiRGBToGray_32f_C3C1R_Ctx**(const *Npp32f* *pSrc, int nSrcStep, *Npp32f* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

3 channel 32-bit floating point packed RGB to 1 channel 32-bit floating point packed Gray conversion.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiRGBToGray_32f_AC4C1R_Ctx**(const *Npp32f* *pSrc, int nSrcStep, *Npp32f* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

4 channel 32-bit floating point packed RGB with alpha to 1 channel 32-bit floating point packed Gray conversion.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

ColorToGray

RGB Color to Gray conversion using user supplied conversion coefficients.

Here is how NPP converts gamma corrected RGB Color to Gray using user supplied conversion coefficients.

```
nGray =  aCoeffs[0] * R + aCoeffs[1] * G + aCoeffs[2] * B;
```

For the C4C1R versions of the functions the calculations are as follows.

For BGRA or other formats with alpha just rearrange the coefficients accordingly.

```
nGray =  aCoeffs[0] * R + aCoeffs[1] * G + aCoeffs[2] * B + aCoeffs[3] * A;
```

NppStatus **nppiColorToGray_8u_C3C1R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp32f* aCoeffs[3], *NppStreamContext* nppStreamCtx)

3 channel 8-bit unsigned packed RGB to 1 channel 8-bit unsigned packed Gray conversion.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **aCoeffs** – Host memory fixed size array of constant floating point conversion coefficient values, one per color channel.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiColorToGray_8u_AC4C1R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp32f* aCoeffs[3], *NppStreamContext* nppStreamCtx)

4 channel 8-bit unsigned packed RGB with alpha to 1 channel 8-bit unsigned packed Gray conversion.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **aCoeffs** – Host memory fixed size array of constant floating point conversion coefficient values, one per color channel.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiColorToGray_8u_C4C1R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp32f* aCoeffs[4], *NppStreamContext* nppStreamCtx)

4 channel 8-bit unsigned packed RGBA to 1 channel 8-bit unsigned packed Gray conversion.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **aCoeffs** – Host memory fixed size array of constant floating point conversion coefficient values, one per color channel.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiColorToGray_16u_C3C1R_Ctx**(const *Npp16u* *pSrc, int nSrcStep, *Npp16u* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp32f* aCoeffs[3], *NppStreamContext* nppStreamCtx)

3 channel 16-bit unsigned packed RGB to 1 channel 16-bit unsigned packed Gray conversion.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.

- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **aCoeffs** – Host memory fixed size array of constant floating point conversion coefficient values, one per color channel.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiColorToGray_16u_AC4C1R_Ctx**(const *Npp16u* *pSrc, int nSrcStep, *Npp16u* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp32f* aCoeffs[3], *NppStreamContext* nppStreamCtx)

4 channel 16-bit unsigned packed RGB with alpha to 1 channel 16-bit unsigned packed Gray conversion.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **aCoeffs** – Host memory fixed size array of constant floating point conversion coefficient values, one per color channel.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiColorToGray_16u_C4C1R_Ctx**(const *Npp16u* *pSrc, int nSrcStep, *Npp16u* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp32f* aCoeffs[4], *NppStreamContext* nppStreamCtx)

4 channel 16-bit unsigned packed RGBA to 1 channel 16-bit unsigned packed Gray conversion.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **aCoeffs** – Host memory fixed size array of constant floating point conversion coefficient values, one per color channel.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiColorToGray_16s_C3C1R_Ctx**(const *Npp16s* *pSrc, int nSrcStep, *Npp16s* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp32f* aCoeffs[3], *NppStreamContext* nppStreamCtx)

3 channel 16-bit signed packed RGB to 1 channel 16-bit signed packed Gray conversion.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **aCoeffs** – Host memory fixed size array of constant floating point conversion coefficient values, one per color channel.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiColorToGray_16s_AC4C1R_Ctx**(const *Npp16s* *pSrc, int nSrcStep, *Npp16s* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp32f* aCoeffs[3], *NppStreamContext* nppStreamCtx)

4 channel 16-bit signed packed RGB with alpha to 1 channel 16-bit signed packed Gray conversion.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **aCoeffs** – Host memory fixed size array of constant floating point conversion coefficient values, one per color channel.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiColorToGray_16s_C4C1R_Ctx**(const *Npp16s* *pSrc, int nSrcStep, *Npp16s* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp32f* aCoeffs[4], *NppStreamContext* nppStreamCtx)

4 channel 16-bit signed packed RGBA to 1 channel 16-bit signed packed Gray conversion.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.

- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **aCoeffs** – Host memory fixed size array of constant floating point conversion coefficient values, one per color channel.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiColorToGray_32f_C3C1R_Ctx**(const *Npp32f* *pSrc, int nSrcStep, *Npp32f* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp32f* aCoeffs[3], *NppStreamContext* nppStreamCtx)

3 channel 32-bit floating point packed RGB to 1 channel 32-bit floating point packed Gray conversion.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **aCoeffs** – Host memory fixed size array of constant floating point conversion coefficient values, one per color channel.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiColorToGray_32f_AC4C1R_Ctx**(const *Npp32f* *pSrc, int nSrcStep, *Npp32f* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp32f* aCoeffs[3], *NppStreamContext* nppStreamCtx)

4 channel 32-bit floating point packed RGB with alpha to 1 channel 32-bit floating point packed Gray conversion.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **aCoeffs** – Host memory fixed size array of constant floating point conversion coefficient values, one per color channel.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiColorToGray_32f_C4C1R_Ctx**(const *Npp32f* *pSrc, int nSrcStep, *Npp32f* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp32f* aCoeffs[4], *NppStreamContext* nppStreamCtx)

4 channel 32-bit floating point packed RGBA to 1 channel 32-bit floating point packed Gray conversion.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **aCoeffs** – Host memory fixed size array of constant floating point conversion coefficient values, one per color channel.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*

GradientColorToGray

RGB Color to Gray Gradient conversion using user selected gradient distance method.

NppStatus **nppiGradientColorToGray_8u_C3C1R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppiNorm* eNorm, *NppStreamContext* nppStreamCtx)

3 channel 8-bit unsigned packed RGB to 1 channel 8-bit unsigned packed Gray Gradient conversion.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **eNorm** – Gradient distance method to use.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiGradientColorToGray_16u_C3C1R_Ctx**(const *Npp16u* *pSrc, int nSrcStep, *Npp16u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppiNorm* eNorm, *NppStreamContext* nppStreamCtx)

3 channel 16-bit unsigned packed RGB to 1 channel 16-bit unsigned packed Gray Gradient conversion.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **eNorm** – Gradient distance method to use.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiGradientColorToGray_16s_C3C1R_Ctx**(const *Npp16s* *pSrc, int nSrcStep, *Npp16s* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppiNorm* eNorm, *NppStreamContext* nppStreamCtx)

3 channel 16-bit signed packed RGB to 1 channel 16-bit signed packed Gray Gradient conversion.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **eNorm** – Gradient distance method to use.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiGradientColorToGray_32f_C3C1R_Ctx**(const *Npp32f* *pSrc, int nSrcStep, *Npp32f* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppiNorm* eNorm, *NppStreamContext* nppStreamCtx)

3 channel 32-bit floating point packed RGB to 1 channel 32-bit floating point packed Gray Gradient conversion.

Parameters

- **pSrc** – *Source-Image Pointer*.

- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **eNorm** – Gradient distance method to use.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

1.8.1.2 Color Debayer

Grayscale Color Filter Array to RGB Color Debayer conversion.

Generates one RGB color pixel for every grayscale source pixel. Source and destination images must have even width and height. Missing pixel colors are generated using bilinear interpolation with chroma correlation of generated green values (eInterpolation MUST be set to 0). eGrid allows the user to specify the Bayer grid registration position at source image location oSrcROI.x, oSrcROI.y relative to pSrc. Possible registration positions are:

```
NPPI_BAYER_BGGR  NPPI_BAYER_RGGB  NPPI_BAYER_GBRG  NPPI_BAYER_GRBG

      B G              R G              G B              G R
      G R              G B              R G              B G
```

If it becomes necessary to access source pixels outside source image then the source image borders are mirrored.

Here is how the algorithm works. R, G, and B base pixels from the source image are used unmodified. To generate R values for those G pixels, the average of R(x - 1, y) and R(x + 1, y) or R(x, y - 1) and R(x, y + 1) is used depending on whether the left and right or top and bottom pixels are R base pixels. To generate B values for those G pixels, the same algorithm is used using nearest B values. For an R base pixel, if there are no B values in the upper, lower, left, or right adjacent pixels then B is the average of B values in the 4 diagonal (G base) pixels. The same algorithm is used using R values to generate the R value of a B base pixel. Chroma correlation is applied to generated G values only, for a B base pixel G(x - 1, y) and G(x + 1, y) are averaged or G(x, y - 1) and G(x, y + 1) are averaged depending on whether the absolute difference between B(x, y) and the average of B(x - 2, y) and B(x + 2, y) is smaller than the absolute difference between B(x, y) and the average of B(x, y - 2) and B(x, y + 2). For an R base pixel the same algorithm is used testing against the surrounding R values at those offsets. If the horizontal and vertical differences are the same at one of those pixels then the average of the four left, right, upper and lower G values is used instead.

Functions

NppStatus **nppiCFAToRGB_8u_C1C3R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *NppiSize* oSrcSize, *NppiRect* oSrcROI, *Npp8u* *pDst, int nDstStep, *NppiBayerGridPosition* eGrid, *NppiInterpolationMode* eInterpolation, *NppStreamContext* nppStreamCtx)

1 channel 8-bit unsigned packed CFA grayscale Bayer pattern to 3 channel 8-bit unsigned packed RGB conversion.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **oSrcSize** – full source image width and height relative to pSrc.
- **oSrcROI** – rectangle specifying starting source image pixel x and y location relative to pSrc and ROI width and height.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **eGrid** – enumeration value specifying bayer grid registration position at location oSrcROI.x, oSrcROI.y relative to pSrc.
- **eInterpolation** – MUST be NPPI_INTER_UNDEFINED
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiCFAToRGBA_8u_C1AC4R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *NppiSize* oSrcSize, *NppiRect* oSrcROI, *Npp8u* *pDst, int nDstStep, *NppiBayerGridPosition* eGrid, *NppiInterpolationMode* eInterpolation, *Npp8u* nAlpha, *NppStreamContext* nppStreamCtx)

1 channel 8-bit unsigned packed CFA grayscale Bayer pattern to 4 channel 8-bit unsigned packed RGB conversion with alpha.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **oSrcSize** – full source image width and height relative to pSrc.
- **oSrcROI** – rectangle specifying starting source image pixel x and y location relative to pSrc and ROI width and height.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **eGrid** – enumeration value specifying bayer grid registration position at location oSrcROI.x, oSrcROI.y relative to pSrc.
- **eInterpolation** – MUST be NPPI_INTER_UNDEFINED

- **nAlpha** – constant alpha value to be written to each destination pixel
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiCFAToRGB_16u_C1C3R_Ctx**(const *Npp16u* *pSrc, int nSrcStep, *NppiSize* oSrcSize, *NppiRect* oSrcROI, *Npp16u* *pDst, int nDstStep, *NppiBayerGridPosition* eGrid, *NppiInterpolationMode* eInterpolation, *NppStreamContext* nppStreamCtx)

1 channel 16-bit unsigned packed CFA grayscale Bayer pattern to 3 channel 16-bit unsigned packed RGB conversion.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **oSrcSize** – full source image width and height relative to pSrc.
- **oSrcROI** – rectangle specifying starting source image pixel x and y location relative to pSrc and ROI width and height.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **eGrid** – enumeration value specifying bayer grid registration position at location oSrcROI.x, oSrcROI.y relative to pSrc.
- **eInterpolation** – MUST be NPPI_INTER_UNDEFINED
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiCFAToRGBA_16u_C1AC4R_Ctx**(const *Npp16u* *pSrc, int nSrcStep, *NppiSize* oSrcSize, *NppiRect* oSrcROI, *Npp16u* *pDst, int nDstStep, *NppiBayerGridPosition* eGrid, *NppiInterpolationMode* eInterpolation, *Npp16u* nAlpha, *NppStreamContext* nppStreamCtx)

1 channel 16-bit unsigned packed CFA grayscale Bayer pattern to 4 channel 16-bit unsigned packed RGB conversion with alpha.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **oSrcSize** – full source image width and height relative to pSrc.
- **oSrcROI** – rectangle specifying starting source image pixel x and y location relative to pSrc and ROI width and height.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.

- **eGrid** – enumeration value specifying bayer grid registration position at location oSrcROI.x, oSrcROI.y relative to pSrc.
- **eInterpolation** – MUST be NPPI_INTER_UNDEFINED
- **nAlpha** – constant alpha value to be written to each destination pixel
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiCFAToRGB_32u_C1C3R_Ctx**(const *Npp32u* *pSrc, int nSrcStep, *NppiSize* oSrcSize, *NppiRect* oSrcROI, *Npp32u* *pDst, int nDstStep, *NppiBayerGridPosition* eGrid, *NppiInterpolationMode* eInterpolation, *NppStreamContext* nppStreamCtx)

1 channel 32-bit unsigned packed CFA grayscale Bayer pattern to 3 channel 32-bit unsigned packed RGB conversion.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **oSrcSize** – full source image width and height relative to pSrc.
- **oSrcROI** – rectangle specifying starting source image pixel x and y location relative to pSrc and ROI width and height.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **eGrid** – enumeration value specifying bayer grid registration position at location oSrcROI.x, oSrcROI.y relative to pSrc.
- **eInterpolation** – MUST be NPPI_INTER_UNDEFINED
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiCFAToRGBA_32u_C1AC4R_Ctx**(const *Npp32u* *pSrc, int nSrcStep, *NppiSize* oSrcSize, *NppiRect* oSrcROI, *Npp32u* *pDst, int nDstStep, *NppiBayerGridPosition* eGrid, *NppiInterpolationMode* eInterpolation, *Npp32u* nAlpha, *NppStreamContext* nppStreamCtx)

1 channel 32-bit unsigned packed CFA grayscale Bayer pattern to 4 channel 32-bit unsigned packed RGB conversion with alpha.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **oSrcSize** – full source image width and height relative to pSrc.
- **oSrcROI** – rectangle specifying starting source image pixel x and y location relative to pSrc and ROI width and height.

- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **eGrid** – enumeration value specifying bayer grid registration position at location oSrcROI.x, oSrcROI.y relative to pSrc.
- **eInterpolation** – MUST be NPPI_INTER_UNDEFINED
- **nAlpha** – constant alpha value to be written to each destination pixel
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

1.8.1.3 Color Gamma Correction

Routines for correcting image color gamma.

GammaFwd

Forward gamma correction.

NppStatus **nppiGammaFwd_8u_C3R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

3 channel 8-bit unsigned packed color not in place forward gamma correction.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiGammaFwd_8u_C3IR_Ctx**(*Npp8u* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

3 channel 8-bit unsigned packed color in place forward gamma correction.

Parameters

- **pSrcDst** – in place packed pixel image pointer.
- **nSrcDstStep** – in place packed pixel format image line step.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiGammaFwd_8u_AC4R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

4 channel 8-bit unsigned packed color with alpha not in place forward gamma correction.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiGammaFwd_8u_AC4IR_Ctx**(*Npp8u* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

4 channel 8-bit unsigned packed color with alpha in place forward gamma correction.

Parameters

- **pSrcDst** – in place packed pixel format image pointer.
- **nSrcDstStep** – in place packed pixel format image line step.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiGammaFwd_8u_P3R_Ctx**(const *Npp8u* *const pSrc[3], int nSrcStep, *Npp8u* *pDst[3], int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

3 channel 8-bit unsigned planar color not in place forward gamma correction.

Parameters

- **pSrc** – source planar pixel format image pointer array.
- **nSrcStep** – source planar pixel format image line step.
- **pDst** – destination planar pixel format image pointer array.
- **nDstStep** – destination planar pixel format image line step.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiGammaFwd_8u_IP3R_Ctx**(*Npp8u* *const pSrcDst[3], int nSrcDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

3 channel 8-bit unsigned planar color in place forward gamma correction.

Parameters

- **pSrcDst** – in place planar pixel format image pointer array.
- **nSrcDstStep** – in place planar pixel format image line step.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

GammaInv

Inverse gamma correction.

NppStatus **nppiGammaInv_8u_C3R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

3 channel 8-bit unsigned packed color not in place inverse gamma correction.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiGammaInv_8u_C3IR_Ctx**(*Npp8u* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

3 channel 8-bit unsigned packed color in place inverse gamma correction.

Parameters

- **pSrcDst** – in place packed pixel format image pointer.
- **nSrcDstStep** – in place packed pixel format image line step.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiGammaInv_8u_AC4R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

4 channel 8-bit unsigned packed color with alpha not in place inverse gamma correction.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiGammaInv_8u_AC4IR_Ctx**(*Npp8u* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

4 channel 8-bit unsigned packed color with alpha in place inverse gamma correction.

Parameters

- **pSrcDst** – in place packed pixel format image pointer.
- **nSrcDstStep** – in place packed pixel format image line step.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiGammaInv_8u_P3R_Ctx**(const *Npp8u* *const pSrc[3], int nSrcStep, *Npp8u* *pDst[3], int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

3 channel 8-bit unsigned planar color not in place inverse gamma correction.

Parameters

- **pSrc** – source planar pixel format image pointer array.
- **nSrcStep** – source planar pixel format image line step.
- **pDst** – destination planar pixel format image pointer array.
- **nDstStep** – destination planar pixel format image line step.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiGammaInv_8u_IP3R_Ctx**(*Npp8u* *const pSrcDst[3], int nSrcDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

3 channel 8-bit unsigned planar color in place inverse gamma correction.

Parameters

- **pSrcDst** – in place planar pixel format image pointer array.
- **nSrcDstStep** – in place planar pixel format image line step.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

1.8.1.4 Complement Color Key

Routines for performing complement color key replacement.

CompColorKey

Complement color key replacement.

NppStatus **nppiCompColorKey_8u_C1R_Ctx**(const *Npp8u* *pSrc1, int nSrc1Step, const *Npp8u* *pSrc2, int nSrc2Step, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, *Npp8u* nColorKeyConst, *NppStreamContext* nppStreamCtx)

1 channel 8-bit unsigned packed color complement color key replacement of source image 1 by source image 2.

Parameters

- **pSrc1** – source1 packed pixel format image pointer.
- **nSrc1Step** – source1 packed pixel format image line step.
- **pSrc2** – source2 packed pixel format image pointer.
- **nSrc2Step** – source2 packed pixel format image line step.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nColorKeyConst** – color key constant
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiCompColorKey_8u_C3R_Ctx**(const *Npp8u* *pSrc1, int nSrc1Step, const *Npp8u* *pSrc2, int nSrc2Step, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, *Npp8u* nColorKeyConst[3], *NppStreamContext* nppStreamCtx)

3 channel 8-bit unsigned packed color complement color key replacement of source image 1 by source image 2.

Parameters

- **pSrc1** – source1 packed pixel format image pointer.
- **nSrc1Step** – source1 packed pixel format image line step.
- **pSrc2** – source2 packed pixel format image pointer.
- **nSrc2Step** – source2 packed pixel format image line step.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nColorKeyConst** – color key constant array
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiCompColorKey_8u_C4R_Ctx**(const *Npp8u* *pSrc1, int nSrc1Step, const *Npp8u* *pSrc2, int nSrc2Step, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, *Npp8u* nColorKeyConst[4], *NppStreamContext* nppStreamCtx)

4 channel 8-bit unsigned packed color complement color key replacement of source image 1 by source image 2.

Parameters

- **pSrc1** – source1 packed pixel format image pointer.
- **nSrc1Step** – source1 packed pixel format image line step.
- **pSrc2** – source2 packed pixel format image pointer.
- **nSrc2Step** – source2 packed pixel format image line step.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nColorKeyConst** – color key constant array
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiAlphaCompColorKey_8u_AC4R_Ctx**(const *Npp8u* *pSrc1, int nSrc1Step, *Npp8u* nAlpha1, const *Npp8u* *pSrc2, int nSrc2Step, *Npp8u* nAlpha2, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, *Npp8u* nColorKeyConst[4], *NppiAlphaOp* nppAlphaOp, *NppStreamContext* nppStreamCtx)

4 channel 8-bit unsigned packed color complement color key replacement of source image 1 by source image 2 with alpha blending.

Parameters

- **pSrc1** – source1 packed pixel format image pointer.
- **nSrc1Step** – source1 packed pixel format image line step.
- **nAlpha1** – source1 image alpha opacity (0 - max channel pixel value).
- **pSrc2** – source2 packed pixel format image pointer.
- **nSrc2Step** – source2 packed pixel format image line step.
- **nAlpha2** – source2 image alpha opacity (0 - max channel pixel value).
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nColorKeyConst** – color key constant array
- **nppAlphaOp** – NppiAlphaOp alpha compositing operation selector (excluding premul ops).
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

1.8.1.5 ColorTwist

Routines for converting between various image color models using user supplied matrix coefficients.

ColorTwist

Perform color twist pixel processing.

Color twist consists of applying the following formula to each image pixel using coefficients from the user supplied color twist host matrix array as follows where dst[x] and src[x] represent destination pixel and source pixel channel or plane x. The full sized coefficient matrix should be sent for all pixel channel sizes, the function will process the appropriate coefficients and channels for the corresponding pixel size.

```
dst[0] = aTwist[0][0] * src[0] + aTwist[0][1] * src[1] + aTwist[0][2] * src[2] +
↪aTwist[0][3]
dst[1] = aTwist[1][0] * src[0] + aTwist[1][1] * src[1] + aTwist[1][2] * src[2] +
↪aTwist[1][3]
dst[2] = aTwist[2][0] * src[0] + aTwist[2][1] * src[1] + aTwist[2][2] * src[2] +
↪aTwist[2][3]
```

NppStatus **nppiColorTwist32f_8u_C1R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp32f* aTwist[3][4], *NppStreamContext* nppStreamCtx)

1 channel 8-bit unsigned color twist.

An input color twist matrix with floating-point coefficient values is applied within ROI.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **aTwist** – Host memory array containing the color twist matrix with floating-point coefficient values.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiColorTwist32f_8u_C1IR_Ctx**(*Npp8u* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, const *Npp32f* aTwist[3][4], *NppStreamContext* nppStreamCtx)

1 channel 8-bit unsigned in place color twist.

An input color twist matrix with floating-point coefficient values is applied within ROI.

Parameters

- **pSrcDst** – in place packed pixel format image pointer.
- **nSrcDstStep** – in place packed pixel format image line step.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **aTwist** – Host memory array containing the color twist matrix with floating-point coefficient values.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiColorTwist32f_8u_C2R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp32f* aTwist[3][4], *NppStreamContext* nppStreamCtx)

2 channel 8-bit unsigned color twist.

An input color twist matrix with floating-point coefficient values is applied within ROI.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.

- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **aTwist** – Host memory array containing the color twist matrix with floating-point coefficient values.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiColorTwist32f_8u_C2IR_Ctx**(*Npp8u* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, const *Npp32f* aTwist[3][4], *NppStreamContext* nppStreamCtx)

2 channel 8-bit unsigned in place color twist.

An input color twist matrix with floating-point coefficient values is applied within ROI.

Parameters

- **pSrcDst** – in place packed pixel format image pointer.
- **nSrcDstStep** – in place packed pixel format image line step.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **aTwist** – Host memory array containing the color twist matrix with floating-point coefficient values.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiColorTwist32f_8u_C3R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp32f* aTwist[3][4], *NppStreamContext* nppStreamCtx)

3 channel 8-bit unsigned color twist.

An input color twist matrix with floating-point coefficient values is applied within ROI.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **aTwist** – Host memory array containing the color twist matrix with floating-point coefficient values.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiColorTwist32f_8u_C3IR_Ctx**(*Npp8u* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, const *Npp32f* aTwist[3][4], *NppStreamContext* nppStreamCtx)

3 channel 8-bit unsigned in place color twist.

An input color twist matrix with floating-point coefficient values is applied within ROI.

Parameters

- **pSrcDst** – in place packed pixel format image pointer.
- **nSrcDstStep** – in place packed pixel format image line step.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **aTwist** – Host memory array containing the color twist matrix with floating-point coefficient values.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiColorTwist32f_8u_C4R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp32f* aTwist[3][4], *NppStreamContext* nppStreamCtx)

4 channel 8-bit unsigned color twist, with alpha copy.

An input color twist matrix with floating-point coefficient values is applied with in ROI. Alpha channel is the last channel and is copied unmodified from the source pixel to the destination pixel.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **aTwist** – Host memory array containing the color twist matrix with floating-point coefficient values.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiColorTwist32f_8u_C4IR_Ctx**(*Npp8u* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, const *Npp32f* aTwist[3][4], *NppStreamContext* nppStreamCtx)

4 channel 8-bit unsigned in place color twist, not affecting Alpha.

An input color twist matrix with floating-point coefficient values is applied with in ROI. Alpha channel is the last channel and is unmodified.

Parameters

- **pSrcDst** – in place packed pixel format image pointer.
- **nSrcDstStep** – in place packed pixel format image line step.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **aTwist** – Host memory array containing the color twist matrix with floating-point coefficient values.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiColorTwist32f_8u_AC4R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp32f* aTwist[3][4], *NppStreamContext* nppStreamCtx)

4 channel 8-bit unsigned color twist, not affecting Alpha.

An input color twist matrix with floating-point coefficient values is applied with in ROI. Alpha channel is the last channel and is not processed.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **aTwist** – Host memory array containing the color twist matrix with floating-point coefficient values.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiColorTwist32f_8u_AC4IR_Ctx**(*Npp8u* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, const *Npp32f* aTwist[3][4], *NppStreamContext* nppStreamCtx)

4 channel 8-bit unsigned in place color twist, not affecting Alpha.

An input color twist matrix with floating-point coefficient values is applied with in ROI. Alpha channel is the last channel and is not processed.

Parameters

- **pSrcDst** – in place packed pixel format image pointer.
- **nSrcDstStep** – in place packed pixel format image line step.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **aTwist** – Host memory array containing the color twist matrix with floating-point coefficient values.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiColorTwist32fC_8u_C4R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp32f* aTwist[4][4], const *Npp32f* aConstants[4], *NppStreamContext* nppStreamCtx)

4 channel 8-bit unsigned color twist with 4x4 matrix and constant vector addition.

An input 4x4 color twist matrix with floating-point coefficient values with an additional constant vector addition is applied within ROI. For this particular version of the function the result is generated as shown below.

```
dst[0] = aTwist[0][0] * src[0] + aTwist[0][1] * src[1] + aTwist[0][2] * src[2] +
↪aTwist[0][3] * src[3] + aConstants[0]
dst[1] = aTwist[1][0] * src[0] + aTwist[1][1] * src[1] + aTwist[1][2] * src[2] +
↪aTwist[1][3] * src[3] + aConstants[1]
dst[2] = aTwist[2][0] * src[0] + aTwist[2][1] * src[1] + aTwist[2][2] * src[2] +
↪aTwist[2][3] * src[3] + aConstants[2]
dst[3] = aTwist[3][0] * src[0] + aTwist[3][1] * src[1] + aTwist[3][2] * src[2] +
↪aTwist[3][3] * src[3] + aConstants[3]
```

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **aTwist** – Host memory array containing the color twist matrix with floating-point coefficient values.
- **aConstants** – fixed size array of constant values, one per channel..
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiColorTwist32fC_8u_C4IR_Ctx**(*Npp8u* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, const *Npp32f* aTwist[4][4], const *Npp32f* aConstants[4], *NppStreamContext* nppStreamCtx)

4 channel 8-bit unsigned in place color twist with 4x4 matrix and an additional constant vector addition.

An input 4x4 color twist matrix with floating-point coefficient values with an additional constant vector addition is applied within ROI. For this particular version of the function the result is generated as shown below.

```
dst[0] = aTwist[0][0] * src[0] + aTwist[0][1] * src[1] + aTwist[0][2] * src[2] +
↪aTwist[0][3] * src[3] + aConstants[0]
dst[1] = aTwist[1][0] * src[0] + aTwist[1][1] * src[1] + aTwist[1][2] * src[2] +
↪aTwist[1][3] * src[3] + aConstants[1]
dst[2] = aTwist[2][0] * src[0] + aTwist[2][1] * src[1] + aTwist[2][2] * src[2] +
↪aTwist[2][3] * src[3] + aConstants[2]
dst[3] = aTwist[3][0] * src[0] + aTwist[3][1] * src[1] + aTwist[3][2] * src[2] +
↪aTwist[3][3] * src[3] + aConstants[3]
```

Parameters

- **pSrcDst** – in place packed pixel format image pointer.
- **nSrcDstStep** – in place packed pixel format image line step.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **aTwist** – Host memory array containing the color twist matrix with floating-point coefficient values.
- **aConstants** – fixed size array of constant values, one per channel..
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiColorTwist32f_8u_P3R_Ctx**(const *Npp8u* *const pSrc[3], int nSrcStep, *Npp8u* *const pDst[3], int nDstStep, *NppiSize* oSizeROI, const *Npp32f* aTwist[3][4], *NppStreamContext* nppStreamCtx)

3 channel 8-bit unsigned planar color twist.

An input color twist matrix with floating-point coefficient values is applied within ROI.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **aTwist** – Host memory array containing the color twist matrix with floating-point coefficient values.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiColorTwist32f_8u_IP3R_Ctx**(*Npp8u* *const pSrcDst[3], int nSrcDstStep, *NppiSize* oSizeROI, const *Npp32f* aTwist[3][4], *NppStreamContext* nppStreamCtx)

3 channel 8-bit unsigned planar in place color twist.

An input color twist matrix with floating-point coefficient values is applied within ROI.

Parameters

- **pSrcDst** – in place planar pixel format image pointer array, one pointer per plane.
- **nSrcDstStep** – in place planar pixel format image line step.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **aTwist** – Host memory array containing the color twist matrix with floating-point coefficient values.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiColorTwist32f_8s_C1R_Ctx**(const *Npp8s* *pSrc, int nSrcStep, *Npp8s* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp32f* aTwist[3][4], *NppStreamContext* nppStreamCtx)

1 channel 8-bit signed color twist.

An input color twist matrix with floating-point coefficient values is applied within ROI.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **aTwist** – Host memory array containing the color twist matrix with floating-point coefficient values.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiColorTwist32f_8s_C1IR_Ctx**(*Npp8s* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, const *Npp32f* aTwist[3][4], *NppStreamContext* nppStreamCtx)

1 channel 8-bit signed in place color twist.

An input color twist matrix with floating-point coefficient values is applied within ROI.

Parameters

- **pSrcDst** – in place packed pixel format image pointer.
- **nSrcDstStep** – in place packed pixel format image line step.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **aTwist** – Host memory array containing the color twist matrix with floating-point coefficient values.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiColorTwist32f_8s_C2R_Ctx**(const *Npp8s* *pSrc, int nSrcStep, *Npp8s* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp32f* aTwist[3][4], *NppStreamContext* nppStreamCtx)

2 channel 8-bit signed color twist.

An input color twist matrix with floating-point coefficient values is applied within ROI.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **aTwist** – Host memory array containing the color twist matrix with floating-point coefficient values.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiColorTwist32f_8s_C2IR_Ctx**(*Npp8s* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, const *Npp32f* aTwist[3][4], *NppStreamContext* nppStreamCtx)

2 channel 8-bit signed in place color twist.

An input color twist matrix with floating-point coefficient values is applied within ROI.

Parameters

- **pSrcDst** – in place packed pixel format image pointer.
- **nSrcDstStep** – in place packed pixel format image line step.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **aTwist** – Host memory array containing the color twist matrix with floating-point coefficient values.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiColorTwist32f_8s_C3R_Ctx**(const *Npp8s* *pSrc, int nSrcStep, *Npp8s* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp32f* aTwist[3][4], *NppStreamContext* nppStreamCtx)

3 channel 8-bit signed color twist.

An input color twist matrix with floating-point coefficient values is applied within ROI.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **aTwist** – Host memory array containing the color twist matrix with floating-point coefficient values.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiColorTwist32f_8s_C3IR_Ctx**(*Npp8s* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, const *Npp32f* aTwist[3][4], *NppStreamContext* nppStreamCtx)

3 channel 8-bit signed in place color twist.

An input color twist matrix with floating-point coefficient values is applied within ROI.

Parameters

- **pSrcDst** – in place packed pixel format image pointer.
- **nSrcDstStep** – in place packed pixel format image line step.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **aTwist** – Host memory array containing the color twist matrix with floating-point coefficient values.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiColorTwist32f_8s_C4R_Ctx**(const *Npp8s* *pSrc, int nSrcStep, *Npp8s* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp32f* aTwist[3][4], *NppStreamContext* nppStreamCtx)

4 channel 8-bit signed color twist, with alpha copy.

An input color twist matrix with floating-point coefficient values is applied with in ROI. Alpha channel is the last channel and is copied unmodified from the source pixel to the destination pixel.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **aTwist** – Host memory array containing the color twist matrix with floating-point coefficient values.

- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiColorTwist32f_8s_C4IR_Ctx**(*Npp8s* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, const *Npp32f* aTwist[3][4], *NppStreamContext* nppStreamCtx)

4 channel 8-bit signed in place color twist, not affecting Alpha.

An input color twist matrix with floating-point coefficient values is applied with in ROI. Alpha channel is the last channel and is unmodified.

Parameters

- **pSrcDst** – in place packed pixel format image pointer.
- **nSrcDstStep** – in place packed pixel format image line step.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **aTwist** – Host memory array containing the color twist matrix with floating-point coefficient values.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiColorTwist32f_8s_AC4R_Ctx**(const *Npp8s* *pSrc, int nSrcStep, *Npp8s* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp32f* aTwist[3][4], *NppStreamContext* nppStreamCtx)

4 channel 8-bit signed color twist, not affecting Alpha.

An input color twist matrix with floating-point coefficient values is applied with in ROI. Alpha channel is the last channel and is not processed.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **aTwist** – Host memory array containing the color twist matrix with floating-point coefficient values.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiColorTwist32f_8s_AC4IR_Ctx**(*Npp8s* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, const *Npp32f* aTwist[3][4], *NppStreamContext* nppStreamCtx)

4 channel 8-bit signed in place color twist, not affecting Alpha.

An input color twist matrix with floating-point coefficient values is applied with in ROI. Alpha channel is the last channel and is not processed.

Parameters

- **pSrcDst** – in place packed pixel format image pointer.
- **nSrcDstStep** – in place packed pixel format image line step.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **aTwist** – Host memory array containing the color twist matrix with floating-point coefficient values.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiColorTwist32f_8s_P3R_Ctx**(const *Npp8s* *const pSrc[3], int nSrcStep, *Npp8s* *const pDst[3], int nDstStep, *NppiSize* oSizeROI, const *Npp32f* aTwist[3][4], *NppStreamContext* nppStreamCtx)

3 channel 8-bit signed planar color twist.

An input color twist matrix with floating-point coefficient values is applied within ROI.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **aTwist** – Host memory array containing the color twist matrix with floating-point coefficient values.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiColorTwist32f_8s_IP3R_Ctx**(*Npp8s* *const pSrcDst[3], int nSrcDstStep, *NppiSize* oSizeROI, const *Npp32f* aTwist[3][4], *NppStreamContext* nppStreamCtx)

3 channel 8-bit signed planar in place color twist.

An input color twist matrix with floating-point coefficient values is applied within ROI.

Parameters

- **pSrcDst** – in place planar pixel format image pointer array, one pointer per plane.
- **nSrcDstStep** – in place planar pixel format image line step.
- **oSizeROI** – *Region-Of-Interest (ROI)*.

- **aTwist** – Host memory array containing the color twist matrix with floating-point coefficient values.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiColorTwist32f_16u_C1R_Ctx**(const *Npp16u* *pSrc, int nSrcStep, *Npp16u* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp32f* aTwist[3][4], *NppStreamContext* nppStreamCtx)

1 channel 16-bit unsigned color twist.

An input color twist matrix with floating-point coefficient values is applied within ROI.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **aTwist** – Host memory array containing the color twist matrix with floating-point coefficient values.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiColorTwist32f_16u_C1IR_Ctx**(*Npp16u* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, const *Npp32f* aTwist[3][4], *NppStreamContext* nppStreamCtx)

1 channel 16-bit unsigned in place color twist.

An input color twist matrix with floating-point coefficient values is applied within ROI.

Parameters

- **pSrcDst** – in place packed pixel format image pointer.
- **nSrcDstStep** – in place packed pixel format image line step.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **aTwist** – Host memory array containing the color twist matrix with floating-point coefficient values.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiColorTwist32f_16u_C2R_Ctx**(const *Npp16u* *pSrc, int nSrcStep, *Npp16u* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp32f* aTwist[3][4], *NppStreamContext* nppStreamCtx)

2 channel 16-bit unsigned color twist.

An input color twist matrix with floating-point coefficient values is applied within ROI.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **aTwist** – Host memory array containing the color twist matrix with floating-point coefficient values.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiColorTwist32f_16u_C2IR_Ctx**(*Npp16u* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, const *Npp32f* aTwist[3][4], *NppStreamContext* nppStreamCtx)

2 channel 16-bit unsigned in place color twist.

An input color twist matrix with floating-point coefficient values is applied within ROI.

Parameters

- **pSrcDst** – in place packed pixel format image pointer.
- **nSrcDstStep** – in place packed pixel format image line step.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **aTwist** – Host memory array containing the color twist matrix with floating-point coefficient values.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiColorTwist32f_16u_C3R_Ctx**(const *Npp16u* *pSrc, int nSrcStep, *Npp16u* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp32f* aTwist[3][4], *NppStreamContext* nppStreamCtx)

3 channel 16-bit unsigned color twist.

An input color twist matrix with floating-point coefficient values is applied within ROI.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.

- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **aTwist** – Host memory array containing the color twist matrix with floating-point coefficient values.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiColorTwist32f_16u_C3IR_Ctx**(*Npp16u* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, const *Npp32f* aTwist[3][4], *NppStreamContext* nppStreamCtx)

3 channel 16-bit unsigned in place color twist.

An input color twist matrix with floating-point coefficient values is applied within ROI.

Parameters

- **pSrcDst** – in place packed pixel format image pointer.
- **nSrcDstStep** – in place packed pixel format image line step.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **aTwist** – Host memory array containing the color twist matrix with floating-point coefficient values.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiColorTwist32f_16u_AC4R_Ctx**(const *Npp16u* *pSrc, int nSrcStep, *Npp16u* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp32f* aTwist[3][4], *NppStreamContext* nppStreamCtx)

4 channel 16-bit unsigned color twist, not affecting Alpha.

An input color twist matrix with floating-point coefficient values is applied with in ROI. Alpha channel is the last channel and is not processed.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **aTwist** – Host memory array containing the color twist matrix with floating-point coefficient values.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiColorTwist32f_16u_AC4IR_Ctx**(*Npp16u* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, const *Npp32f* aTwist[3][4], *NppStreamContext* nppStreamCtx)

4 channel 16-bit unsigned in place color twist, not affecting Alpha.

An input color twist matrix with floating-point coefficient values is applied with in ROI. Alpha channel is the last channel and is not processed.

Parameters

- **pSrcDst** – in place packed pixel format image pointer.
- **nSrcDstStep** – in place packed pixel format image line step.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **aTwist** – Host memory array containing the color twist matrix with floating-point coefficient values.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiColorTwist32f_16u_P3R_Ctx**(const *Npp16u* *const pSrc[3], int nSrcStep, *Npp16u* *const pDst[3], int nDstStep, *NppiSize* oSizeROI, const *Npp32f* aTwist[3][4], *NppStreamContext* nppStreamCtx)

3 channel 16-bit unsigned planar color twist.

An input color twist matrix with floating-point coefficient values is applied within ROI.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **aTwist** – Host memory array containing the color twist matrix with floating-point coefficient values.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiColorTwist32f_16u_IP3R_Ctx**(*Npp16u* *const pSrcDst[3], int nSrcDstStep, *NppiSize* oSizeROI, const *Npp32f* aTwist[3][4], *NppStreamContext* nppStreamCtx)

3 channel 16-bit unsigned planar in place color twist.

An input color twist matrix with floating-point coefficient values is applied within ROI.

Parameters

- **pSrcDst** – in place planar pixel format image pointer array, one pointer per plane.
- **nSrcDstStep** – in place planar pixel format image line step.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **aTwist** – Host memory array containing the color twist matrix with floating-point coefficient values.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiColorTwist32f_16s_C1R_Ctx**(const *Npp16s* *pSrc, int nSrcStep, *Npp16s* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp32f* aTwist[3][4], *NppStreamContext* nppStreamCtx)

1 channel 16-bit signed color twist.

An input color twist matrix with floating-point coefficient values is applied within ROI.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **aTwist** – Host memory array containing the color twist matrix with floating-point coefficient values.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiColorTwist32f_16s_C1IR_Ctx**(*Npp16s* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, const *Npp32f* aTwist[3][4], *NppStreamContext* nppStreamCtx)

1 channel 16-bit signed in place color twist.

An input color twist matrix with floating-point coefficient values is applied within ROI.

Parameters

- **pSrcDst** – in place packed pixel format image pointer.
- **nSrcDstStep** – in place packed pixel format image line step.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **aTwist** – Host memory array containing the color twist matrix with floating-point coefficient values.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiColorTwist32f_16s_C2R_Ctx**(const *Npp16s* *pSrc, int nSrcStep, *Npp16s* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp32f* aTwist[3][4], *NppStreamContext* nppStreamCtx)

2 channel 16-bit signed color twist.

An input color twist matrix with floating-point coefficient values is applied within ROI.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **aTwist** – Host memory array containing the color twist matrix with floating-point coefficient values.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiColorTwist32f_16s_C2IR_Ctx**(*Npp16s* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, const *Npp32f* aTwist[3][4], *NppStreamContext* nppStreamCtx)

2 channel 16-bit signed in place color twist.

An input color twist matrix with floating-point coefficient values is applied within ROI.

Parameters

- **pSrcDst** – in place packed pixel format image pointer.
- **nSrcDstStep** – in place packed pixel format image line step.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **aTwist** – Host memory array containing the color twist matrix with floating-point coefficient values.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiColorTwist32f_16s_C3R_Ctx**(const *Npp16s* *pSrc, int nSrcStep, *Npp16s* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp32f* aTwist[3][4], *NppStreamContext* nppStreamCtx)

3 channel 16-bit signed color twist.

An input color twist matrix with floating-point coefficient values is applied within ROI.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.

- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **aTwist** – Host memory array containing the color twist matrix with floating-point coefficient values.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiColorTwist32f_16s_C3IR_Ctx**(*Npp16s* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, const *Npp32f* aTwist[3][4], *NppStreamContext* nppStreamCtx)

3 channel 16-bit signed in place color twist.

An input color twist matrix with floating-point coefficient values is applied within ROI.

Parameters

- **pSrcDst** – in place packed pixel format image pointer.
- **nSrcDstStep** – in place packed pixel format image line step.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **aTwist** – Host memory array containing the color twist matrix with floating-point coefficient values.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiColorTwist32f_16s_AC4R_Ctx**(const *Npp16s* *pSrc, int nSrcStep, *Npp16s* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp32f* aTwist[3][4], *NppStreamContext* nppStreamCtx)

4 channel 16-bit signed color twist, not affecting Alpha.

An input color twist matrix with floating-point coefficient values is applied with in ROI. Alpha channel is the last channel and is not processed.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **aTwist** – Host memory array containing the color twist matrix with floating-point coefficient values.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiColorTwist32f_16s_AC4IR_Ctx**(*Npp16s* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, const *Npp32f* aTwist[3][4], *NppStreamContext* nppStreamCtx)

4 channel 16-bit signed in place color twist, not affecting Alpha.

An input color twist matrix with floating-point coefficient values is applied with in ROI. Alpha channel is the last channel and is not processed.

Parameters

- **pSrcDst** – in place packed pixel format image pointer.
- **nSrcDstStep** – in place packed pixel format image line step.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **aTwist** – Host memory array containing the color twist matrix with floating-point coefficient values.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiColorTwist32f_16s_P3R_Ctx**(const *Npp16s* *const pSrc[3], int nSrcStep, *Npp16s* *const pDst[3], int nDstStep, *NppiSize* oSizeROI, const *Npp32f* aTwist[3][4], *NppStreamContext* nppStreamCtx)

3 channel 16-bit signed planar color twist.

An input color twist matrix with floating-point coefficient values is applied within ROI.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **aTwist** – Host memory array containing the color twist matrix with floating-point coefficient values.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiColorTwist32f_16s_IP3R_Ctx**(*Npp16s* *const pSrcDst[3], int nSrcDstStep, *NppiSize* oSizeROI, const *Npp32f* aTwist[3][4], *NppStreamContext* nppStreamCtx)

3 channel 16-bit signed planar in place color twist.

An input color twist matrix with floating-point coefficient values is applied within ROI.

Parameters

- **pSrcDst** – in place planar pixel format image pointer array, one pointer per plane.
- **nSrcDstStep** – in place planar pixel format image line step.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **aTwist** – Host memory array containing the color twist matrix with floating-point coefficient values.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiColorTwist32f_16f_C1R_Ctx**(const *Npp16f* *pSrc, int nSrcStep, *Npp16f* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp32f* aTwist[3][4], *NppStreamContext* nppStreamCtx)

1 channel 16-bit floating point color twist.

An input color twist matrix with 32-bit floating-point coefficient values is applied within ROI.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **aTwist** – Host memory array containing the color twist matrix with floating-point coefficient values.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiColorTwist32f_16f_C1IR_Ctx**(*Npp16f* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, const *Npp32f* aTwist[3][4], *NppStreamContext* nppStreamCtx)

1 channel 16-bit floating point in place color twist.

An input color twist matrix with 32-bit floating-point coefficient values is applied within ROI.

Parameters

- **pSrcDst** – in place packed pixel format image pointer.
- **nSrcDstStep** – in place packed pixel format image line step.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **aTwist** – Host memory array containing the color twist matrix with floating-point coefficient values.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiColorTwist32f_16f_C2R_Ctx**(const *Npp16f* *pSrc, int nSrcStep, *Npp16f* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp32f* aTwist[3][4], *NppStreamContext* nppStreamCtx)

2 channel 16-bit floating point color twist.

An input color twist matrix with 32-bit floating-point coefficient values is applied within ROI.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **aTwist** – Host memory array containing the color twist matrix with floating-point coefficient values.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiColorTwist32f_16f_C2IR_Ctx**(*Npp16f* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, const *Npp32f* aTwist[3][4], *NppStreamContext* nppStreamCtx)

2 channel 16-bit floating point in place color twist.

An input color twist matrix with 32-bit floating-point coefficient values is applied within ROI.

Parameters

- **pSrcDst** – in place packed pixel format image pointer.
- **nSrcDstStep** – in place packed pixel format image line step.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **aTwist** – Host memory array containing the color twist matrix with floating-point coefficient values.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiColorTwist32f_16f_C3R_Ctx**(const *Npp16f* *pSrc, int nSrcStep, *Npp16f* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp32f* aTwist[3][4], *NppStreamContext* nppStreamCtx)

3 channel 16-bit floating point color twist.

An input color twist matrix with 32-bit floating-point coefficient values is applied within ROI.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.

- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **aTwist** – Host memory array containing the color twist matrix with floating-point coefficient values.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiColorTwist32f_16f_C3IR_Ctx**(*Npp16f* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, const *Npp32f* aTwist[3][4], *NppStreamContext* nppStreamCtx)

3 channel 16-bit floating point in place color twist.

An input color twist matrix with 32-bit floating-point coefficient values is applied within ROI.

Parameters

- **pSrcDst** – in place packed pixel format image pointer.
- **nSrcDstStep** – in place packed pixel format image line step.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **aTwist** – Host memory array containing the color twist matrix with floating-point coefficient values.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiColorTwist32f_16f_C4R_Ctx**(const *Npp16f* *pSrc, int nSrcStep, *Npp16f* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp32f* aTwist[3][4], *NppStreamContext* nppStreamCtx)

4 channel 16-bit floating point color twist, with alpha copy.

An input color twist matrix with 32-bit floating-point coefficient values is applied with in ROI. Alpha channel is the last channel and is copied unmodified from the source pixel to the destination pixel.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **aTwist** – Host memory array containing the color twist matrix with floating-point coefficient values.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiColorTwist32f_16f_C4IR_Ctx**(*Npp16f* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, const *Npp32f* aTwist[3][4], *NppStreamContext* nppStreamCtx)

4 channel 16-bit floating point in place color twist, not affecting Alpha.

An input color twist matrix with 32-bit floating-point coefficient values is applied with in ROI. Alpha channel is the last channel and is not modified.

Parameters

- **pSrcDst** – in place packed pixel format image pointer.
- **nSrcDstStep** – in place packed pixel format image line step.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **aTwist** – Host memory array containing the color twist matrix with floating-point coefficient values.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiColorTwist32fC_16f_C4R_Ctx**(const *Npp16f* *pSrc, int nSrcStep, *Npp16f* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp32f* aTwist[4][4], const *Npp32f* aConstants[4], *NppStreamContext* nppStreamCtx)

4 channel 16-bit floating point color twist with 4x4 matrix and constant vector addition.

An input 4x4 color twist matrix with 32-bit floating-point coefficient values with an additional 32-bit floating point constant vector addition is applied within ROI. For this particular version of the function the result is generated as shown below.

```
dst[0] = aTwist[0][0] * src[0] + aTwist[0][1] * src[1] + aTwist[0][2] * src[2] +
↪aTwist[0][3] * src[3] + aConstants[0]
dst[1] = aTwist[1][0] * src[0] + aTwist[1][1] * src[1] + aTwist[1][2] * src[2] +
↪aTwist[1][3] * src[3] + aConstants[1]
dst[2] = aTwist[2][0] * src[0] + aTwist[2][1] * src[1] + aTwist[2][2] * src[2] +
↪aTwist[2][3] * src[3] + aConstants[2]
dst[3] = aTwist[3][0] * src[0] + aTwist[3][1] * src[1] + aTwist[3][2] * src[2] +
↪aTwist[3][3] * src[3] + aConstants[3]
```

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.

- **aTwist** – Host memory array containing the color twist matrix with floating-point coefficient values.
- **aConstants** – fixed size array of constant values, one per channel..
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiColorTwist32fC_16f_C4IR_Ctx**(*Npp16f* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, const *Npp32f* aTwist[4][4], const *Npp32f* aConstants[4], *NppStreamContext* nppStreamCtx)

4 channel 16-bit floating point in place color twist with 4x4 matrix and an additional constant vector addition.

An input 4x4 color twist matrix with 32-bit floating-point coefficient values with an additional 32-bit floating point constant vector addition is applied within ROI. For this particular version of the function the result is generated as shown below.

```
dst[0] = aTwist[0][0] * src[0] + aTwist[0][1] * src[1] + aTwist[0][2] * src[2] +
↪aTwist[0][3] * src[3] + aConstants[0]
dst[1] = aTwist[1][0] * src[0] + aTwist[1][1] * src[1] + aTwist[1][2] * src[2] +
↪aTwist[1][3] * src[3] + aConstants[1]
dst[2] = aTwist[2][0] * src[0] + aTwist[2][1] * src[1] + aTwist[2][2] * src[2] +
↪aTwist[2][3] * src[3] + aConstants[2]
dst[3] = aTwist[3][0] * src[0] + aTwist[3][1] * src[1] + aTwist[3][2] * src[2] +
↪aTwist[3][3] * src[3] + aConstants[3]
```

Parameters

- **pSrcDst** – in place packed pixel format image pointer.
- **nSrcDstStep** – in place packed pixel format image line step.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **aTwist** – Host memory array containing the color twist matrix with floating-point coefficient values.
- **aConstants** – fixed size array of constant values, one per channel..
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiColorTwist_32f_C1R_Ctx**(const *Npp32f* *pSrc, int nSrcStep, *Npp32f* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp32f* aTwist[3][4], *NppStreamContext* nppStreamCtx)

1 channel 32-bit floating point color twist.

An input color twist matrix with floating-point coefficient values is applied within ROI.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **aTwist** – Host memory array containing the color twist matrix with floating-point coefficient values.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiColorTwist_32f_C1IR_Ctx**(*Npp32f* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, const *Npp32f* aTwist[3][4], *NppStreamContext* nppStreamCtx)

1 channel 32-bit floating point in place color twist.

An input color twist matrix with floating-point coefficient values is applied within ROI.

Parameters

- **pSrcDst** – in place packed pixel format image pointer.
- **nSrcDstStep** – in place packed pixel format image line step.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **aTwist** – Host memory array containing the color twist matrix with floating-point coefficient values.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiColorTwist_32f_C2R_Ctx**(const *Npp32f* *pSrc, int nSrcStep, *Npp32f* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp32f* aTwist[3][4], *NppStreamContext* nppStreamCtx)

2 channel 32-bit floating point color twist.

An input color twist matrix with floating-point coefficient values is applied within ROI.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **aTwist** – Host memory array containing the color twist matrix with floating-point coefficient values.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiColorTwist_32f_C2IR_Ctx**(*Npp32f* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, const *Npp32f* aTwist[3][4], *NppStreamContext* nppStreamCtx)

2 channel 32-bit floating point in place color twist.

An input color twist matrix with floating-point coefficient values is applied within ROI.

Parameters

- **pSrcDst** – in place packed pixel format image pointer.
- **nSrcDstStep** – in place packed pixel format image line step.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **aTwist** – Host memory array containing the color twist matrix with floating-point coefficient values.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiColorTwist_32f_C3R_Ctx**(const *Npp32f* *pSrc, int nSrcStep, *Npp32f* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp32f* aTwist[3][4], *NppStreamContext* nppStreamCtx)

3 channel 32-bit floating point color twist.

An input color twist matrix with floating-point coefficient values is applied within ROI.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **aTwist** – Host memory array containing the color twist matrix with floating-point coefficient values.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiColorTwist_32f_C3IR_Ctx**(*Npp32f* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, const *Npp32f* aTwist[3][4], *NppStreamContext* nppStreamCtx)

3 channel 32-bit floating point in place color twist.

An input color twist matrix with floating-point coefficient values is applied within ROI.

Parameters

- **pSrcDst** – in place packed pixel format image pointer.
- **nSrcDstStep** – in place packed pixel format image line step.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **aTwist** – Host memory array containing the color twist matrix with floating-point coefficient values.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiColorTwist_32f_C4R_Ctx**(const *Npp32f* *pSrc, int nSrcStep, *Npp32f* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp32f* aTwist[3][4], *NppStreamContext* nppStreamCtx)

4 channel 32-bit floating point color twist, with alpha copy.

An input color twist matrix with floating-point coefficient values is applied with in ROI. Alpha channel is the last channel and is copied unmodified from the source pixel to the destination pixel.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **aTwist** – Host memory array containing the color twist matrix with floating-point coefficient values.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiColorTwist_32f_C4IR_Ctx**(*Npp32f* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, const *Npp32f* aTwist[3][4], *NppStreamContext* nppStreamCtx)

4 channel 32-bit floating point in place color twist, not affecting Alpha.

An input color twist matrix with floating-point coefficient values is applied with in ROI. Alpha channel is the last channel and is not modified.

Parameters

- **pSrcDst** – in place packed pixel format image pointer.
- **nSrcDstStep** – in place packed pixel format image line step.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **aTwist** – Host memory array containing the color twist matrix with floating-point coefficient values.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiColorTwist_32f_AC4R_Ctx**(const *Npp32f* *pSrc, int nSrcStep, *Npp32f* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp32f* aTwist[3][4], *NppStreamContext* nppStreamCtx)

4 channel 32-bit floating point color twist, not affecting Alpha.

An input color twist matrix with floating-point coefficient values is applied with in ROI. Alpha channel is the last channel and is not processed.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **aTwist** – Host memory array containing the color twist matrix with floating-point coefficient values.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiColorTwist_32f_AC4IR_Ctx**(*Npp32f* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, const *Npp32f* aTwist[3][4], *NppStreamContext* nppStreamCtx)

4 channel 32-bit floating point in place color twist, not affecting Alpha.

An input color twist matrix with floating-point coefficient values is applied with in ROI. Alpha channel is the last channel and is not processed.

Parameters

- **pSrcDst** – in place packed pixel format image pointer.
- **nSrcDstStep** – in place packed pixel format image line step.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **aTwist** – Host memory array containing the color twist matrix with floating-point coefficient values.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiColorTwist_32fC_C4R_Ctx**(const *Npp32f* *pSrc, int nSrcStep, *Npp32f* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp32f* aTwist[4][4], const *Npp32f* aConstants[4], *NppStreamContext* nppStreamCtx)

4 channel 32-bit floating point color twist with 4x4 matrix and constant vector addition.

An input 4x4 color twist matrix with floating-point coefficient values with an additional constant vector addition is applied within ROI. For this particular version of the function the result is generated as shown below.

```
dst[0] = aTwist[0][0] * src[0] + aTwist[0][1] * src[1] + aTwist[0][2] * src[2] +
↪aTwist[0][3] * src[3] + aConstants[0]
dst[1] = aTwist[1][0] * src[0] + aTwist[1][1] * src[1] + aTwist[1][2] * src[2] +
↪aTwist[1][3] * src[3] + aConstants[1]
dst[2] = aTwist[2][0] * src[0] + aTwist[2][1] * src[1] + aTwist[2][2] * src[2] +
↪aTwist[2][3] * src[3] + aConstants[2]
dst[3] = aTwist[3][0] * src[0] + aTwist[3][1] * src[1] + aTwist[3][2] * src[2] +
↪aTwist[3][3] * src[3] + aConstants[3]
```

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **aTwist** – Host memory array containing the color twist matrix with floating-point coefficient values.
- **aConstants** – fixed size array of constant values, one per channel..
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiColorTwist_32fC_C4IR_Ctx**(*Npp32f* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, const *Npp32f* aTwist[4][4], const *Npp32f* aConstants[4], *NppStreamContext* nppStreamCtx)

4 channel 32-bit floating point in place color twist with 4x4 matrix and an additional constant vector addition.

An input 4x4 color twist matrix with floating-point coefficient values with an additional constant vector addition is applied within ROI. For this particular version of the function the result is generated as shown below.

```
dst[0] = aTwist[0][0] * src[0] + aTwist[0][1] * src[1] + aTwist[0][2] * src[2] +
↪aTwist[0][3] * src[3] + aConstants[0]
dst[1] = aTwist[1][0] * src[0] + aTwist[1][1] * src[1] + aTwist[1][2] * src[2] +
↪aTwist[1][3] * src[3] + aConstants[1]
dst[2] = aTwist[2][0] * src[0] + aTwist[2][1] * src[1] + aTwist[2][2] * src[2] +
↪aTwist[2][3] * src[3] + aConstants[2]
dst[3] = aTwist[3][0] * src[0] + aTwist[3][1] * src[1] + aTwist[3][2] * src[2] +
↪aTwist[3][3] * src[3] + aConstants[3]
```

Parameters

- **pSrcDst** – in place packed pixel format image pointer.
- **nSrcDstStep** – in place packed pixel format image line step.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **aTwist** – Host memory array containing the color twist matrix with floating-point coefficient values.
- **aConstants** – fixed size array of constant values, one per channel..
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiColorTwist_32f_P3R_Ctx**(const *Npp32f* *const pSrc[3], int nSrcStep, *Npp32f* *const pDst[3], int nDstStep, *NppiSize* oSizeROI, const *Npp32f* aTwist[3][4], *NppStreamContext* nppStreamCtx)

3 channel 32-bit floating point planar color twist.

An input color twist matrix with floating-point coefficient values is applied within ROI.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **aTwist** – Host memory array containing the color twist matrix with floating-point coefficient values.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiColorTwist_32f_IP3R_Ctx**(*Npp32f* *const pSrcDst[3], int nSrcDstStep, *NppiSize* oSizeROI, const *Npp32f* aTwist[3][4], *NppStreamContext* nppStreamCtx)

3 channel 32-bit floating point planar in place color twist.

An input color twist matrix with floating-point coefficient values is applied within ROI.

Parameters

- **pSrcDst** – in place planar pixel format image pointer array, one pointer per plane.
- **nSrcDstStep** – in place planar pixel format image line step.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **aTwist** – Host memory array containing the color twist matrix with floating-point coefficient values.

- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

1.8.1.6 ColorTwistBatch

Routines for converting between various image color models using user supplied matrix coefficients on batches of images.

ColorTwistBatch

Perform color twist pixel batch processing.

Color twist consists of applying the following formula to each image pixel using coefficients from one or more user supplied color twist device memory matrix arrays as follows where dst[x] and src[x] represent destination pixel and source pixel channel or plane x. The full sized coefficient matrix should be sent for all pixel channel sizes, the function will process the appropriate coefficients and channels for the corresponding pixel size. ColorTwistBatch generally takes the same parameter list as ColorTwist except that there is a list of N instances of those parameters (N > 1) and that list is passed in device memory; The matrix pointers referenced for each image in the batch also need to point to device memory matrix values. A convenient data structure is provided that allows for easy initialization of the parameter lists. The only restriction on these functions is that there is one single ROI which is applied respectively to each image in the batch. The primary purpose of this function is to provide improved performance for batches of smaller images as long as GPU resources are available. Therefore it is recommended that the function not be used for very large images as there may not be resources available for processing several large images simultaneously.

```
dst[0] = aTwist[0][0] * src[0] + aTwist[0][1] * src[1] + aTwist[0][2] * src[2] +
↪aTwist[0][3]
dst[1] = aTwist[1][0] * src[0] + aTwist[1][1] * src[1] + aTwist[1][2] * src[2] +
↪aTwist[1][3]
dst[2] = aTwist[2][0] * src[0] + aTwist[2][1] * src[1] + aTwist[2][2] * src[2] +
↪aTwist[2][3]
```

NppStatus **nppiColorTwistBatch32f_8u_C1R_Ctx**(*Npp32f* nMin, *Npp32f* nMax, *NppiSize* oSizeROI, *NppiColorTwistBatchCXR* *pBatchList, int nBatchSize, *NppStreamContext* nppStreamCtx)

1 channel 8-bit unsigned integer color twist batch.

An input color twist matrix with floating-point coefficient values is applied within the ROI for each image in batch. Color twist matrix can vary per image. The same ROI is applied to each image.

Parameters

- **nMin** – Minimum clamp value.
- **nMax** – Maximum saturation and clamp value.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **pBatchList** – Device memory pointer to nBatchSize list of *NppiColorTwistBatchCXR* structures.

- **nBatchSize** – Number of *NppiColorTwistBatchCXR* structures in this call (must be > 1).
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiColorTwistBatch32f_8u_C1IR_Ctx**(*Npp32f* nMin, *Npp32f* nMax, *NppiSize* oSizeROI, *NppiColorTwistBatchCXR* *pBatchList, int nBatchSize, *NppStreamContext* nppStreamCtx)

1 channel 8-bit unsigned integer in place color twist batch.

An input color twist matrix with floating-point coefficient values is applied within ROI for each image in batch. Color twist matrix can vary per image. The same ROI is applied to each image.

Parameters

- **nMin** – Minimum clamp value.
- **nMax** – Maximum saturation and clamp value.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **pBatchList** – Device memory pointer to nBatchSize list of *NppiColorTwistBatchCXR* structures.
- **nBatchSize** – Number of *NppiColorTwistBatchCXR* structures in this call (must be > 1).
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiColorTwistBatch32f_8u_C3R_Ctx**(*Npp32f* nMin, *Npp32f* nMax, *NppiSize* oSizeROI, *NppiColorTwistBatchCXR* *pBatchList, int nBatchSize, *NppStreamContext* nppStreamCtx)

3 channel 8-bit unsigned integer color twist batch.

An input color twist matrix with floating-point coefficient values is applied within the ROI for each image in batch. Color twist matrix can vary per image. The same ROI is applied to each image.

Parameters

- **nMin** – Minimum clamp value.
- **nMax** – Maximum saturation and clamp value.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **pBatchList** – Device memory pointer to nBatchSize list of *NppiColorTwistBatchCXR* structures.
- **nBatchSize** – Number of *NppiColorTwistBatchCXR* structures in this call (must be > 1).
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiColorTwistBatch32f_8u_C3IR_Ctx**(*Npp32f* nMin, *Npp32f* nMax, *NppiSize* oSizeROI, *NppiColorTwistBatchCXR* *pBatchList, int nBatchSize, *NppStreamContext* nppStreamCtx)

3 channel 8-bit unsigned integer in place color twist batch.

An input color twist matrix with floating-point coefficient values is applied within ROI for each image in batch. Color twist matrix can vary per image. The same ROI is applied to each image.

Parameters

- **nMin** – Minimum clamp value.
- **nMax** – Maximum saturation and clamp value.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **pBatchList** – Device memory pointer to nBatchSize list of *NppiColorTwistBatchCXR* structures.
- **nBatchSize** – Number of *NppiColorTwistBatchCXR* structures in this call (must be > 1).
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiColorTwistBatch32f_8u_C4R_Ctx**(*Npp32f* nMin, *Npp32f* nMax, *NppiSize* oSizeROI, *NppiColorTwistBatchCXR* *pBatchList, int nBatchSize, *NppStreamContext* nppStreamCtx)

4 channel 8-bit unsigned integer color twist batch.

An input color twist matrix with floating-point coefficient values is applied within the ROI for each image in batch. Color twist matrix can vary per image. The same ROI is applied to each image.

Parameters

- **nMin** – Minimum clamp value.
- **nMax** – Maximum saturation and clamp value.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **pBatchList** – Device memory pointer to nBatchSize list of *NppiColorTwistBatchCXR* structures.
- **nBatchSize** – Number of *NppiColorTwistBatchCXR* structures in this call (must be > 1).
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiColorTwistBatch32f_8u_C4IR_Ctx**(*Npp32f* nMin, *Npp32f* nMax, *NppiSize* oSizeROI, *NppiColorTwistBatchCXR* *pBatchList, int nBatchSize, *NppStreamContext* nppStreamCtx)

4 channel 8-bit unsigned integer in place color twist batch.

An input color twist matrix with floating-point coefficient values is applied within ROI for each image in batch. Color twist matrix can vary per image. The same ROI is applied to each image.

Parameters

- **nMin** – Minimum clamp value.
- **nMax** – Maximum saturation and clamp value.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **pBatchList** – Device memory pointer to nBatchSize list of *NppiColorTwistBatchCXR* structures.
- **nBatchSize** – Number of *NppiColorTwistBatchCXR* structures in this call (must be > 1).
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiColorTwistBatch32f_8u_AC4R_Ctx**(*Npp32f* nMin, *Npp32f* nMax, *NppiSize* oSizeROI, *NppiColorTwistBatchCXR* *pBatchList, int nBatchSize, *NppStreamContext* nppStreamCtx)

4 channel 8-bit unsigned integer color twist batch, not affecting Alpha.

An input color twist matrix with floating-point coefficient values is applied within the ROI for each image in batch. Color twist matrix can vary per image. The same ROI is applied to each image.

Parameters

- **nMin** – Minimum clamp value.
- **nMax** – Maximum saturation and clamp value.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **pBatchList** – Device memory pointer to nBatchSize list of *NppiColorTwistBatchCXR* structures.
- **nBatchSize** – Number of *NppiColorTwistBatchCXR* structures in this call (must be > 1).
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiColorTwistBatch32f_8u_AC4IR_Ctx**(*Npp32f* nMin, *Npp32f* nMax, *NppiSize* oSizeROI, *NppiColorTwistBatchCXR* *pBatchList, int nBatchSize, *NppStreamContext* nppStreamCtx)

4 channel 8-bit unsigned integer in place color twist batch, not affecting Alpha.

An input color twist matrix with floating-point coefficient values is applied within ROI for each image in batch. Color twist matrix can vary per image. The same ROI is applied to each image.

Parameters

- **nMin** – Minimum clamp value.
- **nMax** – Maximum saturation and clamp value.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **pBatchList** – Device memory pointer to nBatchSize list of *NppiColorTwistBatchCXR* structures.
- **nBatchSize** – Number of *NppiColorTwistBatchCXR* structures in this call (must be > 1).
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiColorTwistBatch32fC_8u_C4R_Ctx**(*Npp32f* nMin, *Npp32f* nMax, *NppiSize* oSizeROI, *NppiColorTwistBatchCXR* *pBatchList, int nBatchSize, *NppStreamContext* nppStreamCtx)

4 channel 8-bit unsigned integer color twist with 4x5 matrix including a constant vector (20 coefficients total).

An input 4x5 color twist matrix with floating-point coefficient values including a constant (in the fourth column) vector is applied within ROI. For this particular version of the function the result is generated as shown below.

```
dst[0] = aTwist[0][0] * src[0] + aTwist[0][1] * src[1] + aTwist[0][2] * src[2] +
↪aTwist[0][3] * src[3] + aTwist[0][4]
dst[1] = aTwist[1][0] * src[0] + aTwist[1][1] * src[1] + aTwist[1][2] * src[2] +
↪aTwist[1][3] * src[3] + aTwist[1][4]
dst[2] = aTwist[2][0] * src[0] + aTwist[2][1] * src[1] + aTwist[2][2] * src[2] +
↪aTwist[2][3] * src[3] + aTwist[2][4]
dst[3] = aTwist[3][0] * src[0] + aTwist[3][1] * src[1] + aTwist[3][2] * src[2] +
↪aTwist[3][3] * src[3] + aTwist[3][4]
```

An input color twist matrix with floating-point coefficient values is applied within ROI for each image in batch. Color twist matrix can vary per image. The same ROI is applied to each image.

Parameters

- **nMin** – Minimum clamp value.
- **nMax** – Maximum saturation and clamp value.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **pBatchList** – Device memory pointer to nBatchSize list of *NppiColorTwistBatchCXR* structures.

- **nBatchSize** – Number of *NppiColorTwistBatchCXR* structures in this call (must be > 1).
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiColorTwistBatch32fC_8u_C4IR_Ctx**(*Npp32f* nMin, *Npp32f* nMax, *NppiSize* oSizeROI, *NppiColorTwistBatchCXR* *pBatchList, int nBatchSize, *NppStreamContext* nppStreamCtx)

4 channel 8-bit unsigned integer in place color twist with 4x5 matrix including a constant vector (20 coefficients total).

An input 4x5 color twist matrix with floating-point coefficient values including a constant (in the fourth column) vector is applied within ROI. For this particular version of the function the result is generated as shown below.

```
dst[0] = aTwist[0][0] * src[0] + aTwist[0][1] * src[1] + aTwist[0][2] * src[2] +
↪aTwist[0][3] * src[3] + aTwist[0][4]
dst[1] = aTwist[1][0] * src[0] + aTwist[1][1] * src[1] + aTwist[1][2] * src[2] +
↪aTwist[1][3] * src[3] + aTwist[1][4]
dst[2] = aTwist[2][0] * src[0] + aTwist[2][1] * src[1] + aTwist[2][2] * src[2] +
↪aTwist[2][3] * src[3] + aTwist[2][4]
dst[3] = aTwist[3][0] * src[0] + aTwist[3][1] * src[1] + aTwist[3][2] * src[2] +
↪aTwist[3][3] * src[3] + aTwist[3][4]
```

An input color twist matrix with floating-point coefficient values is applied within ROI for each image in batch. Color twist matrix can vary per image. The same ROI is applied to each image.

Parameters

- **nMin** – Minimum clamp value.
- **nMax** – Maximum saturation and clamp value.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **pBatchList** – Device memory pointer to nBatchSize list of *NppiColorTwistBatchCXR* structures.
- **nBatchSize** – Number of *NppiColorTwistBatchCXR* structures in this call (must be > 1).
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiColorTwistBatch_32f_C1R_Ctx**(*Npp32f* nMin, *Npp32f* nMax, *NppiSize* oSizeROI, *NppiColorTwistBatchCXR* *pBatchList, int nBatchSize, *NppStreamContext* nppStreamCtx)

1 channel 32-bit floating point color twist batch.

An input color twist matrix with floating-point coefficient values is applied within the ROI for each image in batch. Color twist matrix can vary per image. The same ROI is applied to each image.

Parameters

- **nMin** – Minimum clamp value.
- **nMax** – Maximum saturation and clamp value.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **pBatchList** – Device memory pointer to nBatchSize list of *NppiColorTwistBatchCXR* structures.
- **nBatchSize** – Number of *NppiColorTwistBatchCXR* structures in this call (must be > 1).
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiColorTwistBatch_32f_C1IR_Ctx**(*Npp32f* nMin, *Npp32f* nMax, *NppiSize* oSizeROI, *NppiColorTwistBatchCXR* *pBatchList, int nBatchSize, *NppStreamContext* nppStreamCtx)

1 channel 32-bit floating point in place color twist batch.

An input color twist matrix with floating-point coefficient values is applied within ROI for each image in batch. Color twist matrix can vary per image. The same ROI is applied to each image.

Parameters

- **nMin** – Minimum clamp value.
- **nMax** – Maximum saturation and clamp value.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **pBatchList** – Device memory pointer to nBatchSize list of *NppiColorTwistBatchCXR* structures.
- **nBatchSize** – Number of *NppiColorTwistBatchCXR* structures in this call (must be > 1).
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiColorTwistBatch_32f_C3R_Ctx**(*Npp32f* nMin, *Npp32f* nMax, *NppiSize* oSizeROI, *NppiColorTwistBatchCXR* *pBatchList, int nBatchSize, *NppStreamContext* nppStreamCtx)

3 channel 32-bit floating point color twist batch.

An input color twist matrix with floating-point coefficient values is applied within the ROI for each image in batch. Color twist matrix can vary per image. The same ROI is applied to each image.

Parameters

- **nMin** – Minimum clamp value.
- **nMax** – Maximum saturation and clamp value.
- **oSizeROI** – *Region-Of-Interest (ROI)*.

- **pBatchList** – Device memory pointer to nBatchSize list of *NppiColorTwistBatchCXR* structures.
- **nBatchSize** – Number of *NppiColorTwistBatchCXR* structures in this call (must be > 1).
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiColorTwistBatch_32f_C3IR_Ctx**(*Npp32f* nMin, *Npp32f* nMax, *NppiSize* oSizeROI, *NppiColorTwistBatchCXR* *pBatchList, int nBatchSize, *NppStreamContext* nppStreamCtx)

3 channel 32-bit floating point in place color twist batch.

An input color twist matrix with floating-point coefficient values is applied within ROI for each image in batch. Color twist matrix can vary per image. The same ROI is applied to each image.

Parameters

- **nMin** – Minimum clamp value.
- **nMax** – Maximum saturation and clamp value.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **pBatchList** – Device memory pointer to nBatchSize list of *NppiColorTwistBatchCXR* structures.
- **nBatchSize** – Number of *NppiColorTwistBatchCXR* structures in this call (must be > 1).
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiColorTwistBatch_32f_C4R_Ctx**(*Npp32f* nMin, *Npp32f* nMax, *NppiSize* oSizeROI, *NppiColorTwistBatchCXR* *pBatchList, int nBatchSize, *NppStreamContext* nppStreamCtx)

4 channel 32-bit floating point color twist batch.

An input color twist matrix with floating-point coefficient values is applied within the ROI for each image in batch. Color twist matrix can vary per image. The same ROI is applied to each image.

Parameters

- **nMin** – Minimum clamp value.
- **nMax** – Maximum saturation and clamp value.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **pBatchList** – Device memory pointer to nBatchSize list of *NppiColorTwistBatchCXR* structures.
- **nBatchSize** – Number of *NppiColorTwistBatchCXR* structures in this call (must be > 1).
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiColorTwistBatch_32f_C4IR_Ctx**(*Npp32f* nMin, *Npp32f* nMax, *NppiSize* oSizeROI, *NppiColorTwistBatchCXR* *pBatchList, int nBatchSize, *NppStreamContext* nppStreamCtx)

4 channel 32-bit floating point in place color twist batch.

An input color twist matrix with floating-point coefficient values is applied within ROI for each image in batch. Color twist matrix can vary per image. The same ROI is applied to each image.

Parameters

- **nMin** – Minimum clamp value.
- **nMax** – Maximum saturation and clamp value.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **pBatchList** – Device memory pointer to nBatchSize list of *NppiColorTwistBatchCXR* structures.
- **nBatchSize** – Number of *NppiColorTwistBatchCXR* structures in this call (must be > 1).
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiColorTwistBatch_32f_AC4R_Ctx**(*Npp32f* nMin, *Npp32f* nMax, *NppiSize* oSizeROI, *NppiColorTwistBatchCXR* *pBatchList, int nBatchSize, *NppStreamContext* nppStreamCtx)

4 channel 32-bit floating point color twist batch, not affecting Alpha.

An input color twist matrix with floating-point coefficient values is applied within the ROI for each image in batch. Color twist matrix can vary per image. The same ROI is applied to each image.

Parameters

- **nMin** – Minimum clamp value.
- **nMax** – Maximum saturation and clamp value.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **pBatchList** – Device memory pointer to nBatchSize list of *NppiColorTwistBatchCXR* structures.
- **nBatchSize** – Number of *NppiColorTwistBatchCXR* structures in this call (must be > 1).
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiColorTwistBatch_32f_AC4IR_Ctx**(*Npp32f* nMin, *Npp32f* nMax, *NppiSize* oSizeROI, *NppiColorTwistBatchCXR* *pBatchList, int nBatchSize, *NppStreamContext* nppStreamCtx)

4 channel 32-bit floating point in place color twist batch, not affecting Alpha.

An input color twist matrix with floating-point coefficient values is applied within ROI for each image in batch. Color twist matrix can vary per image. The same ROI is applied to each image.

Parameters

- **nMin** – Minimum clamp value.
- **nMax** – Maximum saturation and clamp value.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **pBatchList** – Device memory pointer to nBatchSize list of *NppiColorTwistBatchCXR* structures.
- **nBatchSize** – Number of *NppiColorTwistBatchCXR* structures in this call (must be > 1).
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiColorTwistBatch_32fC_C4R_Ctx**(*Npp32f* nMin, *Npp32f* nMax, *NppiSize* oSizeROI, *NppiColorTwistBatchCXR* *pBatchList, int nBatchSize, *NppStreamContext* nppStreamCtx)

4 channel 32-bit floating point color twist with 4x5 matrix including a constant vector (20 coefficients total).

An input 4x5 color twist matrix with floating-point coefficient values including a constant (in the fourth column) vector is applied within ROI. For this particular version of the function the result is generated as shown below.

```
dst[0] = aTwist[0][0] * src[0] + aTwist[0][1] * src[1] + aTwist[0][2] * src[2] +
↪aTwist[0][3] * src[3] + aTwist[0][4]
dst[1] = aTwist[1][0] * src[0] + aTwist[1][1] * src[1] + aTwist[1][2] * src[2] +
↪aTwist[1][3] * src[3] + aTwist[1][4]
dst[2] = aTwist[2][0] * src[0] + aTwist[2][1] * src[1] + aTwist[2][2] * src[2] +
↪aTwist[2][3] * src[3] + aTwist[2][4]
dst[3] = aTwist[3][0] * src[0] + aTwist[3][1] * src[1] + aTwist[3][2] * src[2] +
↪aTwist[3][3] * src[3] + aTwist[3][4]
```

An input color twist matrix with floating-point coefficient values is applied within ROI for each image in batch. Color twist matrix can vary per image. The same ROI is applied to each image.

Parameters

- **nMin** – Minimum clamp value.
- **nMax** – Maximum saturation and clamp value.
- **oSizeROI** – *Region-Of-Interest (ROI)*.

- **pBatchList** – Device memory pointer to nBatchSize list of *NppiColorTwistBatchCXR* structures.
- **nBatchSize** – Number of *NppiColorTwistBatchCXR* structures in this call (must be > 1).
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiColorTwistBatch_32fC_C4IR_Ctx**(*Npp32f* nMin, *Npp32f* nMax, *NppiSize* oSizeROI, *NppiColorTwistBatchCXR* *pBatchList, int nBatchSize, *NppStreamContext* nppStreamCtx)

4 channel in place 32-bit floating point color twist with 4x5 matrix including a constant vector (20 coefficients total).

An input 4x5 color twist matrix with floating-point coefficient values including a constant (in the fourth column) vector is applied within ROI. For this particular version of the function the result is generated as shown below.

```
dst[0] = aTwist[0][0] * src[0] + aTwist[0][1] * src[1] + aTwist[0][2] * src[2] +
↪aTwist[0][3] * src[3] + aTwist[0][4]
dst[1] = aTwist[1][0] * src[0] + aTwist[1][1] * src[1] + aTwist[1][2] * src[2] +
↪aTwist[1][3] * src[3] + aTwist[1][4]
dst[2] = aTwist[2][0] * src[0] + aTwist[2][1] * src[1] + aTwist[2][2] * src[2] +
↪aTwist[2][3] * src[3] + aTwist[2][4]
dst[3] = aTwist[3][0] * src[0] + aTwist[3][1] * src[1] + aTwist[3][2] * src[2] +
↪aTwist[3][3] * src[3] + aTwist[3][4]
```

An input color twist matrix with floating-point coefficient values is applied within ROI for each image in batch. Color twist matrix can vary per image. The same ROI is applied to each image.

Parameters

- **nMin** – Minimum clamp value.
- **nMax** – Maximum saturation and clamp value.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **pBatchList** – Device memory pointer to nBatchSize list of *NppiColorTwistBatchCXR* structures.
- **nBatchSize** – Number of *NppiColorTwistBatchCXR* structures in this call (must be > 1).
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiColorTwistBatch32f_16f_C1R_Ctx**(*Npp32f* nMin, *Npp32f* nMax, *NppiSize* oSizeROI, *NppiColorTwistBatchCXR* *pBatchList, int nBatchSize, *NppStreamContext* nppStreamCtx)

1 channel 16-bit floating point color twist batch.

An input color twist matrix with 32-bit floating-point coefficient values is applied within the ROI for each image in batch. Color twist matrix can vary per image. The same ROI is applied to each image.

Parameters

- **nMin** – Minimum clamp value.
- **nMax** – Maximum saturation and clamp value.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **pBatchList** – Device memory pointer to nBatchSize list of *NppiColorTwistBatchCXR* structures.
- **nBatchSize** – Number of *NppiColorTwistBatchCXR* structures in this call (must be > 1).
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiColorTwistBatch32f_16f_C1IR_Ctx**(*Npp32f* nMin, *Npp32f* nMax, *NppiSize* oSizeROI, *NppiColorTwistBatchCXR* *pBatchList, int nBatchSize, *NppStreamContext* nppStreamCtx)

1 channel 16-bit floating point in place color twist batch.

An input color twist matrix with 32-bit floating-point coefficient values is applied within ROI for each image in batch. Color twist matrix can vary per image. The same ROI is applied to each image.

Parameters

- **nMin** – Minimum clamp value.
- **nMax** – Maximum saturation and clamp value.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **pBatchList** – Device memory pointer to nBatchSize list of *NppiColorTwistBatchCXR* structures.
- **nBatchSize** – Number of *NppiColorTwistBatchCXR* structures in this call (must be > 1).
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiColorTwistBatch32f_16f_C3R_Ctx**(*Npp32f* nMin, *Npp32f* nMax, *NppiSize* oSizeROI, *NppiColorTwistBatchCXR* *pBatchList, int nBatchSize, *NppStreamContext* nppStreamCtx)

3 channel 16-bit floating point color twist batch.

An input color twist matrix with 32-bit floating-point coefficient values is applied within the ROI for each image in batch. Color twist matrix can vary per image. The same ROI is applied to each image.

Parameters

- **nMin** – Minimum clamp value.
- **nMax** – Maximum saturation and clamp value.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **pBatchList** – Device memory pointer to nBatchSize list of *NppiColorTwistBatchCXR* structures.
- **nBatchSize** – Number of *NppiColorTwistBatchCXR* structures in this call (must be > 1).
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiColorTwistBatch32f_16f_C3IR_Ctx**(*Npp32f* nMin, *Npp32f* nMax, *NppiSize* oSizeROI, *NppiColorTwistBatchCXR* *pBatchList, int nBatchSize, *NppStreamContext* nppStreamCtx)

3 channel 16-bit floating point in place color twist batch.

An input color twist matrix with floating-point coefficient values is applied within ROI for each image in batch. Color twist matrix can vary per image. The same ROI is applied to each image.

Parameters

- **nMin** – Minimum clamp value.
- **nMax** – Maximum saturation and clamp value.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **pBatchList** – Device memory pointer to nBatchSize list of *NppiColorTwistBatchCXR* structures.
- **nBatchSize** – Number of *NppiColorTwistBatchCXR* structures in this call (must be > 1).
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiColorTwistBatch32f_16f_C4R_Ctx**(*Npp32f* nMin, *Npp32f* nMax, *NppiSize* oSizeROI, *NppiColorTwistBatchCXR* *pBatchList, int nBatchSize, *NppStreamContext* nppStreamCtx)

4 channel 16-bit floating point color twist batch.

An input color twist matrix with 32-bit floating-point coefficient values is applied within the ROI for each image in batch. Color twist matrix can vary per image. The same ROI is applied to each image.

Parameters

- **nMin** – Minimum clamp value.

- **nMax** – Maximum saturation and clamp value.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **pBatchList** – Device memory pointer to nBatchSize list of *NppiColorTwistBatchCXR* structures.
- **nBatchSize** – Number of *NppiColorTwistBatchCXR* structures in this call (must be > 1).
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiColorTwistBatch32f_16f_C4IR_Ctx**(*Npp32f* nMin, *Npp32f* nMax, *NppiSize* oSizeROI, *NppiColorTwistBatchCXR* *pBatchList, int nBatchSize, *NppStreamContext* nppStreamCtx)

4 channel 16-bit floating point in place color twist batch.

An input color twist matrix with 32-bit floating-point coefficient values is applied within ROI for each image in batch. Color twist matrix can vary per image. The same ROI is applied to each image.

Parameters

- **nMin** – Minimum clamp value.
- **nMax** – Maximum saturation and clamp value.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **pBatchList** – Device memory pointer to nBatchSize list of *NppiColorTwistBatchCXR* structures.
- **nBatchSize** – Number of *NppiColorTwistBatchCXR* structures in this call (must be > 1).
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiColorTwistBatch32fC_16f_C4R_Ctx**(*Npp32f* nMin, *Npp32f* nMax, *NppiSize* oSizeROI, *NppiColorTwistBatchCXR* *pBatchList, int nBatchSize, *NppStreamContext* nppStreamCtx)

4 channel 16-bit floating point color twist with 4x5 matrix including a constant vector (20 coefficients total).

An input 4x5 color twist matrix with 32-bit floating-point coefficient values including a constant (in the fourth column) vector is applied within ROI. For this particular version of the function the result is generated as shown below.

```
dst[0] = aTwist[0][0] * src[0] + aTwist[0][1] * src[1] + aTwist[0][2] * src[2] +
↪aTwist[0][3] * src[3] + aTwist[0][4]
dst[1] = aTwist[1][0] * src[0] + aTwist[1][1] * src[1] + aTwist[1][2] * src[2] +
↪aTwist[1][3] * src[3] + aTwist[1][4]
```

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```
dst[2] = aTwist[2][0] * src[0] + aTwist[2][1] * src[1] + aTwist[2][2] * src[2] +
↪aTwist[2][3] * src[3] + aTwist[2][4]
dst[3] = aTwist[3][0] * src[0] + aTwist[3][1] * src[1] + aTwist[3][2] * src[2] +
↪aTwist[3][3] * src[3] + aTwist[3][4]
```

An input color twist matrix with 32-bit floating-point coefficient values is applied within ROI for each image in batch. Color twist matrix can vary per image. The same ROI is applied to each image.

Parameters

- **nMin** – Minimum clamp value.
- **nMax** – Maximum saturation and clamp value.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **pBatchList** – Device memory pointer to nBatchSize list of *NppiColorTwistBatchCXR* structures.
- **nBatchSize** – Number of *NppiColorTwistBatchCXR* structures in this call (must be > 1).
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiColorTwistBatch32fC_16f_C4IR_Ctx**(*Npp32f* nMin, *Npp32f* nMax, *NppiSize* oSizeROI, *NppiColorTwistBatchCXR* *pBatchList, int nBatchSize, *NppStreamContext* nppStreamCtx)

4 channel in place 16-bit floating point color twist with 4x5 matrix including a constant vector (20 coefficients total).

An input 4x5 color twist matrix with 32-bitfloating-point coefficient values including a constant (in the fourth column) vector is applied within ROI. For this particular version of the function the result is generated as shown below.

```
dst[0] = aTwist[0][0] * src[0] + aTwist[0][1] * src[1] + aTwist[0][2] * src[2] +
↪aTwist[0][3] * src[3] + aTwist[0][4]
dst[1] = aTwist[1][0] * src[0] + aTwist[1][1] * src[1] + aTwist[1][2] * src[2] +
↪aTwist[1][3] * src[3] + aTwist[1][4]
dst[2] = aTwist[2][0] * src[0] + aTwist[2][1] * src[1] + aTwist[2][2] * src[2] +
↪aTwist[2][3] * src[3] + aTwist[2][4]
dst[3] = aTwist[3][0] * src[0] + aTwist[3][1] * src[1] + aTwist[3][2] * src[2] +
↪aTwist[3][3] * src[3] + aTwist[3][4]
```

An input color twist matrix with 32-bit floating-point coefficient values is applied within ROI for each image in batch. Color twist matrix can vary per image. The same ROI is applied to each image.

Parameters

- **nMin** – Minimum clamp value.
- **nMax** – Maximum saturation and clamp value.

- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **pBatchList** – Device memory pointer to nBatchSize list of *NppiColorTwistBatchCXR* structures.
- **nBatchSize** – Number of *NppiColorTwistBatchCXR* structures in this call (must be > 1).
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

1.8.1.7 ColorLUT

Perform image color processing using members of various types of color look up tables.

Functions

NppStatus **nppiLUT_8u_C1R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp32s* *pValues, const *Npp32s* *pLevels, int nLevels, *NppStreamContext* nppStreamCtx)

8-bit unsigned look-up-table color conversion.

The LUT is derived from a set of user defined mapping points with no interpolation.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **pValues** – Pointer to an array of user defined OUTPUT values (this is a device memory pointer)
- **pLevels** – Pointer to an array of user defined INPUT values (this is a device memory pointer)
- **nLevels** – Number of user defined number of input/output mapping points (levels)
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

- NPP_LUT_NUMBER_OF_LEVELS_ERROR if the number of levels is less than 2 or greater than 256.

NppStatus **nppiLUT_8u_C1IR_Ctx**(*Npp8u* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, const *Npp32s* *pValues, const *Npp32s* *pLevels, int nLevels, *NppStreamContext* nppStreamCtx)

8-bit unsigned look-up-table in place color conversion.

The LUT is derived from a set of user defined mapping points with no interpolation.

Parameters

- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **pValues** – Pointer to an array of user defined OUTPUT values (this is a device memory pointer)
- **pLevels** – Pointer to an array of user defined INPUT values (this is a device memory pointer)
- **nLevels** – Number of user defined number of input/output mapping points (levels)
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

- NPP_LUT_NUMBER_OF_LEVELS_ERROR if the number of levels is less than 2 or greater than 256.

NppStatus **nppiLUT_8u_C3R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp32s* *pValues[3], const *Npp32s* *pLevels[3], int nLevels[3], *NppStreamContext* nppStreamCtx)

3 channel 8-bit unsigned look-up-table color conversion.

The LUT is derived from a set of user defined mapping points using no interpolation.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **pValues** – Host pointer to an array of 3 device memory pointers, one per color CHANNEL, pointing to user defined OUTPUT values.
- **pLevels** – Host pointer to an array of 3 device memory pointers, one per color CHANNEL, pointing to user defined INPUT values.
- **nLevels** – Host pointer to an array of 3 user defined number of input/output mapping points, one per color CHANNEL.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

- NPP_LUT_NUMBER_OF_LEVELS_ERROR if the number of levels is less than 2 or greater than 256.

NppStatus **nppiLUT_8u_C3IR_Ctx**(*Npp8u* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, const *Npp32s* *pValues[3], const *Npp32s* *pLevels[3], int nLevels[3], *NppStreamContext* nppStreamCtx)

3 channel 8-bit unsigned look-up-table in place color conversion.

The LUT is derived from a set of user defined mapping points with no interpolation.

Parameters

- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **pValues** – Host pointer to an array of 3 device memory pointers, one per color CHANNEL, pointing to user defined OUTPUT values.
- **pLevels** – Host pointer to an array of 3 device memory pointers, one per color CHANNEL, pointing to user defined INPUT values.
- **nLevels** – Host pointer to an array of 3 user defined number of input/output mapping points, one per color CHANNEL.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

- NPP_LUT_NUMBER_OF_LEVELS_ERROR if the number of levels is less than 2 or greater than 256.

NppStatus **nppiLUT_8u_C4R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp32s* *pValues[4], const *Npp32s* *pLevels[4], int nLevels[4], *NppStreamContext* nppStreamCtx)

4 channel 8-bit unsigned look-up-table color conversion.

The LUT is derived from a set of user defined mapping points with no interpolation.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **pValues** – Host pointer to an array of 4 device memory pointers, one per color CHANNEL, pointing to user defined OUTPUT values.
- **pLevels** – Host pointer to an array of 4 device memory pointers, one per color CHANNEL, pointing to user defined INPUT values.
- **nLevels** – Host pointer to an array of 4 user defined number of input/output mapping points, one per color CHANNEL.

- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

- NPP_LUT_NUMBER_OF_LEVELS_ERROR if the number of levels is less than 2 or greater than 256.

NppStatus **nppiLUT_8u_C4IR_Ctx**(*Npp8u* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, const *Npp32s* *pValues[4], const *Npp32s* *pLevels[4], int nLevels[4], *NppStreamContext* nppStreamCtx)

4 channel 8-bit unsigned look-up-table in place color conversion.

The LUT is derived from a set of user defined mapping points using no interpolation.

Parameters

- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **pValues** – Host pointer to an array of 4 device memory pointers, one per color CHANNEL, pointing to user defined OUTPUT values.
- **pLevels** – Host pointer to an array of 4 device memory pointers, one per color CHANNEL, pointing to user defined INPUT values.
- **nLevels** – Host pointer to an array of 4 user defined number of input/output mapping points, one per color CHANNEL.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

- NPP_LUT_NUMBER_OF_LEVELS_ERROR if the number of levels is less than 2 or greater than 256.

NppStatus **nppiLUT_8u_AC4R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp32s* *pValues[3], const *Npp32s* *pLevels[3], int nLevels[3], *NppStreamContext* nppStreamCtx)

4 channel 8-bit unsigned look-up-table color conversion, not affecting Alpha.

The LUT is derived from a set of user defined mapping points using no interpolation. Alpha channel is the last channel and is not processed.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **pValues** – Host pointer to an array of 3 device memory pointers, one per color CHANNEL, pointing to user defined OUTPUT values.

- **pLevels** – Host pointer to an array of 3 device memory pointers, one per color CHANNEL, pointing to user defined INPUT values.
- **nLevels** – Host pointer to an array of 3 user defined number of input/output mapping points, one per color CHANNEL.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

- NPP_LUT_NUMBER_OF_LEVELS_ERROR if the number of levels is less than 2 or greater than 256.

NppStatus **nppiLUT_8u_AC4IR_Ctx**(*Npp8u* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, const *Npp32s* *pValues[3], const *Npp32s* *pLevels[3], int nLevels[3], *NppStreamContext* nppStreamCtx)

4 channel 8-bit unsigned look-up-table in place color conversion, not affecting Alpha.

The LUT is derived from a set of user defined mapping points using no interpolation. Alpha channel is the last channel and is not processed.

Parameters

- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **pValues** – Host pointer to an array of 3 device memory pointers, one per color CHANNEL, pointing to user defined OUTPUT values.
- **pLevels** – Host pointer to an array of 3 device memory pointers, one per color CHANNEL, pointing to user defined INPUT values.
- **nLevels** – Host pointer to an array of 3 user defined number of input/output mapping points, one per color CHANNEL.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

- NPP_LUT_NUMBER_OF_LEVELS_ERROR if the number of levels is less than 2 or greater than 256.

NppStatus **nppiLUT_16u_C1R_Ctx**(const *Npp16u* *pSrc, int nSrcStep, *Npp16u* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp32s* *pValues, const *Npp32s* *pLevels, int nLevels, *NppStreamContext* nppStreamCtx)

16-bit unsigned look-up-table color conversion.

The LUT is derived from a set of user defined mapping points with no interpolation.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.

- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **pValues** – Pointer to an array of user defined OUTPUT values (this is a device memory pointer)
- **pLevels** – Pointer to an array of user defined INPUT values (this is a device memory pointer)
- **nLevels** – Number of user defined number of input/output mapping points (levels)
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

- NPP_LUT_NUMBER_OF_LEVELS_ERROR if the number of levels is less than 2 or greater than 1024 (the current size limit).

NppStatus **nppiLUT_16u_C1IR_Ctx**(*Npp16u* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, const *Npp32s* *pValues, const *Npp32s* *pLevels, int nLevels, *NppStreamContext* nppStreamCtx)

16-bit unsigned look-up-table in place color conversion.

The LUT is derived from a set of user defined mapping points with no interpolation.

Parameters

- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **pValues** – Pointer to an array of user defined OUTPUT values (this is a device memory pointer)
- **pLevels** – Pointer to an array of user defined INPUT values (this is a device memory pointer)
- **nLevels** – Number of user defined number of input/output mapping points (levels)
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

- NPP_LUT_NUMBER_OF_LEVELS_ERROR if the number of levels is less than 2 or greater than 1024 (the current size limit).

NppStatus **nppiLUT_16u_C3R_Ctx**(const *Npp16u* *pSrc, int nSrcStep, *Npp16u* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp32s* *pValues[3], const *Npp32s* *pLevels[3], int nLevels[3], *NppStreamContext* nppStreamCtx)

3 channel 16-bit unsigned look-up-table color conversion.

The LUT is derived from a set of user defined mapping points using no interpolation.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.

- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **pValues** – Host pointer to an array of 3 device memory pointers, one per color CHANNEL, pointing to user defined OUTPUT values.
- **pLevels** – Host pointer to an array of 3 device memory pointers, one per color CHANNEL, pointing to user defined INPUT values.
- **nLevels** – Host pointer to an array of 3 user defined number of input/output mapping points, one per color CHANNEL.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

- NPP_LUT_NUMBER_OF_LEVELS_ERROR if the number of levels is less than 2 or greater than 1024 (the current size limit).

NppStatus **nppiLUT_16u_C3IR_Ctx**(*Npp16u* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, const *Npp32s* *pValues[3], const *Npp32s* *pLevels[3], int nLevels[3], *NppStreamContext* nppStreamCtx)

3 channel 16-bit unsigned look-up-table in place color conversion.

The LUT is derived from a set of user defined mapping points with no interpolation.

Parameters

- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **pValues** – Host pointer to an array of 3 device memory pointers, one per color CHANNEL, pointing to user defined OUTPUT values.
- **pLevels** – Host pointer to an array of 3 device memory pointers, one per color CHANNEL, pointing to user defined INPUT values.
- **nLevels** – Host pointer to an array of 3 user defined number of input/output mapping points, one per color CHANNEL.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

- NPP_LUT_NUMBER_OF_LEVELS_ERROR if the number of levels is less than 2 or greater than 1024 (the current size limit).

NppStatus **nppiLUT_16u_C4R_Ctx**(const *Npp16u* *pSrc, int nSrcStep, *Npp16u* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp32s* *pValues[4], const *Npp32s* *pLevels[4], int nLevels[4], *NppStreamContext* nppStreamCtx)

4 channel 16-bit unsigned look-up-table color conversion.

The LUT is derived from a set of user defined mapping points with no interpolation.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **pValues** – Host pointer to an array of 4 device memory pointers, one per color CHANNEL, pointing to user defined OUTPUT values.
- **pLevels** – Host pointer to an array of 4 device memory pointers, one per color CHANNEL, pointing to user defined INPUT values.
- **nLevels** – Host pointer to an array of 4 user defined number of input/output mapping points, one per color CHANNEL.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

- NPP_LUT_NUMBER_OF_LEVELS_ERROR if the number of levels is less than 2 or greater than 1024 (the current size limit).

NppStatus **nppiLUT_16u_C4IR_Ctx**(*Npp16u* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, const *Npp32s* *pValues[4], const *Npp32s* *pLevels[4], int nLevels[4], *NppStreamContext* nppStreamCtx)

4 channel 16-bit unsigned look-up-table in place color conversion.

The LUT is derived from a set of user defined mapping points using no interpolation.

Parameters

- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **pValues** – Host pointer to an array of 4 device memory pointers, one per color CHANNEL, pointing to user defined OUTPUT values.
- **pLevels** – Host pointer to an array of 4 device memory pointers, one per color CHANNEL, pointing to user defined INPUT values.
- **nLevels** – Host pointer to an array of 4 user defined number of input/output mapping points, one per color CHANNEL.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

- NPP_LUT_NUMBER_OF_LEVELS_ERROR if the number of levels is less than 2 or greater than 1024 (the current size limit).

NppStatus **nppiLUT_16u_AC4R_Ctx**(const *Npp16u* *pSrc, int nSrcStep, *Npp16u* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp32s* *pValues[3], const *Npp32s* *pLevels[3], int nLevels[3], *NppStreamContext* nppStreamCtx)

4 channel 16-bit unsigned look-up-table color conversion, not affecting Alpha.

The LUT is derived from a set of user defined mapping points using no interpolation. Alpha channel is the last channel and is not processed.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **pValues** – Host pointer to an array of 3 device memory pointers, one per color CHANNEL, pointing to user defined OUTPUT values.
- **pLevels** – Host pointer to an array of 3 device memory pointers, one per color CHANNEL, pointing to user defined INPUT values.
- **nLevels** – Host pointer to an array of 3 user defined number of input/output mapping points, one per color CHANNEL.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

- NPP_LUT_NUMBER_OF_LEVELS_ERROR if the number of levels is less than 2 or greater than 1024 (the current size limit).

NppStatus **nppiLUT_16u_AC4IR_Ctx**(*Npp16u* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, const *Npp32s* *pValues[3], const *Npp32s* *pLevels[3], int nLevels[3], *NppStreamContext* nppStreamCtx)

4 channel 16-bit unsigned look-up-table in place color conversion, not affecting Alpha.

The LUT is derived from a set of user defined mapping points using no interpolation. Alpha channel is the last channel and is not processed.

Parameters

- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **pValues** – Host pointer to an array of 3 device memory pointers, one per color CHANNEL, pointing to user defined OUTPUT values.
- **pLevels** – Host pointer to an array of 3 device memory pointers, one per color CHANNEL, pointing to user defined INPUT values.
- **nLevels** – Host pointer to an array of 3 user defined number of input/output mapping points, one per color CHANNEL.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

- NPP_LUT_NUMBER_OF_LEVELS_ERROR if the number of levels is less than 2 or greater than 1024 (the current size limit).

NppStatus **nppiLUT_16s_C1R_Ctx**(const *Npp16s* *pSrc, int nSrcStep, *Npp16s* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp32s* *pValues, const *Npp32s* *pLevels, int nLevels, *NppStreamContext* nppStreamCtx)

16-bit signed look-up-table color conversion.

The LUT is derived from a set of user defined mapping points with no interpolation.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **pValues** – Pointer to an array of user defined OUTPUT values (this is a device memory pointer)
- **pLevels** – Pointer to an array of user defined INPUT values (this is a device memory pointer)
- **nLevels** – Number of user defined number of input/output mapping points (levels)
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

- NPP_LUT_NUMBER_OF_LEVELS_ERROR if the number of levels is less than 2 or greater than 1024 (the current size limit).

NppStatus **nppiLUT_16s_C1IR_Ctx**(*Npp16s* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, const *Npp32s* *pValues, const *Npp32s* *pLevels, int nLevels, *NppStreamContext* nppStreamCtx)

16-bit signed look-up-table in place color conversion.

The LUT is derived from a set of user defined mapping points with no interpolation.

Parameters

- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **pValues** – Pointer to an array of user defined OUTPUT values (this is a device memory pointer)
- **pLevels** – Pointer to an array of user defined INPUT values (this is a device memory pointer)
- **nLevels** – Number of user defined number of input/output mapping points (levels)
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

- NPP_LUT_NUMBER_OF_LEVELS_ERROR if the number of levels is less than 2 or greater than 1024 (the current size limit).

NppStatus **nppiLUT_16s_C3R_Ctx**(const *Npp16s* *pSrc, int nSrcStep, *Npp16s* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp32s* *pValues[3], const *Npp32s* *pLevels[3], int nLevels[3], *NppStreamContext* nppStreamCtx)

3 channel 16-bit signed look-up-table color conversion.

The LUT is derived from a set of user defined mapping points using no interpolation.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **pValues** – Host pointer to an array of 3 device memory pointers, one per color CHANNEL, pointing to user defined OUTPUT values.
- **pLevels** – Host pointer to an array of 3 device memory pointers, one per color CHANNEL, pointing to user defined INPUT values.
- **nLevels** – Host pointer to an array of 3 user defined number of input/output mapping points, one per color CHANNEL.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

- NPP_LUT_NUMBER_OF_LEVELS_ERROR if the number of levels is less than 2 or greater than 1024 (the current size limit).

NppStatus **nppiLUT_16s_C3IR_Ctx**(*Npp16s* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, const *Npp32s* *pValues[3], const *Npp32s* *pLevels[3], int nLevels[3], *NppStreamContext* nppStreamCtx)

3 channel 16-bit signed look-up-table in place color conversion.

The LUT is derived from a set of user defined mapping points with no interpolation.

Parameters

- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **pValues** – Host pointer to an array of 3 device memory pointers, one per color CHANNEL, pointing to user defined OUTPUT values.
- **pLevels** – Host pointer to an array of 3 device memory pointers, one per color CHANNEL, pointing to user defined INPUT values.

- **nLevels** – Host pointer to an array of 3 user defined number of input/output mapping points, one per color CHANNEL.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

- NPP_LUT_NUMBER_OF_LEVELS_ERROR if the number of levels is less than 2 or greater than 1024 (the current size limit).

NppStatus **nppiLUT_16s_C4R_Ctx**(const *Npp16s* *pSrc, int nSrcStep, *Npp16s* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp32s* *pValues[4], const *Npp32s* *pLevels[4], int nLevels[4], *NppStreamContext* nppStreamCtx)

4 channel 16-bit signed look-up-table color conversion.

The LUT is derived from a set of user defined mapping points with no interpolation.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **pValues** – Host pointer to an array of 4 device memory pointers, one per color CHANNEL, pointing to user defined OUTPUT values.
- **pLevels** – Host pointer to an array of 4 device memory pointers, one per color CHANNEL, pointing to user defined INPUT values.
- **nLevels** – Host pointer to an array of 4 user defined number of input/output mapping points, one per color CHANNEL.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

- NPP_LUT_NUMBER_OF_LEVELS_ERROR if the number of levels is less than 2 or greater than 1024 (the current size limit).

NppStatus **nppiLUT_16s_C4IR_Ctx**(*Npp16s* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, const *Npp32s* *pValues[4], const *Npp32s* *pLevels[4], int nLevels[4], *NppStreamContext* nppStreamCtx)

4 channel 16-bit signed look-up-table in place color conversion.

The LUT is derived from a set of user defined mapping points using no interpolation.

Parameters

- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.

- **pValues** – Host pointer to an array of 4 device memory pointers, one per color CHANNEL, pointing to user defined OUTPUT values.
- **pLevels** – Host pointer to an array of 4 device memory pointers, one per color CHANNEL, pointing to user defined INPUT values.
- **nLevels** – Host pointer to an array of 4 user defined number of input/output mapping points, one per color CHANNEL.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

- NPP_LUT_NUMBER_OF_LEVELS_ERROR if the number of levels is less than 2 or greater than 1024 (the current size limit).

NppStatus **nppiLUT_16s_AC4R_Ctx**(const *Npp16s* *pSrc, int nSrcStep, *Npp16s* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp32s* *pValues[3], const *Npp32s* *pLevels[3], int nLevels[3], *NppStreamContext* nppStreamCtx)

4 channel 16-bit signed look-up-table color conversion, not affecting Alpha.

The LUT is derived from a set of user defined mapping points using no interpolation. Alpha channel is the last channel and is not processed.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **pValues** – Host pointer to an array of 3 device memory pointers, one per color CHANNEL, pointing to user defined OUTPUT values.
- **pLevels** – Host pointer to an array of 3 device memory pointers, one per color CHANNEL, pointing to user defined INPUT values.
- **nLevels** – Host pointer to an array of 3 user defined number of input/output mapping points, one per color CHANNEL.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

- NPP_LUT_NUMBER_OF_LEVELS_ERROR if the number of levels is less than 2 or greater than 1024 (the current size limit).

NppStatus **nppiLUT_16s_AC4IR_Ctx**(*Npp16s* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, const *Npp32s* *pValues[3], const *Npp32s* *pLevels[3], int nLevels[3], *NppStreamContext* nppStreamCtx)

4 channel 16-bit signed look-up-table in place color conversion, not affecting Alpha.

The LUT is derived from a set of user defined mapping points using no interpolation. Alpha channel is the last channel and is not processed.

Parameters

- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **pValues** – Host pointer to an array of 3 device memory pointers, one per color CHANNEL, pointing to user defined OUTPUT values.
- **pLevels** – Host pointer to an array of 3 device memory pointers, one per color CHANNEL, pointing to user defined INPUT values.
- **nLevels** – Host pointer to an array of 3 user defined number of input/output mapping points, one per color CHANNEL.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

- NPP_LUT_NUMBER_OF_LEVELS_ERROR if the number of levels is less than 2 or greater than 1024 (the current size limit).

NppStatus **nppiLUT_32f_C1R_Ctx**(const *Npp32f* *pSrc, int nSrcStep, *Npp32f* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp32f* *pValues, const *Npp32f* *pLevels, int nLevels, *NppStreamContext* nppStreamCtx)

32-bit floating point look-up-table color conversion.

The LUT is derived from a set of user defined mapping points with no interpolation.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **pValues** – Pointer to an array of user defined OUTPUT values (this is a device memory pointer)
- **pLevels** – Pointer to an array of user defined INPUT values (this is a device memory pointer)
- **nLevels** – Number of user defined number of input/output mapping points (levels)
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

- NPP_LUT_NUMBER_OF_LEVELS_ERROR if the number of levels is less than 2 or greater than 1024 (the current size limit).

NppStatus **nppiLUT_32f_C1IR_Ctx**(*Npp32f* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, const *Npp32f* *pValues, const *Npp32f* *pLevels, int nLevels, *NppStreamContext* nppStreamCtx)

32-bit floating point look-up-table in place color conversion.

The LUT is derived from a set of user defined mapping points with no interpolation.

Parameters

- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **pValues** – Pointer to an array of user defined OUTPUT values (this is a device memory pointer)
- **pLevels** – Pointer to an array of user defined INPUT values (this is a device memory pointer)
- **nLevels** – Number of user defined number of input/output mapping points (levels)
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

- NPP_LUT_NUMBER_OF_LEVELS_ERROR if the number of levels is less than 2 or greater than 1024 (the current size limit).

NppStatus **nppiLUT_32f_C3R_Ctx**(const *Npp32f* *pSrc, int nSrcStep, *Npp32f* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp32f* *pValues[3], const *Npp32f* *pLevels[3], int nLevels[3], *NppStreamContext* nppStreamCtx)

3 channel 32-bit floating point look-up-table color conversion.

The LUT is derived from a set of user defined mapping points using no interpolation.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **pValues** – Host pointer to an array of 3 device memory pointers, one per color CHANNEL, pointing to user defined OUTPUT values.
- **pLevels** – Host pointer to an array of 3 device memory pointers, one per color CHANNEL, pointing to user defined INPUT values.
- **nLevels** – Host pointer to an array of 3 user defined number of input/output mapping points, one per color CHANNEL.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

- NPP_LUT_NUMBER_OF_LEVELS_ERROR if the number of levels is less than 2 or greater than 1024 (the current size limit).

NppStatus **nppiLUT_32f_C3IR_Ctx**(*Npp32f* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, const *Npp32f* *pValues[3], const *Npp32f* *pLevels[3], int nLevels[3], *NppStreamContext* nppStreamCtx)

3 channel 32-bit floating point look-up-table in place color conversion.

The LUT is derived from a set of user defined mapping points with no interpolation.

Parameters

- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **pValues** – Host pointer to an array of 3 device memory pointers, one per color CHANNEL, pointing to user defined OUTPUT values.
- **pLevels** – Host pointer to an array of 3 device memory pointers, one per color CHANNEL, pointing to user defined INPUT values.
- **nLevels** – Host pointer to an array of 3 user defined number of input/output mapping points, one per color CHANNEL.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

- NPP_LUT_NUMBER_OF_LEVELS_ERROR if the number of levels is less than 2 or greater than 1024 (the current size limit).

NppStatus **nppiLUT_32f_C4R_Ctx**(const *Npp32f* *pSrc, int nSrcStep, *Npp32f* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp32f* *pValues[4], const *Npp32f* *pLevels[4], int nLevels[4], *NppStreamContext* nppStreamCtx)

4 channel 32-bit floating point look-up-table color conversion.

The LUT is derived from a set of user defined mapping points with no interpolation.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **pValues** – Host pointer to an array of 4 device memory pointers, one per color CHANNEL, pointing to user defined OUTPUT values.
- **pLevels** – Host pointer to an array of 4 device memory pointers, one per color CHANNEL, pointing to user defined INPUT values.

- **nLevels** – Host pointer to an array of 4 user defined number of input/output mapping points, one per color CHANNEL.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

- NPP_LUT_NUMBER_OF_LEVELS_ERROR if the number of levels is less than 2 or greater than 1024 (the current size limit).

NppStatus **nppiLUT_32f_C4IR_Ctx**(*Npp32f* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, const *Npp32f* *pValues[4], const *Npp32f* *pLevels[4], int nLevels[4], *NppStreamContext* nppStreamCtx)

4 channel 32-bit floating point look-up-table in place color conversion.

The LUT is derived from a set of user defined mapping points using no interpolation.

Parameters

- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **pValues** – Host pointer to an array of 4 device memory pointers, one per color CHANNEL, pointing to user defined OUTPUT values.
- **pLevels** – Host pointer to an array of 4 device memory pointers, one per color CHANNEL, pointing to user defined INPUT values.
- **nLevels** – Host pointer to an array of 4 user defined number of input/output mapping points, one per color CHANNEL.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

- NPP_LUT_NUMBER_OF_LEVELS_ERROR if the number of levels is less than 2 or greater than 1024 (the current size limit).

NppStatus **nppiLUT_32f_AC4R_Ctx**(const *Npp32f* *pSrc, int nSrcStep, *Npp32f* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp32f* *pValues[3], const *Npp32f* *pLevels[3], int nLevels[3], *NppStreamContext* nppStreamCtx)

4 channel 32-bit floating point look-up-table color conversion, not affecting Alpha.

The LUT is derived from a set of user defined mapping points using no interpolation. Alpha channel is the last channel and is not processed.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.

- **pValues** – Host pointer to an array of 3 device memory pointers, one per color CHANNEL, pointing to user defined OUTPUT values.
- **pLevels** – Host pointer to an array of 3 device memory pointers, one per color CHANNEL, pointing to user defined INPUT values.
- **nLevels** – Host pointer to an array of 3 user defined number of input/output mapping points, one per color CHANNEL.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

- NPP_LUT_NUMBER_OF_LEVELS_ERROR if the number of levels is less than 2 or greater than 1024 (the current size limit).

NppStatus **nppiLUT_32f_AC4IR_Ctx**(*Npp32f* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, const *Npp32f* *pValues[3], const *Npp32f* *pLevels[3], int nLevels[3], *NppStreamContext* nppStreamCtx)

4 channel 32-bit floating point look-up-table in place color conversion, not affecting Alpha.

The LUT is derived from a set of user defined mapping points using no interpolation. Alpha channel is the last channel and is not processed.

Parameters

- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **pValues** – Host pointer to an array of 3 device memory pointers, one per color CHANNEL, pointing to user defined OUTPUT values.
- **pLevels** – Host pointer to an array of 3 device memory pointers, one per color CHANNEL, pointing to user defined INPUT values.
- **nLevels** – Host pointer to an array of 3 user defined number of input/output mapping points, one per color CHANNEL.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

- NPP_LUT_NUMBER_OF_LEVELS_ERROR if the number of levels is less than 2 or greater than 1024 (the current size limit).

1.8.1.8 ColorLUTLinear

Perform image color processing using linear interpolation between members of various types of color look up tables.

Functions

NppStatus **nppiLUT_Linear_8u_C1R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp32s* *pValues, const *Npp32s* *pLevels, int nLevels, *NppStreamContext* nppStreamCtx)

8-bit unsigned linear interpolated look-up-table color conversion.

The LUT is derived from a set of user defined mapping points through linear interpolation.

```
* >>>>>>> ATTENTION ATTENTION <<<<<<<
*
```

NOTE: As of the 5.0 release of NPP, the pValues and pLevels pointers need to be device memory pointers.

```
* >>>>>>>                       <<<<<<<
*
```

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **pValues** – Pointer to an array of user defined OUTPUT values (this is now a device memory pointer)
- **pLevels** – Pointer to an array of user defined INPUT values (this is now a device memory pointer)
- **nLevels** – Number of user defined number of input/output mapping points (levels)
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

- NPP_LUT_NUMBER_OF_LEVELS_ERROR if the number of levels is less than 2 or greater than 256.

NppStatus **nppiLUT_Linear_8u_C1IR_Ctx**(*Npp8u* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, const *Npp32s* *pValues, const *Npp32s* *pLevels, int nLevels, *NppStreamContext* nppStreamCtx)

8-bit unsigned linear interpolated look-up-table in place color conversion.

The LUT is derived from a set of user defined mapping points through linear interpolation.

Parameters

- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **pValues** – Pointer to an array of user defined OUTPUT values (this is a device memory pointer)
- **pLevels** – Pointer to an array of user defined INPUT values (this is a device memory pointer)
- **nLevels** – Number of user defined number of input/output mapping points (levels)
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

- NPP_LUT_NUMBER_OF_LEVELS_ERROR if the number of levels is less than 2 or greater than 256.

NppStatus **nppiLUT_Linear_8u_C3R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp32s* *pValues[3], const *Npp32s* *pLevels[3], int nLevels[3], *NppStreamContext* nppStreamCtx)

3 channel 8-bit unsigned linear interpolated look-up-table color conversion.

The LUT is derived from a set of user defined mapping points through linear interpolation.

```
* >>>>>>> ATTENTION ATTENTION <<<<<<<
*
```

NOTE: As of the 5.0 release of NPP, the pValues and pLevels pointers need to be host memory pointers to arrays of device memory pointers.

```
* >>>>>>>                        <<<<<<<
*
```

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **pValues** – Host pointer to an array of 3 device memory pointers, one per color CHANNEL, pointing to user defined OUTPUT values.
- **pLevels** – Host pointer to an array of 3 device memory pointers, one per color CHANNEL, pointing to user defined INPUT values.

- **nLevels** – Host pointer to an array of 3 user defined number of input/output mapping points, one per color CHANNEL.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

- NPP_LUT_NUMBER_OF_LEVELS_ERROR if the number of levels is less than 2 or greater than 256.

NppStatus **nppiLUT_Linear_8u_C3IR_Ctx**(*Npp8u* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, const *Npp32s* *pValues[3], const *Npp32s* *pLevels[3], int nLevels[3], *NppStreamContext* nppStreamCtx)

3 channel 8-bit unsigned linear interpolated look-up-table in place color conversion.

The LUT is derived from a set of user defined mapping points through linear interpolation.

Parameters

- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **pValues** – Host pointer to an array of 3 device memory pointers, one per color CHANNEL, pointing to user defined OUTPUT values.
- **pLevels** – Host pointer to an array of 3 device memory pointers, one per color CHANNEL, pointing to user defined INPUT values.
- **nLevels** – Host pointer to an array of 3 user defined number of input/output mapping points, one per color CHANNEL.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

- NPP_LUT_NUMBER_OF_LEVELS_ERROR if the number of levels is less than 2 or greater than 256.

NppStatus **nppiLUT_Linear_8u_C4R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp32s* *pValues[4], const *Npp32s* *pLevels[4], int nLevels[4], *NppStreamContext* nppStreamCtx)

4 channel 8-bit unsigned linear interpolated look-up-table color conversion.

The LUT is derived from a set of user defined mapping points through linear interpolation.

```
* >>>>>>> ATTENTION ATTENTION <<<<<<<
*
```

NOTE: As of the 5.0 release of NPP, the pValues and pLevels pointers need to be host memory pointers to arrays of device memory pointers.

```
* >>>>>>>                        <<<<<<<
*
```

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **pValues** – Host pointer to an array of 4 device memory pointers, one per color CHANNEL, pointing to user defined OUTPUT values.
- **pLevels** – Host pointer to an array of 4 device memory pointers, one per color CHANNEL, pointing to user defined INPUT values.
- **nLevels** – Host pointer to an array of 4 user defined number of input/output mapping points, one per color CHANNEL.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

- NPP_LUT_NUMBER_OF_LEVELS_ERROR if the number of levels is less than 2 or greater than 256.

NppStatus **nppiLUT_Linear_8u_C4IR_Ctx**(*Npp8u* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, const *Npp32s* *pValues[4], const *Npp32s* *pLevels[4], int nLevels[4], *NppStreamContext* nppStreamCtx)

4 channel 8-bit unsigned linear interpolated look-up-table in place color conversion.

The LUT is derived from a set of user defined mapping points through linear interpolation.

Parameters

- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **pValues** – Host pointer to an array of 4 device memory pointers, one per color CHANNEL, pointing to user defined OUTPUT values.
- **pLevels** – Host pointer to an array of 4 device memory pointers, one per color CHANNEL, pointing to user defined INPUT values.
- **nLevels** – Host pointer to an array of 4 user defined number of input/output mapping points, one per color CHANNEL.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

- NPP_LUT_NUMBER_OF_LEVELS_ERROR if the number of levels is less than 2 or greater than 256.

NppStatus **nppiLUT_Linear_8u_AC4R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp32s* *pValues[3], const *Npp32s* *pLevels[3], int nLevels[3], *NppStreamContext* nppStreamCtx)

4 channel 8-bit unsigned linear interpolated look-up-table color conversion, not affecting Alpha.

The LUT is derived from a set of user defined mapping points through linear interpolation. Alpha channel is the last channel and is not processed.

```
* >>>>>>> ATTENTION ATTENTION <<<<<<<
*
```

NOTE: As of the 5.0 release of NPP, the pValues and pLevels pointers need to be host memory pointers to arrays of device memory pointers.

```
* >>>>>>>                      <<<<<<<
*
```

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **pValues** – Host pointer to an array of 3 device memory pointers, one per color CHANNEL, pointing to user defined OUTPUT values.
- **pLevels** – Host pointer to an array of 3 device memory pointers, one per color CHANNEL, pointing to user defined INPUT values.
- **nLevels** – Host pointer to an array of 3 user defined number of input/output mapping points, one per color CHANNEL.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

- NPP_LUT_NUMBER_OF_LEVELS_ERROR if the number of levels is less than 2 or greater than 256.

NppStatus **nppiLUT_Linear_8u_AC4IR_Ctx**(*Npp8u* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, const *Npp32s* *pValues[3], const *Npp32s* *pLevels[3], int nLevels[3], *NppStreamContext* nppStreamCtx)

4 channel 8-bit unsigned linear interpolated look-up-table in place color conversion, not affecting Alpha.

The LUT is derived from a set of user defined mapping points through linear interpolation. Alpha channel is the last channel and is not processed.

Parameters

- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **pValues** – Host pointer to an array of 3 device memory pointers, one per color CHANNEL, pointing to user defined OUTPUT values.
- **pLevels** – Host pointer to an array of 3 device memory pointers, one per color CHANNEL, pointing to user defined INPUT values.
- **nLevels** – Host pointer to an array of 3 user defined number of input/output mapping points, one per color CHANNEL.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

- NPP_LUT_NUMBER_OF_LEVELS_ERROR if the number of levels is less than 2 or greater than 256.

NppStatus **nppiLUT_Linear_16u_C1R_Ctx**(const *Npp16u* *pSrc, int nSrcStep, *Npp16u* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp32s* *pValues, const *Npp32s* *pLevels, int nLevels, *NppStreamContext* nppStreamCtx)

16-bit unsigned look-up-table color conversion.

The LUT is derived from a set of user defined mapping points using linear interpolation.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **pValues** – Pointer to an array of user defined OUTPUT values (this is a device memory pointer)
- **pLevels** – Pointer to an array of user defined INPUT values (this is a device memory pointer)
- **nLevels** – Number of user defined number of input/output mapping points (levels)
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

- NPP_LUT_NUMBER_OF_LEVELS_ERROR if the number of levels is less than 2 or greater than 1024 (the current size limit).

NppStatus **nppiLUT_Linear_16u_C1IR_Ctx**(*Npp16u* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, const *Npp32s* *pValues, const *Npp32s* *pLevels, int nLevels, *NppStreamContext* nppStreamCtx)

16-bit unsigned look-up-table in place color conversion.

The LUT is derived from a set of user defined mapping points using linear interpolation.

Parameters

- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **pValues** – Pointer to an array of user defined OUTPUT values (this is a device memory pointer)
- **pLevels** – Pointer to an array of user defined INPUT values (this is a device memory pointer)
- **nLevels** – Number of user defined number of input/output mapping points (levels)
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

- NPP_LUT_NUMBER_OF_LEVELS_ERROR if the number of levels is less than 2 or greater than 1024 (the current size limit).

NppStatus **nppiLUT_Linear_16u_C3R_Ctx**(const *Npp16u* *pSrc, int nSrcStep, *Npp16u* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp32s* *pValues[3], const *Npp32s* *pLevels[3], int nLevels[3], *NppStreamContext* nppStreamCtx)

3 channel 16-bit unsigned look-up-table color conversion.

The LUT is derived from a set of user defined mapping points using no interpolation.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **pValues** – Host pointer to an array of 3 device memory pointers, one per color CHANNEL, pointing to user defined OUTPUT values.
- **pLevels** – Host pointer to an array of 3 device memory pointers, one per color CHANNEL, pointing to user defined INPUT values.
- **nLevels** – Host pointer to an array of 3 user defined number of input/output mapping points, one per color CHANNEL.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

- NPP_LUT_NUMBER_OF_LEVELS_ERROR if the number of levels is less than 2 or greater than 1024 (the current size limit).

NppStatus **nppiLUT_Linear_16u_C3IR_Ctx**(*Npp16u* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, const *Npp32s* *pValues[3], const *Npp32s* *pLevels[3], int nLevels[3], *NppStreamContext* nppStreamCtx)

3 channel 16-bit unsigned look-up-table in place color conversion.

The LUT is derived from a set of user defined mapping points using linear interpolation.

Parameters

- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **pValues** – Host pointer to an array of 3 device memory pointers, one per color CHANNEL, pointing to user defined OUTPUT values.
- **pLevels** – Host pointer to an array of 3 device memory pointers, one per color CHANNEL, pointing to user defined INPUT values.
- **nLevels** – Host pointer to an array of 3 user defined number of input/output mapping points, one per color CHANNEL.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

- NPP_LUT_NUMBER_OF_LEVELS_ERROR if the number of levels is less than 2 or greater than 1024 (the current size limit).

NppStatus **nppiLUT_Linear_16u_C4R_Ctx**(const *Npp16u* *pSrc, int nSrcStep, *Npp16u* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp32s* *pValues[4], const *Npp32s* *pLevels[4], int nLevels[4], *NppStreamContext* nppStreamCtx)

4 channel 16-bit unsigned look-up-table color conversion.

The LUT is derived from a set of user defined mapping points using linear interpolation.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **pValues** – Host pointer to an array of 4 device memory pointers, one per color CHANNEL, pointing to user defined OUTPUT values.
- **pLevels** – Host pointer to an array of 4 device memory pointers, one per color CHANNEL, pointing to user defined INPUT values.

- **nLevels** – Host pointer to an array of 4 user defined number of input/output mapping points, one per color CHANNEL.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

- NPP_LUT_NUMBER_OF_LEVELS_ERROR if the number of levels is less than 2 or greater than 1024 (the current size limit).

NppStatus **nppiLUT_Linear_16u_C4IR_Ctx**(*Npp16u* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, const *Npp32s* *pValues[4], const *Npp32s* *pLevels[4], int nLevels[4], *NppStreamContext* nppStreamCtx)

4 channel 16-bit unsigned look-up-table in place color conversion.

The LUT is derived from a set of user defined mapping points using no interpolation.

Parameters

- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **pValues** – Host pointer to an array of 4 device memory pointers, one per color CHANNEL, pointing to user defined OUTPUT values.
- **pLevels** – Host pointer to an array of 4 device memory pointers, one per color CHANNEL, pointing to user defined INPUT values.
- **nLevels** – Host pointer to an array of 4 user defined number of input/output mapping points, one per color CHANNEL.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

- NPP_LUT_NUMBER_OF_LEVELS_ERROR if the number of levels is less than 2 or greater than 1024 (the current size limit).

NppStatus **nppiLUT_Linear_16u_AC4R_Ctx**(const *Npp16u* *pSrc, int nSrcStep, *Npp16u* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp32s* *pValues[3], const *Npp32s* *pLevels[3], int nLevels[3], *NppStreamContext* nppStreamCtx)

4 channel 16-bit unsigned look-up-table color conversion, not affecting Alpha.

The LUT is derived from a set of user defined mapping points using no interpolation. Alpha channel is the last channel and is not processed.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.

- **pValues** – Host pointer to an array of 3 device memory pointers, one per color CHANNEL, pointing to user defined OUTPUT values.
- **pLevels** – Host pointer to an array of 3 device memory pointers, one per color CHANNEL, pointing to user defined INPUT values.
- **nLevels** – Host pointer to an array of 3 user defined number of input/output mapping points, one per color CHANNEL.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

- NPP_LUT_NUMBER_OF_LEVELS_ERROR if the number of levels is less than 2 or greater than 1024 (the current size limit).

NppStatus **nppiLUT_Linear_16u_AC4IR_Ctx**(*Npp16u* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, const *Npp32s* *pValues[3], const *Npp32s* *pLevels[3], int nLevels[3], *NppStreamContext* nppStreamCtx)

4 channel 16-bit unsigned look-up-table in place color conversion, not affecting Alpha.

The LUT is derived from a set of user defined mapping points using no interpolation. Alpha channel is the last channel and is not processed.

Parameters

- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **pValues** – Host pointer to an array of 3 device memory pointers, one per color CHANNEL, pointing to user defined OUTPUT values.
- **pLevels** – Host pointer to an array of 3 device memory pointers, one per color CHANNEL, pointing to user defined INPUT values.
- **nLevels** – Host pointer to an array of 3 user defined number of input/output mapping points, one per color CHANNEL.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

- NPP_LUT_NUMBER_OF_LEVELS_ERROR if the number of levels is less than 2 or greater than 1024 (the current size limit).

NppStatus **nppiLUT_Linear_16s_C1R_Ctx**(const *Npp16s* *pSrc, int nSrcStep, *Npp16s* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp32s* *pValues, const *Npp32s* *pLevels, int nLevels, *NppStreamContext* nppStreamCtx)

16-bit signed look-up-table color conversion.

The LUT is derived from a set of user defined mapping points using linear interpolation.

Parameters

- **pSrc** – *Source-Image Pointer*.

- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **pValues** – Pointer to an array of user defined OUTPUT values (this is a device memory pointer)
- **pLevels** – Pointer to an array of user defined INPUT values (this is a device memory pointer)
- **nLevels** – Number of user defined number of input/output mapping points (levels)
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

- NPP_LUT_NUMBER_OF_LEVELS_ERROR if the number of levels is less than 2 or greater than 1024 (the current size limit).

NppStatus **nppiLUT_Linear_16s_C1IR_Ctx**(*Npp16s* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, const *Npp32s* *pValues, const *Npp32s* *pLevels, int nLevels, *NppStreamContext* nppStreamCtx)

16-bit signed look-up-table in place color conversion.

The LUT is derived from a set of user defined mapping points using linear interpolation.

Parameters

- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **pValues** – Pointer to an array of user defined OUTPUT values (this is a device memory pointer)
- **pLevels** – Pointer to an array of user defined INPUT values (this is a device memory pointer)
- **nLevels** – Number of user defined number of input/output mapping points (levels)
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

- NPP_LUT_NUMBER_OF_LEVELS_ERROR if the number of levels is less than 2 or greater than 1024 (the current size limit).

NppStatus **nppiLUT_Linear_16s_C3R_Ctx**(const *Npp16s* *pSrc, int nSrcStep, *Npp16s* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp32s* *pValues[3], const *Npp32s* *pLevels[3], int nLevels[3], *NppStreamContext* nppStreamCtx)

3 channel 16-bit signed look-up-table color conversion.

The LUT is derived from a set of user defined mapping points using no interpolation.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **pValues** – Host pointer to an array of 3 device memory pointers, one per color CHANNEL, pointing to user defined OUTPUT values.
- **pLevels** – Host pointer to an array of 3 device memory pointers, one per color CHANNEL, pointing to user defined INPUT values.
- **nLevels** – Host pointer to an array of 3 user defined number of input/output mapping points, one per color CHANNEL.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

- NPP_LUT_NUMBER_OF_LEVELS_ERROR if the number of levels is less than 2 or greater than 1024 (the current size limit).

NppStatus **nppiLUT_Linear_16s_C3IR_Ctx**(*Npp16s* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, const *Npp32s* *pValues[3], const *Npp32s* *pLevels[3], int nLevels[3], *NppStreamContext* nppStreamCtx)

3 channel 16-bit signed look-up-table in place color conversion.

The LUT is derived from a set of user defined mapping points using linear interpolation.

Parameters

- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **pValues** – Host pointer to an array of 3 device memory pointers, one per color CHANNEL, pointing to user defined OUTPUT values.
- **pLevels** – Host pointer to an array of 3 device memory pointers, one per color CHANNEL, pointing to user defined INPUT values.
- **nLevels** – Host pointer to an array of 3 user defined number of input/output mapping points, one per color CHANNEL.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

- NPP_LUT_NUMBER_OF_LEVELS_ERROR if the number of levels is less than 2 or greater than 1024 (the current size limit).

NppStatus **nppiLUT_Linear_16s_C4R_Ctx**(const *Npp16s* *pSrc, int nSrcStep, *Npp16s* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp32s* *pValues[4], const *Npp32s* *pLevels[4], int nLevels[4], *NppStreamContext* nppStreamCtx)

4 channel 16-bit signed look-up-table color conversion.

The LUT is derived from a set of user defined mapping points using linear interpolation.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **pValues** – Host pointer to an array of 4 device memory pointers, one per color CHANNEL, pointing to user defined OUTPUT values.
- **pLevels** – Host pointer to an array of 4 device memory pointers, one per color CHANNEL, pointing to user defined INPUT values.
- **nLevels** – Host pointer to an array of 4 user defined number of input/output mapping points, one per color CHANNEL.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

- NPP_LUT_NUMBER_OF_LEVELS_ERROR if the number of levels is less than 2 or greater than 1024 (the current size limit).

NppStatus **nppiLUT_Linear_16s_C4IR_Ctx**(*Npp16s* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, const *Npp32s* *pValues[4], const *Npp32s* *pLevels[4], int nLevels[4], *NppStreamContext* nppStreamCtx)

4 channel 16-bit signed look-up-table in place color conversion.

The LUT is derived from a set of user defined mapping points using no interpolation.

Parameters

- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **pValues** – Host pointer to an array of 4 device memory pointers, one per color CHANNEL, pointing to user defined OUTPUT values.
- **pLevels** – Host pointer to an array of 4 device memory pointers, one per color CHANNEL, pointing to user defined INPUT values.
- **nLevels** – Host pointer to an array of 4 user defined number of input/output mapping points, one per color CHANNEL.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

- NPP_LUT_NUMBER_OF_LEVELS_ERROR if the number of levels is less than 2 or greater than 1024 (the current size limit).

NppStatus **nppiLUT_Linear_16s_AC4R_Ctx**(const *Npp16s* *pSrc, int nSrcStep, *Npp16s* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp32s* *pValues[3], const *Npp32s* *pLevels[3], int nLevels[3], *NppStreamContext* nppStreamCtx)

4 channel 16-bit signed look-up-table color conversion, not affecting Alpha.

The LUT is derived from a set of user defined mapping points using no interpolation. Alpha channel is the last channel and is not processed.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **pValues** – Host pointer to an array of 3 device memory pointers, one per color CHANNEL, pointing to user defined OUTPUT values.
- **pLevels** – Host pointer to an array of 3 device memory pointers, one per color CHANNEL, pointing to user defined INPUT values.
- **nLevels** – Host pointer to an array of 3 user defined number of input/output mapping points, one per color CHANNEL.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

- NPP_LUT_NUMBER_OF_LEVELS_ERROR if the number of levels is less than 2 or greater than 1024 (the current size limit).

NppStatus **nppiLUT_Linear_16s_AC4IR_Ctx**(*Npp16s* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, const *Npp32s* *pValues[3], const *Npp32s* *pLevels[3], int nLevels[3], *NppStreamContext* nppStreamCtx)

4 channel 16-bit signed look-up-table in place color conversion, not affecting Alpha.

The LUT is derived from a set of user defined mapping points using no interpolation. Alpha channel is the last channel and is not processed.

Parameters

- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.

- **pValues** – Host pointer to an array of 3 device memory pointers, one per color CHANNEL, pointing to user defined OUTPUT values.
- **pLevels** – Host pointer to an array of 3 device memory pointers, one per color CHANNEL, pointing to user defined INPUT values.
- **nLevels** – Host pointer to an array of 3 user defined number of input/output mapping points, one per color CHANNEL.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

- NPP_LUT_NUMBER_OF_LEVELS_ERROR if the number of levels is less than 2 or greater than 1024 (the current size limit).

NppStatus **nppiLUT_Linear_32f_C1R_Ctx**(const *Npp32f* *pSrc, int nSrcStep, *Npp32f* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp32f* *pValues, const *Npp32f* *pLevels, int nLevels, *NppStreamContext* nppStreamCtx)

32-bit floating point look-up-table color conversion.

The LUT is derived from a set of user defined mapping points using linear interpolation.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **pValues** – Pointer to an array of user defined OUTPUT values (this is a device memory pointer)
- **pLevels** – Pointer to an array of user defined INPUT values (this is a device memory pointer)
- **nLevels** – Number of user defined number of input/output mapping points (levels)
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

- NPP_LUT_NUMBER_OF_LEVELS_ERROR if the number of levels is less than 2 or greater than 1024 (the current size limit).

NppStatus **nppiLUT_Linear_32f_C1IR_Ctx**(*Npp32f* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, const *Npp32f* *pValues, const *Npp32f* *pLevels, int nLevels, *NppStreamContext* nppStreamCtx)

32-bit floating point look-up-table in place color conversion.

The LUT is derived from a set of user defined mapping points using linear interpolation.

Parameters

- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **pValues** – Pointer to an array of user defined OUTPUT values (this is a device memory pointer)
- **pLevels** – Pointer to an array of user defined INPUT values (this is a device memory pointer)
- **nLevels** – Number of user defined number of input/output mapping points (levels)
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

- NPP_LUT_NUMBER_OF_LEVELS_ERROR if the number of levels is less than 2 or greater than 1024 (the current size limit).

NppStatus **nppiLUT_Linear_32f_C3R_Ctx**(const *Npp32f* *pSrc, int nSrcStep, *Npp32f* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp32f* *pValues[3], const *Npp32f* *pLevels[3], int nLevels[3], *NppStreamContext* nppStreamCtx)

3 channel 32-bit floating point look-up-table color conversion.

The LUT is derived from a set of user defined mapping points using no interpolation.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **pValues** – Host pointer to an array of 3 device memory pointers, one per color CHANNEL, pointing to user defined OUTPUT values.
- **pLevels** – Host pointer to an array of 3 device memory pointers, one per color CHANNEL, pointing to user defined INPUT values.
- **nLevels** – Host pointer to an array of 3 user defined number of input/output mapping points, one per color CHANNEL.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

- NPP_LUT_NUMBER_OF_LEVELS_ERROR if the number of levels is less than 2 or greater than 1024 (the current size limit).

NppStatus **nppiLUT_Linear_32f_C3IR_Ctx**(*Npp32f* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, const *Npp32f* *pValues[3], const *Npp32f* *pLevels[3], int nLevels[3], *NppStreamContext* nppStreamCtx)

3 channel 32-bit floating point look-up-table in place color conversion.

The LUT is derived from a set of user defined mapping points using linear interpolation.

Parameters

- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **pValues** – Host pointer to an array of 3 device memory pointers, one per color CHANNEL, pointing to user defined OUTPUT values.
- **pLevels** – Host pointer to an array of 3 device memory pointers, one per color CHANNEL, pointing to user defined INPUT values.
- **nLevels** – Host pointer to an array of 3 user defined number of input/output mapping points, one per color CHANNEL.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

- NPP_LUT_NUMBER_OF_LEVELS_ERROR if the number of levels is less than 2 or greater than 1024 (the current size limit).

NppStatus **nppiLUT_Linear_32f_C4R_Ctx**(const *Npp32f* *pSrc, int nSrcStep, *Npp32f* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp32f* *pValues[4], const *Npp32f* *pLevels[4], int nLevels[4], *NppStreamContext* nppStreamCtx)

4 channel 32-bit floating point look-up-table color conversion.

The LUT is derived from a set of user defined mapping points using linear interpolation.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **pValues** – Host pointer to an array of 4 device memory pointers, one per color CHANNEL, pointing to user defined OUTPUT values.
- **pLevels** – Host pointer to an array of 4 device memory pointers, one per color CHANNEL, pointing to user defined INPUT values.
- **nLevels** – Host pointer to an array of 4 user defined number of input/output mapping points, one per color CHANNEL.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

- NPP_LUT_NUMBER_OF_LEVELS_ERROR if the number of levels is less than 2 or greater than 1024 (the current size limit).

NppStatus **nppiLUT_Linear_32f_C4IR_Ctx**(*Npp32f* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, const *Npp32f* *pValues[4], const *Npp32f* *pLevels[4], int nLevels[4], *NppStreamContext* nppStreamCtx)

4 channel 32-bit floating point look-up-table in place color conversion.

The LUT is derived from a set of user defined mapping points using no interpolation.

Parameters

- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **pValues** – Host pointer to an array of 4 device memory pointers, one per color CHANNEL, pointing to user defined OUTPUT values.
- **pLevels** – Host pointer to an array of 4 device memory pointers, one per color CHANNEL, pointing to user defined INPUT values.
- **nLevels** – Host pointer to an array of 4 user defined number of input/output mapping points, one per color CHANNEL.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

- NPP_LUT_NUMBER_OF_LEVELS_ERROR if the number of levels is less than 2 or greater than 1024 (the current size limit).

NppStatus **nppiLUT_Linear_32f_AC4R_Ctx**(const *Npp32f* *pSrc, int nSrcStep, *Npp32f* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp32f* *pValues[3], const *Npp32f* *pLevels[3], int nLevels[3], *NppStreamContext* nppStreamCtx)

4 channel 32-bit floating point look-up-table color conversion, not affecting Alpha.

The LUT is derived from a set of user defined mapping points using no interpolation. Alpha channel is the last channel and is not processed.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **pValues** – Host pointer to an array of 3 device memory pointers, one per color CHANNEL, pointing to user defined OUTPUT values.
- **pLevels** – Host pointer to an array of 3 device memory pointers, one per color CHANNEL, pointing to user defined INPUT values.

- **nLevels** – Host pointer to an array of 3 user defined number of input/output mapping points, one per color CHANNEL.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

- NPP_LUT_NUMBER_OF_LEVELS_ERROR if the number of levels is less than 2 or greater than 1024 (the current size limit).

NppStatus **nppiLUT_Linear_32f_AC4IR_Ctx**(*Npp32f* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, const *Npp32f* *pValues[3], const *Npp32f* *pLevels[3], int nLevels[3], *NppStreamContext* nppStreamCtx)

4 channel 32-bit floating point look-up-table in place color conversion, not affecting Alpha.

The LUT is derived from a set of user defined mapping points using no interpolation. Alpha channel is the last channel and is not processed.

Parameters

- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **pValues** – Host pointer to an array of 3 device memory pointers, one per color CHANNEL, pointing to user defined OUTPUT values.
- **pLevels** – Host pointer to an array of 3 device memory pointers, one per color CHANNEL, pointing to user defined INPUT values.
- **nLevels** – Host pointer to an array of 3 user defined number of input/output mapping points, one per color CHANNEL.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

- NPP_LUT_NUMBER_OF_LEVELS_ERROR if the number of levels is less than 2 or greater than 1024 (the current size limit).

1.8.1.9 ColorLUTCubic

Perform image color processing using linear interpolation between members of various types of color look up tables.

Functions

NppStatus **nppiLUT_Cubic_8u_C1R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp32s* *pValues, const *Npp32s* *pLevels, int nLevels, *NppStreamContext* nppStreamCtx)

8-bit unsigned cubic interpolated look-up-table color conversion.

The LUT is derived from a set of user defined mapping points through cubic interpolation.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **pValues** – Pointer to an array of user defined OUTPUT values (this is a device memory pointer)
- **pLevels** – Pointer to an array of user defined INPUT values (this is a device memory pointer)
- **nLevels** – Number of user defined number of input/output mapping points (levels)
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

- NPP_LUT_NUMBER_OF_LEVELS_ERROR if the number of levels is less than 2 or greater than 256.

NppStatus **nppiLUT_Cubic_8u_C1IR_Ctx**(*Npp8u* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, const *Npp32s* *pValues, const *Npp32s* *pLevels, int nLevels, *NppStreamContext* nppStreamCtx)

8-bit unsigned cubic interpolated look-up-table in place color conversion.

The LUT is derived from a set of user defined mapping points through cubic interpolation.

Parameters

- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **pValues** – Pointer to an array of user defined OUTPUT values (this is a device memory pointer)
- **pLevels** – Pointer to an array of user defined INPUT values (this is a device memory pointer)
- **nLevels** – Number of user defined number of input/output mapping points (levels)

- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

- NPP_LUT_NUMBER_OF_LEVELS_ERROR if the number of levels is less than 2 or greater than 256.

NppStatus **nppiLUT_Cubic_8u_C3R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp32s* *pValues[3], const *Npp32s* *pLevels[3], int nLevels[3], *NppStreamContext* nppStreamCtx)

3 channel 8-bit unsigned cubic interpolated look-up-table color conversion.

The LUT is derived from a set of user defined mapping points through cubic interpolation.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **pValues** – Host pointer to an array of 3 device memory pointers, one per color CHANNEL, pointing to user defined OUTPUT values.
- **pLevels** – Host pointer to an array of 3 device memory pointers, one per color CHANNEL, pointing to user defined INPUT values.
- **nLevels** – Host pointer to an array of 3 user defined number of input/output mapping points, one per color CHANNEL.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

- NPP_LUT_NUMBER_OF_LEVELS_ERROR if the number of levels is less than 2 or greater than 256.

NppStatus **nppiLUT_Cubic_8u_C3IR_Ctx**(*Npp8u* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, const *Npp32s* *pValues[3], const *Npp32s* *pLevels[3], int nLevels[3], *NppStreamContext* nppStreamCtx)

3 channel 8-bit unsigned cubic interpolated look-up-table in place color conversion.

The LUT is derived from a set of user defined mapping points through cubic interpolation.

Parameters

- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **pValues** – Host pointer to an array of 3 device memory pointers, one per color CHANNEL, pointing to user defined OUTPUT values.

- **pLevels** – Host pointer to an array of 3 device memory pointers, one per color CHANNEL, pointing to user defined INPUT values.
- **nLevels** – Host pointer to an array of 3 user defined number of input/output mapping points, one per color CHANNEL.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

- NPP_LUT_NUMBER_OF_LEVELS_ERROR if the number of levels is less than 2 or greater than 256.

NppStatus **nppiLUT_Cubic_8u_C4R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp32s* *pValues[4], const *Npp32s* *pLevels[4], int nLevels[4], *NppStreamContext* nppStreamCtx)

4 channel 8-bit unsigned cubic interpolated look-up-table color conversion.

The LUT is derived from a set of user defined mapping points through cubic interpolation.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **pValues** – Host pointer to an array of 4 device memory pointers, one per color CHANNEL, pointing to user defined OUTPUT values.
- **pLevels** – Host pointer to an array of 4 device memory pointers, one per color CHANNEL, pointing to user defined INPUT values.
- **nLevels** – Host pointer to an array of 4 user defined number of input/output mapping points, one per color CHANNEL.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

- NPP_LUT_NUMBER_OF_LEVELS_ERROR if the number of levels is less than 2 or greater than 256.

NppStatus **nppiLUT_Cubic_8u_C4IR_Ctx**(*Npp8u* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, const *Npp32s* *pValues[4], const *Npp32s* *pLevels[4], int nLevels[4], *NppStreamContext* nppStreamCtx)

4 channel 8-bit unsigned cubic interpolated look-up-table in place color conversion.

The LUT is derived from a set of user defined mapping points through cubic interpolation.

Parameters

- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.

- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **pValues** – Host pointer to an array of 4 device memory pointers, one per color CHANNEL, pointing to user defined OUTPUT values.
- **pLevels** – Host pointer to an array of 4 device memory pointers, one per color CHANNEL, pointing to user defined INPUT values.
- **nLevels** – Host pointer to an array of 4 user defined number of input/output mapping points, one per color CHANNEL.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

- NPP_LUT_NUMBER_OF_LEVELS_ERROR if the number of levels is less than 2 or greater than 256.

NppStatus **nppiLUT_Cubic_8u_AC4R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp32s* *pValues[3], const *Npp32s* *pLevels[3], int nLevels[3], *NppStreamContext* nppStreamCtx)

4 channel 8-bit unsigned cubic interpolated look-up-table color conversion, not affecting Alpha.

The LUT is derived from a set of user defined mapping points through cubic interpolation. Alpha channel is the last channel and is not processed.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **pValues** – Host pointer to an array of 3 device memory pointers, one per color CHANNEL, pointing to user defined OUTPUT values.
- **pLevels** – Host pointer to an array of 3 device memory pointers, one per color CHANNEL, pointing to user defined INPUT values.
- **nLevels** – Host pointer to an array of 3 user defined number of input/output mapping points, one per color CHANNEL.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

- NPP_LUT_NUMBER_OF_LEVELS_ERROR if the number of levels is less than 2 or greater than 256.

NppStatus **nppiLUT_Cubic_8u_AC4IR_Ctx**(*Npp8u* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, const *Npp32s* *pValues[3], const *Npp32s* *pLevels[3], int nLevels[3], *NppStreamContext* nppStreamCtx)

4 channel 8-bit unsigned cubic interpolated look-up-table in place color conversion, not affecting Alpha.

The LUT is derived from a set of user defined mapping points through cubic interpolation. Alpha channel is the last channel and is not processed.

Parameters

- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **pValues** – Host pointer to an array of 3 device memory pointers, one per color CHANNEL, pointing to user defined OUTPUT values.
- **pLevels** – Host pointer to an array of 3 device memory pointers, one per color CHANNEL, pointing to user defined INPUT values.
- **nLevels** – Host pointer to an array of 3 user defined number of input/output mapping points, one per color CHANNEL.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

- NPP_LUT_NUMBER_OF_LEVELS_ERROR if the number of levels is less than 2 or greater than 256.

NppStatus **nppiLUT_Cubic_16u_C1R_Ctx**(const *Npp16u* *pSrc, int nSrcStep, *Npp16u* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp32s* *pValues, const *Npp32s* *pLevels, int nLevels, *NppStreamContext* nppStreamCtx)

16-bit unsigned look-up-table color conversion.

The LUT is derived from a set of user defined mapping points through cubic interpolation.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **pValues** – Pointer to an array of user defined OUTPUT values (this is a device memory pointer)
- **pLevels** – Pointer to an array of user defined INPUT values (this is a device memory pointer)
- **nLevels** – Number of user defined number of input/output mapping points (levels)
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

- NPP_LUT_NUMBER_OF_LEVELS_ERROR if the number of levels is less than 2 or greater than 1024 (the current size limit).

NppStatus **nppiLUT_Cubic_16u_C1IR_Ctx**(*Npp16u* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, const *Npp32s* *pValues, const *Npp32s* *pLevels, int nLevels, *NppStreamContext* nppStreamCtx)

16-bit unsigned look-up-table in place color conversion.

The LUT is derived from a set of user defined mapping points through cubic interpolation.

Parameters

- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **pValues** – Pointer to an array of user defined OUTPUT values (this is a device memory pointer)
- **pLevels** – Pointer to an array of user defined INPUT values (this is a device memory pointer)
- **nLevels** – Number of user defined number of input/output mapping points (levels)
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

- NPP_LUT_NUMBER_OF_LEVELS_ERROR if the number of levels is less than 2 or greater than 1024 (the current size limit).

NppStatus **nppiLUT_Cubic_16u_C3R_Ctx**(const *Npp16u* *pSrc, int nSrcStep, *Npp16u* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp32s* *pValues[3], const *Npp32s* *pLevels[3], int nLevels[3], *NppStreamContext* nppStreamCtx)

3 channel 16-bit unsigned look-up-table color conversion.

The LUT is derived from a set of user defined mapping points using no interpolation.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **pValues** – Host pointer to an array of 3 device memory pointers, one per color CHANNEL, pointing to user defined OUTPUT values.
- **pLevels** – Host pointer to an array of 3 device memory pointers, one per color CHANNEL, pointing to user defined INPUT values.
- **nLevels** – Host pointer to an array of 3 user defined number of input/output mapping points, one per color CHANNEL.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

- NPP_LUT_NUMBER_OF_LEVELS_ERROR if the number of levels is less than 2 or greater than 1024 (the current size limit).

NppStatus **nppiLUT_Cubic_16u_C3IR_Ctx**(*Npp16u* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, const *Npp32s* *pValues[3], const *Npp32s* *pLevels[3], int nLevels[3], *NppStreamContext* nppStreamCtx)

3 channel 16-bit unsigned look-up-table in place color conversion.

The LUT is derived from a set of user defined mapping points through cubic interpolation.

Parameters

- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **pValues** – Host pointer to an array of 3 device memory pointers, one per color CHANNEL, pointing to user defined OUTPUT values.
- **pLevels** – Host pointer to an array of 3 device memory pointers, one per color CHANNEL, pointing to user defined INPUT values.
- **nLevels** – Host pointer to an array of 3 user defined number of input/output mapping points, one per color CHANNEL.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

- NPP_LUT_NUMBER_OF_LEVELS_ERROR if the number of levels is less than 2 or greater than 1024 (the current size limit).

NppStatus **nppiLUT_Cubic_16u_C4R_Ctx**(const *Npp16u* *pSrc, int nSrcStep, *Npp16u* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp32s* *pValues[4], const *Npp32s* *pLevels[4], int nLevels[4], *NppStreamContext* nppStreamCtx)

4 channel 16-bit unsigned look-up-table color conversion.

The LUT is derived from a set of user defined mapping points through cubic interpolation.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **pValues** – Host pointer to an array of 4 device memory pointers, one per color CHANNEL, pointing to user defined OUTPUT values.
- **pLevels** – Host pointer to an array of 4 device memory pointers, one per color CHANNEL, pointing to user defined INPUT values.

- **nLevels** – Host pointer to an array of 4 user defined number of input/output mapping points, one per color CHANNEL.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

- NPP_LUT_NUMBER_OF_LEVELS_ERROR if the number of levels is less than 2 or greater than 1024 (the current size limit).

NppStatus **nppiLUT_Cubic_16u_C4IR_Ctx**(*Npp16u* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, const *Npp32s* *pValues[4], const *Npp32s* *pLevels[4], int nLevels[4], *NppStreamContext* nppStreamCtx)

4 channel 16-bit unsigned look-up-table in place color conversion.

The LUT is derived from a set of user defined mapping points using no interpolation.

Parameters

- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **pValues** – Host pointer to an array of 4 device memory pointers, one per color CHANNEL, pointing to user defined OUTPUT values.
- **pLevels** – Host pointer to an array of 4 device memory pointers, one per color CHANNEL, pointing to user defined INPUT values.
- **nLevels** – Host pointer to an array of 4 user defined number of input/output mapping points, one per color CHANNEL.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

- NPP_LUT_NUMBER_OF_LEVELS_ERROR if the number of levels is less than 2 or greater than 1024 (the current size limit).

NppStatus **nppiLUT_Cubic_16u_AC4R_Ctx**(const *Npp16u* *pSrc, int nSrcStep, *Npp16u* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp32s* *pValues[3], const *Npp32s* *pLevels[3], int nLevels[3], *NppStreamContext* nppStreamCtx)

4 channel 16-bit unsigned look-up-table color conversion, not affecting Alpha.

The LUT is derived from a set of user defined mapping points using no interpolation. Alpha channel is the last channel and is not processed.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.

- **pValues** – Host pointer to an array of 3 device memory pointers, one per color CHANNEL, pointing to user defined OUTPUT values.
- **pLevels** – Host pointer to an array of 3 device memory pointers, one per color CHANNEL, pointing to user defined INPUT values.
- **nLevels** – Host pointer to an array of 3 user defined number of input/output mapping points, one per color CHANNEL.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

- NPP_LUT_NUMBER_OF_LEVELS_ERROR if the number of levels is less than 2 or greater than 1024 (the current size limit).

NppStatus **nppiLUT_Cubic_16u_AC4IR_Ctx**(*Npp16u* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, const *Npp32s* *pValues[3], const *Npp32s* *pLevels[3], int nLevels[3], *NppStreamContext* nppStreamCtx)

4 channel 16-bit unsigned look-up-table in place color conversion, not affecting Alpha.

The LUT is derived from a set of user defined mapping points using no interpolation. Alpha channel is the last channel and is not processed.

Parameters

- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **pValues** – Host pointer to an array of 3 device memory pointers, one per color CHANNEL, pointing to user defined OUTPUT values.
- **pLevels** – Host pointer to an array of 3 device memory pointers, one per color CHANNEL, pointing to user defined INPUT values.
- **nLevels** – Host pointer to an array of 3 user defined number of input/output mapping points, one per color CHANNEL.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

- NPP_LUT_NUMBER_OF_LEVELS_ERROR if the number of levels is less than 2 or greater than 1024 (the current size limit).

NppStatus **nppiLUT_Cubic_16s_C1R_Ctx**(const *Npp16s* *pSrc, int nSrcStep, *Npp16s* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp32s* *pValues, const *Npp32s* *pLevels, int nLevels, *NppStreamContext* nppStreamCtx)

16-bit signed look-up-table color conversion.

The LUT is derived from a set of user defined mapping points through cubic interpolation.

Parameters

- **pSrc** – *Source-Image Pointer*.

- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **pValues** – Pointer to an array of user defined OUTPUT values (this is a device memory pointer)
- **pLevels** – Pointer to an array of user defined INPUT values (this is a device memory pointer)
- **nLevels** – Number of user defined number of input/output mapping points (levels)
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

- NPP_LUT_NUMBER_OF_LEVELS_ERROR if the number of levels is less than 2 or greater than 1024 (the current size limit).

NppStatus **nppiLUT_Cubic_16s_C1IR_Ctx**(*Npp16s* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, const *Npp32s* *pValues, const *Npp32s* *pLevels, int nLevels, *NppStreamContext* nppStreamCtx)

16-bit signed look-up-table in place color conversion.

The LUT is derived from a set of user defined mapping points through cubic interpolation.

Parameters

- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **pValues** – Pointer to an array of user defined OUTPUT values (this is a device memory pointer)
- **pLevels** – Pointer to an array of user defined INPUT values (this is a device memory pointer)
- **nLevels** – Number of user defined number of input/output mapping points (levels)
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

- NPP_LUT_NUMBER_OF_LEVELS_ERROR if the number of levels is less than 2 or greater than 1024 (the current size limit).

NppStatus **nppiLUT_Cubic_16s_C3R_Ctx**(const *Npp16s* *pSrc, int nSrcStep, *Npp16s* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp32s* *pValues[3], const *Npp32s* *pLevels[3], int nLevels[3], *NppStreamContext* nppStreamCtx)

3 channel 16-bit signed look-up-table color conversion.

The LUT is derived from a set of user defined mapping points using no interpolation.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **pValues** – Host pointer to an array of 3 device memory pointers, one per color CHANNEL, pointing to user defined OUTPUT values.
- **pLevels** – Host pointer to an array of 3 device memory pointers, one per color CHANNEL, pointing to user defined INPUT values.
- **nLevels** – Host pointer to an array of 3 user defined number of input/output mapping points, one per color CHANNEL.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

- NPP_LUT_NUMBER_OF_LEVELS_ERROR if the number of levels is less than 2 or greater than 1024 (the current size limit).

NppStatus **nppiLUT_Cubic_16s_C3IR_Ctx**(*Npp16s* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, const *Npp32s* *pValues[3], const *Npp32s* *pLevels[3], int nLevels[3], *NppStreamContext* nppStreamCtx)

3 channel 16-bit signed look-up-table in place color conversion.

The LUT is derived from a set of user defined mapping points through cubic interpolation.

Parameters

- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **pValues** – Host pointer to an array of 3 device memory pointers, one per color CHANNEL, pointing to user defined OUTPUT values.
- **pLevels** – Host pointer to an array of 3 device memory pointers, one per color CHANNEL, pointing to user defined INPUT values.
- **nLevels** – Host pointer to an array of 3 user defined number of input/output mapping points, one per color CHANNEL.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

- NPP_LUT_NUMBER_OF_LEVELS_ERROR if the number of levels is less than 2 or greater than 1024 (the current size limit).

NppStatus **nppiLUT_Cubic_16s_C4R_Ctx**(const *Npp16s* *pSrc, int nSrcStep, *Npp16s* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp32s* *pValues[4], const *Npp32s* *pLevels[4], int nLevels[4], *NppStreamContext* nppStreamCtx)

4 channel 16-bit signed look-up-table color conversion.

The LUT is derived from a set of user defined mapping points through cubic interpolation.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **pValues** – Host pointer to an array of 4 device memory pointers, one per color CHANNEL, pointing to user defined OUTPUT values.
- **pLevels** – Host pointer to an array of 4 device memory pointers, one per color CHANNEL, pointing to user defined INPUT values.
- **nLevels** – Host pointer to an array of 4 user defined number of input/output mapping points, one per color CHANNEL.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

- NPP_LUT_NUMBER_OF_LEVELS_ERROR if the number of levels is less than 2 or greater than 1024 (the current size limit).

NppStatus **nppiLUT_Cubic_16s_C4IR_Ctx**(*Npp16s* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, const *Npp32s* *pValues[4], const *Npp32s* *pLevels[4], int nLevels[4], *NppStreamContext* nppStreamCtx)

4 channel 16-bit signed look-up-table in place color conversion.

The LUT is derived from a set of user defined mapping points using no interpolation.

Parameters

- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **pValues** – Host pointer to an array of 4 device memory pointers, one per color CHANNEL, pointing to user defined OUTPUT values.
- **pLevels** – Host pointer to an array of 4 device memory pointers, one per color CHANNEL, pointing to user defined INPUT values.
- **nLevels** – Host pointer to an array of 4 user defined number of input/output mapping points, one per color CHANNEL.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

- NPP_LUT_NUMBER_OF_LEVELS_ERROR if the number of levels is less than 2 or greater than 1024 (the current size limit).

NppStatus **nppiLUT_Cubic_16s_AC4R_Ctx**(const *Npp16s* *pSrc, int nSrcStep, *Npp16s* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp32s* *pValues[3], const *Npp32s* *pLevels[3], int nLevels[3], *NppStreamContext* nppStreamCtx)

4 channel 16-bit signed look-up-table color conversion, not affecting Alpha.

The LUT is derived from a set of user defined mapping points using no interpolation. Alpha channel is the last channel and is not processed.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **pValues** – Host pointer to an array of 3 device memory pointers, one per color CHANNEL, pointing to user defined OUTPUT values.
- **pLevels** – Host pointer to an array of 3 device memory pointers, one per color CHANNEL, pointing to user defined INPUT values.
- **nLevels** – Host pointer to an array of 3 user defined number of input/output mapping points, one per color CHANNEL.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

- NPP_LUT_NUMBER_OF_LEVELS_ERROR if the number of levels is less than 2 or greater than 1024 (the current size limit).

NppStatus **nppiLUT_Cubic_16s_AC4IR_Ctx**(*Npp16s* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, const *Npp32s* *pValues[3], const *Npp32s* *pLevels[3], int nLevels[3], *NppStreamContext* nppStreamCtx)

4 channel 16-bit signed look-up-table in place color conversion, not affecting Alpha.

The LUT is derived from a set of user defined mapping points using no interpolation. Alpha channel is the last channel and is not processed.

Parameters

- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **pValues** – Host pointer to an array of 3 device memory pointers, one per color CHANNEL, pointing to user defined OUTPUT values.

- **pLevels** – Host pointer to an array of 3 device memory pointers, one per color CHANNEL, pointing to user defined INPUT values.
- **nLevels** – Host pointer to an array of 3 user defined number of input/output mapping points, one per color CHANNEL.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

- NPP_LUT_NUMBER_OF_LEVELS_ERROR if the number of levels is less than 2 or greater than 1024 (the current size limit).

NppStatus **nppiLUT_Cubic_32f_C1R_Ctx**(const *Npp32f* *pSrc, int nSrcStep, *Npp32f* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp32f* *pValues, const *Npp32f* *pLevels, int nLevels, *NppStreamContext* nppStreamCtx)

32-bit floating point look-up-table color conversion.

The LUT is derived from a set of user defined mapping points through cubic interpolation.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **pValues** – Pointer to an array of user defined OUTPUT values (this is a device memory pointer)
- **pLevels** – Pointer to an array of user defined INPUT values (this is a device memory pointer)
- **nLevels** – Number of user defined number of input/output mapping points (levels)
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

- NPP_LUT_NUMBER_OF_LEVELS_ERROR if the number of levels is less than 2 or greater than 1024 (the current size limit).

NppStatus **nppiLUT_Cubic_32f_C1IR_Ctx**(*Npp32f* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, const *Npp32f* *pValues, const *Npp32f* *pLevels, int nLevels, *NppStreamContext* nppStreamCtx)

32-bit floating point look-up-table in place color conversion.

The LUT is derived from a set of user defined mapping points through cubic interpolation.

Parameters

- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.

- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **pValues** – Pointer to an array of user defined OUTPUT values (this is a device memory pointer)
- **pLevels** – Pointer to an array of user defined INPUT values (this is a device memory pointer)
- **nLevels** – Number of user defined number of input/output mapping points (levels)
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

- NPP_LUT_NUMBER_OF_LEVELS_ERROR if the number of levels is less than 2 or greater than 1024 (the current size limit).

NppStatus **nppiLUT_Cubic_32f_C3R_Ctx**(const *Npp32f* *pSrc, int nSrcStep, *Npp32f* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp32f* *pValues[3], const *Npp32f* *pLevels[3], int nLevels[3], *NppStreamContext* nppStreamCtx)

3 channel 32-bit floating point look-up-table color conversion.

The LUT is derived from a set of user defined mapping points using no interpolation.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **pValues** – Host pointer to an array of 3 device memory pointers, one per color CHANNEL, pointing to user defined OUTPUT values.
- **pLevels** – Host pointer to an array of 3 device memory pointers, one per color CHANNEL, pointing to user defined INPUT values.
- **nLevels** – Host pointer to an array of 3 user defined number of input/output mapping points, one per color CHANNEL.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

- NPP_LUT_NUMBER_OF_LEVELS_ERROR if the number of levels is less than 2 or greater than 1024 (the current size limit).

NppStatus **nppiLUT_Cubic_32f_C3IR_Ctx**(*Npp32f* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, const *Npp32f* *pValues[3], const *Npp32f* *pLevels[3], int nLevels[3], *NppStreamContext* nppStreamCtx)

3 channel 32-bit floating point look-up-table in place color conversion.

The LUT is derived from a set of user defined mapping points through cubic interpolation.

Parameters

- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **pValues** – Host pointer to an array of 3 device memory pointers, one per color CHANNEL, pointing to user defined OUTPUT values.
- **pLevels** – Host pointer to an array of 3 device memory pointers, one per color CHANNEL, pointing to user defined INPUT values.
- **nLevels** – Host pointer to an array of 3 user defined number of input/output mapping points, one per color CHANNEL.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

- NPP_LUT_NUMBER_OF_LEVELS_ERROR if the number of levels is less than 2 or greater than 1024 (the current size limit).

NppStatus **nppiLUT_Cubic_32f_C4R_Ctx**(const *Npp32f* *pSrc, int nSrcStep, *Npp32f* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp32f* *pValues[4], const *Npp32f* *pLevels[4], int nLevels[4], *NppStreamContext* nppStreamCtx)

4 channel 32-bit floating point look-up-table color conversion.

The LUT is derived from a set of user defined mapping points through cubic interpolation.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **pValues** – Host pointer to an array of 4 device memory pointers, one per color CHANNEL, pointing to user defined OUTPUT values.
- **pLevels** – Host pointer to an array of 4 device memory pointers, one per color CHANNEL, pointing to user defined INPUT values.
- **nLevels** – Host pointer to an array of 4 user defined number of input/output mapping points, one per color CHANNEL.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

- NPP_LUT_NUMBER_OF_LEVELS_ERROR if the number of levels is less than 2 or greater than 1024 (the current size limit).

NppStatus **nppiLUT_Cubic_32f_C4IR_Ctx**(*Npp32f* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, const *Npp32f* *pValues[4], const *Npp32f* *pLevels[4], int nLevels[4], *NppStreamContext* nppStreamCtx)

4 channel 32-bit floating point look-up-table in place color conversion.

The LUT is derived from a set of user defined mapping points using no interpolation.

Parameters

- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **pValues** – Host pointer to an array of 4 device memory pointers, one per color CHANNEL, pointing to user defined OUTPUT values.
- **pLevels** – Host pointer to an array of 4 device memory pointers, one per color CHANNEL, pointing to user defined INPUT values.
- **nLevels** – Host pointer to an array of 4 user defined number of input/output mapping points, one per color CHANNEL.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

- NPP_LUT_NUMBER_OF_LEVELS_ERROR if the number of levels is less than 2 or greater than 1024 (the current size limit).

NppStatus **nppiLUT_Cubic_32f_AC4R_Ctx**(const *Npp32f* *pSrc, int nSrcStep, *Npp32f* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp32f* *pValues[3], const *Npp32f* *pLevels[3], int nLevels[3], *NppStreamContext* nppStreamCtx)

4 channel 32-bit floating point look-up-table color conversion, not affecting Alpha.

The LUT is derived from a set of user defined mapping points using no interpolation. Alpha channel is the last channel and is not processed.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **pValues** – Host pointer to an array of 3 device memory pointers, one per color CHANNEL, pointing to user defined OUTPUT values.
- **pLevels** – Host pointer to an array of 3 device memory pointers, one per color CHANNEL, pointing to user defined INPUT values.
- **nLevels** – Host pointer to an array of 3 user defined number of input/output mapping points, one per color CHANNEL.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

- NPP_LUT_NUMBER_OF_LEVELS_ERROR if the number of levels is less than 2 or greater than 1024 (the current size limit).

NppStatus **nppiLUT_Cubic_32f_AC4IR_Ctx**(*Npp32f* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, const *Npp32f* *pValues[3], const *Npp32f* *pLevels[3], int nLevels[3], *NppStreamContext* nppStreamCtx)

4 channel 32-bit floating point look-up-table in place color conversion, not affecting Alpha.

The LUT is derived from a set of user defined mapping points using no interpolation. Alpha channel is the last channel and is not processed.

Parameters

- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **pValues** – Host pointer to an array of 3 device memory pointers, one per color CHANNEL, pointing to user defined OUTPUT values.
- **pLevels** – Host pointer to an array of 3 device memory pointers, one per color CHANNEL, pointing to user defined INPUT values.
- **nLevels** – Host pointer to an array of 3 user defined number of input/output mapping points, one per color CHANNEL.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

- NPP_LUT_NUMBER_OF_LEVELS_ERROR if the number of levels is less than 2 or greater than 1024 (the current size limit).

1.8.1.10 ColorLUTTrilinear

Perform image color processing using 3D trilinear interpolation between members of various types of color look up tables.

Functions

NppStatus **nppiLUT_Trilinear_8u_C4R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, *Npp32u* *pValues, *Npp8u* *pLevels[3], int aLevels[3], *NppStreamContext* nppStreamCtx)

Four channel 8-bit unsigned 3D trilinear interpolated look-up-table color conversion, with alpha copy.

Alpha channel is the last channel and is copied to the destination unmodified.

The LUT is derived from a set of user defined mapping points through trilinear interpolation.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **pValues** – Device pointer to aLevels[2] number of contiguous 2D x,y planes of 4-byte packed RGBX values containing the user defined base OUTPUT values at that x,y, and z (R,G,B) level location. Each level must contain x * y 4-byte packed pixel values (4th byte is used for alignement only and is ignored) in row (x) order.
- **pLevels** – Host pointer to an array of 3 host pointers, one per cube edge, pointing to user defined INPUT level values.
- **aLevels** – Host pointer to an array of 3 user defined number of input/output mapping points, one per 3D cube edge. aLevels[0] represents the number of x axis levels (Red), aLevels[1] represents the number of y axis levels (Green), and aLevels[2] represets the number of z axis levels (Blue).
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

- NPP_LUT_NUMBER_OF_LEVELS_ERROR if the number of levels is less than 2 or greater than 256.

NppStatus **nppiLUT_Trilinear_8u_AC4R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, *Npp32u* *pValues, *Npp8u* *pLevels[3], int aLevels[3], *NppStreamContext* nppStreamCtx)

Four channel 8-bit unsigned 3D trilinear interpolated look-up-table color conversion, not affecting alpha.

Alpha channel is the last channel and is not processed.

The LUT is derived from a set of user defined mapping points through trilinear interpolation.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **pValues** – Device pointer to aLevels[2] number of contiguous 2D x,y planes of 4-byte packed RGBX values containing the user defined base OUTPUT values at that x,y, and z (R,G,B) level location. Each level must contain x * y 4-byte packed pixel values (4th byte is used for alignement only and is ignored) in row (x) order.
- **pLevels** – Host pointer to an array of 3 host pointers, one per cube edge, pointing to user defined INPUT level values.

- **aLevels** – Host pointer to an array of 3 user defined number of input/output mapping points, one per 3D cube edge. aLevels[0] represents the number of x axis levels (Red), aLevels[1] represents the number of y axis levels (Green), and aLevels[2] represets the number of z axis levels (Blue).
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

- NPP_LUT_NUMBER_OF_LEVELS_ERROR if the number of levels is less than 2 or greater than 256.

NppStatus **nppiLUT_Trilinear_8u_AC4IR_Ctx**(*Npp8u* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, *Npp32u* *pValues, *Npp8u* *pLevels[3], int aLevels[3], *NppStreamContext* nppStreamCtx)

Four channel 8-bit unsigned 3D trilinear interpolated look-up-table in place color conversion, not affecting alpha.

Alpha channel is the last channel and is not processed.

The LUT is derived from a set of user defined mapping points through trilinear interpolation.

Parameters

- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **pValues** – Device pointer aLevels[2] number of contiguous 2D x,y planes of 4-byte packed RGBX values containing the user defined base OUTPUT values at that x,y, and z (R,G,B) level location. Each level must contain x * y 4-byte packed pixel values (4th byte is used for alignement only and is ignored) in row (x) order.
- **pLevels** – Host pointer to an array of 3 host pointers, one per cube edge, pointing to user defined INPUT level values.
- **aLevels** – Host pointer to an array of 3 user defined number of input/output mapping points, one per 3D cube edge. aLevels[0] represents the number of x axis levels (Red), aLevels[1] represents the number of y axis levels (Green), and aLevels[2] represets the number of z axis levels (Blue).
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

- NPP_LUT_NUMBER_OF_LEVELS_ERROR if the number of levels is less than 2 or greater than 256.

1.8.1.11 ColorLUTPalette

Perform image color processing using various types of bit range restricted palette color look up tables.

Functions

NppStatus **nppiLUTPalette_8u_C1R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp8u* *pTable, int nBitSize, *NppStreamContext* nppStreamCtx)

One channel 8-bit unsigned bit range restricted palette look-up-table color conversion.

The LUT is derived from a set of user defined mapping points in a palette and source pixels are then processed using a restricted bit range when looking up palette values.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **pTable** – Pointer to an array of user defined OUTPUT palette values (this is a device memory pointer)
- **nBitSize** – Number of least significant bits (must be > 0 and <= 8) of each source pixel value to use as index into palette table during conversion.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

- NPP_LUT_PALETTE_BITSIZE_ERROR if nBitSize is < 1 or > 8.

NppStatus **nppiLUTPalette_8u24u_C1R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp8u* *pTable, int nBitSize, *NppStreamContext* nppStreamCtx)

One channel 8-bit unsigned bit range restricted 24-bit palette look-up-table color conversion with 24-bit destination output per pixel.

The LUT is derived from a set of user defined mapping points in a palette and source pixels are then processed using a restricted bit range when looking up palette values.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step* (3 bytes per pixel).
- **oSizeROI** – *Region-Of-Interest (ROI)*.

- **pTable** – Pointer to an array of user defined OUTPUT palette values (this is a device memory pointer)
- **nBitSize** – Number of least significant bits (must be > 0 and <= 8) of each source pixel value to use as index into palette table during conversion.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

- NPP_LUT_PALETTE_BITSIZE_ERROR if nBitSize is < 1 or > 8.

NppStatus **nppiLUTPalette_8u32u_C1R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *Npp32u* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp32u* *pTable, int nBitSize, *NppStreamContext* nppStreamCtx)

One channel 8-bit unsigned bit range restricted 32-bit palette look-up-table color conversion with 32-bit destination output per pixel.

The LUT is derived from a set of user defined mapping points in a palette and source pixels are then processed using a restricted bit range when looking up palette values.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step* (4 bytes per pixel).
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **pTable** – Pointer to an array of user defined OUTPUT palette values (this is a device memory pointer)
- **nBitSize** – Number of least significant bits (must be > 0 and <= 8) of each source pixel value to use as index into palette table during conversion.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

- NPP_LUT_PALETTE_BITSIZE_ERROR if nBitSize is < 1 or > 8.

NppStatus **nppiLUTPalette_8u_C3R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp8u* *pTables[3], int nBitSize, *NppStreamContext* nppStreamCtx)

Three channel 8-bit unsigned bit range restricted palette look-up-table color conversion.

The LUT is derived from a set of user defined mapping points in a palette and source pixels are then processed using a restricted bit range when looking up palette values.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.

- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **pTables** – Host pointer to an array of 3 device memory pointers, one per color CHANNEL, pointing to user defined OUTPUT palette values.
- **nBitSize** – Number of least significant bits (must be > 0 and <= 8) of each source pixel value to use as index into palette table during conversion.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

- NPP_LUT_PALETTE_BITSIZE_ERROR if nBitSize is < 1 or > 8.

NppStatus **nppiLUTPalette_8u_C4R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp8u* *pTables[4], int nBitSize, *NppStreamContext* nppStreamCtx)

Four channel 8-bit unsigned bit range restricted palette look-up-table color conversion.

The LUT is derived from a set of user defined mapping points in a palette and source pixels are then processed using a restricted bit range when looking up palette values.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **pTables** – Host pointer to an array of 4 device memory pointers, one per color CHANNEL, pointing to user defined OUTPUT palette values.
- **nBitSize** – Number of least significant bits (must be > 0 and <= 8) of each source pixel value to use as index into palette table during conversion.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

- NPP_LUT_PALETTE_BITSIZE_ERROR if nBitSize is < 1 or > 8.

NppStatus **nppiLUTPalette_8u_AC4R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp8u* *pTables[3], int nBitSize, *NppStreamContext* nppStreamCtx)

Four channel 8-bit unsigned bit range restricted palette look-up-table color conversion, not affecting Alpha.

The LUT is derived from a set of user defined mapping points in a palette and source pixels are then processed using a restricted bit range when looking up palette values. Alpha channel is the last channel and is not processed.

Parameters

- **pSrc** – *Source-Image Pointer*.

- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **pTables** – Host pointer to an array of 3 device memory pointers, one per color CHANNEL, pointing to user defined OUTPUT palette values.
- **nBitSize** – Number of least significant bits (must be > 0 and <= 8) of each source pixel value to use as index into palette table during conversion.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

- NPP_LUT_PALETTE_BITSIZE_ERROR if nBitSize is < 1 or > 8.

NppStatus **nppiLUTPalette_16u_C1R_Ctx**(const *Npp16u* *pSrc, int nSrcStep, *Npp16u* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp16u* *pTable, int nBitSize, *NppStreamContext* nppStreamCtx)

One channel 16-bit unsigned bit range restricted palette look-up-table color conversion.

The LUT is derived from a set of user defined mapping points in a palette and source pixels are then processed using a restricted bit range when looking up palette values.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **pTable** – Pointer to an array of user defined OUTPUT palette values (this is a device memory pointer)
- **nBitSize** – Number of least significant bits (must be > 0 and <= 16) of each source pixel value to use as index into palette table during conversion.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

- NPP_LUT_PALETTE_BITSIZE_ERROR if nBitSize is < 1 or > 16.

NppStatus **nppiLUTPalette_16u8u_C1R_Ctx**(const *Npp16u* *pSrc, int nSrcStep, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp8u* *pTable, int nBitSize, *NppStreamContext* nppStreamCtx)

One channel 16-bit unsigned bit range restricted 8-bit unsigned palette look-up-table color conversion with 8-bit unsigned destination output per pixel.

The LUT is derived from a set of user defined mapping points in a palette and source pixels are then processed using a restricted bit range when looking up palette values.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step* (1 unsigned byte per pixel).
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **pTable** – Pointer to an array of user defined OUTPUT palette values (this is a device memory pointer)
- **nBitSize** – Number of least significant bits (must be > 0 and <= 16) of each source pixel value to use as index into palette table during conversion.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

- NPP_LUT_PALETTE_BITSIZE_ERROR if nBitSize is < 1 or > 16.

NppStatus **nppiLUTPalette_16u24u_C1R_Ctx**(const *Npp16u* *pSrc, int nSrcStep, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp8u* *pTable, int nBitSize, *NppStreamContext* nppStreamCtx)

One channel 16-bit unsigned bit range restricted 24-bit unsigned palette look-up-table color conversion with 24-bit unsigned destination output per pixel.

The LUT is derived from a set of user defined mapping points in a palette and source pixels are then processed using a restricted bit range when looking up palette values.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step* (3 unsigned bytes per pixel).
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **pTable** – Pointer to an array of user defined OUTPUT palette values (this is a device memory pointer)
- **nBitSize** – Number of least significant bits (must be > 0 and <= 16) of each source pixel value to use as index into palette table during conversion.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

- NPP_LUT_PALETTE_BITSIZE_ERROR if nBitSize is < 1 or > 16.

NppStatus **nppiLUTPalette_16u32u_C1R_Ctx**(const *Npp16u* *pSrc, int nSrcStep, *Npp32u* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp32u* *pTable, int nBitSize, *NppStreamContext* nppStreamCtx)

One channel 16-bit unsigned bit range restricted 32-bit palette look-up-table color conversion with 32-bit unsigned destination output per pixel.

The LUT is derived from a set of user defined mapping points in a palette and source pixels are then processed using a restricted bit range when looking up palette values.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step* (4 bytes per pixel).
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **pTable** – Pointer to an array of user defined OUTPUT palette values (this is a device memory pointer)
- **nBitSize** – Number of least significant bits (must be > 0 and <= 16) of each source pixel value to use as index into palette table during conversion.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

- NPP_LUT_PALETTE_BITSIZE_ERROR if nBitSize is < 1 or > 16.

NppStatus **nppiLUTPalette_16u_C3R_Ctx**(const *Npp16u* *pSrc, int nSrcStep, *Npp16u* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp16u* *pTables[3], int nBitSize, *NppStreamContext* nppStreamCtx)

Three channel 16-bit unsigned bit range restricted palette look-up-table color conversion.

The LUT is derived from a set of user defined mapping points in a palette and source pixels are then processed using a restricted bit range when looking up palette values.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **pTables** – Host pointer to an array of 3 device memory pointers, one per color CHANNEL, pointing to user defined OUTPUT palette values.
- **nBitSize** – Number of least significant bits (must be > 0 and <= 16) of each source pixel value to use as index into palette table during conversion.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

- NPP_LUT_PALETTE_BITSIZE_ERROR if nBitSize is < 1 or > 16.

NppStatus **nppiLUTPalette_16u_C4R_Ctx**(const *Npp16u* *pSrc, int nSrcStep, *Npp16u* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp16u* *pTables[4], int nBitSize, *NppStreamContext* nppStreamCtx)

Four channel 16-bit unsigned bit range restricted palette look-up-table color conversion.

The LUT is derived from a set of user defined mapping points in a palette and source pixels are then processed using a restricted bit range when looking up palette values.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **pTables** – Host pointer to an array of 4 device memory pointers, one per color CHANNEL, pointing to user defined OUTPUT palette values.
- **nBitSize** – Number of least significant bits (must be > 0 and <= 16) of each source pixel value to use as index into palette table during conversion.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

- NPP_LUT_PALETTE_BITSIZE_ERROR if nBitSize is < 1 or > 16.

NppStatus **nppiLUTPalette_16u_AC4R_Ctx**(const *Npp16u* *pSrc, int nSrcStep, *Npp16u* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp16u* *pTables[3], int nBitSize, *NppStreamContext* nppStreamCtx)

Four channel 16-bit unsigned bit range restricted palette look-up-table color conversion, not affecting Alpha.

The LUT is derived from a set of user defined mapping points in a palette and source pixels are then processed using a restricted bit range when looking up palette values. Alpha channel is the last channel and is not processed.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **pTables** – Host pointer to an array of 3 device memory pointers, one per color CHANNEL, pointing to user defined OUTPUT palette values.

- **nBitSize** – Number of least significant bits (must be > 0 and <= 16) of each source pixel value to use as index into palette table during conversion.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

- NPP_LUT_PALETTE_BITSIZE_ERROR if nBitSize is < 1 or > 16.

NppStatus **nppiLUTPaletteSwap_8u_C3A0C4R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, int nAlphaValue, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp8u* *pTables[3], int nBitSize, *NppStreamContext* nppStreamCtx)

Three channel 8-bit unsigned source bit range restricted palette look-up-table color conversion to four channel 8-bit unsigned destination output with alpha.

The LUT is derived from a set of user defined mapping points in a palette and source pixels are then processed using a restricted bit range when looking up palette values. This function also reverses the source pixel channel order in the destination so the Alpha channel is the first channel.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step* (3 bytes per pixel).
- **nAlphaValue** – Signed alpha value that will be used to initialize the pixel alpha channel position in all modified destination pixels.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step* (4 bytes per pixel with alpha).
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **pTables** – Host pointer to an array of 3 device memory pointers, one per color CHANNEL, pointing to user defined OUTPUT palette values. Alpha values < 0 or > 255 will cause destination pixel alpha channel values to be unmodified.
- **nBitSize** – Number of least significant bits (must be > 0 and <= 8) of each source pixel value to use as index into palette table during conversion.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

- NPP_LUT_PALETTE_BITSIZE_ERROR if nBitSize is < 1 or > 8.

NppStatus **nppiLUTPaletteSwap_16u_C3A0C4R_Ctx**(const *Npp16u* *pSrc, int nSrcStep, int nAlphaValue, *Npp16u* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp16u* *pTables[3], int nBitSize, *NppStreamContext* nppStreamCtx)

Three channel 16-bit unsigned source bit range restricted palette look-up-table color conversion to four channel 16-bit unsigned destination output with alpha.

The LUT is derived from a set of user defined mapping points in a palette and source pixels are then processed using a restricted bit range when looking up palette values. This function also

reverses the source pixel channel order in the destination so the Alpha channel is the first channel.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step* (3 unsigned short integers per pixel).
- **nAlphaValue** – Signed alpha value that will be used to initialize the pixel alpha channel position in all modified destination pixels.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step* (4 unsigned short integers per pixel with alpha).
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **pTables** – Host pointer to an array of 3 device memory pointers, one per color CHANNEL, pointing to user defined OUTPUT palette values. Alpha values < 0 or > 65535 will cause destination pixel alpha channel values to be unmodified.
- **nBitSize** – Number of least significant bits (must be > 0 and <= 16) of each source pixel value to use as index into palette table during conversion.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

- NPP_LUT_PALETTE_BITSIZE_ERROR if nBitSize is < 1 or > 16.

1.8.2. Color Sampling Format Conversion Functions

Routines for converting between various image color sampling formats.

1.8.2.1 YCbCr420ToYCbCr411

YCbCr420 to YCbCr411 sampling format conversion.

Functions

NppStatus **nppiYCbCr420ToYCbCr411_8u_P3P2R_Ctx**(const *Npp8u* *const pSrc[3], int rSrcStep[3], *Npp8u* *pDstY, int nDstYStep, *Npp8u* *pDstCbCr, int nDstCbCrStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

3 channel 8-bit unsigned planar YCbCr420 to 2 channel 8-bit unsigned planar YCbCr411 sampling format conversion.

Parameters

- **pSrc** – *Source-Planar-Image Pointer Array*.

- **rSrcStep** – *Source-Planar-Image Line Step Array*.
- **pDstY** – *Destination-Planar-Image Pointer*.
- **nDstYStep** – *Destination-Planar-Image Line Step*.
- **pDstCbCr** – *Destination-Planar-Image Pointer*.
- **nDstCbCrStep** – *Destination-Planar-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiYCbCr420ToYCbCr411_8u_P2P3R_Ctx**(const *Npp8u* *pSrcY, int nSrcYStep, const *Npp8u* *pSrcCbCr, int nSrcCbCrStep, *Npp8u* *pDst[3], int rDstStep[3], *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

2 channel 8-bit unsigned planar YCbCr420 to 3 channel 8-bit unsigned planar YCbCr411 sampling format conversion.

Parameters

- **pSrcY** – *Source-Planar-Image Pointer*.
- **nSrcYStep** – *Source-Planar-Image Line Step*.
- **pSrcCbCr** – *Source-Planar-Image Pointer*.
- **nSrcCbCrStep** – *Source-Planar-Image Line Step*.
- **pDst** – *Destination-Planar-Image Pointer Array*.
- **rDstStep** – Destination-Planar-Image Line Step Array.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

1.8.2.2 YCbCr422ToYCbCr422

YCbCr422 to YCbCr422 sampling format conversion.

Functions

NppStatus **nppiYCbCr422_8u_C2P3R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *Npp8u* *pDst[3], int rDstStep[3], *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

2 channel 8-bit unsigned packed YCbCr422 to 3 channel 8-bit unsigned planar YCbCr422 sampling format conversion.

images.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Planar-Image Pointer Array*.
- **rDstStep** – Destination-Planar-Image Line Step Array.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiYCbCr422_8u_P3C2R_Ctx**(const *Npp8u* *const pSrc[3], int rSrcStep[3], *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

3 channel 8-bit unsigned planar YCbCr422 to 2 channel 8-bit unsigned packed YCbCr422 sampling format conversion.

images.

Parameters

- **pSrc** – *Source-Planar-Image Pointer Array*.
- **rSrcStep** – *Source-Planar-Image Line Step Array*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

1.8.2.3 YCbCr422ToYCrCb422

YCbCr422 to YCrCb422 sampling format conversion.

Functions

NppStatus **nppiYCbCr422ToYCrCb422_8u_C2R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

2 channel 8-bit unsigned packed YCbCr422 to 2 channel 8-bit unsigned packed YCrCb422 sampling format conversion.

images.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiYCbCr422ToYCrCb422_8u_P3C2R_Ctx**(const *Npp8u* *const pSrc[3], int rSrcStep[3], *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

3 channel 8-bit unsigned planar YCbCr422 to 2 channel 8-bit unsigned packed YCrCb422 sampling format conversion.

images.

Parameters

- **pSrc** – *Source-Planar-Image Pointer Array*.
- **rSrcStep** – *Source-Planar-Image Line Step Array*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

1.8.2.4 YCbCr422ToCbYCr422

YCbCr422 to CbYCr422 sampling format conversion.

Functions

NppStatus **nppiYCbCr422ToCbYCr422_8u_C2R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

2 channel 8-bit unsigned packed YCbCr422 to 2 channel 8-bit unsigned packed CbYCr422 sampling format conversion.

images.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

1.8.2.5 CbYCr422ToYCbCr411

CbYCr422 to YCbCr411 sampling format conversion.

Functions

NppStatus **nppiCbYCr422ToYCbCr411_8u_C2P3R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *Npp8u* *pDst[3], int rDstStep[3], *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

2 channel 8-bit unsigned packed CbYCr422 to 3 channel 8-bit unsigned planar YCbCr411 sampling format conversion.

images.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Planar-Image Pointer Array*.
- **rDstStep** – Destination-Planar-Image Line Step Array.

- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

1.8.2.6 YCbCr422ToYCbCr420

YCbCr422 to YCbCr420 sampling format conversion.

Functions

NppStatus **nppiYCbCr422ToYCbCr420_8u_P3R_Ctx**(const *Npp8u* *const pSrc[3], int rSrcStep[3], *Npp8u* *pDst[3], int nDstStep[3], *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

3 channel 8-bit unsigned planar YCbCr422 to 3 channel 8-bit unsigned planar YCbCr420 sampling format conversion.

images.

Parameters

- **pSrc** – *Source-Planar-Image Pointer Array*.
- **rSrcStep** – *Source-Planar-Image Line Step Array*.
- **pDst** – *Destination-Planar-Image Pointer Array*.
- **nDstStep** – Destination-Planar-Image Line Step Array.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiYCbCr422ToYCbCr420_8u_P3P2R_Ctx**(const *Npp8u* *const pSrc[3], int rSrcStep[3], *Npp8u* *pDstY, int nDstYStep, *Npp8u* *pDstCbCr, int nDstCbCrStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

3 channel 8-bit unsigned planar YCbCr422 to 2 channel 8-bit unsigned planar YCbCr420 sampling format conversion.

images.

Parameters

- **pSrc** – *Source-Planar-Image Pointer Array*.
- **rSrcStep** – *Source-Planar-Image Line Step Array*.
- **pDstY** – *Destination-Planar-Image Pointer*.
- **nDstYStep** – *Destination-Planar-Image Line Step*.
- **pDstCbCr** – *Destination-Planar-Image Pointer*.

- **nDstCbCrStep** – *Destination-Planar-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiYCbCr422ToYCbCr420_8u_C2P3R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *Npp8u* *pDst[3], int rDstStep[3], *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

2 channel 8-bit unsigned packed YCbCr422 to 3 channel 8-bit unsigned planar YCbCr420 sampling format conversion.

images.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Planar-Image Pointer Array*.
- **rDstStep** – Destination-Planar-Image Line Step Array.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiYCbCr422ToYCbCr420_8u_C2P2R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *Npp8u* *pDstY, int nDstYStep, *Npp8u* *pDstCbCr, int nDstCbCrStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

2 channel 8-bit unsigned packed YCbCr422 to 2 channel 8-bit unsigned planar YCbCr420 sampling format conversion.

images.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDstY** – *Destination-Planar-Image Pointer*.
- **nDstYStep** – *Destination-Planar-Image Line Step*.
- **pDstCbCr** – *Destination-Planar-Image Pointer*.
- **nDstCbCrStep** – *Destination-Planar-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

1.8.2.7 YCrCb420ToYCbCr422

YCrCb420 to YCbCr422 sampling format conversion.

Functions

NppStatus **nppiYCrCb420ToYCbCr422_8u_P3R_Ctx**(const *Npp8u* *const pSrc[3], int rSrcStep[3], *Npp8u* *pDst[3], int rDstStep[3], *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

3 channel 8-bit unsigned planar YCrCb420 to 3 channel 8-bit unsigned planar YCbCr422 sampling format conversion.

images.

Parameters

- **pSrc** – *Source-Planar-Image Pointer Array*.
- **rSrcStep** – *Source-Planar-Image Line Step Array*.
- **pDst** – *Destination-Planar-Image Pointer Array*.
- **rDstStep** – Destination-Planar-Image Line Step Array.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiYCrCb420ToYCbCr422_8u_P3C2R_Ctx**(const *Npp8u* *const pSrc[3], int rSrcStep[3], *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

3 channel 8-bit unsigned planar YCrCb420 to 2 channel 8-bit unsigned packed YCbCr422 sampling format conversion.

images.

Parameters

- **pSrc** – *Source-Planar-Image Pointer Array*.
- **rSrcStep** – *Source-Planar-Image Line Step Array*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

1.8.2.8 YCbCr422ToYCrCb420

YCbCr422 to YCrCb420 sampling format conversion.

Functions

NppStatus **nppiYCbCr422ToYCrCb420_8u_C2P3R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *Npp8u* *pDst[3], int rDstStep[3], *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

2 channel 8-bit unsigned packed YCbCr422 to 3 channel 8-bit unsigned planar YCrCb420 sampling format conversion.

images.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Planar-Image Pointer Array*.
- **rDstStep** – Destination-Planar-Image Line Step Array.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

1.8.2.9 YCbCr422ToYCbCr411

YCbCr422 to YCbCr411 sampling format conversion.

Functions

NppStatus **nppiYCbCr422ToYCbCr411_8u_P3R_Ctx**(const *Npp8u* *const pSrc[3], int rSrcStep[3], *Npp8u* *pDst[3], int rDstStep[3], *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

3 channel 8-bit unsigned planar YCbCr422 to 3 channel 8-bit unsigned planar YCbCr411 sampling format conversion.

images.

Parameters

- **pSrc** – *Source-Planar-Image Pointer Array*.
- **rSrcStep** – *Source-Planar-Image Line Step Array*.
- **pDst** – *Destination-Planar-Image Pointer Array*.
- **rDstStep** – Destination-Planar-Image Line Step Array.

- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiYCbCr422ToYCbCr411_8u_P3P2R_Ctx**(const *Npp8u* *const pSrc[3], int rSrcStep[3], *Npp8u* *pDstY, int nDstYStep, *Npp8u* *pDstCbCr, int nDstCbCrStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

3 channel 8-bit unsigned planar YCbCr422 to 2 channel 8-bit unsigned planar YCbCr411 sampling format conversion.

images.

Parameters

- **pSrc** – *Source-Planar-Image Pointer Array*.
- **rSrcStep** – *Source-Planar-Image Line Step Array*.
- **pDstY** – *Destination-Planar-Image Pointer*.
- **nDstYStep** – *Destination-Planar-Image Line Step*.
- **pDstCbCr** – *Destination-Planar-Image Pointer*.
- **nDstCbCrStep** – *Destination-Planar-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiYCbCr422ToYCbCr411_8u_C2P3R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *Npp8u* *pDst[3], int rDstStep[3], *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

2 channel 8-bit unsigned packed YCbCr422 to 3 channel 8-bit unsigned planar YCbCr411 sampling format conversion.

images.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Planar-Image Pointer Array*.
- **rDstStep** – Destination-Planar-Image Line Step Array.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiYCbCr422ToYCbCr411_8u_C2P2R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *Npp8u* *pDstY, int nDstYStep, *Npp8u* *pDstCbCr, int nDstCbCrStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

2 channel 8-bit unsigned packed YCbCr422 to 2 channel 8-bit unsigned planar YCbCr411 sampling format conversion.

images.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDstY** – *Destination-Planar-Image Pointer*.
- **nDstYStep** – *Destination-Planar-Image Line Step*.
- **pDstCbCr** – *Destination-Planar-Image Pointer*.
- **nDstCbCrStep** – *Destination-Planar-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

1.8.2.10 YCrCb422ToYCbCr422

YCrCb422 to YCbCr422 sampling format conversion.

Functions

NppStatus **nppiYCrCb422ToYCbCr422_8u_C2P3R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *Npp8u* *pDst[3], int rDstStep[3], *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

2 channel 8-bit unsigned packed YCrCb422 to 3 channel 8-bit unsigned planar YCbCr422 sampling format conversion.

images.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Planar-Image Pointer Array*.
- **rDstStep** – Destination-Planar-Image Line Step Array.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*

1.8.2.11 YCrCb422ToYCbCr420

YCrCb422 to YCbCr420 sampling format conversion.

Functions

NppStatus **nppiYCrCb422ToYCbCr420_8u_C2P3R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *Npp8u* *pDst[3], int rDstStep[3], *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

2 channel 8-bit unsigned packed YCrCb422 to 3 channel 8-bit unsigned planar YCbCr420 sampling format conversion.

images.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Planar-Image Pointer Array*.
- **rDstStep** – Destination-Planar-Image Line Step Array.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*

1.8.2.12 YCrCb422ToYCbCr411

YCrCb422 to YCbCr411 sampling format conversion.

Functions

NppStatus **nppiYCrCb422ToYCbCr411_8u_C2P3R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *Npp8u* *pDst[3], int rDstStep[3], *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

2 channel 8-bit unsigned packed YCrCb422 to 3 channel 8-bit unsigned planar YCbCr411 sampling format conversion.

images.

Parameters

- **pSrc** – *Source-Image Pointer*.

- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Planar-Image Pointer Array*.
- **rDstStep** – Destination-Planar-Image Line Step Array.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

1.8.2.13 CbYCr422ToYCbCr422

CbYCr422 to YCbCr422 sampling format conversion.

Functions

NppStatus **nppiCbYCr422ToYCbCr422_8u_C2R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

2 channel 8-bit unsigned packed CbYCr422 to 2 channel 8-bit unsigned packed YCbCr422 sampling format conversion.

images.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiCbYCr422ToYCbCr422_8u_C2P3R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *Npp8u* *pDst[3], int rDstStep[3], *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

2 channel 8-bit unsigned packed CbYCr422 to 3 channel 8-bit unsigned planar YCbCr422 sampling format conversion.

images.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.

- **pDst** – *Destination-Planar-Image Pointer Array*.
- **rDstStep** – Destination-Planar-Image Line Step Array.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

1.8.2.14 CbYCr422ToYCbCr420

CbYCr422 to YCbCr420 sampling format conversion.

Functions

NppStatus **nppiCbYCr422ToYCbCr420_8u_C2P3R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *Npp8u* *pDst[3], int rDstStep[3], *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

2 channel 8-bit unsigned packed CbYCr422 to 3 channel 8-bit unsigned planar YCbCr420 sampling format conversion.

images.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Planar-Image Pointer Array*.
- **rDstStep** – Destination-Planar-Image Line Step Array.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiCbYCr422ToYCbCr420_8u_C2P2R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *Npp8u* *pDstY, int nDstYStep, *Npp8u* *pDstCbCr, int nDstCbCrStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

2 channel 8-bit unsigned packed CbYCr422 to 2 channel 8-bit unsigned planar YCbCr420 sampling format conversion.

images.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDstY** – *Destination-Planar-Image Pointer*.

- **nDstYStep** – *Destination-Planar-Image Line Step*.
- **pDstCbCr** – *Destination-Planar-Image Pointer*.
- **nDstCbCrStep** – *Destination-Planar-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

1.8.2.15 CbYCr422ToYCrCb420

CbYCr422 to YCrCb420 sampling format conversion.

Functions

NppStatus **nppiCbYCr422ToYCrCb420_8u_C2P3R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *Npp8u* *pDst[3], int rDstStep[3], *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

2 channel 8-bit unsigned packed CbYCr422 to 3 channel 8-bit unsigned planar YCrCb420 sampling format conversion.

images.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Planar-Image Pointer Array*.
- **rDstStep** – Destination-Planar-Image Line Step Array.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

1.8.2.16 YCbCr420ToYCbCr420

YCbCr420 to YCbCr420 sampling format conversion.

Functions

NppStatus **nppiYCbCr420_8u_P3P2R_Ctx**(const *Npp8u* *const pSrc[3], int rSrcStep[3], *Npp8u* *pDstY, int nDstYStep, *Npp8u* *pDstCbCr, int nDstCbCrStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

3 channel 8-bit unsigned planar YCbCr420 to 2 channel 8-bit unsigned planar YCbCr420 sampling format conversion.

images.

Parameters

- **pSrc** – *Source-Planar-Image Pointer Array*.
- **rSrcStep** – *Source-Planar-Image Line Step Array*.
- **pDstY** – *Destination-Planar-Image Pointer*.
- **nDstYStep** – *Destination-Planar-Image Line Step*.
- **pDstCbCr** – *Destination-Planar-Image Pointer*.
- **nDstCbCrStep** – *Destination-Planar-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiYCbCr420_8u_P2P3R_Ctx**(const *Npp8u* *const pSrcY, int nSrcYStep, const *Npp8u* *pSrcCbCr, int nSrcCbCrStep, *Npp8u* *pDst[3], int rDstStep[3], *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

2 channel 8-bit unsigned planar YCbCr420 to 3 channel 8-bit unsigned planar YCbCr420 sampling format conversion.

Parameters

- **pSrcY** – *Source-Planar-Image Pointer*.
- **nSrcYStep** – *Source-Planar-Image Line Step*.
- **pSrcCbCr** – *Source-Planar-Image Pointer*.
- **nSrcCbCrStep** – *Source-Planar-Image Line Step*.
- **pDst** – *Destination-Planar-Image Pointer Array*.
- **rDstStep** – Destination-Planar-Image Line Step Array.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

1.8.2.17 YCbCr420ToYCbCr422

YCbCr420 to YCbCr422 sampling format conversion.

Functions

NppStatus **nppiYCbCr420ToYCbCr422_8u_P3R_Ctx**(const *Npp8u* *const pSrc[3], int rSrcStep[3], *Npp8u* *pDst[3], int nDstStep[3], *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

3 channel 8-bit unsigned planar YCbCr420 to 3 channel 8-bit unsigned planar YCbCr422 sampling format conversion.

images.

Parameters

- **pSrc** – *Source-Planar-Image Pointer Array*.
- **rSrcStep** – *Source-Planar-Image Line Step Array*.
- **pDst** – *Destination-Planar-Image Pointer Array*.
- **nDstStep** – Destination-Planar-Image Line Step Array.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiYCbCr420ToYCbCr422_8u_P2P3R_Ctx**(const *Npp8u* *pSrcY, int nSrcYStep, const *Npp8u* *pSrcCbCr, int nSrcCbCrStep, *Npp8u* *pDst[3], int rDstStep[3], *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

2 channel 8-bit unsigned planar YCbCr420 to 3 channel 8-bit unsigned planar YCbCr422 sampling format conversion.

Parameters

- **pSrcY** – *Source-Planar-Image Pointer*.
- **nSrcYStep** – *Source-Planar-Image Line Step*.
- **pSrcCbCr** – *Source-Planar-Image Pointer*.
- **nSrcCbCrStep** – *Source-Planar-Image Line Step*.
- **pDst** – *Destination-Planar-Image Pointer Array*.
- **rDstStep** – Destination-Planar-Image Line Step Array.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiYCbCr420ToYCbCr422_8u_P2C2R_Ctx**(const *Npp8u* *pSrcY, int nSrcYStep, const *Npp8u* *pSrcCbCr, int nSrcCbCrStep, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

2 channel 8-bit unsigned planar YCbCr420 to 2 channel 8-bit unsigned packed YCbCr422 sampling format conversion.

Parameters

- **pSrcY** – *Source-Planar-Image Pointer*.
- **nSrcYStep** – *Source-Planar-Image Line Step*.
- **pSrcCbCr** – *Source-Planar-Image Pointer*.
- **nSrcCbCrStep** – *Source-Planar-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

1.8.2.18 YCbCr420ToCbYCr422

YCbCr420 to CbYCr422 sampling format conversion.

Functions

NppStatus **nppiYCbCr420ToCbYCr422_8u_P2C2R_Ctx**(const *Npp8u* *pSrcY, int nSrcYStep, const *Npp8u* *pSrcCbCr, int nSrcCbCrStep, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

2 channel 8-bit unsigned planar YCbCr420 to 2 channel 8-bit unsigned packed CbYCr422 sampling format conversion.

Parameters

- **pSrcY** – *Source-Planar-Image Pointer*.
- **nSrcYStep** – *Source-Planar-Image Line Step*.
- **pSrcCbCr** – *Source-Planar-Image Pointer*.
- **nSrcCbCrStep** – *Source-Planar-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*

1.8.2.19 YCbCr420ToYCrCb420

YCbCr420 to YCrCb420 sampling format conversion.

Functions

NppStatus **nppiYCbCr420ToYCrCb420_8u_P2P3R_Ctx**(const *Npp8u* *pSrcY, int nSrcYStep, const *Npp8u* *pSrcCbCr, int nSrcCbCrStep, *Npp8u* *pDst[3], int rDstStep[3], *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

2 channel 8-bit unsigned planar YCbCr420 to 3 channel 8-bit unsigned planar YCrCb420 sampling format conversion.

Parameters

- **pSrcY** – *Source-Planar-Image Pointer*.
- **nSrcYStep** – *Source-Planar-Image Line Step*.
- **pSrcCbCr** – *Source-Planar-Image Pointer*.
- **nSrcCbCrStep** – *Source-Planar-Image Line Step*.
- **pDst** – *Destination-Planar-Image Pointer Array*.
- **rDstStep** – Destination-Planar-Image Line Step Array.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*

1.8.2.20 YCrCb420ToCbYCr422

YCrCb420 to CbYCr422 sampling format conversion.

Functions

NppStatus **nppiYCrCb420ToCbYCr422_8u_P3C2R_Ctx**(const *Npp8u* *const pSrc[3], int rSrcStep[3], *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

3 channel 8-bit unsigned planar YCrCb420 to 2 channel 8-bit unsigned packed CbYCr422 sampling format conversion.

images.

Parameters

- **pSrc** – *Source-Planar-Image Pointer Array*.
- **rSrcStep** – *Source-Planar-Image Line Step Array*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

1.8.2.21 YCrCb420ToYCbYCr420

YCrCb420 to YCbCr420 sampling format conversion.

Functions

NppStatus **nppiYCrCb420ToYCbCr420_8u_P3P2R_Ctx**(const *Npp8u* *const pSrc[3], int rSrcStep[3], *Npp8u* *pDstY, int nDstYStep, *Npp8u* *pDstCbCr, int nDstCbCrStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

3 channel 8-bit unsigned planar YCrCb420 to 2 channel 8-bit unsigned planar YCbCr420 sampling format conversion.

images.

Parameters

- **pSrc** – *Source-Planar-Image Pointer Array*.
- **rSrcStep** – *Source-Planar-Image Line Step Array*.
- **pDstY** – *Destination-Planar-Image Pointer*.
- **nDstYStep** – *Destination-Planar-Image Line Step*.
- **pDstCbCr** – *Destination-Planar-Image Pointer*.
- **nDstCbCrStep** – *Destination-Planar-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

1.8.2.22 YCrCb420ToYCbYCr411

YCrCb420 to YCbCr411 sampling format conversion.

Functions

NppStatus **nppiYCrCb420ToYCbCr411_8u_P3P2R_Ctx**(const *Npp8u* *const pSrc[3], int rSrcStep[3], *Npp8u* *pDstY, int nDstYStep, *Npp8u* *pDstCbCr, int nDstCbCrStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

3 channel 8-bit unsigned planar YCrCb420 to 2 channel 8-bit unsigned planar YCbCr411 sampling format conversion.

images.

Parameters

- **pSrc** – *Source-Planar-Image Pointer Array*.
- **rSrcStep** – *Source-Planar-Image Line Step Array*.
- **pDstY** – *Destination-Planar-Image Pointer*.
- **nDstYStep** – *Destination-Planar-Image Line Step*.
- **pDstCbCr** – *Destination-Planar-Image Pointer*.
- **nDstCbCrStep** – *Destination-Planar-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

1.8.2.23 YCbCr411ToYCbCr411

YCbCr411 to YCbCr411 sampling format conversion.

Functions

NppStatus **nppiYCbCr411_8u_P3P2R_Ctx**(const *Npp8u* *const pSrc[3], int rSrcStep[3], *Npp8u* *pDstY, int nDstYStep, *Npp8u* *pDstCbCr, int nDstCbCrStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

3 channel 8-bit unsigned planar YCbCr411 to 2 channel 8-bit unsigned planar YCbCr411 sampling format conversion.

images.

Parameters

- **pSrc** – *Source-Planar-Image Pointer Array*.

- **rSrcStep** – *Source-Planar-Image Line Step Array*.
- **pDstY** – *Destination-Planar-Image Pointer*.
- **nDstYStep** – *Destination-Planar-Image Line Step*.
- **pDstCbCr** – *Destination-Planar-Image Pointer*.
- **nDstCbCrStep** – *Destination-Planar-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiYCbCr411_8u_P2P3R_Ctx**(const *Npp8u* *pSrcY, int nSrcYStep, const *Npp8u* *pSrcCbCr, int nSrcCbCrStep, *Npp8u* *pDst[3], int rDstStep[3], *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

2 channel 8-bit unsigned planar YCbCr411 to 3 channel 8-bit unsigned planar YCbCr411 sampling format conversion.

Parameters

- **pSrcY** – *Source-Planar-Image Pointer*.
- **nSrcYStep** – *Source-Planar-Image Line Step*.
- **pSrcCbCr** – *Source-Planar-Image Pointer*.
- **nSrcCbCrStep** – *Source-Planar-Image Line Step*.
- **pDst** – *Destination-Planar-Image Pointer Array*.
- **rDstStep** – Destination-Planar-Image Line Step Array.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

1.8.2.24 YCbCr411ToYCbCr422

YCbCr411 to YCbCr422 sampling format conversion.

Functions

NppStatus **nppiYCbCr411ToYCbCr422_8u_P3R_Ctx**(const *Npp8u* *const pSrc[3], int rSrcStep[3], *Npp8u* *pDst[3], int nDstStep[3], *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

3 channel 8-bit unsigned planar YCbCr411 to 3 channel 8-bit unsigned planar YCbCr422 sampling format conversion.

images.

Parameters

- **pSrc** – *Source-Planar-Image Pointer Array*.
- **rSrcStep** – *Source-Planar-Image Line Step Array*.
- **pDst** – *Destination-Planar-Image Pointer Array*.
- **nDstStep** – Destination-Planar-Image Line Step Array.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiYCbCr411ToYCbCr422_8u_P3C2R_Ctx**(const *Npp8u* *const pSrc[3], int rSrcStep[3], *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

3 channel 8-bit unsigned planar YCbCr411 to 2 channel 8-bit unsigned packed YCbCr422 sampling format conversion.

images.

Parameters

- **pSrc** – *Source-Planar-Image Pointer Array*.
- **rSrcStep** – *Source-Planar-Image Line Step Array*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiYCbCr411ToYCbCr422_8u_P2P3R_Ctx**(const *Npp8u* *const pSrcY, int nSrcYStep, const *Npp8u* *pSrcCbCr, int nSrcCbCrStep, *Npp8u* *pDst[3], int rDstStep[3], *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

2 channel 8-bit unsigned planar YCbCr411 to 3 channel 8-bit unsigned planar YCbCr422 sampling format conversion.

Parameters

- **pSrcY** – *Source-Planar-Image Pointer*.
- **nSrcYStep** – *Source-Planar-Image Line Step*.
- **pSrcCbCr** – *Source-Planar-Image Pointer*.
- **nSrcCbCrStep** – *Source-Planar-Image Line Step*.
- **pDst** – *Destination-Planar-Image Pointer Array*.

- **rDstStep** – Destination-Planar-Image Line Step Array.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiYCbCr411ToYCbCr422_8u_P2C2R_Ctx**(const *Npp8u* *pSrcY, int nSrcYStep, const *Npp8u* *pSrcCbCr, int nSrcCbCrStep, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

2 channel 8-bit unsigned planar YCbCr411 to 2 channel 8-bit unsigned packed YCbCr422 sampling format conversion.

Parameters

- **pSrcY** – *Source-Planar-Image Pointer*.
- **nSrcYStep** – *Source-Planar-Image Line Step*.
- **pSrcCbCr** – *Source-Planar-Image Pointer*.
- **nSrcCbCrStep** – *Source-Planar-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

1.8.2.25 YCbCr411ToYCrCb422

YCbCr411 to YCrCb422 sampling format conversion.

Functions

NppStatus **nppiYCbCr411ToYCrCb422_8u_P3R_Ctx**(const *Npp8u* *const pSrc[3], int rSrcStep[3], *Npp8u* *pDst[3], int nDstStep[3], *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

3 channel 8-bit unsigned planar YCbCr411 to 3 channel 8-bit unsigned planar YCrCb422 sampling format conversion.

images.

Parameters

- **pSrc** – *Source-Planar-Image Pointer Array*.
- **rSrcStep** – *Source-Planar-Image Line Step Array*.
- **pDst** – *Destination-Planar-Image Pointer Array*.

- **nDstStep** – Destination-Planar-Image Line Step Array.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiYCbCr411ToYCrCb422_8u_P3C2R_Ctx**(const *Npp8u* *const pSrc[3], int rSrcStep[3], *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

3 channel 8-bit unsigned planar YCbCr411 to 2 channel 8-bit unsigned packed YCrCb422 sampling format conversion.

images.

Parameters

- **pSrc** – *Source-Planar-Image Pointer Array*.
- **rSrcStep** – *Source-Planar-Image Line Step Array*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*

1.8.2.26 YCbCr411ToYCbCr420

YCbCr411 to YCbCr420 sampling format conversion.

Functions

NppStatus **nppiYCbCr411ToYCbCr420_8u_P3R_Ctx**(const *Npp8u* *const pSrc[3], int rSrcStep[3], *Npp8u* *pDst[3], int nDstStep[3], *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

3 channel 8-bit unsigned planar YCbCr411 to 3 channel 8-bit unsigned planar YCbCr420 sampling format conversion.

images.

Parameters

- **pSrc** – *Source-Planar-Image Pointer Array*.
- **rSrcStep** – *Source-Planar-Image Line Step Array*.
- **pDst** – *Destination-Planar-Image Pointer Array*.
- **nDstStep** – Destination-Planar-Image Line Step Array.

- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiYCbCr411ToYCbCr420_8u_P3P2R_Ctx**(const *Npp8u* *const pSrc[3], int rSrcStep[3], *Npp8u* *pDstY, int nDstYStep, *Npp8u* *pDstCbCr, int nDstCbCrStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

3 channel 8-bit unsigned planar YCbCr411 to 2 channel 8-bit unsigned planar YCbCr420 sampling format conversion.

images.

Parameters

- **pSrc** – *Source-Planar-Image Pointer Array*.
- **rSrcStep** – *Source-Planar-Image Line Step Array*.
- **pDstY** – *Destination-Planar-Image Pointer*.
- **nDstYStep** – *Destination-Planar-Image Line Step*.
- **pDstCbCr** – *Destination-Planar-Image Pointer*.
- **nDstCbCrStep** – *Destination-Planar-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiYCbCr411ToYCbCr420_8u_P2P3R_Ctx**(const *Npp8u* *pSrcY, int nSrcYStep, const *Npp8u* *pSrcCbCr, int nSrcCbCrStep, *Npp8u* *pDst[3], int rDstStep[3], *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

2 channel 8-bit unsigned planar YCbCr411 to 3 channel 8-bit unsigned planar YCbCr420 sampling format conversion.

Parameters

- **pSrcY** – *Source-Planar-Image Pointer*.
- **nSrcYStep** – *Source-Planar-Image Line Step*.
- **pSrcCbCr** – *Source-Planar-Image Pointer*.
- **nSrcCbCrStep** – *Source-Planar-Image Line Step*.
- **pDst** – *Destination-Planar-Image Pointer Array*.
- **rDstStep** – Destination-Planar-Image Line Step Array.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*

1.8.2.27 YCbCr411ToYCrCb420

YCbCr411 to YCrCb420 sampling format conversion.

Functions

NppStatus **nppiYCbCr411ToYCrCb420_8u_P2P3R_Ctx**(const *Npp8u* *pSrcY, int nSrcYStep, const *Npp8u* *pSrcCbCr, int nSrcCbCrStep, *Npp8u* *pDst[3], int rDstStep[3], *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

2 channel 8-bit unsigned planar YCbCr411 to 3 channel 8-bit unsigned planar YCrCb420 sampling format conversion.

Parameters

- **pSrcY** – *Source-Planar-Image Pointer*.
- **nSrcYStep** – *Source-Planar-Image Line Step*.
- **pSrcCbCr** – *Source-Planar-Image Pointer*.
- **nSrcCbCrStep** – *Source-Planar-Image Line Step*.
- **pDst** – *Destination-Planar-Image Pointer Array*.
- **rDstStep** – Destination-Planar-Image Line Step Array.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*

1.8.2.28 NV12ToYUV420

NV12 to YUV420 color conversion.

Functions

NppStatus **nppiNV12ToYUV420_8u_P2P3R_Ctx**(const *Npp8u* *const pSrc[2], int nSrcStep, *Npp8u* *pDst[3], int aDstStep[3], *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

2 channel 8-bit unsigned planar NV12 to 3 channel 8-bit unsigned planar YUV420 color conversion.

Parameters

- **pSrc** – *Source-Planar-Image Pointer Array* (one for Y plane, one for UV plane).

- **nSrcStep** – *Source-Planar-Image Line Step*. Same value is used for each plane.
- **pDst** – *Destination-Image Pointer*.
- **aDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

1.8.3. Color Model Conversion Functions

Routines for converting between various image color models.

1.8.3.1 RGBToYUV

RGB to YUV color conversion.

Here is how NPP converts gamma corrected RGB or BGR to YUV. For digital RGB values in the range [0..255], Y has the range [0..255], U varies in the range [-112..+112], and V in the range [-157..+157]. To fit in the range of [0..255], a constant value of 128 is added to computed U and V values, and V is then saturated.

```
Npp32f nY =  0.299F * R + 0.587F * G + 0.114F * B;
Npp32f nU = (0.492F * ((Npp32f)nB - nY)) + 128.0F;
Npp32f nV = (0.877F * ((Npp32f)nR - nY)) + 128.0F;
if (nV > 255.0F)
    nV = 255.0F;
```

Functions

NppStatus **nppiRGBToYUV_8u_C3R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

3 channel 8-bit unsigned packed RGB to 3 channel 8-bit unsigned packed YUV color conversion.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiRGBToYUV_8u_AC4R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

4 channel 8-bit unsigned packed RGB with alpha to 4 channel 8-bit unsigned packed YUV color conversion with alpha, not affecting alpha.

images.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiRGBToYUV_8u_P3R_Ctx**(const *Npp8u* *const pSrc[3], int nSrcStep, *Npp8u* *pDst[3], int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

3 channel 8-bit unsigned planar RGB to 3 channel 8-bit unsigned planar YUV color conversion.

Parameters

- **pSrc** – *Source-Planar-Image Pointer Array*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Planar-Image Pointer Array*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiRGBToYUV_8u_C3P3R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *Npp8u* *pDst[3], int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

3 channel 8-bit unsigned packed RGB to 3 channel 8-bit unsigned planar YUV color conversion.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Planar-Image Pointer Array*.

- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiRGBToYUV_8u_AC4P4R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *Npp8u* *pDst[4], int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

4 channel 8-bit unsigned packed RGB with alpha to 4 channel 8-bit unsigned planar YUV color conversion with alpha.

images.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Planar-Image Pointer Array*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

1.8.3.2 BGRToYUV

BGR to YUV color conversion.

Here is how NPP converts gamma corrected RGB or BGR to YUV. For digital RGB values in the range [0..255], Y has the range [0..255], U varies in the range [-112..+112], and V in the range [-157..+157]. To fit in the range of [0..255], a constant value of 128 is added to computed U and V values, and V is then saturated.

```
Npp32f nY =  0.299F * R + 0.587F * G + 0.114F * B;
Npp32f nU = (0.492F * ((Npp32f)nB - nY)) + 128.0F;
Npp32f nV = (0.877F * ((Npp32f)nR - nY)) + 128.0F;
if (nV > 255.0F)
    nV = 255.0F;
```

Functions

NppStatus **nppiBGRToYUV_8u_C3R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

3 channel 8-bit unsigned packed BGR to 3 channel 8-bit unsigned packed YUV color conversion.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiBGRToYUV_8u_AC4R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

4 channel 8-bit unsigned packed BGR with alpha to 4 channel 8-bit unsigned packed YUV color conversion with alpha, not affecting alpha.

images.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiBGRToYUV_8u_P3R_Ctx**(const *Npp8u* *const pSrc[3], int nSrcStep, *Npp8u* *pDst[3], int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

3 channel 8-bit unsigned planar BGR to 3 channel 8-bit unsigned planar YUV color conversion.

Parameters

- **pSrc** – *Source-Planar-Image Pointer Array*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Planar-Image Pointer Array*.

- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiBGRToYUV_8u_C3P3R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *Npp8u* *pDst[3], int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

3 channel 8-bit unsigned packed BGR to 3 channel 8-bit unsigned planar YUV color conversion.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Planar-Image Pointer Array*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiBGRToYUV_8u_AC4P4R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *Npp8u* *pDst[4], int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

4 channel 8-bit unsigned packed BGR with alpha to 4 channel 8-bit unsigned planar YUV color conversion with alpha.

images.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Planar-Image Pointer Array*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*

1.8.3.3 YUVToRGB

YUV to RGB color conversion.

Here is how NPP converts YUV to gamma corrected RGB or BGR.

```
Npp32f nY = (Npp32f)Y;
Npp32f nU = (Npp32f)U - 128.0F;
Npp32f nV = (Npp32f)V - 128.0F;
Npp32f nR = nY + 1.140F * nV;
if (nR < 0.0F)
    nR = 0.0F;
if (nR > 255.0F)
    nR = 255.0F;
Npp32f nG = nY - 0.394F * nU - 0.581F * nV;
if (nG < 0.0F)
    nG = 0.0F;
if (nG > 255.0F)
    nG = 255.0F;
Npp32f nB = nY + 2.032F * nU;
if (nB < 0.0F)
    nB = 0.0F;
if (nB > 255.0F)
    nB = 255.0F;
```

Functions

NppStatus **nppiYUVToRGB_8u_C3R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

3 channel 8-bit unsigned packed YUV to 3 channel 8-bit unsigned packed RGB color conversion.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiYUVToRGB_8u_AC4R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

4 channel 8-bit packed YUV with alpha to 4 channel 8-bit unsigned packed RGB color conversion with alpha, not affecting alpha.

images.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiYUVToRGB_8u_P3R_Ctx**(const *Npp8u* *const pSrc[3], int nSrcStep, *Npp8u* *pDst[3], int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

3 channel 8-bit unsigned planar YUV to 3 channel 8-bit unsigned planar RGB color conversion.

Parameters

- **pSrc** – *Source-Planar-Image Pointer Array*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Planar-Image Pointer Array*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiYUVToRGB_8u_P3C3R_Ctx**(const *Npp8u* *const pSrc[3], int nSrcStep, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

3 channel 8-bit unsigned planar YUV to 3 channel 8-bit unsigned packed RGB color conversion.

Parameters

- **pSrc** – *Source-Planar-Image Pointer Array*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

1.8.3.4 YUVToRGBBatch

YUV to RGB batch color conversion with a single *Region-Of-Interest (ROI)* for all pairs of input/output images provided in batches.

NPP converts YUV to gamma corrected RGB the same way as in *YUVToRGB*.

Functions

NppStatus **nppiYUVToRGBBatch_8u_C3R_Ctx**(const *NppiImageDescriptor* *pSrcBatchList, *NppiImageDescriptor* *pDstBatchList, int nBatchSize, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

3 channel 8-bit unsigned packed YUV to 3 channel 8-bit unsigned packed RGB batch color conversion for a single ROI.

Provided oSizeROI will be used for all pairs of input and output images passed in pSrcBatchList and pSrcBatchList arguments. API user must ensure that provided ROI (oSizeROI) does not go beyond the borders of any of provided images.

Parameters

- **pSrcBatchList** – *Source-Batch-Images Pointer*.
- **pDstBatchList** – *Destination-Batch-Images Pointer*.
- **nBatchSize** – Number of *NppiImageDescriptor* structures processed in this call (must be > 1).
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiYUVToRGBBatch_8u_P3C3R_Ctx**(const *NppiImageDescriptor* *const pSrcBatchList[3], *NppiImageDescriptor* *pDstBatchList, int nBatchSize, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

3 channel 8-bit unsigned planar YUV to 3 channel 8-bit unsigned packed RGB batch color conversion for a single ROI.

Provided oSizeROI will be used for all pairs of input planes making input images and output packed images passed in pSrcBatchList and pSrcBatchList arguments. API user must ensure that provided ROI (oSizeROI) does not go beyond the borders of any of provided images.

Parameters

- **pSrcBatchList** – An array where each element is a batch of images representing one of planes in planar images, *Source-Batch-Images Pointer*. The first element of array (pSrcBatchList[0]) represents a batch of Y planes. The second element of array (pSrcBatchList[1]) represents a batch of U planes. The third element of array (pSrcBatchList[2]) represents a batch of V planes.
- **pDstBatchList** – *Destination-Batch-Images Pointer*.

- **nBatchSize** – A number of *NppiImageDescriptor* structures processed in this call (must be > 1).
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

1.8.3.5 YUVToRGBBatchAdvanced

YUV to RGB batch color conversion where each pair of input/output images from provided batches has own *Region-Of-Interest (ROI)*.

NPP converts YUV to gamma corrected RGB the same way as in *YUVToRGB*.

Functions

NppStatus **nppiYUVToRGBBatch_8u_C3R_Advanced_Ctx**(const *NppiImageDescriptor* *pSrcBatchList, *NppiImageDescriptor* *pDstBatchList, int nBatchSize, *NppiSize* oMaxSizeROI, *NppStreamContext* nppStreamCtx)

3 channel 8-bit unsigned packed YUV to 3 channel 8-bit unsigned packed RGB batch color conversion where each pair of input/output images has own ROI.

Provided oMaxSizeROI must contain the maximum width and the maximum height of all ROIs defined in pDstBatchList. API user must ensure that ROI from pDstBatchList for each pair of input and output images does not go beyond the borders of images in each pair.

Parameters

- **pSrcBatchList** – *Source-Batch-Images Pointer*.
- **pDstBatchList** – *Destination-Batch-Images Pointer*.
- **nBatchSize** – Number of *NppiImageDescriptor* structures processed in this call (must be > 1).
- **oMaxSizeROI** – *Region-Of-Interest (ROI)*, must contain the maximum width and the maximum height from all destination ROIs used for processing data.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiYUVToRGBBatch_8u_P3C3R_Advanced_Ctx**(const *NppiImageDescriptor* *const pSrcBatchList[3], *NppiImageDescriptor* *pDstBatchList, int nBatchSize, *NppiSize* oMaxSizeROI, *NppStreamContext* nppStreamCtx)

3 channel 8-bit unsigned planar YUV to 3 channel 8-bit unsigned packed RGB batch color conversion where each pair of input/output images has own ROI.

Provided oMaxSizeROI must contain the maximum width and the maximum height of all ROIs defined in pDstBatchList. API user must ensure that ROI from pDstBatchList for each pair of input and output images does not go beyond the borders of images in each pair.

Parameters

- **pSrcBatchList** – An array where each element is a batch of images representing one of planes in planar images, *Source-Batch-Images Pointer*. The first element of array (pSrcBatchList[0]) represents a batch of Y planes. The second element of array (pSrcBatchList[1]) represents a batch of U planes. The third element of array (pSrcBatchList[2]) represents a batch of V planes.
- **pDstBatchList** – *Destination-Batch-Images Pointer*.
- **nBatchSize** – Number of *NppiImageDescriptor* structures processed in this call (must be > 1).
- **oMaxSizeROI** – *Region-Of-Interest (ROI)*, must contain the maximum width and the maximum height from all destination ROIs used for processing data.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

1.8.3.6 YUVToBGR

YUV to BGR color conversion.

Here is how NPP converts YUV to gamma corrected RGB or BGR.

```
Npp32f nY = (Npp32f)Y;
Npp32f nU = (Npp32f)U - 128.0F;
Npp32f nV = (Npp32f)V - 128.0F;
Npp32f nR = nY + 1.140F * nV;
if (nR < 0.0F)
    nR = 0.0F;
if (nR > 255.0F)
    nR = 255.0F;
Npp32f nG = nY - 0.394F * nU - 0.581F * nV;
if (nG < 0.0F)
    nG = 0.0F;
if (nG > 255.0F)
    nG = 255.0F;
Npp32f nB = nY + 2.032F * nU;
if (nB < 0.0F)
    nB = 0.0F;
if (nB > 255.0F)
    nB = 255.0F;
```

Functions

NppStatus **nppiYUVToBGR_8u_C3R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

3 channel 8-bit unsigned packed YUV to 3 channel 8-bit unsigned packed BGR color conversion.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiYUVToBGR_8u_AC4R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

4 channel 8-bit packed YUV with alpha to 4 channel 8-bit unsigned packed BGR color conversion with alpha, not affecting alpha.

images.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiYUVToBGR_8u_P3R_Ctx**(const *Npp8u* *const pSrc[3], int nSrcStep, *Npp8u* *pDst[3], int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

3 channel 8-bit unsigned planar YUV to 3 channel 8-bit unsigned planar BGR color conversion.

Parameters

- **pSrc** – *Source-Planar-Image Pointer Array*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Planar-Image Pointer Array*.

- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiYUVToBGR_8u_P3C3R_Ctx**(const *Npp8u* *const pSrc[3], int nSrcStep, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

3 channel 8-bit unsigned planar YUV to 3 channel 8-bit unsigned packed BGR color conversion.

Parameters

- **pSrc** – *Source-Planar-Image Pointer Array*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*

1.8.3.7 YUVToBGRBatch

YUV to BGR batch color conversion with a single *Region-Of-Interest (ROI)* for all pairs of input/output images provided in batches.

NPP converts YUV to gamma corrected BGR the same way as in *YUVToBGR*.

Functions

NppStatus **nppiYUVToBGRBatch_8u_C3R_Ctx**(const *NppiImageDescriptor* *pSrcBatchList, *NppiImageDescriptor* *pDstBatchList, int nBatchSize, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

3 channel 8-bit unsigned packed YUV to 3 channel 8-bit unsigned packed BGR batch color conversion for a single ROI.

Provided oSizeROI will be used for all pairs of input and output images passed in pSrcBatchList and pSrcBatchList arguments. API user must ensure that provided ROI (oSizeROI) does not go beyond the borders of any of provided images.

Parameters

- **pSrcBatchList** – *Source-Batch-Images Pointer*.
- **pDstBatchList** – *Destination-Batch-Images Pointer*.

- **nBatchSize** – Number of *NppiImageDescriptor* structures processed in this call (must be > 1).
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiYUVToBGRBatch_8u_P3C3R_Ctx**(const *NppiImageDescriptor* *const pSrcBatchList[3], *NppiImageDescriptor* *pDstBatchList, int nBatchSize, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

3 channel 8-bit unsigned planar YUV to 3 channel 8-bit unsigned packed BGR batch color conversion for a single ROI.

Provided oSizeROI will be used for all pairs of input planes making input images and output packed images passed in pSrcBatchList and pSrcBatchList arguments. API user must ensure that provided ROI (oSizeROI) does not go beyond the borders of any of provided images.

Parameters

- **pSrcBatchList** – An array where each element is a batch of images representing one of planes in planar images, *Source-Batch-Images Pointer*. The first element of array (pSrcBatchList[0]) represents a batch of Y planes. The second element of array (pSrcBatchList[1]) represents a batch of U planes. The third element of array (pSrcBatchList[2]) represents a batch of V planes.
- **pDstBatchList** – *Destination-Batch-Images Pointer*.
- **nBatchSize** – A number of *NppiImageDescriptor* structures processed in this call (must be > 1).
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

1.8.3.8 YUVToBGRBatchAdvanced

YUV to BGR batch color conversion where each pair of input/output images from provided batches has own *Region-Of-Interest (ROI)*.

NPP converts YUV to gamma corrected BGR the same way as in *YUVToBGR*.

Functions

NppStatus **nppiYUVToBGRBatch_8u_C3R_Advanced_Ctx**(const *NppiImageDescriptor* *pSrcBatchList, *NppiImageDescriptor* *pDstBatchList, int nBatchSize, *NppiSize* oMaxSizeROI, *NppStreamContext* nppStreamCtx)

3 channel 8-bit unsigned packed YUV to 3 channel 8-bit unsigned packed BGR batch color conversion where each pair of input/output images has own ROI.

Provided oMaxSizeROI must contain the maximum width and the maximum height of all ROIs defined in pDstBatchList. API user must ensure that ROI from pDstBatchList for each pair of input and output images does not go beyond the borders of images in each pair.

Parameters

- **pSrcBatchList** – *Source-Batch-Images Pointer*.
- **pDstBatchList** – *Destination-Batch-Images Pointer*.
- **nBatchSize** – Number of *NppiImageDescriptor* structures processed in this call (must be > 1).
- **oMaxSizeROI** – *Region-Of-Interest (ROI)*, must contain the maximum width and the maximum height from all destination ROIs used for processing data.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiYUVToBGRBatch_8u_P3C3R_Advanced_Ctx**(const *NppiImageDescriptor* *const pSrcBatchList[3], *NppiImageDescriptor* *pDstBatchList, int nBatchSize, *NppiSize* oMaxSizeROI, *NppStreamContext* nppStreamCtx)

3 channel 8-bit unsigned planar YUV to 3 channel 8-bit unsigned packed BGR batch color conversion where each pair of input/output images has own ROI.

Provided oMaxSizeROI must contain the maximum width and the maximum height of all ROIs defined in pDstBatchList. API user must ensure that ROI from pDstBatchList for each pair of input and output images does not go beyond the borders of images in each pair.

Parameters

- **pSrcBatchList** – An array where each element is a batch of images representing one of planes in planar images, *Source-Batch-Images Pointer*. The first element of array (pSrcBatchList[0]) represents a batch of Y planes. The second element of array (pSrcBatchList[1]) represents a batch of U planes. The third element of array (pSrcBatchList[2]) represents a batch of V planes.
- **pDstBatchList** – *Destination-Batch-Images Pointer*.
- **nBatchSize** – Number of *NppiImageDescriptor* structures processed in this call (must be > 1).
- **oMaxSizeROI** – *Region-Of-Interest (ROI)*, must contain the maximum width and the maximum height from all destination ROIs used for processing data.

- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

1.8.3.9 RGBToYUV422

RGB to YUV422 color conversion.

NPP converts YUV to gamma corrected BGR the same way as in *YUVToBGR*.

Functions

NppStatus **nppiRGBToYUV422_8u_C3C2R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

3 channel 8-bit unsigned packed RGB to 2 channel 8-bit unsigned packed YUV422 color conversion.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiRGBToYUV422_8u_P3R_Ctx**(const *Npp8u* *const pSrc[3], int nSrcStep, *Npp8u* *pDst[3], int rDstStep[3], *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

3 channel 8-bit unsigned planar RGB to 3 channel 8-bit unsigned planar YUV422 color conversion.

images.

Parameters

- **pSrc** – *Source-Planar-Image Pointer Array*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Planar-Image Pointer Array*.
- **rDstStep** – Destination-Planar-Image Line Step Array.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiRGBToYUV422_8u_C3P3R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *Npp8u* *pDst[3], int rDstStep[3], *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

3 channel 8-bit unsigned packed RGB to 3 channel 8-bit unsigned planar YUV422 color conversion.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Planar-Image Pointer Array*.
- **rDstStep** – Destination-Planar-Image Line Step Array.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

1.8.3.10 YUV422ToRGB

YUV422 to RGB color conversion.

Functions

NppStatus **nppiYUV422ToRGB_8u_C2C3R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

2 channel 8-bit unsigned packed YUV422 to 3 channel 8-bit unsigned packed RGB color conversion.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiYUV422ToRGB_8u_P3R_Ctx**(const *Npp8u* *const pSrc[3], int rSrcStep[3], *Npp8u* *pDst[3], int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

3 channel 8-bit unsigned planar YUV422 to 3 channel 8-bit unsigned planar RGB color conversion.

Parameters

- **pSrc** – *Source-Planar-Image Pointer Array*.
- **rSrcStep** – *Source-Planar-Image Line Step Array*.
- **pDst** – *Destination-Planar-Image Pointer Array*.
- **nDstStep** – *Destination-Planar-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiYUV422ToRGB_8u_P3C3R_Ctx**(const *Npp8u* *const pSrc[3], int rSrcStep[3], *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

3 channel 8-bit unsigned planar YUV422 to 3 channel 8-bit unsigned packed RGB color conversion.

Parameters

- **pSrc** – *Source-Planar-Image Pointer Array*.
- **rSrcStep** – *Source-Planar-Image Line Step Array*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiYUV422ToRGB_8u_P3AC4R_Ctx**(const *Npp8u* *const pSrc[3], int rSrcStep[3], *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

3 channel 8-bit unsigned planar YUV422 to 4 channel 8-bit unsigned packed RGB color conversion with alpha.

Parameters

- **pSrc** – *Source-Planar-Image Pointer Array*.
- **rSrcStep** – *Source-Planar-Image Line Step Array*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

1.8.3.11 YUV422ToRGBBatch

Planar YUV422 to packed RGB batch color conversion with a single *Region-Of-Interest (ROI)* for all pairs of input/output images provided in batches.

Functions

NppStatus **nppiYUV422ToRGBBatch_8u_P3C3R_Ctx**(const *NppiImageDescriptor* *const pSrcBatchList[3], *NppiImageDescriptor* *pDstBatchList, int nBatchSize, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

3 channel 8-bit unsigned planar YUV422 to 3 channel 8-bit unsigned packed RGB batch color conversion for a single ROI.

Provided oSizeROI will be used for all pairs of input planes making input images and output packed images passed in pSrcBatchList and pSrcBatchList arguments. API user must ensure that provided ROI (oSizeROI) does not go beyond the borders of any of provided images.

Parameters

- **pSrcBatchList** – An array where each element is a batch of images representing one of planes in planar images, *Source-Batch-Images Pointer*. The first element of array (pSrcBatchList[0]) represents a batch of Y planes. The second element of array (pSrcBatchList[1]) represents a batch of U planes. The third element of array (pSrcBatchList[2]) represents a batch of V planes.
- **pDstBatchList** – *Destination-Batch-Images Pointer*.
- **nBatchSize** – A number of *NppiImageDescriptor* structures processed in this call (must be > 1).
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

1.8.3.12 YUV422ToRGBBatchAdvanced

Planar YUV422 to packed RGB batch color conversion where each pair of input/output images from provided batches has own *Region-Of-Interest (ROI)*.

Functions

NppStatus **nppiYUV422ToRGBBatch_8u_P3C3R_Advanced_Ctx**(const *NppiImageDescriptor* *const pSrcBatchList[3], *NppiImageDescriptor* *pDstBatchList, int nBatchSize, *NppiSize* oMaxSizeROI, *NppStreamContext* nppStreamCtx)

3 channel 8-bit unsigned planar YUV422 to 3 channel 8-bit unsigned packed RGB batch color conversion where each pair of input/output images has own ROI.

Provided oMaxSizeROI must contain the maximum width and the maximum height of all ROIs defined in pDstBatchList. API user must ensure that ROI from pDstBatchList for each pair of input and output images does not go beyond the borders of images in each pair.

Parameters

- **pSrcBatchList** – An array where each element is a batch of images representing one of planes in planar images, *Source-Batch-Images Pointer*. The first element of array (pSrcBatchList[0]) represents a batch of Y planes. The second element of array (pSrcBatchList[1]) represents a batch of U planes. The third element of array (pSrcBatchList[2]) represents a batch of V planes.
- **pDstBatchList** – *Destination-Batch-Images Pointer*.
- **nBatchSize** – Number of *NppiImageDescriptor* structures processed in this call (must be > 1).
- **oMaxSizeROI** – *Region-Of-Interest (ROI)*, must contain the maximum width and the maximum height from all destination ROIs used for processing data.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

1.8.3.13 YUV422ToBGRBatch

Planar YUV422 to packed BGR batch color conversion with a single *Region-Of-Interest (ROI)* for all pairs of input/output images provided in batches.

Functions

NppStatus **nppiYUV422ToBGRBatch_8u_P3C3R_Ctx**(const *NppiImageDescriptor* *const pSrcBatchList[3], *NppiImageDescriptor* *pDstBatchList, int nBatchSize, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

3 channel 8-bit unsigned planar YUV422 to 3 channel 8-bit unsigned packed BGR batch color conversion for a single ROI.

Provided oSizeROI will be used for all pairs of input planes making input images and output packed images passed in pSrcBatchList and pSrcBatchList arguments. API user must ensure that provided ROI (oSizeROI) does not go beyond the borders of any of provided images.

Parameters

- **pSrcBatchList** – An array where each element is a batch of images representing one of planes in planar images, *Source-Batch-Images Pointer*. The first element of array (pSrcBatchList[0]) represents a batch of Y planes. The second element of array (pSrcBatchList[1]) represents a batch of U planes. The third element of array (pSrcBatchList[2]) represents a batch of V planes.
- **pDstBatchList** – *Destination-Batch-Images Pointer*.

- **nBatchSize** – A number of *NppiImageDescriptor* structures processed in this call (must be > 1).
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

1.8.3.14 YUV422ToBGRBatchAdvanced

Planar YUV422 to packed BGR batch color conversion where each pair of input/output images from provided batches has own *Region-Of-Interest (ROI)*.

Functions

NppStatus **nppiYUV422ToBGRBatch_8u_P3C3R_Advanced_Ctx**(const *NppiImageDescriptor* *const pSrcBatchList[3], *NppiImageDescriptor* *pDstBatchList, int nBatchSize, *NppiSize* oMaxSizeROI, *NppStreamContext* nppStreamCtx)

3 channel 8-bit unsigned planar YUV422 to 3 channel 8-bit unsigned packed BGR batch color conversion where each pair of input/output images has own ROI.

Provided oMaxSizeROI must contain the maximum width and the maximum height of all ROIs defined in pDstBatchList. API user must ensure that ROI from pDstBatchList for each pair of input and output images does not go beyond the borders of images in each pair.

Parameters

- **pSrcBatchList** – An array where each element is a batch of images representing one of planes in planar images, *Source-Batch-Images Pointer*. The first element of array (pSrcBatchList[0]) represents a batch of Y planes. The second element of array (pSrcBatchList[1]) represents a batch of U planes. The third element of array (pSrcBatchList[2]) represents a batch of V planes.
- **pDstBatchList** – *Destination-Batch-Images Pointer*.
- **nBatchSize** – Number of *NppiImageDescriptor* structures processed in this call (must be > 1).
- **oMaxSizeROI** – *Region-Of-Interest (ROI)*, must contain the maximum width and the maximum height from all destination ROIs used for processing data.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

1.8.3.15 RGBToYUV420

RGB to YUV420 color conversion.

Functions

NppStatus **nppiRGBToYUV420_8u_P3R_Ctx**(const *Npp8u* *const pSrc[3], int nSrcStep, *Npp8u* *pDst[3], int rDstStep[3], *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

3 channel 8-bit unsigned planar RGB to 3 channel 8-bit unsigned planar YUV420 color conversion.

images.

Parameters

- **pSrc** – *Source-Planar-Image Pointer Array*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Planar-Image Pointer Array*.
- **rDstStep** – Destination-Planar-Image Line Step Array.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiRGBToYUV420_8u_C3P3R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *Npp8u* *pDst[3], int rDstStep[3], *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

3 channel 8-bit unsigned packed RGB to 3 channel 8-bit unsigned planar YUV420 color conversion.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Planar-Image Pointer Array*.
- **rDstStep** – Destination-Planar-Image Line Step Array.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

1.8.3.16 YUV420ToRGB

YUV420 to RGB color conversion.

Functions

NppStatus **nppiYUV420ToRGB_8u_P3R_Ctx**(const *Npp8u* *const pSrc[3], int rSrcStep[3], *Npp8u* *pDst[3], int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

3 channel 8-bit unsigned planar YUV420 to 3 channel 8-bit unsigned planar RGB color conversion.

Parameters

- **pSrc** – *Source-Planar-Image Pointer Array*.
- **rSrcStep** – *Source-Planar-Image Line Step Array*.
- **pDst** – *Destination-Planar-Image Pointer Array*.
- **nDstStep** – *Destination-Planar-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiYUV420ToRGB_8u_P3C3R_Ctx**(const *Npp8u* *const pSrc[3], int rSrcStep[3], *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

3 channel 8-bit unsigned planar YUV420 to 3 channel 8-bit unsigned packed RGB color conversion.

Parameters

- **pSrc** – *Source-Planar-Image Pointer Array*.
- **rSrcStep** – *Source-Planar-Image Line Step Array*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiYUV420ToRGB_8u_P3C4R_Ctx**(const *Npp8u* *const pSrc[3], int rSrcStep[3], *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

3 channel 8-bit unsigned planar YUV420 to 4 channel 8-bit unsigned packed RGB color conversion with constant alpha (0xFF).

Parameters

- **pSrc** – *Source-Planar-Image Pointer Array*.
- **rSrcStep** – *Source-Planar-Image Line Step Array*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiYUV420ToRGB_8u_P3AC4R_Ctx**(const *Npp8u* *const pSrc[3], int rSrcStep[3], *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

3 channel 8-bit unsigned planar YUV420 to 4 channel 8-bit unsigned packed RGB color conversion with alpha.

Parameters

- **pSrc** – *Source-Planar-Image Pointer Array*.
- **rSrcStep** – *Source-Planar-Image Line Step Array*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

1.8.3.17 YUV420ToRGBBatch

Planar YUV420 to packed RGB batch color conversion with a single *Region-Of-Interest (ROI)* for all pairs of input/output images provided in batches.

Functions

NppStatus **nppiYUV420ToRGBBatch_8u_P3C3R_Ctx**(const *NppiImageDescriptor* *const pSrcBatchList[3], *NppiImageDescriptor* *pDstBatchList, int nBatchSize, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

3 channel 8-bit unsigned planar YUV420 to 3 channel 8-bit unsigned packed RGB batch color conversion for a single ROI.

Provided oSizeROI will be used for all pairs of input planes making input images and output packed images passed in pSrcBatchList and pSrcBatchList arguments. API user must ensure that provided ROI (oSizeROI) does not go beyond the borders of any of provided images.

Parameters

- **pSrcBatchList** – An array where each element is a batch of images representing one of planes in planar images, *Source-Batch-Images Pointer*. The first element of array (pSrcBatchList[0]) represents Y planes. The second element of array (pSrcBatchList[1]) represents U planes. The third element of array (pSrcBatchList[2]) represents V planes.
- **pDstBatchList** – *Destination-Batch-Images Pointer*.
- **nBatchSize** – A number of *NppiImageDescriptor* structures processed in this call (must be > 1).
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

1.8.3.18 YUV420ToRGBBatchAdvanced

Planar YUV420 to packed RGB batch color conversion where each pair of input/output images from provided batches has own *Region-Of-Interest (ROI)*.

Functions

NppStatus **nppiYUV420ToRGBBatch_8u_P3C3R_Advanced_Ctx**(const *NppiImageDescriptor* *const pSrcBatchList[3], *NppiImageDescriptor* *pDstBatchList, int nBatchSize, *NppiSize* oMaxSizeROI, *NppStreamContext* nppStreamCtx)

3 channel 8-bit unsigned planar YUV420 to 3 channel 8-bit unsigned packed RGB batch color conversion where each pair of input/output images has own ROI.

Provided oMaxSizeROI must contain the maximum width and the maximum height of all ROIs defined in pDstBatchList. API user must ensure that ROI from pDstBatchList for each pair of input and output images does not go beyond the borders of images in each pair.

Parameters

- **pSrcBatchList** – An array where each element is a batch of images representing one of planes in planar images, *Source-Batch-Images Pointer*. The first element of array (pSrcBatchList[0]) represents a batch of Y planes. The second element of array (pSrcBatchList[1]) represents a batch of U planes. The third element of array (pSrcBatchList[2]) represents a batch of V planes.
- **pDstBatchList** – *Destination-Batch-Images Pointer*.
- **nBatchSize** – Number of *NppiImageDescriptor* structures processed in this call (must be > 1).
- **oMaxSizeROI** – *Region-Of-Interest (ROI)*, must contain the maximum width and the maximum height from all destination ROIs used for processing data.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*

1.8.3.19 NV12ToRGB

NV12 to RGB color conversion.

Functions

NppStatus **nppiNV12ToRGB_8u_P2C3R_Ctx**(const *Npp8u* *const pSrc[2], int rSrcStep, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

2 channel 8-bit unsigned planar NV12 to 3 channel 8-bit unsigned packed RGB color conversion.

Parameters

- **pSrc** – *Source-Planar-Image Pointer Array* (one for Y plane, one for UV plane).
- **rSrcStep** – *Source-Planar-Image Line Step*. Same value is used for each source plane.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiNV12ToRGB_709HDTV_8u_P2C3R_Ctx**(const *Npp8u* *const pSrc[2], int rSrcStep, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

2 channel 8-bit unsigned planar NV12 to 3 channel 8-bit unsigned packed RGB 709 HDTV full color conversion.

Note that HDTV conversion assumes full color range of 0 - 255, use CSC version for limited range color.

Parameters

- **pSrc** – *Source-Planar-Image Pointer Array* (one for Y plane, one for UV plane).
- **rSrcStep** – *Source-Planar-Image Line Step*. Same value is used for each plane.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiNV12ToRGB_709CSC_8u_P2C3R_Ctx**(const *Npp8u* *const pSrc[2], int rSrcStep, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

2 channel 8-bit unsigned planar NV12 to 3 channel 8-bit unsigned packed RGB 709 CSC color conversion.

Note that HDTV conversion assumes full color range of 0 - 255, use CSC version for limited range color.

Parameters

- **pSrc** – *Source-Planar-Image Pointer Array* (one for Y plane, one for UV plane).
- **rSrcStep** – *Source-Planar-Image Line Step*. Same value is used for each plane.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiNV12ToRGB_601_8u_P2C3R_Ctx**(const *Npp8u* *const pSrc[2], int rSrcStep, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

2 channel 8-bit unsigned planar NV12 to 3 channel 8-bit unsigned packed RGB BT.601 full-range color conversion (ITU-T T.871 / JFIF).

Coefficients derived from BT.601 luma weights (Kr=0.299, Kb=0.114) with full digital range Y=[0..255], Cb/Cr=[0..255] (offset 128). Use this variant for cameras that signal full-range BT.601 NV12 (e.g. OAK-D VPU encoder output), as distinct from the unspecified-range default nppiNV12ToRGB_8u_P2C3R and the BT.709 variants.

Parameters

- **pSrc** – *Source-Planar-Image Pointer Array* (one for Y plane, one for UV plane).
- **rSrcStep** – *Source-Planar-Image Line Step*. Same value is used for each plane.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

1.8.3.20 NV21ToRGB

NV21 to RGB color conversion.

Functions

NppStatus **nppiNV21ToRGB_8u_P2C4R_Ctx**(const *Npp8u* *const pSrc[2], int rSrcStep, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

2 channel 8-bit unsigned planar NV21 to 4 channel 8-bit unsigned packed RGBA color conversion with constant alpha (0xFF).

Parameters

- **pSrc** – *Source-Planar-Image Pointer Array* (one for Y plane, one for VU plane).
- **rSrcStep** – *Source-Planar-Image Line Step*. Same value is used for each plane.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

1.8.3.21 BGRToYUV420

BGR to YUV420 color conversion.

Functions

NppStatus **nppiBGRToYUV420_8u_AC4P3R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *Npp8u* *pDst[3], int rDstStep[3], *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

4 channel 8-bit unsigned pacmed BGR with alpha to 3 channel 8-bit unsigned planar YUV420 color conversion.

images.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Planar-Image Pointer Array*.
- **rDstStep** – Destination-Planar-Image Line Step Array.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*

1.8.3.22 YUV420ToBGR

YUV420 to BGR color conversion.

Functions

NppStatus **nppiYUV420ToBGR_8u_P3C3R_Ctx**(const *Npp8u* *const pSrc[3], int rSrcStep[3], *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

3 channel 8-bit unsigned planar YUV420 to 3 channel 8-bit unsigned packed BGR color conversion.

Parameters

- **pSrc** – *Source-Planar-Image Pointer Array*.
- **rSrcStep** – *Source-Planar-Image Line Step Array*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiYUV420ToBGR_8u_P3C4R_Ctx**(const *Npp8u* *const pSrc[3], int rSrcStep[3], *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

3 channel 8-bit unsigned planar YUV420 to 4 channel 8-bit unsigned packed BGR color conversion with constant alpha (0xFF).

Parameters

- **pSrc** – *Source-Planar-Image Pointer Array*.
- **rSrcStep** – *Source-Planar-Image Line Step Array*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*

1.8.3.23 YUV420ToBGRBatch

Planar YUV420 to packed BGR batch color conversion with a single *Region-Of-Interest (ROI)* for all pairs of input/output images provided in batches.

Functions

NppStatus **nppiYUV420ToBGRBatch_8u_P3C3R_Ctx**(const *NppiImageDescriptor* *const pSrcBatchList[3], *NppiImageDescriptor* *pDstBatchList, int nBatchSize, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

3 channel 8-bit unsigned planar YUV420 to 3 channel 8-bit unsigned packed BGR batch color conversion for a single ROI.

Provided oSizeROI will be used for all pairs of input planes making input images and output packed images passed in pSrcBatchList and pSrcBatchList arguments. API user must ensure that provided ROI (oSizeROI) does not go beyond the borders of any of provided images.

Parameters

- **pSrcBatchList** – An array where each element is a batch of images representing one of planes in planar images, *Source-Batch-Images Pointer*. The first element of array (pSrcBatchList[0]) represents Y planes. The second element of array (pSrcBatchList[1]) represents U planes. The third element of array (pSrcBatchList[2]) represents V planes.
- **pDstBatchList** – *Destination-Batch-Images Pointer*.
- **nBatchSize** – A number of *NppiImageDescriptor* structures processed in this call (must be > 1).
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

1.8.3.24 YUV420ToBGRBatchAdvanced

Planar YUV420 to packed BGR batch color conversion where each pair of input/output images from provided batches has own *Region-Of-Interest (ROI)*.

Functions

NppStatus **nppiYUV420ToBGRBatch_8u_P3C3R_Advanced_Ctx**(const *NppiImageDescriptor* *const pSrcBatchList[3], *NppiImageDescriptor* *pDstBatchList, int nBatchSize, *NppiSize* oMaxSizeROI, *NppStreamContext* nppStreamCtx)

3 channel 8-bit unsigned planar YUV420 to 3 channel 8-bit unsigned packed BGR batch color conversion where each pair of input/output images has own ROI.

Provided oMaxSizeROI must contain the maximum width and the maximum height of all ROIs defined in pDstBatchList. API user must ensure that ROI from pDstBatchList for each pair of input and output images does not go beyond the borders of images in each pair.

Parameters

- **pSrcBatchList** – An array where each element is a batch of images representing one of planes in planar images, *Source-Batch-Images Pointer*. The first element of array (pSrcBatchList[0]) represents a batch of Y planes. The second element of array (pSrcBatchList[1]) represents a batch of U planes. The third element of array (pSrcBatchList[2]) represents a batch of V planes.
- **pDstBatchList** – *Destination-Batch-Images Pointer*.
- **nBatchSize** – Number of *NppiImageDescriptor* structures processed in this call (must be > 1).
- **oMaxSizeROI** – *Region-Of-Interest (ROI)*, must contain the maximum width and the maximum height from all destination ROIs used for processing data.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

1.8.3.25 NV12ToBGR

NV12 to BGR color conversion.

Functions

NppStatus **nppiNV12ToBGR_8u_P2C3R_Ctx**(const *Npp8u* *const pSrc[2], int rSrcStep, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

2 channel 8-bit unsigned planar NV12 to 3 channel 8-bit unsigned packed BGR color conversion.

Parameters

- **pSrc** – *Source-Planar-Image Pointer Array* (one for Y plane, one for UV plane).
- **rSrcStep** – *Source-Planar-Image Line Step*. Same value is used for each plane.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiNV12ToBGR_709HDTV_8u_P2C3R_Ctx**(const *Npp8u* *const pSrc[2], int rSrcStep, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

2 channel 8-bit unsigned planar NV12 to 3 channel 8-bit unsigned packed RGB 709 HDTV full color conversion.

Note that HDTV conversion assumes full color range of 0 - 255, use CSC version for limited range color.

Parameters

- **pSrc** – *Source-Planar-Image Pointer Array* (one for Y plane, one for UV plane).
- **rSrcStep** – *Source-Planar-Image Line Step*. Same value is used for each plane.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiNV12ToBGR_709CSC_8u_P2C3R_Ctx**(const *Npp8u* *const pSrc[2], int rSrcStep, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

2 channel 8-bit unsigned planar NV12 to 3 channel 8-bit unsigned packed RGB 709 CSC color conversion.

Note that HDTV conversion assumes full color range of 0 - 255, use CSC version for limited range color.

Parameters

- **pSrc** – *Source-Planar-Image Pointer Array* (one for Y plane, one for UV plane).
- **rSrcStep** – *Source-Planar-Image Line Step*. Same value is used for each plane.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiNV12ToBGR_601_8u_P2C3R_Ctx**(const *Npp8u* *const pSrc[2], int rSrcStep, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

2 channel 8-bit unsigned planar NV12 to 3 channel 8-bit unsigned packed BGR BT.601 full-range color conversion (ITU-T T.871 / JFIF).

Coefficients derived from BT.601 luma weights (Kr=0.299, Kb=0.114) with full digital range Y=[0..255], Cb/Cr=[0..255] (offset 128).

Parameters

- **pSrc** – *Source-Planar-Image Pointer Array* (one for Y plane, one for UV plane).
- **rSrcStep** – *Source-Planar-Image Line Step*. Same value is used for each plane.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

1.8.3.26 NV21ToBGR

NV21 to BGR color conversion.

Functions

NppStatus **nppiNV21ToBGR_8u_P2C4R_Ctx**(const *Npp8u* *const pSrc[2], int rSrcStep, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

2 channel 8-bit unsigned planar NV21 to 4 channel 8-bit unsigned packed BGRA color conversion with constant alpha (0xFF).

Parameters

- **pSrc** – *Source-Planar-Image Pointer Array* (one for Y plane, one for VU plane).
- **rSrcStep** – *Source-Planar-Image Line Step*. Same value is used for each plane.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

1.8.3.27 RGBToYCbCr

RGB to YCbCr color conversion.

Here is how NPP converts gamma corrected RGB or BGR to YCbCr. In the YCbCr model, Y is defined to have a nominal range [16..235], while Cb and Cr are defined to have a range [16..240], with the value of 128 as corresponding to zero.

```
Npp32f nY  =  0.257F * R + 0.504F * G + 0.098F * B + 16.0F;
Npp32f nCb = -0.148F * R - 0.291F * G + 0.439F * B + 128.0F;
Npp32f nCr =  0.439F * R - 0.368F * G - 0.071F * B + 128.0F;
```

Functions

NppStatus **nppiRGBToYCbCr_8u_C3R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

3 channel 8-bit unsigned packed RGB to 3 channel unsigned 8-bit packed YCbCr color conversion.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiRGBToYCbCr_8u_AC4R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

4 channel 8-bit unsigned packed RGB with alpha to 4 channel unsigned 8-bit packed YCbCr with alpha color conversion, not affecting alpha.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiRGBToYCbCr_8u_P3R_Ctx**(const *Npp8u* *const pSrc[3], int nSrcStep, *Npp8u* *pDst[3], int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

3 channel planar 8-bit unsigned RGB to 3 channel planar 8-bit YCbCr color conversion.

Parameters

- **pSrc** – *Source-Planar-Image Pointer Array*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Planar-Image Pointer Array*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiRGBToYCbCr_8u_C3P3R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *Npp8u* *pDst[3], int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

3 channel 8-bit unsigned packed RGB to 3 channel unsigned 8-bit planar YCbCr color conversion.

images.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiRGBToYCbCr_8u_AC4P3R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *Npp8u* *pDst[3], int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

4 channel 8-bit unsigned packed RGB with alpha to 3 channel 8-bit unsigned planar YCbCr color conversion.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Planar-Image Pointer Array*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

1.8.3.28 YCbCrToRGB

YCbCr to RGB color conversion.

Here is how NPP converts YCbCr to gamma corrected RGB or BGR. The output RGB values are saturated to the range [0..255].

```
Npp32f nY = 1.164F * ((Npp32f)Y - 16.0F);
Npp32f nR = ((Npp32f)Cr - 128.0F); Npp32f nB = ((Npp32f)Cb
- 128.0F); Npp32f nG = nY - 0.813F * nR - 0.392F * nB; if (nG > 255.0F)
    nG = 255.0F;
nR = nY + 1.596F * nR;
if (nR > 255.0F)
    nR = 255.0F;
nB = nY + 2.017F * nB;
if (nB > 255.0F)
    nB = 255.0F;
```

Functions

NppStatus **nppiYCbCrToRGB_8u_C3R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

3 channel 8-bit unsigned packed YCbCr to 3 channel 8-bit unsigned packed RGB color conversion.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiYCbCrToRGB_8u_AC4R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

4 channel 8-bit unsigned packed YCbCr with alpha to 4 channel 8-bit unsigned packed RGB with alpha color conversion, not affecting alpha.

Alpha channel is the last channel and is not processed.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.

- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiYCbCrToRGB_8u_P3R_Ctx**(const *Npp8u* *const pSrc[3], int nSrcStep, *Npp8u* *pDst[3], int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

3 channel 8-bit unsigned planar YCbCr to 3 channel 8-bit unsigned planar RGB color conversion.

Parameters

- **pSrc** – *Source-Planar-Image Pointer Array*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Planar-Image Pointer Array*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiYCbCrToRGB_8u_P3C3R_Ctx**(const *Npp8u* *const pSrc[3], int nSrcStep, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

3 channel 8-bit unsigned planar YCbCr to 3 channel 8-bit unsigned packed RGB color conversion.

Parameters

- **pSrc** – *Source-Planar-Image Pointer Array*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiYCbCrToRGB_8u_P3C4R_Ctx**(const *Npp8u* *const pSrc[3], int nSrcStep, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, *Npp8u* nAval, *NppStreamContext* nppStreamCtx)

3 channel 8-bit unsigned planar YCbCr to 4 channel 8-bit unsigned packed RGB color conversion with constant alpha.

Parameters

- **pSrc** – *Source-Planar-Image Pointer Array*.

- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nAval** – 8-bit unsigned alpha constant.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

1.8.3.29 YCbCrToRGBBatch

YCbCr to RGB batch color conversion with a single *Region-Of-Interest (ROI)* for all pairs of input/output images provided in batches.

NPP converts YCbCr to gamma corrected RGB the same way as in *YCbCr To RGB*.

Functions

NppStatus **nppiYCbCrToRGBBatch_8u_C3R_Ctx**(const *NppiImageDescriptor* *pSrcBatchList, *NppiImageDescriptor* *pDstBatchList, int nBatchSize, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

3 channel 8-bit unsigned packed YCbCr to 3 channel 8-bit unsigned packed RGB batch color conversion for a single ROI.

Provided oSizeROI will be used for all pairs of input and output images passed in pSrcBatchList and pSrcBatchList arguments. API user must ensure that provided ROI (oSizeROI) does not go beyond the borders of any of provided images.

Parameters

- **pSrcBatchList** – *Source-Batch-Images Pointer*.
- **pDstBatchList** – *Destination-Batch-Images Pointer*.
- **nBatchSize** – Number of *NppiImageDescriptor* structures processed in this call (must be > 1).
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiYCbCrToRGBBatch_8u_P3C3R_Ctx**(const *NppiImageDescriptor* *const pSrcBatchList[3], *NppiImageDescriptor* *pDstBatchList, int nBatchSize, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

3 channel 8-bit unsigned planar YCbCr to 3 channel 8-bit unsigned packed RGB batch color conversion for a single ROI.

Provided oSizeROI will be used for all pairs of input planes making input images and output packed images passed in pSrcBatchList and pSrcBatchList arguments. API user must ensure that provided ROI (oSizeROI) does not go beyond the borders of any of provided images.

Parameters

- **pSrcBatchList** – An array where each element is a batch of images representing one of planes in planar images, *Source-Batch-Images Pointer*. The first element of array (pSrcBatchList[0]) represents a batch of Y planes. The second element of array (pSrcBatchList[1]) represents a batch of Cb planes. The third element of array (pSrcBatchList[2]) represents a batch of Cr planes.
- **pDstBatchList** – *Destination-Batch-Images Pointer*.
- **nBatchSize** – A number of *NppiImageDescriptor* structures processed in this call (must be > 1).
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

1.8.3.30 YCbCrToRGBBatchAdvanced

YCbCr to RGB batch color conversion where each pair of input/output images from provided batches has own *Region-Of-Interest (ROI)*.

NPP converts YCbCr to gamma corrected RGB the same way as in *YCbCr To RGB*.

Functions

NppStatus **nppiYCbCrToRGBBatch_8u_C3R_Advanced_Ctx**(const *NppiImageDescriptor* *pSrcBatchList, *NppiImageDescriptor* *pDstBatchList, int nBatchSize, *NppiSize* oMaxSizeROI, *NppStreamContext* nppStreamCtx)

3 channel 8-bit unsigned packed YCbCr to 3 channel 8-bit unsigned packed RGB batch color conversion where each pair of input/output images has own ROI.

Provided oMaxSizeROI must contain the maximum width and the maximum height of all ROIs defined in pDstBatchList. API user must ensure that ROI from pDstBatchList for each pair of input and output images does not go beyond the borders of images in each pair.

Parameters

- **pSrcBatchList** – *Source-Batch-Images Pointer*.
- **pDstBatchList** – *Destination-Batch-Images Pointer*.
- **nBatchSize** – Number of *NppiImageDescriptor* structures processed in this call (must be > 1).
- **oMaxSizeROI** – *Region-Of-Interest (ROI)*, must contain the maximum width and the maximum height from all destination ROIs used for processing data.

- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiYCbCrToRGBBatch_8u_P3C3R_Advanced_Ctx**(const *NppiImageDescriptor* *const pSrcBatchList[3], *NppiImageDescriptor* *pDstBatchList, int nBatchSize, *NppiSize* oMaxSizeROI, *NppStreamContext* nppStreamCtx)

3 channel 8-bit unsigned planar YCbCr to 3 channel 8-bit unsigned packed RGB batch color conversion where each pair of input/output images has own ROI.

Provided oMaxSizeROI must contain the maximum width and the maximum height of all ROIs defined in pDstBatchList. API user must ensure that ROI from pDstBatchList for each pair of input and output images does not go beyond the borders of images in each pair.

Parameters

- **pSrcBatchList** – An array where each element is a batch of images representing one of planes in planar images, *Source-Batch-Images Pointer*. The first element of array (pSrcBatchList[0]) represents a batch of Y planes. The second element of array (pSrcBatchList[1]) represents a batch of Cb planes. The third element of array (pSrcBatchList[2]) represents a batch of Cr planes.
- **pDstBatchList** – *Destination-Batch-Images Pointer*.
- **nBatchSize** – Number of *NppiImageDescriptor* structures processed in this call (must be > 1).
- **oMaxSizeROI** – *Region-Of-Interest (ROI)*, must contain the maximum width and the maximum height from all destination ROIs used for processing data.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

1.8.3.31 YCbCrToBGR

YCbCr to BGR color conversion.

Functions

NppStatus **nppiYCbCrToBGR_8u_P3C3R_Ctx**(const *Npp8u* *const pSrc[3], int nSrcStep, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

3 channel 8-bit unsigned planar YCbCr to 3 channel 8-bit unsigned packed BGR color conversion.

Parameters

- **pSrc** – *Source-Planar-Image Pointer Array*.
- **nSrcStep** – *Source-Image Line Step*.

- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiYCbCrToBGR_8u_P3C4R_Ctx**(const *Npp8u* *const pSrc[3], int nSrcStep, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, *Npp8u* nAval, *NppStreamContext* nppStreamCtx)

3 channel 8-bit unsigned planar YCbCr to 4 channel 8-bit unsigned packed BGR color conversion with constant alpha.

Parameters

- **pSrc** – *Source-Planar-Image Pointer Array*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nAval** – 8-bit unsigned alpha constant.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

1.8.3.32 YCbCrToBGRBatch

YCbCr to BGR batch color conversion with a single *Region-Of-Interest (ROI)* for all pairs of input/output images provided in batches.

NPP converts YCbCr to gamma corrected BGR the same way as in *YCbCrToBGR*.

Functions

NppStatus **nppiYCbCrToBGRBatch_8u_C3R_Ctx**(const *NppiImageDescriptor* *pSrcBatchList, *NppiImageDescriptor* *pDstBatchList, int nBatchSize, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

3 channel 8-bit unsigned packed YCbCr to 3 channel 8-bit unsigned packed BGR batch color conversion for a single ROI.

Provided oSizeROI will be used for all pairs of input and output images passed in pSrcBatchList and pSrcBatchList arguments. API user must ensure that provided ROI (oSizeROI) does not go beyond the borders of any of provided images.

Parameters

- **pSrcBatchList** – *Source-Batch-Images Pointer*.
- **pDstBatchList** – *Destination-Batch-Images Pointer*.
- **nBatchSize** – Number of *NppiImageDescriptor* structures processed in this call (must be > 1).
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiYCbCrToBGRBatch_8u_P3C3R_Ctx**(const *NppiImageDescriptor* *const pSrcBatchList[3], *NppiImageDescriptor* *pDstBatchList, int nBatchSize, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

3 channel 8-bit unsigned planar YCbCr to 3 channel 8-bit unsigned packed BGR batch color conversion for a single ROI.

Provided oSizeROI will be used for all pairs of input planes making input images and output packed images passed in pSrcBatchList and pSrcBatchList arguments. API user must ensure that provided ROI (oSizeROI) does not go beyond the borders of any of provided images.

Parameters

- **pSrcBatchList** – An array where each element is a batch of images representing one of planes in planar images, *Source-Batch-Images Pointer*. The first element of array (pSrcBatchList[0]) represents a batch of Y planes. The second element of array (pSrcBatchList[1]) represents a batch of Cb planes. The third element of array (pSrcBatchList[2]) represents a batch of Cr planes.
- **pDstBatchList** – *Destination-Batch-Images Pointer*.
- **nBatchSize** – A number of *NppiImageDescriptor* structures processed in this call (must be > 1).
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

1.8.3.33 YCbCrToBGRBatchAdvanced

YCbCr to BGR batch color conversion where each pair of input/output images from provided batches has own *Region-Of-Interest (ROI)*.

NPP converts YCbCr to gamma corrected BGR the same way as in *YCbCrToBGR*.

Functions

NppStatus **nppiYCbCrToBGRBatch_8u_C3R_Advanced_Ctx**(const *NppiImageDescriptor* *pSrcBatchList, *NppiImageDescriptor* *pDstBatchList, int nBatchSize, *NppiSize* oMaxSizeROI, *NppStreamContext* nppStreamCtx)

3 channel 8-bit unsigned packed YCbCr to 3 channel 8-bit unsigned packed BGR batch color conversion where each pair of input/output images has own ROI.

Provided oMaxSizeROI must contain the maximum width and the maximum height of all ROIs defined in pDstBatchList. API user must ensure that ROI from pDstBatchList for each pair of input and output images does not go beyond the borders of images in each pair.

Parameters

- **pSrcBatchList** – *Source-Batch-Images Pointer*.
- **pDstBatchList** – *Destination-Batch-Images Pointer*.
- **nBatchSize** – Number of *NppiImageDescriptor* structures processed in this call (must be > 1).
- **oMaxSizeROI** – *Region-Of-Interest (ROI)*, must contain the maximum width and the maximum height from all destination ROIs used for processing data.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiYCbCrToBGRBatch_8u_P3C3R_Advanced_Ctx**(const *NppiImageDescriptor* *const pSrcBatchList[3], *NppiImageDescriptor* *pDstBatchList, int nBatchSize, *NppiSize* oMaxSizeROI, *NppStreamContext* nppStreamCtx)

3 channel 8-bit unsigned planar YCbCr to 3 channel 8-bit unsigned packed BGR batch color conversion where each pair of input/output images has own ROI.

Provided oMaxSizeROI must contain the maximum width and the maximum height of all ROIs defined in pDstBatchList. API user must ensure that ROI from pDstBatchList for each pair of input and output images does not go beyond the borders of images in each pair.

Parameters

- **pSrcBatchList** – An array where each element is a batch of images representing one of planes in planar images, *Source-Batch-Images Pointer*. The first element of array (pSrcBatchList[0]) represents a batch of Y planes. The second element of array (pSrcBatchList[1]) represents a batch of Cb planes. The third element of array (pSrcBatchList[2]) represents a batch of Cr planes.
- **pDstBatchList** – *Destination-Batch-Images Pointer*.
- **nBatchSize** – Number of *NppiImageDescriptor* structures processed in this call (must be > 1).
- **oMaxSizeROI** – *Region-Of-Interest (ROI)*, must contain the maximum width and the maximum height from all destination ROIs used for processing data.

- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

1.8.3.34 YCbCrToBGR709CSC

YCbCr to BGR_709CSC color conversion.

Functions

NppStatus **nppiYCbCrToBGR_709CSC_8u_P3C3R_Ctx**(const *Npp8u* *const pSrc[3], int nSrcStep, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

3 channel 8-bit unsigned planar YCbCr to 3 channel 8-bit unsigned packed BGR_709CSC color conversion.

Parameters

- **pSrc** – *Source-Planar-Image Pointer Array*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiYCbCrToBGR_709CSC_8u_P3C4R_Ctx**(const *Npp8u* *const pSrc[3], int nSrcStep, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, *Npp8u* nAval, *NppStreamContext* nppStreamCtx)

3 channel 8-bit unsigned planar YCbCr to 4 channel 8-bit unsigned packed BGR_709CSC color conversion with constant alpha.

Parameters

- **pSrc** – *Source-Planar-Image Pointer Array*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nAval** – 8-bit unsigned alpha constant.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*

1.8.3.35 RGBToYCbCr422

RGB to YCbCr422 color conversion.

Functions

NppStatus **nppiRGBToYCbCr422_8u_C3C2R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

3 channel 8-bit unsigned packed RGB to 2 channel 8-bit unsigned packed YCbCr422 color conversion.

images.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiRGBToYCbCr422_8u_C3P3R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *Npp8u* *pDst[3], int rDstStep[3], *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

3 channel 8-bit unsigned packed RGB to 3 channel 8-bit unsigned planar YCbCr422 color conversion.

images.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Planar-Image Pointer Array*.
- **rDstStep** – Destination-Planar-Image Line Step Array.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiRGBToYCbCr422_8u_P3C2R_Ctx**(const *Npp8u* *const pSrc[3], int nSrcStep, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

3 channel 8-bit unsigned planar RGB to 2 channel 8-bit unsigned packed YCbCr422 color conversion.

images.

Parameters

- **pSrc** – *Source-Planar-Image Pointer Array*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

1.8.3.36 YCbCr422ToRGB

YCbCr422 to RGB color conversion.

Functions

NppStatus **nppiYCbCr422ToRGB_8u_C2C3R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

2 channel 8-bit unsigned packed YCbCr422 to 3 channel 8-bit unsigned packed RGB color conversion.

images.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiYCbCr422ToRGB_8u_C2P3R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *Npp8u* *pDst[3], int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

2 channel 8-bit unsigned packed YCbCr422 to 3 channel 8-bit unsigned planar RGB color conversion.

images.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Planar-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiYCbCr422ToRGB_8u_P3C3R_Ctx**(const *Npp8u* *const pSrc[3], int rSrcStep[3], *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

3 channel 8-bit unsigned planar YCbCr422 to 3 channel 8-bit unsigned packed RGB color conversion.

images.

Parameters

- **pSrc** – *Source-Planar-Image Pointer Array*.
- **rSrcStep** – *Source-Planar-Image Line Step Array*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

1.8.3.37 YCbCr422ToRGBBatch

Planar YCbCr422 to packed RGB batch color conversion with a single *Region-Of-Interest (ROI)* for all pairs of input/output images provided in batches.

Functions

NppStatus **nppiYCbCr422ToRGBBatch_8u_P3C3R_Ctx**(const *NppiImageDescriptor* *const pSrcBatchList[3], *NppiImageDescriptor* *pDstBatchList, int nBatchSize, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

3 channel 8-bit unsigned planar YCbCr422 to 3 channel 8-bit unsigned packed RGB batch color conversion for a single ROI.

Provided oSizeROI will be used for all pairs of input planes making input images and output packed images passed in pSrcBatchList and pSrcBatchList arguments. API user must ensure that provided ROI (oSizeROI) does not go beyond the borders of any of provided images.

Parameters

- **pSrcBatchList** – An array where each element is a batch of images representing one of planes in planar images, *Source-Batch-Images Pointer*. The first element of array (pSrcBatchList[0]) represents a batch of Y planes. The second element of array (pSrcBatchList[1]) represents a batch of Cb planes. The third element of array (pSrcBatchList[2]) represents a batch of Cr planes.
- **pDstBatchList** – *Destination-Batch-Images Pointer*.
- **nBatchSize** – A number of *NppiImageDescriptor* structures processed in this call (must be > 1).
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

1.8.3.38 YCbCr422ToRGBBatchAdvanced

Planar YCbCr422 to packed RGB batch color conversion where each pair of input/output images from provided batches has own *Region-Of-Interest (ROI)*.

Functions

NppStatus **nppiYCbCr422ToRGBBatch_8u_P3C3R_Advanced_Ctx**(const *NppiImageDescriptor* *const pSrcBatchList[3], *NppiImageDescriptor* *pDstBatchList, int nBatchSize, *NppiSize* oMaxSizeROI, *NppStreamContext* nppStreamCtx)

3 channel 8-bit unsigned planar YCbCr422 to 3 channel 8-bit unsigned packed RGB batch color conversion where each pair of input/output images has own ROI.

Provided oMaxSizeROI must contain the maximum width and the maximum height of all ROIs defined in pDstBatchList. API user must ensure that ROI from pDstBatchList for each pair of input and output images does not go beyond the borders of images in each pair.

Parameters

- **pSrcBatchList** – An array where each element is a batch of images representing one of planes in planar images, *Source-Batch-Images Pointer*. The first element of array (pSrcBatchList[0]) represents a batch of Y planes. The second element of array (pSrcBatchList[1]) represents a batch of Cb planes. The third element of array (pSrcBatchList[2]) represents a batch of Cr planes.
- **pDstBatchList** – *Destination-Batch-Images Pointer*.
- **nBatchSize** – Number of *NppiImageDescriptor* structures processed in this call (must be > 1).
- **oMaxSizeROI** – *Region-Of-Interest (ROI)*, must contain the maximum width and the maximum height from all destination ROIs used for processing data.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

1.8.3.39 RGBToYCrCb422

RGB to YCrCb422 color conversion.

Functions

NppStatus **nppiRGBToYCrCb422_8u_C3C2R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

3 channel 8-bit unsigned packed RGB to 2 channel 8-bit unsigned packed YCrCb422 color conversion.

images.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiRGBToYCrCb422_8u_P3C2R_Ctx**(const *Npp8u* *const pSrc[3], int nSrcStep, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

3 channel 8-bit unsigned planar RGB to 2 channel 8-bit unsigned packed YCrCb422 color conversion.

images.

Parameters

- **pSrc** – *Source-Planar-Image Pointer Array*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

1.8.3.40 YCrCb422ToRGB

YCrCb422 to RGB color conversion.

Functions

NppStatus **nppiYCrCb422ToRGB_8u_C2C3R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

2 channel 8-bit unsigned packed YCrCb422 to 3 channel 8-bit unsigned packed RGB color conversion.

images.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiYCrCb422ToRGB_8u_C2P3R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *Npp8u* *pDst[3], int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

2 channel 8-bit unsigned packed YCrCb422 to 3 channel 8-bit unsigned planar RGB color conversion.

images.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Planar-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

1.8.3.41 YCbCr422ToBGR

YCbCr422 to BGR color conversion.

Functions

NppStatus **nppiYCbCr422ToBGR_8u_C2C3R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

2 channel 8-bit unsigned packed YCrCb422 to 3 channel 8-bit unsigned packed BGR color conversion.

images.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiYCbCr422ToBGR_8u_C2C4R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, *Npp8u* nAval, *NppStreamContext* nppStreamCtx)

2 channel 8-bit unsigned packed YCrCb422 to 4 channel 8-bit unsigned packed BGR color conversion with constant alpha.

images.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nAval** – 8-bit unsigned alpha constant.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiYCbCr422ToBGR_8u_P3C3R_Ctx**(const *Npp8u* *const pSrc[3], int rSrcStep[3], *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

3 channel 8-bit unsigned planar YCbCr422 to 3 channel 8-bit unsigned packed BGR color conversion.

images.

Parameters

- **pSrc** – *Source-Planar-Image Pointer Array*.
- **rSrcStep** – *Source-Planar-Image Line Step Array*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

1.8.3.42 YCbCr422ToBGRBatch

Planar YCbCr422 to packed BGR batch color conversion with a single *Region-Of-Interest (ROI)* for all pairs of input/output images provided in batches.

Functions

NppStatus **nppiYCbCr422ToBGRBatch_8u_P3C3R_Ctx**(const *NppiImageDescriptor* *const pSrcBatchList[3], *NppiImageDescriptor* *pDstBatchList, int nBatchSize, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

3 channel 8-bit unsigned planar YCbCr422 to 3 channel 8-bit unsigned packed BGR batch color conversion for a single ROI.

Provided oSizeROI will be used for all pairs of input planes making input images and output packed images passed in pSrcBatchList and pSrcBatchList arguments. API user must ensure that provided ROI (oSizeROI) does not go beyond the borders of any of provided images.

Parameters

- **pSrcBatchList** – An array where each element is a batch of images representing one of planes in planar images, *Source-Batch-Images Pointer*. The first element of array (pSrcBatchList[0]) represents a batch of Y planes. The second element of array (pSrcBatchList[1]) represents a batch of Cb planes. The third element of array (pSrcBatchList[2]) represents a batch of Cr planes.
- **pDstBatchList** – *Destination-Batch-Images Pointer*.
- **nBatchSize** – A number of *NppiImageDescriptor* structures processed in this call (must be > 1).
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

1.8.3.43 YCbCr422ToBGRBatchAdvanced

Planar YCbCr422 to packed BGR batch color conversion where each pair of input/output images from provided batches has own *Region-Of-Interest (ROI)*.

Functions

NppStatus **nppiYCbCr422ToBGRBatch_8u_P3C3R_Advanced_Ctx**(const *NppiImageDescriptor* *const pSrcBatchList[3], *NppiImageDescriptor* *pDstBatchList, int nBatchSize, *NppiSize* oMaxSizeROI, *NppStreamContext* nppStreamCtx)

3 channel 8-bit unsigned planar YCbCr422 to 3 channel 8-bit unsigned packed BGR batch color conversion where each pair of input/output images has own ROI.

Provided oMaxSizeROI must contain the maximum width and the maximum height of all ROIs defined in pDstBatchList. API user must ensure that ROI from pDstBatchList for each pair of input and output images does not go beyond the borders of images in each pair.

Parameters

- **pSrcBatchList** – An array where each element is a batch of images representing one of planes in planar images, *Source-Batch-Images Pointer*. The first element of array (pSrcBatchList[0]) represents a batch of Y planes. The second element of array (pSrcBatchList[1]) represents a batch of Cb planes. The third element of array (pSrcBatchList[2]) represents a batch of Cr planes.
- **pDstBatchList** – *Destination-Batch-Images Pointer*.

- **nBatchSize** – Number of *NppiImageDescriptor* structures processed in this call (must be > 1).
- **oMaxSizeROI** – *Region-Of-Interest (ROI)*, must contain the maximum width and the maximum height from all destination ROIs used for processing data.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

1.8.3.44 RGBToCbYCr422

RGB to CbYCr422 color conversion.

Functions

NppStatus **nppiRGBToCbYCr422_8u_C3C2R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

3 channel 8-bit unsigned packed RGB to 2 channel 8-bit unsigned packed CbYCr422 color conversion.

images.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiRGBToCbYCr422Gamma_8u_C3C2R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

3 channel 8-bit unsigned packed RGB first gets forward gamma corrected then converted to 2 channel 8-bit unsigned packed CbYCr422 color conversion.

images.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.

- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*

1.8.3.45 CbYCr422ToRGB

CbYCr422 to RGB color conversion.

Functions

NppStatus **nppiCbYCr422ToRGB_8u_C2C3R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

2 channel 8-bit unsigned packed CbYCrC22 to 3 channel 8-bit unsigned packed RGB color conversion.

images.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*

1.8.3.46 BGRToCbYCr422

BGR to CbYCr422 color conversion.

Functions

NppStatus **nppiBGRToCbYCr422_8u_AC4C2R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

4 channel 8-bit unsigned packed BGR with alpha to 2 channel 8-bit unsigned packed CbYCr422 color conversion.

images.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

1.8.3.47 BGRToCbYCr422 709HDTV

BGR to CbYCr422_709HDTV color conversion.

Functions

NppStatus **nppiBGRToCbYCr422_709HDTV_8u_C3C2R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

3 channel 8-bit unsigned packed BGR to 2 channel 8-bit unsigned packed CbYCr422_709HDTV color conversion.

images.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiBGRToCbYCr422_709HDTV_8u_AC4C2R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

4 channel 8-bit unsigned packed BGR with alpha to 2 channel 8-bit unsigned packed CbYCr422_709HDTV color conversion.

images.

Parameters

- **pSrc** – *Source-Image Pointer*.

- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

1.8.3.48 CbYCr422ToBGR

CbYCr422 to BGR color conversion.

Functions

NppStatus **nppiCbYCr422ToBGR_8u_C2C4R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, *Npp8u* nAval, *NppStreamContext* nppStreamCtx)

2 channel 8-bit unsigned packed CbYCr422 to 4 channel 8-bit unsigned packed BGR color conversion with alpha.

images.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nAval** – 8-bit unsigned alpha constant.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

1.8.3.49 CbYCr422ToBGR 709HDTV

CbYCr422 to BGR_709HDTV color conversion.

Functions

NppStatus **nppiCbYCr422ToBGR_709HDTV_8u_C2C3R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

2 channel 8-bit unsigned packed CbYCr422 to 3 channel 8-bit unsigned packed BGR_709HDTV color conversion.

images.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiCbYCr422ToBGR_709HDTV_8u_C2C4R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, *Npp8u* nAval, *NppStreamContext* nppStreamCtx)

2 channel 8-bit unsigned packed CbYCr422 to 4 channel 8-bit unsigned packed BGR_709HDTV color conversion with constant alpha.

images.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nAval** – 8-bit unsigned alpha constant.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

1.8.3.50 RGBToYCbCr420

RGB to YCbCr420 color conversion.

Functions

NppStatus **nppiRGBToYCbCr420_8u_C3P3R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *Npp8u* *pDst[3], int rDstStep[3], *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

3 channel 8-bit unsigned packed RGB to 3 channel 8-bit unsigned planar YCbCr420 color conversion.

images.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Planar-Image Pointer Array*.
- **rDstStep** – Destination-Planar-Image Line Step Array.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

1.8.3.51 YCbCr420ToRGB

YCbCr420 to RGB color conversion.

Functions

NppStatus **nppiYCbCr420ToRGB_8u_P3C3R_Ctx**(const *Npp8u* *const pSrc[3], int rSrcStep[3], *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

3 channel 8-bit unsigned planar YCbCr420 to 3 channel 8-bit unsigned packed RGB color conversion.

Parameters

- **pSrc** – *Source-Planar-Image Pointer Array*.
- **rSrcStep** – *Source-Planar-Image Line Step Array*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

1.8.3.52 YCbCr420ToRGBBatch

Planar YCbCr420 to packed RGB batch color conversion with a single *Region-Of-Interest (ROI)* for all pairs of input/output images provided in batches.

Functions

NppStatus **nppiYCbCr420ToRGBBatch_8u_P3C3R_Ctx**(const *NppiImageDescriptor* *const pSrcBatchList[3], *NppiImageDescriptor* *pDstBatchList, int nBatchSize, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

3 channel 8-bit unsigned planar YCbCr420 to 3 channel 8-bit unsigned packed RGB batch color conversion for a single ROI.

Provided oSizeROI will be used for all pairs of input planes making input images and output packed images passed in pSrcBatchList and pSrcBatchList arguments. API user must ensure that provided ROI (oSizeROI) does not go beyond the borders of any of provided images.

Parameters

- **pSrcBatchList** – An array where each element is a batch of images representing one of planes in planar images, *Source-Batch-Images Pointer*. The first element of array (pSrcBatchList[0]) represents a batch of Y planes. The second element of array (pSrcBatchList[1]) represents a batch of Cb planes. The third element of array (pSrcBatchList[2]) represents a batch of Cr planes.
- **pDstBatchList** – *Destination-Batch-Images Pointer*.
- **nBatchSize** – A number of *NppiImageDescriptor* structures processed in this call (must be > 1).
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

1.8.3.53 YCbCr420ToRGBBatchAdvanced

Planar YCbCr420 to packed RGB batch color conversion where each pair of input/output images from provided batches has own *Region-Of-Interest (ROI)*.

Functions

NppStatus **nppiYCbCr420ToRGBBatch_8u_P3C3R_Advanced_Ctx**(const *NppiImageDescriptor* *const pSrcBatchList[3], *NppiImageDescriptor* *pDstBatchList, int nBatchSize, *NppiSize* oMaxSizeROI, *NppStreamContext* nppStreamCtx)

3 channel 8-bit unsigned planar YCbCr420 to 3 channel 8-bit unsigned packed RGB batch color conversion where each pair of input/output images has own ROI.

Provided oMaxSizeROI must contain the maximum width and the maximum height of all ROIs defined in pDstBatchList. API user must ensure that ROI from pDstBatchList for each pair of input and output images does not go beyond the borders of images in each pair.

Parameters

- **pSrcBatchList** – An array where each element is a batch of images representing one of planes in planar images, *Source-Batch-Images Pointer*. The first element of array (pSrcBatchList[0]) represents a batch of Y planes. The second element of array (pSrcBatchList[1]) represents a batch of Cb planes. The third element of array (pSrcBatchList[2]) represents a batch of Cr planes.
- **pDstBatchList** – *Destination-Batch-Images Pointer*.
- **nBatchSize** – Number of *NppiImageDescriptor* structures processed in this call (must be > 1).
- **oMaxSizeROI** – *Region-Of-Interest (ROI)*, must contain the maximum width and the maximum height from all destination ROIs used for processing data.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

1.8.3.54 RGBToYCrCb420

RGB to YCrCb420 color conversion.

Functions

NppStatus **nppiRGBToYCrCb420_8u_AC4P3R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *Npp8u* *pDst[3], int rDstStep[3], *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

4 channel 8-bit unsigned packed RGB with alpha to 3 channel 8-bit unsigned planar YCrCb420 color conversion.

images.

Parameters

- **pSrc** – *Source-Image Pointer*.

- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Planar-Image Pointer Array*.
- **rDstStep** – Destination-Planar-Image Line Step Array.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

1.8.3.55 YCrCb420ToRGB

YCrCb420 to RGB color conversion.

Functions

NppStatus **nppiYCrCb420ToRGB_8u_P3C4R_Ctx**(const *Npp8u* *const pSrc[3], int rSrcStep[3], *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, *Npp8u* nAval, *NppStreamContext* nppStreamCtx)

3 channel 8-bit unsigned planar YCrCb420 to 4 channel 8-bit unsigned packed RGB color conversion with constant alpha.

Parameters

- **pSrc** – *Source-Planar-Image Pointer Array*.
- **rSrcStep** – *Source-Planar-Image Line Step Array*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nAval** – 8-bit unsigned alpha constant.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

1.8.3.56 BGRToYCbCr420

BGR to YCbCr420 color conversion.

Functions

NppStatus **nppiBGRToYCbCr420_8u_C3P3R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *Npp8u* *pDst[3], int rDstStep[3], *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

3 channel 8-bit unsigned packed BGR to 3 channel 8-bit unsigned planar YCbCr420 color conversion.

images.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Planar-Image Pointer Array*.
- **rDstStep** – Destination-Planar-Image Line Step Array.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiBGRToYCbCr420_8u_AC4P3R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *Npp8u* *pDst[3], int rDstStep[3], *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

4 channel 8-bit unsigned packed BGR with alpha to 3 channel 8-bit unsigned planar YCbCr420 color conversion.

images.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Planar-Image Pointer Array*.
- **rDstStep** – Destination-Planar-Image Line Step Array.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

1.8.3.57 BGRToYCbCr420 709CSC

BGR to YCbCr420_709CSC color conversion.

Functions

NppStatus **nppiBGRToYCbCr420_709CSC_8u_C3P3R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *Npp8u* *pDst[3], int rDstStep[3], *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

3 channel 8-bit unsigned packed BGR to 3 channel 8-bit unsigned planar YCbCr420_709CSC color conversion.

images.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Planar-Image Pointer Array*.
- **rDstStep** – Destination-Planar-Image Line Step Array.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiBGRToYCbCr420_709CSC_8u_AC4P3R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *Npp8u* *pDst[3], int rDstStep[3], *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

4 channel 8-bit unsigned packed BGR with alpha to 3 channel 8-bit unsigned planar YCbCr420_709CSC color conversion.

images.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Planar-Image Pointer Array*.
- **rDstStep** – Destination-Planar-Image Line Step Array.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

1.8.3.58 BGRToYCbCr420 709HDTV

BGR to YCbCr420_709HDTV color conversion.

Functions

NppStatus **nppiBGRToYCbCr420_709HDTV_8u_AC4P3R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *Npp8u* *pDst[3], int rDstStep[3], *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

4 channel 8-bit unsigned packed BGR with alpha to 3 channel 8-bit unsigned planar YCbCr420_709HDTV color conversion.

images.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Planar-Image Pointer Array*.
- **rDstStep** – Destination-Planar-Image Line Step Array.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

1.8.3.59 BGRToYCrCb420 709CSC

BGR to YCrCb420_709CSC color conversion.

Functions

NppStatus **nppiBGRToYCrCb420_709CSC_8u_C3P3R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *Npp8u* *pDst[3], int rDstStep[3], *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

3 channel 8-bit unsigned packed BGR to 3 channel 8-bit unsigned planar YCrCb420_709CSC color conversion.

images.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Planar-Image Pointer Array*.
- **rDstStep** – Destination-Planar-Image Line Step Array.

- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiBGRToYCrCb420_709CSC_8u_AC4P3R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *Npp8u* *pDst[3], int rDstStep[3], *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

4 channel 8-bit unsigned packed BGR with alpha to 3 channel 8-bit unsigned planar YCrCb420_709CSC color conversion.

images.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Planar-Image Pointer Array*.
- **rDstStep** – Destination-Planar-Image Line Step Array.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

1.8.3.60 YCbCr420ToBGR

YCbCr420 to BGR color conversion.

Functions

NppStatus **nppiYCbCr420ToBGR_8u_P3C3R_Ctx**(const *Npp8u* *const pSrc[3], int rSrcStep[3], *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

3 channel 8-bit unsigned planar YCbCr420 to 3 channel 8-bit unsigned packed BGR color conversion.

Parameters

- **pSrc** – *Source-Planar-Image Pointer Array*.
- **rSrcStep** – *Source-Planar-Image Line Step Array*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiYCbCr420ToBGR_8u_P3C4R_Ctx**(const *Npp8u* *const pSrc[3], int rSrcStep[3], *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, *Npp8u* nAval, *NppStreamContext* nppStreamCtx)

3 channel 8-bit unsigned planar YCbCr420 to 4 channel 8-bit unsigned packed BGR color conversion with constant alpha.

Parameters

- **pSrc** – *Source-Planar-Image Pointer Array*.
- **rSrcStep** – *Source-Planar-Image Line Step Array*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nAval** – 8-bit unsigned alpha constant.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*

1.8.3.61 YCbCr420ToBGRBatch

Planar YCbCr420 to packed BGR batch color conversion with a single *Region-Of-Interest (ROI)* for all pairs of input/output images provided in batches.

Functions

NppStatus **nppiYCbCr420ToBGRBatch_8u_P3C3R_Ctx**(const *NppiImageDescriptor* *const pSrcBatchList[3], *NppiImageDescriptor* *pDstBatchList, int nBatchSize, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

3 channel 8-bit unsigned planar YCbCr420 to 3 channel 8-bit unsigned packed BGR batch color conversion for a single ROI.

Provided oSizeROI will be used for all pairs of input planes making input images and output packed images passed in pSrcBatchList and pSrcBatchList arguments. API user must ensure that provided ROI (oSizeROI) does not go beyond the borders of any of provided images.

Parameters

- **pSrcBatchList** – An array where each element is a batch of images representing one of planes in planar images, *Source-Batch-Images Pointer*. The first element of array (pSrcBatchList[0]) represents a batch of Y planes. The second element of array (pSrcBatchList[1]) represents a batch of Cb planes. The third element of array (pSrcBatchList[2]) represents a batch of Cr planes.
- **pDstBatchList** – *Destination-Batch-Images Pointer*.

- **nBatchSize** – A number of *NppiImageDescriptor* structures processed in this call (must be > 1).
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

1.8.3.62 YCbCr420ToBGRBatchAdvanced

Planar YCbCr420 to packed BGR batch color conversion where each pair of input/output images from provided batches has own *Region-Of-Interest (ROI)*.

Functions

NppStatus **nppiYCbCr420ToBGRBatch_8u_P3C3R_Advanced_Ctx**(const *NppiImageDescriptor* *const pSrcBatchList[3], *NppiImageDescriptor* *pDstBatchList, int nBatchSize, *NppiSize* oMaxSizeROI, *NppStreamContext* nppStreamCtx)

3 channel 8-bit unsigned planar YCbCr420 to 3 channel 8-bit unsigned packed BGR batch color conversion where each pair of input/output images has own ROI.

Provided oMaxSizeROI must contain the maximum width and the maximum height of all ROIs defined in pDstBatchList. API user must ensure that ROI from pDstBatchList for each pair of input and output images does not go beyond the borders of images in each pair.

Parameters

- **pSrcBatchList** – An array where each element is a batch of images representing one of planes in planar images, *Source-Batch-Images Pointer*. The first element of array (pSrcBatchList[0]) represents a batch of Y planes. The second element of array (pSrcBatchList[1]) represents a batch of Cb planes. The third element of array (pSrcBatchList[2]) represents a batch of Cr planes.
- **pDstBatchList** – *Destination-Batch-Images Pointer*.
- **nBatchSize** – Number of *NppiImageDescriptor* structures processed in this call (must be > 1).
- **oMaxSizeROI** – *Region-Of-Interest (ROI)*, must contain the maximum width and the maximum height from all destination ROIs used for processing data.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

1.8.3.63 YCbCr420ToBGR 709CSC

YCbCr420_709CSC to BGR color conversion.

Functions

NppStatus **nppiYCbCr420ToBGR_709CSC_8u_P3C3R_Ctx**(const *Npp8u* *const pSrc[3], int rSrcStep[3], *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

3 channel 8-bit unsigned planar YCbCr420 to 3 channel 8-bit unsigned packed BGR_709CSC color conversion.

Parameters

- **pSrc** – *Source-Planar-Image Pointer Array*.
- **rSrcStep** – *Source-Planar-Image Line Step Array*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

1.8.3.64 YCbCr420ToBGR 709HDTV

YCbCr420_709HDTV to BGR color conversion.

Functions

NppStatus **nppiYCbCr420ToBGR_709HDTV_8u_P3C4R_Ctx**(const *Npp8u* *const pSrc[3], int rSrcStep[3], *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, *Npp8u* nAval, *NppStreamContext* nppStreamCtx)

3 channel 8-bit unsigned planar YCbCr420 to 4 channel 8-bit unsigned packed BGR_709HDTV color conversion with constant alpha.

Parameters

- **pSrc** – *Source-Planar-Image Pointer Array*.
- **rSrcStep** – *Source-Planar-Image Line Step Array*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nAval** – 8-bit unsigned alpha constant.

- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

1.8.3.65 BGRToYCrCb420

BGR to YCrCb420 color conversion.

Functions

NppStatus **nppiBGRToYCrCb420_8u_C3P3R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *Npp8u* *pDst[3], int rDstStep[3], *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

3 channel 8-bit unsigned packed BGR to 3 channel 8-bit unsigned planar YCrCb420 color conversion.

images.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Planar-Image Pointer Array*.
- **rDstStep** – Destination-Planar-Image Line Step Array.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiBGRToYCrCb420_8u_AC4P3R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *Npp8u* *pDst[3], int rDstStep[3], *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

4 channel 8-bit unsigned packed BGR with alpha to 3 channel 8-bit unsigned planar YCrCb420 color conversion.

images.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Planar-Image Pointer Array*.
- **rDstStep** – Destination-Planar-Image Line Step Array.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*

1.8.3.66 BGRToYCbCr411

BGR to YCbCr411 color conversion.

Functions

NppStatus **nppiBGRToYCbCr411_8u_C3P3R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *Npp8u* *pDst[3], int rDstStep[3], *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

3 channel 8-bit unsigned packed BGR to 3 channel 8-bit unsigned planar YCbCr411 color conversion.

images.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Planar-Image Pointer Array*.
- **rDstStep** – Destination-Planar-Image Line Step Array.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiBGRToYCbCr411_8u_AC4P3R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *Npp8u* *pDst[3], int rDstStep[3], *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

4 channel 8-bit unsigned packed BGR with alpha to 3 channel 8-bit unsigned planar YCbCr411 color conversion.

images.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Planar-Image Pointer Array*.
- **rDstStep** – Destination-Planar-Image Line Step Array.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*

1.8.3.67 BGRToYCbCr

BGR to YCbCr color conversion.

Functions

NppStatus **nppiBGRToYCbCr_8u_C3P3R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *Npp8u* *pDst[3], int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

3 channel 8-bit unsigned packed BGR to 3 channel 8-bit unsigned planar YCbCr color conversion.

images.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Planar-Image Pointer Array*.
- **nDstStep** – Destination-Planar-Image Line Step Array.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiBGRToYCbCr_8u_AC4P3R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *Npp8u* *pDst[3], int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

4 channel 8-bit unsigned packed BGR with alpha to 3 channel 8-bit unsigned planar YCbCr color conversion.

images.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Planar-Image Pointer Array*.
- **nDstStep** – Destination-Planar-Image Line Step Array.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiBGRToYCbCr_8u_AC4P4R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *Npp8u* *pDst[4], int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

4 channel 8-bit unsigned packed BGR with alpha to 4 channel 8-bit unsigned planar YCbCr color conversion.

images.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Planar-Image Pointer Array*.
- **nDstStep** – Destination-Planar-Image Line Step Array.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

1.8.3.68 YCbCr411ToBGR

YCbCr411 to BGR color conversion.

Functions

NppStatus **nppiYCbCr411ToBGR_8u_P3C3R_Ctx**(const *Npp8u* *const pSrc[3], int rSrcStep[3], *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

3 channel 8-bit unsigned planar YCbCr411 to 3 channel 8-bit unsigned packed BGR color conversion.

Parameters

- **pSrc** – *Source-Planar-Image Pointer Array*.
- **rSrcStep** – *Source-Planar-Image Line Step Array*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiYCbCr411ToBGR_8u_P3C4R_Ctx**(const *Npp8u* *const pSrc[3], int rSrcStep[3], *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, *Npp8u* nAval, *NppStreamContext* nppStreamCtx)

3 channel 8-bit unsigned planar YCbCr411 to 4 channel 8-bit unsigned packed BGR color conversion with constant alpha.

Parameters

- **pSrc** – *Source-Planar-Image Pointer Array*.
- **rSrcStep** – *Source-Planar-Image Line Step Array*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nAval** – 8-bit unsigned alpha constant.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

1.8.3.69 YCbCr411ToRGB

YCbCr411 to RGB color conversion.

Functions

NppStatus **nppiYCbCr411ToRGB_8u_P3C3R_Ctx**(const *Npp8u* *const pSrc[3], int rSrcStep[3], *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

3 channel 8-bit unsigned planar YCbCr411 to 3 channel 8-bit unsigned packed RGB color conversion.

Parameters

- **pSrc** – *Source-Planar-Image Pointer Array*.
- **rSrcStep** – *Source-Planar-Image Line Step Array*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiYCbCr411ToRGB_8u_P3C4R_Ctx**(const *Npp8u* *const pSrc[3], int rSrcStep[3], *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, *Npp8u* nAval, *NppStreamContext* nppStreamCtx)

3 channel 8-bit unsigned planar YCbCr411 to 4 channel 8-bit unsigned packed RGB color conversion with constant alpha.

Parameters

- **pSrc** – *Source-Planar-Image Pointer Array*.

- **rSrcStep** – *Source-Planar-Image Line Step Array*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nAval** – 8-bit unsigned alpha constant.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

1.8.3.70 RGBToXYZ

RGB to XYZ color conversion.

Here is how NPP converts gamma corrected RGB or BGR to XYZ.

```
Npp32f nNormalizedR = (Npp32f)R * 0.003921569F; // / 255.0F
Npp32f nNormalizedG = (Npp32f)G * 0.003921569F;
Npp32f nNormalizedB = (Npp32f)B * 0.003921569F;
Npp32f nX = 0.412453F * nNormalizedR + 0.35758F  * nNormalizedG + 0.180423F *
↪nNormalizedB;
if (nX > 1.0F)
    nX = 1.0F;
Npp32f nY = 0.212671F * nNormalizedR + 0.71516F  * nNormalizedG + 0.072169F *
↪nNormalizedB;
if (nY > 1.0F)
    nY = 1.0F;
Npp32f nZ = 0.019334F * nNormalizedR + 0.119193F * nNormalizedG + 0.950227F *
↪nNormalizedB;
if (nZ > 1.0F)
    nZ = 1.0F;
X = (Npp8u)(nX * 255.0F);
Y = (Npp8u)(nY * 255.0F);
Z = (Npp8u)(nZ * 255.0F);
```

Functions

NppStatus **nppiRGBToXYZ_8u_C3R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

3 channel 8-bit unsigned packed RGB to 3 channel 8-bit unsigned packed XYZ color conversion.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.

- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiRGBToXYZ_8u_AC4R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

4 channel 8-bit unsigned packed RGB with alpha to 4 channel 8-bit unsigned packed XYZ with alpha color conversion.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

1.8.3.71 XYZToRGB

XYZ to RGB color conversion.

Here is how NPP converts XYZ to gamma corrected RGB or BGR. The code assumes that X,Y, and Z values are in the range [0..1].

```
Npp32f nNormalizedX = (Npp32f)X * 0.003921569F; // / 255.0F
Npp32f nNormalizedY = (Npp32f)Y * 0.003921569F;
Npp32f nNormalizedZ = (Npp32f)Z * 0.003921569F;
Npp32f nR = 3.240479F * nNormalizedX - 1.53715F  * nNormalizedY - 0.498535F *
↪nNormalizedZ;
if (nR > 1.0F)
    nR = 1.0F;
Npp32f nG = -0.969256F * nNormalizedX + 1.875991F  * nNormalizedY + 0.041556F *
↪nNormalizedZ;
if (nG > 1.0F)
    nG = 1.0F;
Npp32f nB = 0.055648F * nNormalizedX - 0.204043F * nNormalizedY + 1.057311F *
↪nNormalizedZ;
if (nB > 1.0F)
    nB = 1.0F;
R = (Npp8u)(nR * 255.0F);
G = (Npp8u)(nG * 255.0F);
B = (Npp8u)(nB * 255.0F);
```

Functions

NppStatus **nppiXYZToRGB_8u_C3R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

3 channel 8-bit unsigned packed XYZ to 3 channel 8-bit unsigned packed RGB color conversion.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiXYZToRGB_8u_AC4R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

4 channel 8-bit unsigned packed XYZ with alpha to 4 channel 8-bit unsigned packed RGB with alpha color conversion.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

1.8.3.72 RGBToLUV

RGB to LUV color conversion.

Here is how NPP converts gamma corrected RGB or BGR to CIE LUV using the CIE XYZ D65 white point with a Y luminance of 1.0. The computed values of the L component are in the range [0..100], U component in the range [-134..220], and V component in the range [-140..122]. The code uses cbrtf() the 32 bit floating point cube root math function.

```
// use CIE D65 chromaticity coordinates
#define nCIE_XYZ_D65_xn 0.312713F
#define nCIE_XYZ_D65_yn 0.329016F
#define nn_DIVISOR (-2.0F * nCIE_XYZ_D65_xn + 12.0F * nCIE_XYZ_D65_yn + 3.0F)
#define nun (4.0F * nCIE_XYZ_D65_xn / nn_DIVISOR)
#define nvn (9.0F * nCIE_XYZ_D65_yn / nn_DIVISOR)

// First convert to XYZ
Npp32f nNormalizedR = (Npp32f)R * 0.003921569F; // / 255.0F
Npp32f nNormalizedG = (Npp32f)G * 0.003921569F;
Npp32f nNormalizedB = (Npp32f)B * 0.003921569F;
Npp32f nX = 0.412453F * nNormalizedR + 0.35758F  * nNormalizedG + 0.180423F *
↪nNormalizedB;
Npp32f nY = 0.212671F * nNormalizedR + 0.71516F  * nNormalizedG + 0.072169F *
↪nNormalizedB;
Npp32f nZ = 0.019334F * nNormalizedR + 0.119193F * nNormalizedG + 0.950227F *
↪nNormalizedB;
// Now calculate LUV from the XYZ value
Npp32f nTemp = nX + 15.0F * nY + 3.0F * nZ;
Npp32f nu = 4.0F * nX / nTemp;
Npp32f nv = 9.0F * nY / nTemp;
Npp32f nL = 116.0F * cbrtf(nY) - 16.0F;
if (nL < 0.0F)
    nL = 0.0F;
if (nL > 100.0F)
    nL = 100.0F;
nTemp = 13.0F * nL;
Npp32f nU = nTemp * (nu - nun);
if (nU < -134.0F)
    nU = -134.0F;
if (nU > 220.0F)
    nU = 220.0F;
Npp32f nV = nTemp * (nv - nvn);
if (nV < -140.0F)
    nV = -140.0F;
if (nV > 122.0F)
    nV = 122.0F;
L = (Npp8u)(nL * 255.0F * 0.01F); // / 100.0F
U = (Npp8u)((nU + 134.0F) * 255.0F * 0.0028249F); // / 354.0F
V = (Npp8u)((nV + 140.0F) * 255.0F * 0.0038168F); // / 262.0F
```

Functions

NppStatus **nppiRGBToLUV_8u_C3R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

3 channel 8-bit unsigned packed RGB to 3 channel 8-bit unsigned packed LUV color conversion.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.

- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiRGBToLUV_8u_AC4R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

4 channel 8-bit unsigned packed RGB with alpha to 4 channel 8-bit unsigned packed LUV with alpha color conversion.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

1.8.3.73 LUVToRGB

LUV to RGB color conversion.

Here is how NPP converts CIE LUV to gamma corrected RGB or BGR using the CIE XYZ D65 white point with a Y luminance of 1.0. The code uses powf() the 32 bit floating point power math function.

```
// use CIE D65 chromaticity coordinates
#define nCIE_XYZ_D65_xn 0.312713F
#define nCIE_XYZ_D65_yn 0.329016F
#define nn_DIVISOR (-2.0F * nCIE_XYZ_D65_xn + 12.0F * nCIE_XYZ_D65_yn + 3.0F)
#define nun (4.0F * nCIE_XYZ_D65_xn / nn_DIVISOR)
#define nvn (9.0F * nCIE_XYZ_D65_yn / nn_DIVISOR)

// First convert normalized LUV back to original CIE LUV range
Npp32f nL = (Npp32f)L * 100.0F * 0.003921569F;  // / 255.0F
Npp32f nU = ((Npp32f)U * 354.0F * 0.003921569F) - 134.0F;
Npp32f nV = ((Npp32f)V * 262.0F * 0.003921569F) - 140.0F;
// Now convert LUV to CIE XYZ
Npp32f nTemp = 13.0F * nL;
Npp32f nu = nU / nTemp + nun;
Npp32f nv = nV / nTemp + nvn;
Npp32f nNormalizedY;
if (nL > 7.9996248F)
{
    nNormalizedY = (nL + 16.0F) * 0.008621F; // / 116.0F
```

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```
    nNormalizedY = powf(nNormalizedY, 3.0F);
}
else
{
    nNormalizedY = nL * 0.001107F; // / 903.3F
}
Npp32f nNormalizedX = (-9.0F * nNormalizedY * nu) / ((nu - 4.0F) * nv - nu * nv);
Npp32f nNormalizedZ = (9.0F * nNormalizedY - 15.0F * nv * nNormalizedY - nv *
↪nNormalizedX) / (3.0F * nv);
Npp32f nR = 3.240479F * nNormalizedX - 1.53715F  * nNormalizedY - 0.498535F *
↪nNormalizedZ;
if (nR > 1.0F)
    nR = 1.0F;
if (nR < 0.0F)
    nR = 0.0F;
Npp32f nG = -0.969256F * nNormalizedX + 1.875991F  * nNormalizedY + 0.041556F *
↪nNormalizedZ;
if (nG > 1.0F)
    nG = 1.0F;
if (nG < 0.0F)
    nG = 0.0F;
Npp32f nB = 0.055648F * nNormalizedX - 0.204043F * nNormalizedY + 1.057311F *
↪nNormalizedZ;
if (nB > 1.0F)
    nB = 1.0F;
if (nB < 0.0F)
    nB = 0.0F;
R = (Npp8u)(nR * 255.0F);
G = (Npp8u)(nG * 255.0F);
B = (Npp8u)(nB * 255.0F);
```

Functions

NppStatus **nppiLUVToRGB_8u_C3R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

3 channel 8-bit unsigned packed LUV to 3 channel 8-bit unsigned packed RGB color conversion.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiLUVToRGB_8u_AC4R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

4 channel 8-bit unsigned packed LUV with alpha to 4 channel 8-bit unsigned packed RGB with alpha color conversion.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

1.8.3.74 BGRToLab

BGR to Lab color conversion.

This is how NPP converts gamma corrected BGR or RGB to Lab using the CIE Lab D65 white point with a Y luminance of 1.0. The computed values of the L component are in the range [0..100], a and b component values are in the range [-128..127]. The code uses cbrtf() the 32 bit floating point cube root math function.

```
// use CIE Lab chromaticity coordinates
#define nCIE_LAB_D65_xn 0.950455F
#define nCIE_LAB_D65_yn 1.0F
#define nCIE_LAB_D65_zn 1.088753F
// First convert to XYZ
Npp32f nNormalizedR = (Npp32f)R * 0.003921569F; // / 255.0F
Npp32f nNormalizedG = (Npp32f)G * 0.003921569F;
Npp32f nNormalizedB = (Npp32f)B * 0.003921569F;
Npp32f nX = 0.412453F * nNormalizedR + 0.35758F  * nNormalizedG + 0.180423F *
↪nNormalizedB;
Npp32f nY = 0.212671F * nNormalizedR + 0.71516F  * nNormalizedG + 0.072169F *
↪nNormalizedB;
Npp32f nZ = 0.019334F * nNormalizedR + 0.119193F * nNormalizedG + 0.950227F *
↪nNormalizedB;
Npp32f nL = cbrtf(nY);
Npp32f nA; Npp32f nB; Npp32f nfX = nX * 1.052128F; // / nCIE_LAB_D65_xn; Npp32f nfY =
↪nY; Npp32f nfZ = nZ * 0.918482F; // /
nCIE_LAB_D65_zn; nfY = nL - 16.0F; nL = 116.0F * nL - 16.0F; nA = cbrtf(nfX) - 16.0F;
↪nA = 500.0F
* (nA - nfY); nB = cbrtf(nfZ) - 16.0F; nB = 200.0F * (nfY - nB); // Now scale Lab
↪range nL = nL * 255.0F
* 0.01F; // / 100.0F nA = nA + 128.0F; nB = nB + 128.0F; L = (Npp8u)nL; a = (Npp8u)nA;
↪ b = (Npp8u)nB;
```

Functions

NppStatus **nppiBGRToLab_8u_C3R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

3 channel 8-bit unsigned packed BGR to 3 channel 8-bit unsigned packed Lab color conversion.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

1.8.3.75 LabToBGR

Lab to BGR color conversion.

This is how NPP converts Lab to gamma corrected BGR or RGB using the CIE Lab D65 white point with a Y luminance of 1.0. The code uses powf() the 32 bit floating point power math function.

```
// use CIE Lab chromaticity coordinates
#define nCIE_LAB_D65_xn 0.950455F
#define nCIE_LAB_D65_yn 1.0F
#define nCIE_LAB_D65_zn 1.088753F
// First convert Lab back to original range then to CIE XYZ
Npp32f nL = (Npp32f)L * 100.0F * 0.003921569F;  // / 255.0F
Npp32f nA = (Npp32f)a - 128.0F;
Npp32f nB = (Npp32f)b - 128.0F;
Npp32f nP = (nL + 16.0F) * 0.008621F; // / 116.0F
Npp32f nNormalizedY = nP * nP * nP; // powf(nP, 3.0F);
Npp32f nNormalizedX = nCIE_LAB_D65_xn * powf((nP + nA * 0.002F), 3.0F); // / 500.0F
Npp32f nNormalizedZ = nCIE_LAB_D65_zn * powf((nP - nB * 0.005F), 3.0F); // / 200.0F
Npp32f nR = 3.240479F * nNormalizedX - 1.53715F  * nNormalizedY - 0.498535F *
↪nNormalizedZ;
if (nR > 1.0F)
    nR = 1.0F;
Npp32f nG = -0.969256F * nNormalizedX + 1.875991F  * nNormalizedY + 0.041556F *
↪nNormalizedZ;
if (nG > 1.0F)
    nG = 1.0F;
nB = 0.055648F * nNormalizedX - 0.204043F * nNormalizedY + 1.057311F * nNormalizedZ;
if (nB > 1.0F)
    nB = 1.0F;
R = (Npp8u)(nR * 255.0F);
G = (Npp8u)(nG * 255.0F);
B = (Npp8u)(nB * 255.0F);
```

Functions

NppStatus **nppiLabToBGR_8u_C3R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

3 channel 8-bit unsigned packed Lab to 3 channel 8-bit unsigned packed BGR color conversion.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

1.8.3.76 RGBToYCC

RGB to PhotoYCC color conversion.

This is how NPP converts gamma corrected BGR or RGB to PhotoYCC. The computed Y, C1, C2 values are then quantized and converted to fit in the range [0..1] before expanding to 8 bits.

```
Npp32f nNormalizedR = (Npp32f)R * 0.003921569F; // / 255.0F
Npp32f nNormalizedG = (Npp32f)G * 0.003921569F;
Npp32f nNormalizedB = (Npp32f)B * 0.003921569F;
Npp32f nY = 0.299F * nNormalizedR + 0.587F  * nNormalizedG + 0.114F * nNormalizedB;
Npp32f nC1 = nNormalizedB - nY;
nC1 = 111.4F * 0.003921569F * nC1 + 156.0F * 0.003921569F;
Npp32f nC2 = nNormalizedR - nY;
nC2 = 135.64F * 0.003921569F * nC2 + 137.0F * 0.003921569F;
nY = 1.0F * 0.713267F * nY; // / 1.402F
Y = (Npp8u)(nY  * 255.0F);
C1 = (Npp8u)(nC1 * 255.0F);
C2 = (Npp8u)(nC2 * 255.0F);
```

Functions

NppStatus **nppiRGBToYCC_8u_C3R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

3 channel 8-bit unsigned packed RGB to 3 channel 8-bit unsigned packed YCC color conversion.

Parameters

- **pSrc** – *Source-Image Pointer*.

- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiRGBToYCC_8u_AC4R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

4 channel 8-bit unsigned packed RGB with alpha to 4 channel 8-bit unsigned packed YCC with alpha color conversion.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

1.8.3.77 YCCToRGB

PhotoYCC to RGB color conversion.

This is how NPP converts PhotoYCC to gamma corrected RGB or BGR.

```
Npp32f nNormalizedY  = ((Npp32f)Y * 0.003921569F) * 1.3584F;  // / 255.0F
Npp32f nNormalizedC1 = (((Npp32f)C1 * 0.003921569F) - 156.0F * 0.003921569F) * 2.
↪2179F;
Npp32f nNormalizedC2 = (((Npp32f)C2 * 0.003921569F) - 137.0F * 0.003921569F) * 1.
↪8215F;
Npp32f nR = nNormalizedY + nNormalizedC2;
if (nR > 1.0F)
    nR = 1.0F;
Npp32f nG = nNormalizedY - 0.194F  * nNormalizedC1 - 0.509F * nNormalizedC2;
if (nG > 1.0F)
    nG = 1.0F;
Npp32f nB = nNormalizedY + nNormalizedC1;
if (nB > 1.0F)
    nB = 1.0F;
R = (Npp8u)(nR * 255.0F);
G = (Npp8u)(nG * 255.0F);
B = (Npp8u)(nB * 255.0F);
```

Functions

NppStatus **nppiYCCToRGB_8u_C3R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

3 channel 8-bit unsigned packed YCC to 3 channel 8-bit unsigned packed RGB color conversion.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiYCCToRGB_8u_AC4R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

4 channel 8-bit unsigned packed YCC with alpha to 4 channel 8-bit unsigned packed RGB with alpha color conversion.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

1.8.3.78 YCCKToCMYK_JPEG

This function partially converts JPEG YCCK to CMYK.

This is how NPP converts JPEG YCCK to CMYK. NPP only performs and initial YCC to RGB conversion using the 601 conversion coefficients and the RGB to CMY inversion leaving K unmodified. To complete this conversion to useful RGB values an additional RGB conversion needs to follow this function using the color profile contained in the YCCK JPEG file metadata section. NPP does not directly support this conversion but potentially nppiColorTwist can be used to perform it once the conversion coefficients are known.

```
Npp32f nY  = static_cast<Npp32f>(Y);
Npp32f nC1 = static_cast<Npp32f>(Cb);
Npp32f nC2 = static_cast<Npp32f>(Cr);
Npp32f nR = nY + 1.402F * nC2 - 179.456F;
Npp32f nG = nY - 0.34414F * nC1 - 0.71414F * nC2 + 135.45984F;
Npp32f nB = nY + 1.772F * nC1 - 226.816F;

Npp8u nC = static_cast<Npp8u>(255.0F - nR);
Npp8u nM = static_cast<Npp8u>(255.0F - nG);
Npp8u nM = static_cast<Npp8u>(255.0F - nB);
Npp8u nK = K;
```

Functions

NppStatus **nppiYCCKToCMYK_JPEG_601_8u_P4R_Ctx**(const *Npp8u* *pSrc[4], int nSrcStep, *Npp8u* *pDst[4], int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

4 channel 8-bit unsigned planar JPEG YCCK color format to 4 channel 8-bit unsigned planar CMYK color conversion using 601 RGB color coefficients and CMY inversion.

Parameters

- **pSrc** – *Source-Planar-Image Pointer Array*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Planar-Image Pointer Array*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

1.8.3.79 CMYKOrYCCKJPEGToRGB

These functions convert JPEG CMYK or YCCK color format images to either planar or packed RGB images for images which need no color profile conversion.

Functions

NppStatus **nppiCMYKOrYCCKToRGB_JPEG_8u_P4P3R_Ctx**(const *Npp8u* *pSrc[4], int nSrcStep, *Npp8u* *pDst[3], int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

4 channel 8-bit unsigned planar JPEG CMYK or YCCK color model image to 3 channel 8-bit unsigned planar RGB color model image without color profile conversion.

Parameters

- **pSrc** – *Source-Planar-Image Pointer Array*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Planar-Image Pointer Array*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiCMYKOrYCCKToRGB_JPEG_8u_P4C3R_Ctx**(const *Npp8u* *pSrc[4], int nSrcStep, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

4 channel 8-bit unsigned planar JPEG CMYK or YCCK color model image to 3 channel 8-bit unsigned packed RGB color model image without color profile conversion.

Parameters

- **pSrc** – *Source-Planar-Image Pointer Array*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Planar-Image Pointer Array*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*

1.8.3.80 YCCKJPEGOrCMYKToBGR

These functions convert JPEG CMYK or YCCK color format images to either planar or packed BGR images for images which need no color profile conversion.

Functions

NppStatus **nppiCMYKOrYCCKToBGR_JPEG_8u_P4P3R_Ctx**(const *Npp8u* *pSrc[4], int nSrcStep, *Npp8u* *pDst[3], int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

4 channel 8-bit unsigned planar JPEG CMYK or YCCK color model image to 3 channel 8-bit unsigned planar BGR color model image without color profile conversion.

Parameters

- **pSrc** – *Source-Planar-Image Pointer Array*.
- **nSrcStep** – *Source-Image Line Step*.

- **pDst** – *Destination-Planar-Image Pointer Array*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiCMYKOrYCCKToBGR_JPEG_8u_P4C3R_Ctx**(const *Npp8u* *pSrc[4], int nSrcStep, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

4 channel 8-bit unsigned planar JPEG CMYK or YCCK color model image to 3 channel 8-bit unsigned packed BGR color model image without color profile conversion.

Parameters

- **pSrc** – *Source-Planar-Image Pointer Array*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Planar-Image Pointer Array*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

1.8.3.81 RGBToHLS

RGB to HLS color conversion.

This is how NPP converts gamma corrected RGB or BGR to HLS. This code uses the fmaxf() and fminf() 32 bit floating point math functions.

```
Npp32f nNormalizedR = (Npp32f)R * 0.003921569F;  // / 255.0F
Npp32f nNormalizedG = (Npp32f)G * 0.003921569F;
Npp32f nNormalizedB = (Npp32f)B * 0.003921569F;
Npp32f nS;
Npp32f nH;
// Lightness
Npp32f nMax = fmaxf(nNormalizedR, nNormalizedG);
       nMax = fmaxf(nMax, nNormalizedB);
Npp32f nMin = fminf(nNormalizedR, nNormalizedG);
       nMin = fminf(nMin, nNormalizedB);
Npp32f nL = (nMax + nMin) * 0.5F;
Npp32f nDivisor = nMax - nMin;
// Saturation
if (nDivisor == 0.0F) // achromatics case
{
    nS = 0.0F;
```

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```
    nH = 0.0F;
}
else // chromatics case
{
    if (nL > 0.5F)
        nS = nDivisor / (1.0F - (nMax + nMin - 1.0F));
    else
        nS = nDivisor / (nMax + nMin);
}
// Hue
Npp32f nCr = (nMax - nNormalizedR) / nDivisor;
Npp32f nCg = (nMax - nNormalizedG) / nDivisor;
Npp32f nCb = (nMax - nNormalizedB) / nDivisor;
if (nNormalizedR == nMax)
    nH = nCb - nCg;
else if (nNormalizedG == nMax)
    nH = 2.0F + nCr - nCb;
else if (nNormalizedB == nMax)
    nH = 4.0F + nCg - nCr;
nH = nH * 0.166667F; // / 6.0F
if (nH < 0.0F)
    nH = nH + 1.0F;
H = (Npp8u)(nH * 255.0F);
L = (Npp8u)(nL * 255.0F);
S = (Npp8u)(nS * 255.0F);
```

Functions

NppStatus **nppiRGBToHLS_8u_C3R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

3 channel 8-bit unsigned packed RGB to 3 channel 8-bit unsigned packed HLS color conversion.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiRGBToHLS_8u_AC4R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

4 channel 8-bit unsigned packed RGB with alpha to 4 channel 8-bit unsigned packed HLS with alpha color conversion.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

1.8.3.82 HLSToRGB

HLS to RGB color conversion.

This is how NPP converts HLS to gamma corrected RGB or BGR.

```
Npp32f nNormalizedH = (Npp32f)H * 0.003921569F;  // / 255.0F
Npp32f nNormalizedL = (Npp32f)L * 0.003921569F;
Npp32f nNormalizedS = (Npp32f)S * 0.003921569F;
Npp32f nM1;
Npp32f nM2;
Npp32f nR;
Npp32f nG;
Npp32f nB;
Npp32f nh = 0.0F;
if (nNormalizedL <= 0.5F)
    nM2 = nNormalizedL * (1.0F + nNormalizedS);
else
    nM2 = nNormalizedL + nNormalizedS - nNormalizedL * nNormalizedS;
nM1 = 2.0F * nNormalizedL - nM2;
if (nNormalizedS == 0.0F)
    nR = nG = nB = nNormalizedL;
else
{
    nh = nNormalizedH + 0.3333F;
    if (nh > 1.0F)
        nh -= 1.0F;
}
Npp32f nMDiff = nM2 - nM1;
if (0.6667F < nh)
    nR = nM1;
else
{
    if (nh < 0.1667F)
        nR = (nM1 + nMDiff * nh * 6.0F); // / 0.1667F
    else if (nh < 0.5F)
        nR = nM2;
    else
        nR = nM1 + nMDiff * ( 0.6667F - nh ) * 6.0F; // / 0.1667F
}
```

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```
if (nR > 1.0F)
    nR = 1.0F;
nh = nNormalizedH;
if (0.6667F < nh)
    nG = nM1;
else
{
    if (nh < 0.1667F)
        nG = (nM1 + nMDiff * nh * 6.0F); // / 0.1667F
    else if (nh < 0.5F)
        nG = nM2;
    else
        nG = nM1 + nMDiff * (0.6667F - nh ) * 6.0F; // / 0.1667F
}
if (nG > 1.0F)
    nG = 1.0F;
nh = nNormalizedH - 0.3333F;
if (nh < 0.0F)
    nh += 1.0F;
if (0.6667F < nh)
    nB = nM1;
else
{
    if (nh < 0.1667F)
        nB = (nM1 + nMDiff * nh * 6.0F); // / 0.1667F
    else if (nh < 0.5F)
        nB = nM2;
    else
        nB = nM1 + nMDiff * (0.6667F - nh ) * 6.0F; // / 0.1667F
}
if (nB > 1.0F)
    nB = 1.0F;
R = (Npp8u)(nR * 255.0F);
G = (Npp8u)(nG * 255.0F);
B = (Npp8u)(nB * 255.0F);
```

Functions

NppStatus **nppiHLSToRGB_8u_C3R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

3 channel 8-bit unsigned packed HLS to 3 channel 8-bit unsigned packed RGB color conversion.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiHLSToRGB_8u_AC4R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

4 channel 8-bit unsigned packed HLS with alpha to 4 channel 8-bit unsigned packed RGB with alpha color conversion.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*

1.8.3.83 BGRToHLS

BGR to HLS color conversion.

Functions

NppStatus **nppiBGRToHLS_8u_AC4R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

4 channel 8-bit unsigned packed BGR with alpha to 4 channel 8-bit unsigned packed HLS with alpha color conversion.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiBGRToHLS_8u_C3P3R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *Npp8u* *pDst[3], int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

3 channel 8-bit unsigned packed BGR to 3 channel 8-bit unsigned planar HLS color conversion.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Planar-Image Pointer Array*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiBGRToHLS_8u_AC4P4R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *Npp8u* *pDst[4], int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

4 channel 8-bit unsigned packed BGR with alpha to 4 channel 8-bit unsigned planar HLS with alpha color conversion.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Planar-Image Pointer Array*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiBGRToHLS_8u_P3C3R_Ctx**(const *Npp8u* *const pSrc[3], int nSrcStep, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

3 channel 8-bit unsigned planar BGR to 3 channel 8-bit unsigned packed HLS color conversion.

Parameters

- **pSrc** – *Source-Planar-Image Pointer Array*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.

- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiBGRToHLS_8u_AP4C4R_Ctx**(const *Npp8u* *const pSrc[4], int nSrcStep, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

4 channel 8-bit unsigned planar BGR with alpha to 4 channel 8-bit unsigned packed HLS with alpha color conversion.

Parameters

- **pSrc** – *Source-Planar-Image Pointer Array*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiBGRToHLS_8u_P3R_Ctx**(const *Npp8u* *const pSrc[3], int nSrcStep, *Npp8u* *pDst[3], int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

3 channel 8-bit unsigned planar BGR to 3 channel 8-bit unsigned planar HLS color conversion.

Parameters

- **pSrc** – *Source-Planar-Image Pointer Array*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Planar-Image Pointer Array*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiBGRToHLS_8u_AP4R_Ctx**(const *Npp8u* *const pSrc[4], int nSrcStep, *Npp8u* *pDst[4], int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

4 channel 8-bit unsigned planar BGR with alpha to 4 channel 8-bit unsigned planar HLS with alpha color conversion.

Parameters

- **pSrc** – *Source-Planar-Image Pointer Array*.
- **nSrcStep** – *Source-Image Line Step*.

- **pDst** – *Destination-Planar-Image Pointer Array*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

1.8.3.84 HLSToBGR

HLS to BGR color conversion.

Functions

NppStatus **nppiHLSToBGR_8u_C3P3R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *Npp8u* *pDst[3], int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

3 channel 8-bit unsigned packed HLS to 3 channel 8-bit unsigned planar BGR color conversion.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Planar-Image Pointer Array*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiHLSToBGR_8u_AC4P4R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *Npp8u* *pDst[4], int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

4 channel 8-bit unsigned packed HLS with alpha to 4 channel 8-bit unsigned planar BGR with alpha color conversion.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Planar-Image Pointer Array*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiHLSToBGR_8u_P3R_Ctx**(const *Npp8u* *const pSrc[3], int nSrcStep, *Npp8u* *pDst[3], int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

3 channel 8-bit unsigned planar HLS to 3 channel 8-bit unsigned planar BGR color conversion.

Parameters

- **pSrc** – *Source-Planar-Image Pointer Array*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Planar-Image Pointer Array*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiHLSToBGR_8u_AP4R_Ctx**(const *Npp8u* *const pSrc[4], int nSrcStep, *Npp8u* *pDst[4], int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

4 channel 8-bit unsigned planar HLS with alpha to 4 channel 8-bit unsigned planar BGR with alpha color conversion.

Parameters

- **pSrc** – *Source-Planar-Image Pointer Array*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Planar-Image Pointer Array*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiHLSToBGR_8u_P3C3R_Ctx**(const *Npp8u* *const pSrc[3], int nSrcStep, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

3 channel 8-bit unsigned planar HLS to 3 channel 8-bit unsigned packed BGR color conversion.

Parameters

- **pSrc** – *Source-Planar-Image Pointer Array*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.

- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiHLSToBGR_8u_AP4C4R_Ctx**(const *Npp8u* *const pSrc[4], int nSrcStep, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

4 channel 8-bit unsigned planar HLS with alpha to 4 channel 8-bit unsigned packed BGR with alpha color conversion.

Parameters

- **pSrc** – *Source-Planar-Image Pointer Array*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

1.8.3.85 RBGToHSV

RGB to HSV color conversion.

This is how NPP converts gamma corrected RGB or BGR to HSV. This code uses the fmaxf() and fminf() 32 bit floating point math functions.

```
Npp32f nNormalizedR = (Npp32f)R * 0.003921569F; // / 255.0F
Npp32f nNormalizedG = (Npp32f)G * 0.003921569F;
Npp32f nNormalizedB = (Npp32f)B * 0.003921569F;
Npp32f nS;
Npp32f nH;
// Value
Npp32f nV = fmaxf(nNormalizedR, nNormalizedG);
       nV = fmaxf(nV, nNormalizedB);
// Saturation
Npp32f nTemp = fminf(nNormalizedR, nNormalizedG);
       nTemp = fminf(nTemp, nNormalizedB);
Npp32f nDivisor = nV - nTemp;
if (nV == 0.0F) // achromatics case
{
    nS = 0.0F;
    nH = 0.0F;
}
else // chromatics case
    nS = nDivisor / nV;
// Hue:
```

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```
Npp32f nCr = (nV - nNormalizedR) / nDivisor;
Npp32f nCg = (nV - nNormalizedG) / nDivisor;
Npp32f nCb = (nV - nNormalizedB) / nDivisor;
if (nNormalizedR == nV)
    nH = nCb - nCg;
else if (nNormalizedG == nV)
    nH = 2.0F + nCr - nCb;
else if (nNormalizedB == nV)
    nH = 4.0F + nCg - nCr;
nH = nH * 0.166667F; // / 6.0F
if (nH < 0.0F)
    nH = nH + 1.0F;
H = (Npp8u)(nH * 255.0F);
S = (Npp8u)(nS * 255.0F);
V = (Npp8u)(nV * 255.0F);
```

Functions

NppStatus **nppiRGBToHSV_8u_C3R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

3 channel 8-bit unsigned packed RGB to 3 channel 8-bit unsigned packed HSV color conversion.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiRGBToHSV_8u_AC4R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

4 channel 8-bit unsigned packed RGB with alpha to 4 channel 8-bit unsigned packed HSV with alpha color conversion.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.

- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

1.8.3.86 HSVToRGB

HSV to RGB color conversion.

This is how NPP converts HSV to gamma corrected RGB or BGR. This code uses the floorf() 32 bit floating point math function.

```
Npp32f nNormalizedH = (Npp32f)H * 0.003921569F; // / 255.0F
Npp32f nNormalizedS = (Npp32f)S * 0.003921569F;
Npp32f nNormalizedV = (Npp32f)V * 0.003921569F;
Npp32f nR;
Npp32f nG;
Npp32f nB;
if (nNormalizedS == 0.0F)
{
    nR = nG = nB = nNormalizedV;
}
else
{
    if (nNormalizedH == 1.0F)
        nNormalizedH = 0.0F;
    else
        nNormalizedH = nNormalizedH * 6.0F; // / 0.1667F
}
Npp32f nI = floorf(nNormalizedH);
Npp32f nF = nNormalizedH - nI;
Npp32f nM = nNormalizedV * (1.0F - nNormalizedS);
Npp32f nN = nNormalizedV * (1.0F - nNormalizedS * nF);
Npp32f nK = nNormalizedV * (1.0F - nNormalizedS * (1.0F - nF));
if (nI == 0.0F)
    { nR = nNormalizedV; nG = nK; nB = nM; }
else if (nI == 1.0F)
    { nR = nN; nG = nNormalizedV; nB = nM; }
else if (nI == 2.0F)
    { nR = nM; nG = nNormalizedV; nB = nK; }
else if (nI == 3.0F)
    { nR = nM; nG = nN; nB = nNormalizedV; }
else if (nI == 4.0F)
    { nR = nK; nG = nM; nB = nNormalizedV; }
else if (nI == 5.0F)
    { nR = nNormalizedV; nG = nM; nB = nN; }
R = (Npp8u)(nR * 255.0F);
G = (Npp8u)(nG * 255.0F);
B = (Npp8u)(nB * 255.0F);
```

Functions

NppStatus **nppiHSVToRGB_8u_C3R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

3 channel 8-bit unsigned packed HSV to 3 channel 8-bit unsigned packed RGB color conversion.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiHSVToRGB_8u_AC4R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

4 channel 8-bit unsigned packed HSV with alpha to 4 channel 8-bit unsigned packed RGB with alpha color conversion.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

1.8.3.87 JPEG Color Conversion

The set of JPEG color conversion functions available in the library.

RGBToYCbCr_JPEG Planar to planar.

JPEG RGB to YCbCr color conversion.

NppStatus **nppiRGBToYCbCr420_JPEG_8u_P3R_Ctx**(const *Npp8u* *const pSrc[3], int nSrcStep, *Npp8u* *pDst[3], int aDstStep[3], *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

3 channel 8-bit unsigned planar RGB to 3 channel 8-bit unsigned planar YCbCr420 color conversion.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **aDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiRGBToYCbCr422_JPEG_8u_P3R_Ctx**(const *Npp8u* *const pSrc[3], int nSrcStep, *Npp8u* *pDst[3], int aDstStep[3], *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

3 channel 8-bit unsigned planar RGB to 3 channel 8-bit unsigned planar YCbCr422 color conversion.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **aDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiRGBToYCbCr411_JPEG_8u_P3R_Ctx**(const *Npp8u* *const pSrc[3], int nSrcStep, *Npp8u* *pDst[3], int aDstStep[3], *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

3 channel 8-bit unsigned planar RGB to 3 channel 8-bit unsigned planar YCbCr411 color conversion.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.

- **pDst** – *Destination-Image Pointer*.
- **aDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiRGBToYCbCr444_JPEG_8u_P3R_Ctx**(const *Npp8u* *const pSrc[3], int nSrcStep, *Npp8u* *pDst[3], int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

3 channel 8-bit unsigned planar RGB to 3 channel 8-bit unsigned planar YCbCr444 color conversion.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiBGRToYCbCr420_JPEG_8u_P3R_Ctx**(const *Npp8u* *const pSrc[3], int nSrcStep, *Npp8u* *pDst[3], int aDstStep[3], *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

3 channel 8-bit unsigned planar BGR to 3 channel 8-bit unsigned planar YCbCr420 color conversion.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **aDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiBGRToYCbCr422_JPEG_8u_P3R_Ctx**(const *Npp8u* *const pSrc[3], int nSrcStep, *Npp8u* *pDst[3], int aDstStep[3], *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

3 channel 8-bit unsigned planar BGR to 3 channel 8-bit unsigned planar YCbCr422 color conversion.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **aDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiBGRToYCbCr411_JPEG_8u_P3R_Ctx**(const *Npp8u* *const pSrc[3], int nSrcStep, *Npp8u* *pDst[3], int aDstStep[3], *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

3 channel 8-bit unsigned planar BGR to 3 channel 8-bit unsigned planar YCbCr411 color conversion.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **aDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiBGRToYCbCr444_JPEG_8u_P3R_Ctx**(const *Npp8u* *const pSrc[3], int nSrcStep, *Npp8u* *pDst[3], int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

3 channel 8-bit unsigned planar BGR to 3 channel 8-bit unsigned planar YCbCr444 color conversion.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiYCbCr420ToRGB_JPEG_8u_P3R_Ctx**(const *Npp8u* *const pSrc[3], int aSrcStep[3], *Npp8u* *pDst[3], int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

3 channel 8-bit unsigned planar YCbCr420 to 3 channel 8-bit unsigned planar RGB color conversion.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **aSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiYCbCr422ToRGB_JPEG_8u_P3R_Ctx**(const *Npp8u* *const pSrc[3], int aSrcStep[3], *Npp8u* *pDst[3], int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

3 channel 8-bit unsigned planar YCbCr422 to 3 channel 8-bit unsigned planar RGB color conversion.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **aSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiYCbCr411ToRGB_JPEG_8u_P3R_Ctx**(const *Npp8u* *const pSrc[3], int aSrcStep[3], *Npp8u* *pDst[3], int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

3 channel 8-bit unsigned planar YCbCr411 to 3 channel 8-bit unsigned planar RGB color conversion.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **aSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.

- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiYCbCr444ToRGB_JPEG_8u_P3R_Ctx**(const *Npp8u* *const pSrc[3], int nSrcStep, *Npp8u* *pDst[3], int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

3 channel 8-bit unsigned planar YCbCr444 to 3 channel 8-bit unsigned planar RGB color conversion.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiYCbCr420ToBGR_JPEG_8u_P3R_Ctx**(const *Npp8u* *const pSrc[3], int aSrcStep[3], *Npp8u* *pDst[3], int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

3 channel 8-bit unsigned planar YCbCr420 to 3 channel 8-bit unsigned planar BGR color conversion.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **aSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiYCbCr422ToBGR_JPEG_8u_P3R_Ctx**(const *Npp8u* *const pSrc[3], int aSrcStep[3], *Npp8u* *pDst[3], int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

3 channel 8-bit unsigned planar YCbCr422 to 3 channel 8-bit unsigned planar BGR color conversion.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **aSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiYCbCr411ToBGR_JPEG_8u_P3R_Ctx**(const *Npp8u* *const pSrc[3], int aSrcStep[3], *Npp8u* *pDst[3], int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

3 channel 8-bit unsigned planar YCbCr411 to 3 channel 8-bit unsigned planar BGR color conversion.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **aSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiYCbCr444ToBGR_JPEG_8u_P3R_Ctx**(const *Npp8u* *const pSrc[3], int nSrcStep, *Npp8u* *pDst[3], int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

3 channel 8-bit unsigned planar YCbCr444 to 3 channel 8-bit unsigned planar BGR color conversion.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*

RGBToYCbCr_JPEG Planar to packed.

JPEG RGB to YCbCr color conversion.

NppStatus **nppiRGBToYCbCr420_JPEG_8u_C3P3R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *Npp8u* *pDst[3], int aDstStep[3], *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

3 channel 8-bit unsigned packed RGB to 3 channel 8-bit unsigned planar YCbCr420 color conversion.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **aDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiRGBToYCbCr422_JPEG_8u_C3P3R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *Npp8u* *pDst[3], int aDstStep[3], *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

3 channel 8-bit unsigned packed RGB to 3 channel 8-bit unsigned planar YCbCr422 color conversion.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **aDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiRGBToYCbCr411_JPEG_8u_C3P3R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *Npp8u* *pDst[3], int aDstStep[3], *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

3 channel 8-bit unsigned packed RGB to 3 channel 8-bit unsigned planar YCbCr411 color conversion.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **aDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiRGBToYCbCr444_JPEG_8u_C3P3R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *Npp8u* *pDst[3], int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

3 channel 8-bit unsigned packed RGB to 3 channel 8-bit unsigned planar YCbCr444 color conversion.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiBGRToYCbCr420_JPEG_8u_C3P3R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *Npp8u* *pDst[3], int aDstStep[3], *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

3 channel 8-bit unsigned packed BGR to 3 channel 8-bit unsigned planar YCbCr420 color conversion.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **aDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiBGRToYCbCr422_JPEG_8u_C3P3R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *Npp8u* *pDst[3], int aDstStep[3], *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

3 channel 8-bit unsigned packed BGR to 3 channel 8-bit unsigned planar YCbCr422 color conversion.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **aDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiBGRToYCbCr411_JPEG_8u_C3P3R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *Npp8u* *pDst[3], int aDstStep[3], *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

3 channel 8-bit unsigned packed BGR to 3 channel 8-bit unsigned planar YCbCr411 color conversion.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **aDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiBGRToYCbCr444_JPEG_8u_C3P3R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *Npp8u* *pDst[3], int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

3 channel 8-bit unsigned packed BGR to 3 channel 8-bit unsigned planar YCbCr444 color conversion.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.

- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiYCbCr420ToRGB_JPEG_8u_P3C3R_Ctx**(const *Npp8u* *const pSrc[3], int aSrcStep[3], *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

3 channel 8-bit unsigned packed YCbCr420 to 3 channel 8-bit unsigned planar RGB color conversion.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **aSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiYCbCr422ToRGB_JPEG_8u_P3C3R_Ctx**(const *Npp8u* *const pSrc[3], int aSrcStep[3], *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

3 channel 8-bit unsigned packed YCbCr422 to 3 channel 8-bit unsigned planar RGB color conversion.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **aSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiYCbCr411ToRGB_JPEG_8u_P3C3R_Ctx**(const *Npp8u* *const pSrc[3], int aSrcStep[3], *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

3 channel 8-bit unsigned packed YCbCr411 to 3 channel 8-bit unsigned planar RGB color conversion.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **aSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiYCbCr444ToRGB_JPEG_8u_P3C3R_Ctx**(const *Npp8u* *const pSrc[3], int nSrcStep, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

3 channel 8-bit unsigned planar YCbCr444 to 3 channel 8-bit unsigned packed RGB color conversion.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiYCbCr420ToBGR_JPEG_8u_P3C3R_Ctx**(const *Npp8u* *const pSrc[3], int aSrcStep[3], *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

3 channel 8-bit unsigned planar YCbCr420 to 3 channel 8-bit unsigned packed BGR color conversion.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **aSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.

- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiYCbCr422ToBGR_JPEG_8u_P3C3R_Ctx**(const *Npp8u* *const pSrc[3], int aSrcStep[3], *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

3 channel 8-bit unsigned planar YCbCr422 to 3 channel 8-bit unsigned packed BGR color conversion.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **aSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiYCbCr411ToBGR_JPEG_8u_P3C3R_Ctx**(const *Npp8u* *const pSrc[3], int aSrcStep[3], *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

3 channel 8-bit unsigned planar YCbCr411 to 3 channel 8-bit unsigned packed BGR color conversion.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **aSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiYCbCr444ToBGR_JPEG_8u_P3C3R_Ctx**(const *Npp8u* *const pSrc[3], int nSrcStep, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

3 channel 8-bit unsigned planar YCbCr444 to 3 channel 8-bit unsigned packed BGR color conversion.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

1.9. Image Data Exchange And Initialization Functions

Functions for initializing, copying and converting image data.

These functions can be found in the nppidei library. Linking to only the sub-libraries that you use can significantly save link time, application load time, and CUDA runtime startup time when using dynamic libraries.

1.9.1. Set

Functions for setting all pixels within the ROI to a specific value.

1.9.1.1 Common parameters for nppiSet functions:

param nValue
The pixel value to be set.

param pDst
Destination-Image Pointer.

param nDstStep
Destination-Image Line Step.

param oSizeROI
Region-Of-Interest (ROI).

param nppStreamCtx
Application Managed Stream Context.

return
Image Data Related Error Codes, *ROI Related Error Codes*

Functions

NppStatus **nppiSet_8s_C1R_Ctx**(const *Npp8s* nValue, *Npp8s* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

8-bit image set.

For common parameter descriptions see *Common parameters for nppiSet functions:*.

NppStatus **nppiSet_8s_C2R_Ctx**(const *Npp8s* aValue[2], *Npp8s* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

8-bit two-channel image set.

For common parameter descriptions, see *Common parameters for nppiSet functions:*.

NppStatus **nppiSet_8s_C3R_Ctx**(const *Npp8s* aValue[3], *Npp8s* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

8-bit three-channel image set.

For common parameter descriptions, see *Common parameters for nppiSet functions:*.

NppStatus **nppiSet_8s_C4R_Ctx**(const *Npp8s* aValue[4], *Npp8s* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

8-bit four-channel image set.

For common parameter descriptions, see *Common parameters for nppiSet functions:*.

NppStatus **nppiSet_8s_AC4R_Ctx**(const *Npp8s* aValue[3], *Npp8s* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

8-bit four-channel image set ignoring alpha channel.

For common parameter descriptions, see *Common parameters for nppiSet functions:*.

NppStatus **nppiSet_8u_C1R_Ctx**(const *Npp8u* nValue, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

8-bit unsigned image set.

For common parameter descriptions, see *Common parameters for nppiSet functions:*.

NppStatus **nppiSet_8u_C2R_Ctx**(const *Npp8u* aValue[2], *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

2 channel 8-bit unsigned image set.

For common parameter descriptions, see *Common parameters for nppiSet functions:*.

NppStatus **nppiSet_8u_C3R_Ctx**(const *Npp8u* aValue[3], *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

3 channel 8-bit unsigned image set.

For common parameter descriptions, see *Common parameters for nppiSet functions:*.

NppStatus **nppiSet_8u_C4R_Ctx**(const *Npp8u* aValue[4], *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

4 channel 8-bit unsigned image set.

For common parameter descriptions, see *Common parameters for nppiSet functions:*.

NppStatus **nppiSet_8u_AC4R_Ctx**(const *Npp8u* aValue[3], *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

4 channel 8-bit unsigned image set method, not affecting Alpha channel.

For common parameter descriptions, see *Common parameters for nppiSet functions:*.

NppStatus **nppiSet_16u_C1R_Ctx**(const *Npp16u* nValue, *Npp16u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

16-bit unsigned image set.

For common parameter descriptions, see *Common parameters for nppiSet functions:*.

NppStatus **nppiSet_16u_C2R_Ctx**(const *Npp16u* aValue[2], *Npp16u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

2 channel 16-bit unsigned image set.

For common parameter descriptions, see *Common parameters for nppiSet functions:*.

NppStatus **nppiSet_16u_C3R_Ctx**(const *Npp16u* aValue[3], *Npp16u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

3 channel 16-bit unsigned image set.

For common parameter descriptions, see *Common parameters for nppiSet functions:*.

NppStatus **nppiSet_16u_C4R_Ctx**(const *Npp16u* aValue[4], *Npp16u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

4 channel 16-bit unsigned image set.

For common parameter descriptions, see *Common parameters for nppiSet functions:*.

NppStatus **nppiSet_16u_AC4R_Ctx**(const *Npp16u* aValue[3], *Npp16u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

4 channel 16-bit unsigned image set method, not affecting Alpha channel.

For common parameter descriptions, see *Common parameters for nppiSet functions:*.

NppStatus **nppiSet_16s_C1R_Ctx**(const *Npp16s* nValue, *Npp16s* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

16-bit image set.

For common parameter descriptions, see *Common parameters for nppiSet functions:*.

NppStatus **nppiSet_16s_C2R_Ctx**(const *Npp16s* aValue[2], *Npp16s* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

2 channel 16-bit image set.

For common parameter descriptions, see *Common parameters for nppiSet functions:*.

NppStatus **nppiSet_16s_C3R_Ctx**(const *Npp16s* aValue[3], *Npp16s* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

3 channel 16-bit image set.

For common parameter descriptions, see *Common parameters for nppiSet functions:*.

NppStatus **nppiSet_16s_C4R_Ctx**(const *Npp16s* aValue[4], *Npp16s* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

4 channel 16-bit image set.

For common parameter descriptions, see *Common parameters for nppiSet functions:*.

NppStatus **nppiSet_16s_AC4R_Ctx**(const *Npp16s* aValue[3], *Npp16s* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

4 channel 16-bit image set method, not affecting Alpha channel.

For common parameter descriptions, see *Common parameters for nppiSet functions:*.

NppStatus **nppiSet_16sc_C1R_Ctx**(const *Npp16sc* oValue, *Npp16sc* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

16-bit complex integer image set.

For common parameter descriptions, see *Common parameters for nppiSet functions:*.

NppStatus **nppiSet_16sc_C2R_Ctx**(const *Npp16sc* aValue[2], *Npp16sc* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

16-bit complex integer two-channel image set.

For common parameter descriptions, see *Common parameters for nppiSet functions:*.

NppStatus **nppiSet_16sc_C3R_Ctx**(const *Npp16sc* aValue[3], *Npp16sc* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

16-bit complex integer three-channel image set.

For common parameter descriptions, see *Common parameters for nppiSet functions:*.

NppStatus **nppiSet_16sc_C4R_Ctx**(const *Npp16sc* aValue[4], *Npp16sc* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

16-bit complex integer four-channel image set.

For common parameter descriptions, see *Common parameters for nppiSet functions:*.

NppStatus **nppiSet_16sc_AC4R_Ctx**(const *Npp16sc* aValue[3], *Npp16sc* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

16-bit complex integer four-channel image set ignoring alpha.

For common parameter descriptions, see *Common parameters for nppiSet functions:*.

NppStatus **nppiSet_32s_C1R_Ctx**(const *Npp32s* nValue, *Npp32s* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

32-bit image set.

For common parameter descriptions, see *Common parameters for nppiSet functions:*.

NppStatus **nppiSet_32s_C2R_Ctx**(const *Npp32s* aValue[2], *Npp32s* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

2 channel 32-bit image set.

For common parameter descriptions, see *Common parameters for nppiSet functions:*.

NppStatus **nppiSet_32s_C3R_Ctx**(const *Npp32s* aValue[3], *Npp32s* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

3 channel 32-bit image set.

For common parameter descriptions, see *Common parameters for nppiSet functions:*.

NppStatus **nppiSet_32s_C4R_Ctx**(const *Npp32s* aValue[4], *Npp32s* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

4 channel 32-bit image set.

For common parameter descriptions, see *Common parameters for nppiSet functions:*.

NppStatus **nppiSet_32s_AC4R_Ctx**(const *Npp32s* aValue[3], *Npp32s* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

4 channel 32-bit image set method, not affecting Alpha channel.

For common parameter descriptions, see *Common parameters for nppiSet functions:*.

NppStatus **nppiSet_32u_C1R_Ctx**(const *Npp32u* nValue, *Npp32u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

32-bit unsigned image set.

For common parameter descriptions, see *Common parameters for nppiSet functions:*.

NppStatus **nppiSet_32u_C2R_Ctx**(const *Npp32u* aValue[2], *Npp32u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

2 channel 32-bit unsigned image set.

For common parameter descriptions, see *Common parameters for nppiSet functions:*.

NppStatus **nppiSet_32u_C3R_Ctx**(const *Npp32u* aValue[3], *Npp32u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

3 channel 32-bit unsigned image set.

For common parameter descriptions, see *Common parameters for nppiSet functions:*.

NppStatus **nppiSet_32u_C4R_Ctx**(const *Npp32u* aValue[4], *Npp32u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

4 channel 32-bit unsigned image set.

For common parameter descriptions, see *Common parameters for nppiSet functions:*.

NppStatus **nppiSet_32u_AC4R_Ctx**(const *Npp32u* aValue[3], *Npp32u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

4 channel 32-bit unsigned image set method, not affecting Alpha channel.

For common parameter descriptions, see *Common parameters for nppiSet functions:*.

NppStatus **nppiSet_32sc_C1R_Ctx**(const *Npp32sc* oValue, *Npp32sc* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Single channel 32-bit complex integer image set.

For common parameter descriptions, see *Common parameters for nppiSet functions:*.

NppStatus **nppiSet_32sc_C2R_Ctx**(const *Npp32sc* aValue[2], *Npp32sc* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Two channel 32-bit complex integer image set.

For common parameter descriptions, see *Common parameters for nppiSet functions:*.

NppStatus **nppiSet_32sc_C3R_Ctx**(const *Npp32sc* aValue[3], *Npp32sc* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Three channel 32-bit complex integer image set.

For common parameter descriptions, see *Common parameters for nppiSet functions:*.

NppStatus **nppiSet_32sc_C4R_Ctx**(const *Npp32sc* aValue[4], *Npp32sc* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four channel 32-bit complex integer image set.

For common parameter descriptions, see *Common parameters for nppiSet functions:*.

NppStatus **nppiSet_32sc_AC4R_Ctx**(const *Npp32sc* aValue[3], *Npp32sc* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

32-bit complex integer four-channel image set ignoring alpha.

For common parameter descriptions, see *Common parameters for nppiSet functions:*.

NppStatus **nppiSet_16f_C1R_Ctx**(const *Npp32f* nValue, *Npp16f* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

16-bit floating point image set.

For common parameter descriptions, see *Common parameters for nppiSet functions:*.

NppStatus **nppiSet_16f_C2R_Ctx**(const *Npp32f* aValues[2], *Npp16f* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

2 channel 16-bit floating point image set.

For common parameter descriptions, see *Common parameters for nppiSet functions:*.

NppStatus **nppiSet_16f_C3R_Ctx**(const *Npp32f* aValues[3], *Npp16f* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

3 channel 16-bit floating point image set.

For common parameter descriptions, see *Common parameters for nppiSet functions:*.

NppStatus **nppiSet_16f_C4R_Ctx**(const *Npp32f* aValues[4], *Npp16f* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

4 channel 16-bit floating point image set.

For common parameter descriptions, see *Common parameters for nppiSet functions:*.

NppStatus **nppiSet_32f_C1R_Ctx**(const *Npp32f* nValue, *Npp32f* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

32-bit floating point image set.

For common parameter descriptions, see *Common parameters for nppiSet functions:*.

NppStatus **nppiSet_32f_C2R_Ctx**(const *Npp32f* aValue[2], *Npp32f* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

2 channel 32-bit floating point image set.

For common parameter descriptions, see *Common parameters for nppiSet functions:*.

NppStatus **nppiSet_32f_C2R**(const *Npp32f* aValue[2], *Npp32f* *pDst, int nDstStep, *NppiSize* oSizeROI)

2 channel 32-bit floating point image set.

For common parameter descriptions, see *Common parameters for nppiSet functions:*.

NppStatus **nppiSet_32f_C3R_Ctx**(const *Npp32f* aValue[3], *Npp32f* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

3 channel 32-bit floating point image set.

For common parameter descriptions, see *Common parameters for nppiSet functions:*.

NppStatus **nppiSet_32f_C4R_Ctx**(const *Npp32f* aValue[4], *Npp32f* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

4 channel 32-bit floating point image set.

For common parameter descriptions, see *Common parameters for nppiSet functions:*.

NppStatus **nppiSet_32f_AC4R_Ctx**(const *Npp32f* aValue[3], *Npp32f* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

4 channel 32-bit floating point image set method, not affecting Alpha channel.

For common parameter descriptions, see *Common parameters for nppiSet functions:*.

NppStatus **nppiSet_32fc_C1R_Ctx**(const *Npp32fc* oValue, *Npp32fc* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Single channel 32-bit complex image set.

For common parameter descriptions, see *Common parameters for nppiSet functions:*.

NppStatus **nppiSet_32fc_C2R_Ctx**(const *Npp32fc* aValue[2], *Npp32fc* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Two channel 32-bit complex image set.

For common parameter descriptions, see *Common parameters for nppiSet functions:*.

NppStatus **nppiSet_32fc_C3R_Ctx**(const *Npp32fc* aValue[3], *Npp32fc* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Three channel 32-bit complex image set.

For common parameter descriptions, see *Common parameters for nppiSet functions:*.

NppStatus **nppiSet_32fc_C4R_Ctx**(const *Npp32fc* aValue[4], *Npp32fc* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four channel 32-bit complex image set.

For common parameter descriptions, see *Common parameters for nppiSet functions:*.

NppStatus **nppiSet_32fc_AC4R_Ctx**(const *Npp32fc* aValue[3], *Npp32fc* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

32-bit complex four-channel image set ignoring alpha.

For common parameter descriptions, see *Common parameters for nppiSet functions:*.

1.9.2. Masked Set

The masked set primitives have an additional “mask image” input. The mask controls which pixels within the ROI are set. For details see *Masked Operation*.

1.9.2.1 Common parameters for nppiSet_CXM functions:

param nValue
The pixel value to be set for single channel functions.

param aValue
The pixel-value to be set for multi-channel functions.

param pDst
Pointer *Destination-Image Pointer*.

param nDstStep
Destination-Image Line Step.

param oSizeROI
Region-Of-Interest (ROI).

param pMask
Mask-Image Pointer.

param nMaskStep
Mask-Image Line Step.

param nppStreamCtx
Application Managed Stream Context.

return
Image Data Related Error Codes, *ROI Related Error Codes*

Functions

NppStatus **nppiSet_8u_C1MR_Ctx**(*Npp8u* nValue, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp8u* *pMask, int nMaskStep, *NppStreamContext* nppStreamCtx)

Masked 8-bit unsigned image set.

For common parameter descriptions, see *Common parameters for nppiSet_CXM functions:*.

NppStatus **nppiSet_8u_C3MR_Ctx**(const *Npp8u* aValue[3], *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp8u* *pMask, int nMaskStep, *NppStreamContext* nppStreamCtx)

Masked 3 channel 8-bit unsigned image set.

For common parameter descriptions, see *Common parameters for nppiSet_CXM functions:*.

NppStatus **nppiSet_8u_C4MR_Ctx**(const *Npp8u* aValue[4], *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp8u* *pMask, int nMaskStep, *NppStreamContext* nppStreamCtx)

Masked 4 channel 8-bit unsigned image set.

For common parameter descriptions, see *Common parameters for nppiSet_CXM functions:*.

NppStatus **nppiSet_8u_AC4MR_Ctx**(const *Npp8u* aValue[3], *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp8u* *pMask, int nMaskStep, *NppStreamContext* nppStreamCtx)

Masked 4 channel 8-bit unsigned image set method, not affecting Alpha channel.

For common parameter descriptions, see *Common parameters for nppiSet_CXM functions:*.

NppStatus **nppiSet_16u_C1MR_Ctx**(*Npp16u* nValue, *Npp16u* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp8u* *pMask, int nMaskStep, *NppStreamContext* nppStreamCtx)

Masked 16-bit unsigned image set.

For common parameter descriptions, see *Common parameters for nppiSet_CXM functions:*.

NppStatus **nppiSet_16u_C3MR_Ctx**(const *Npp16u* aValue[3], *Npp16u* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp8u* *pMask, int nMaskStep, *NppStreamContext* nppStreamCtx)

Masked 3 channel 16-bit unsigned image set.

For common parameter descriptions, see *Common parameters for nppiSet_CXM functions:*.

NppStatus **nppiSet_16u_C4MR_Ctx**(const *Npp16u* aValue[4], *Npp16u* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp8u* *pMask, int nMaskStep, *NppStreamContext* nppStreamCtx)

Masked 4 channel 16-bit unsigned image set.

For common parameter descriptions, see *Common parameters for nppiSet_CXM functions:*.

NppStatus **nppiSet_16u_AC4MR_Ctx**(const *Npp16u* aValue[3], *Npp16u* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp8u* *pMask, int nMaskStep, *NppStreamContext* nppStreamCtx)

Masked 4 channel 16-bit unsigned image set method, not affecting Alpha channel.

For common parameter descriptions, see *Common parameters for nppiSet_CXM functions:*.

NppStatus **nppiSet_16s_C1MR_Ctx**(*Npp16s* nValue, *Npp16s* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp8u* *pMask, int nMaskStep, *NppStreamContext* nppStreamCtx)

Masked 16-bit image set.

For common parameter descriptions, see *Common parameters for nppiSet_CXM functions:*.

NppStatus **nppiSet_16s_C3MR_Ctx**(const *Npp16s* aValue[3], *Npp16s* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp8u* *pMask, int nMaskStep, *NppStreamContext* nppStreamCtx)

Masked 3 channel 16-bit image set.

For common parameter descriptions, see *Common parameters for nppiSet_CXM functions:*.

NppStatus **nppiSet_16s_C4MR_Ctx**(const *Npp16s* aValue[4], *Npp16s* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp8u* *pMask, int nMaskStep, *NppStreamContext* nppStreamCtx)

Masked 4 channel 16-bit image set.

For common parameter descriptions, see *Common parameters for nppiSet_CXM functions:*.

NppStatus **nppiSet_16s_AC4MR_Ctx**(const *Npp16s* aValue[3], *Npp16s* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp8u* *pMask, int nMaskStep, *NppStreamContext* nppStreamCtx)

Masked 4 channel 16-bit image set method, not affecting Alpha channel.

For common parameter descriptions, see *Common parameters for nppiSet_CXM functions:*.

NppStatus **nppiSet_32s_C1MR_Ctx**(*Npp32s* nValue, *Npp32s* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp8u* *pMask, int nMaskStep, *NppStreamContext* nppStreamCtx)

Masked 32-bit image set.

For common parameter descriptions, see *Common parameters for nppiSet_CXM functions:*.

NppStatus **nppiSet_32s_C3MR_Ctx**(const *Npp32s* aValue[3], *Npp32s* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp8u* *pMask, int nMaskStep, *NppStreamContext* nppStreamCtx)

Masked 3 channel 32-bit image set.

For common parameter descriptions, see *Common parameters for nppiSet_CXM functions:*.

NppStatus **nppiSet_32s_C4MR_Ctx**(const *Npp32s* aValue[4], *Npp32s* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp8u* *pMask, int nMaskStep, *NppStreamContext* nppStreamCtx)

Masked 4 channel 32-bit image set.

For common parameter descriptions, see *Common parameters for nppiSet_CXM functions:*.

NppStatus **nppiSet_32s_AC4MR_Ctx**(const *Npp32s* aValue[3], *Npp32s* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp8u* *pMask, int nMaskStep, *NppStreamContext* nppStreamCtx)

Masked 4 channel 16-bit image set method, not affecting Alpha channel.

For common parameter descriptions, see *Common parameters for nppiSet_CXM functions:*.

NppStatus **nppiSet_32f_C1MR_Ctx**(*Npp32f* nValue, *Npp32f* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp8u* *pMask, int nMaskStep, *NppStreamContext* nppStreamCtx)

Masked 32-bit floating point image set.

For common parameter descriptions, see *Common parameters for nppiSet_CXM functions:*.

NppStatus **nppiSet_32f_C3MR_Ctx**(const *Npp32f* aValue[3], *Npp32f* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp8u* *pMask, int nMaskStep, *NppStreamContext* nppStreamCtx)

Masked 3 channel 32-bit floating point image set.

For common parameter descriptions, see *Common parameters for nppiSet_CXM functions:*.

NppStatus **nppiSet_32f_C4MR_Ctx**(const *Npp32f* aValue[4], *Npp32f* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp8u* *pMask, int nMaskStep, *NppStreamContext* nppStreamCtx)

Masked 4 channel 32-bit floating point image set.

For common parameter descriptions, see *Common parameters for nppiSet_CXM functions:*.

NppStatus **nppiSet_32f_AC4MR_Ctx**(const *Npp32f* aValue[3], *Npp32f* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp8u* *pMask, int nMaskStep, *NppStreamContext* nppStreamCtx)

Masked 4 channel 32-bit floating point image set method, not affecting Alpha channel.

For common parameter descriptions, see *Common parameters for nppiSet_CXM functions:*.

1.9.3. Channel Set

The selected-channel set primitives set a single color channel in multi-channel images to a given value. The channel is selected by adjusting the pDst pointer to point to the desired color channel (see *Channel-of-Interest API*).

1.9.3.1 Common parameters for nppiSet_CXC functions:

param nValue
The pixel-value to be set.

param pDst
Select-Channel Destination-Image Pointer.

param nDstStep
Destination-Image Line Step.

param oSizeROI
Region-Of-Interest (ROI).

param nppStreamCtx
Application Managed Stream Context.

return
Image Data Related Error Codes, *ROI Related Error Codes*

Functions

NppStatus **nppiSet_8u_C3CR_Ctx**(*Npp8u* nValue, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

3 channel 8-bit unsigned image set affecting only single channel.

For common parameter descriptions, see *Common parameters for nppiSet_CXC functions:*.

NppStatus **nppiSet_8u_C4CR_Ctx**(*Npp8u* nValue, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

4 channel 8-bit unsigned image set affecting only single channel.

For common parameter descriptions, see *Common parameters for nppiSet_CXC functions:*.

NppStatus **nppiSet_16u_C3CR_Ctx**(*Npp16u* nValue, *Npp16u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

3 channel 16-bit unsigned image set affecting only single channel.

For common parameter descriptions, see *Common parameters for nppiSet_CXC functions:*.

NppStatus **nppiSet_16u_C4CR_Ctx**(*Npp16u* nValue, *Npp16u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

4 channel 16-bit unsigned image set affecting only single channel.

For common parameter descriptions, see *Common parameters for nppiSet_CXC functions:*.

NppStatus **nppiSet_16s_C3CR_Ctx**(*Npp16s* nValue, *Npp16s* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

3 channel 16-bit signed image set affecting only single channel.

For common parameter descriptions, see *Common parameters for nppiSet_CXC functions:*.

NppStatus **nppiSet_16s_C4CR_Ctx**(*Npp16s* nValue, *Npp16s* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

4 channel 16-bit signed image set affecting only single channel.

For common parameter descriptions, see *Common parameters for nppiSet_CXC functions:*.

NppStatus **nppiSet_32s_C3CR_Ctx**(*Npp32s* nValue, *Npp32s* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

3 channel 32-bit unsigned image set affecting only single channel.

For common parameter descriptions, see *Common parameters for nppiSet_CXC functions:*.

NppStatus **nppiSet_32s_C4CR_Ctx**(*Npp32s* nValue, *Npp32s* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

4 channel 32-bit unsigned image set affecting only single channel.

For common parameter descriptions, see *Common parameters for nppiSet_CXC functions:*.

NppStatus **nppiSet_32f_C3CR_Ctx**(*Npp32f* nValue, *Npp32f* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

3 channel 32-bit floating point image set affecting only single channel.

For common parameter descriptions, see *Common parameters for nppiSet_CXC functions:*.

NppStatus **nppiSet_32f_C4CR_Ctx**(*Npp32f* nValue, *Npp32f* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

4 channel 32-bit floating point image set affecting only single channel.

For common parameter descriptions, see *Common parameters for nppiSet_CXC functions:*.

Functions for copying image pixels.

1.9.4. Copy

Copy pixels from one image to another.

1.9.4.1 Common parameters for nppiCopy functions:

param pSrc
Source-Image Pointer.

param nSrcStep
Source-Image Line Step.

param pDst
Destination-Image Pointer.

param nDstStep
Destination-Image Line Step.

param oSizeROI
Region-Of-Interest (ROI).

param nppStreamCtx
Application Managed Stream Context.

return
Image Data Related Error Codes, *ROI Related Error Codes*

Functions

NppStatus **nppiCopy_8s_C1R_Ctx**(const *Npp8s* *pSrc, int nSrcStep, *Npp8s* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

8-bit image copy.

For common parameter descriptions, see *Common parameters for nppiCopy functions:*.

NppStatus **nppiCopy_8s_C2R_Ctx**(const *Npp8s* *pSrc, int nSrcStep, *Npp8s* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Two-channel 8-bit image copy.

For common parameter descriptions, see *Common parameters for nppiCopy functions:*.

NppStatus **nppiCopy_8s_C3R_Ctx**(const *Npp8s* *pSrc, int nSrcStep, *Npp8s* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Three-channel 8-bit image copy.

For common parameter descriptions, see *Common parameters for nppiCopy functions:*.

NppStatus **nppiCopy_8s_C4R_Ctx**(const *Npp8s* *pSrc, int nSrcStep, *Npp8s* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four-channel 8-bit image copy.

For common parameter descriptions, see *Common parameters for nppiCopy functions:*.

NppStatus **nppiCopy_8s_AC4R_Ctx**(const *Npp8s* *pSrc, int nSrcStep, *Npp8s* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four-channel 8-bit image copy, ignoring alpha channel.

For common parameter descriptions, see *Common parameters for nppiCopy functions:*.

NppStatus **nppiCopy_8u_C1R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

8-bit unsigned image copy.

For common parameter descriptions, see *Common parameters for nppiCopy functions:*.

NppStatus **nppiCopy_8u_C3R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Three channel 8-bit unsigned image copy.

For common parameter descriptions, see *Common parameters for nppiCopy functions:*.

NppStatus **nppiCopy_8u_C4R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

4 channel 8-bit unsigned image copy.

For common parameter descriptions, see *Common parameters for nppiCopy functions:*.

NppStatus **nppiCopy_8u_AC4R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

4 channel 8-bit unsigned image copy, not affecting Alpha channel.

For common parameter descriptions, see *Common parameters for nppiCopy functions:*.

NppStatus **nppiCopy_16u_C1R_Ctx**(const *Npp16u* *pSrc, int nSrcStep, *Npp16u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

16-bit unsigned image copy.

For common parameter descriptions, see *Common parameters for nppiCopy functions:*.

NppStatus **nppiCopy_16u_C3R_Ctx**(const *Npp16u* *pSrc, int nSrcStep, *Npp16u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Three channel 16-bit unsigned image copy.

For common parameter descriptions, see *Common parameters for nppiCopy functions:*.

NppStatus **nppiCopy_16u_C4R_Ctx**(const *Npp16u* *pSrc, int nSrcStep, *Npp16u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

4 channel 16-bit unsigned image copy.

For common parameter descriptions, see *Common parameters for nppiCopy functions:*.

NppStatus **nppiCopy_16u_AC4R_Ctx**(const *Npp16u* *pSrc, int nSrcStep, *Npp16u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

4 channel 16-bit unsigned image copy, not affecting Alpha channel.

For common parameter descriptions, see *Common parameters for nppiCopy functions:*.

NppStatus **nppiCopy_16s_C1R_Ctx**(const *Npp16s* *pSrc, int nSrcStep, *Npp16s* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

16-bit image copy.

For common parameter descriptions, see *Common parameters for nppiCopy functions:*.

NppStatus **nppiCopy_16s_C3R_Ctx**(const *Npp16s* *pSrc, int nSrcStep, *Npp16s* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Three channel 16-bit image copy.

For common parameter descriptions, see *Common parameters for nppiCopy functions:*.

NppStatus **nppiCopy_16s_C4R_Ctx**(const *Npp16s* *pSrc, int nSrcStep, *Npp16s* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

4 channel 16-bit image copy.

For common parameter descriptions, see *Common parameters for nppiCopy functions:*.

NppStatus **nppiCopy_16s_AC4R_Ctx**(const *Npp16s* *pSrc, int nSrcStep, *Npp16s* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

4 channel 16-bit image copy, not affecting Alpha.

For common parameter descriptions, see *Common parameters for nppiCopy functions:*.

NppStatus **nppiCopy_16sc_C1R_Ctx**(const *Npp16sc* *pSrc, int nSrcStep, *Npp16sc* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

16-bit complex image copy.

For common parameter descriptions, see *Common parameters for nppiCopy functions:*.

NppStatus **nppiCopy_16sc_C2R_Ctx**(const *Npp16sc* *pSrc, int nSrcStep, *Npp16sc* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Two-channel 16-bit complex image copy.

For common parameter descriptions, see *Common parameters for nppiCopy functions:*.

NppStatus **nppiCopy_16sc_C3R_Ctx**(const *Npp16sc* *pSrc, int nSrcStep, *Npp16sc* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Three-channel 16-bit complex image copy.

For common parameter descriptions, see *Common parameters for nppiCopy functions:*.

NppStatus **nppiCopy_16sc_C4R_Ctx**(const *Npp16sc* *pSrc, int nSrcStep, *Npp16sc* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four-channel 16-bit complex image copy.

For common parameter descriptions, see *Common parameters for nppiCopy functions:*.

NppStatus **nppiCopy_16sc_AC4R_Ctx**(const *Npp16sc* *pSrc, int nSrcStep, *Npp16sc* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four-channel 16-bit complex image copy, ignoring alpha.

For common parameter descriptions, see *Common parameters for nppiCopy functions:*.

NppStatus **nppiCopy_32s_C1R_Ctx**(const *Npp32s* *pSrc, int nSrcStep, *Npp32s* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

32-bit image copy.

For common parameter descriptions, see *Common parameters for nppiCopy functions:*.

NppStatus **nppiCopy_32s_C3R_Ctx**(const *Npp32s* *pSrc, int nSrcStep, *Npp32s* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Three channel 32-bit image copy.

For common parameter descriptions, see *Common parameters for nppiCopy functions:*.

NppStatus **nppiCopy_32s_C4R_Ctx**(const *Npp32s* *pSrc, int nSrcStep, *Npp32s* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

4 channel 32-bit image copy.

For common parameter descriptions, see *Common parameters for nppiCopy functions:*.

NppStatus **nppiCopy_32s_AC4R_Ctx**(const *Npp32s* *pSrc, int nSrcStep, *Npp32s* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

4 channel 32-bit image copy, not affecting Alpha.

For common parameter descriptions, see *Common parameters for nppiCopy functions:*.

NppStatus **nppiCopy_32sc_C1R_Ctx**(const *Npp32sc* *pSrc, int nSrcStep, *Npp32sc* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

32-bit complex image copy.

For common parameter descriptions, see *Common parameters for nppiCopy functions:*.

NppStatus **nppiCopy_32sc_C2R_Ctx**(const *Npp32sc* *pSrc, int nSrcStep, *Npp32sc* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Two-channel 32-bit complex image copy.

For common parameter descriptions, see *Common parameters for nppiCopy functions:*.

NppStatus **nppiCopy_32sc_C3R_Ctx**(const *Npp32sc* *pSrc, int nSrcStep, *Npp32sc* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Three-channel 32-bit complex image copy.

For common parameter descriptions, see *Common parameters for nppiCopy functions:*.

NppStatus **nppiCopy_32sc_C4R_Ctx**(const *Npp32sc* *pSrc, int nSrcStep, *Npp32sc* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four-channel 32-bit complex image copy.

For common parameter descriptions, see *Common parameters for nppiCopy functions:*.

NppStatus **nppiCopy_32sc_AC4R_Ctx**(const *Npp32sc* *pSrc, int nSrcStep, *Npp32sc* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four-channel 32-bit complex image copy, ignoring alpha.

For common parameter descriptions, see *Common parameters for nppiCopy functions:*.

NppStatus **nppiCopy_16f_C1R_Ctx**(const *Npp16f* *pSrc, int nSrcStep, *Npp16f* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

16-bit floating point image copy.

For common parameter descriptions, see *Common parameters for nppiCopy functions:*.

NppStatus **nppiCopy_16f_C3R_Ctx**(const *Npp16f* *pSrc, int nSrcStep, *Npp16f* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Three channel 16-bit floating point image copy.

For common parameter descriptions, see *Common parameters for nppiCopy functions:*.

NppStatus **nppiCopy_16f_C4R_Ctx**(const *Npp16f* *pSrc, int nSrcStep, *Npp16f* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

4 channel 16-bit floating point image copy.

For common parameter descriptions, see *Common parameters for nppiCopy functions:*.

NppStatus **nppiCopy_32f_C1R_Ctx**(const *Npp32f* *pSrc, int nSrcStep, *Npp32f* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

32-bit floating point image copy.

For common parameter descriptions, see *Common parameters for nppiCopy functions:*.

NppStatus **nppiCopy_32f_C3R_Ctx**(const *Npp32f* *pSrc, int nSrcStep, *Npp32f* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Three channel 32-bit floating point image copy.

For common parameter descriptions, see *Common parameters for nppiCopy functions:*.

NppStatus **nppiCopy_32f_C4R_Ctx**(const *Npp32f* *pSrc, int nSrcStep, *Npp32f* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

4 channel 32-bit floating point image copy.

For common parameter descriptions, see *Common parameters for nppiCopy functions:*.

NppStatus **nppiCopy_32f_AC4R_Ctx**(const *Npp32f* *pSrc, int nSrcStep, *Npp32f* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

4 channel 32-bit floating point image copy, not affecting Alpha.

For common parameter descriptions, see *Common parameters for nppiCopy functions:*.

NppStatus **nppiCopy_32fc_C1R_Ctx**(const *Npp32fc* *pSrc, int nSrcStep, *Npp32fc* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

32-bit floating-point complex image copy.

For common parameter descriptions, see *Common parameters for nppiCopy functions:*.

NppStatus **nppiCopy_32fc_C2R_Ctx**(const *Npp32fc* *pSrc, int nSrcStep, *Npp32fc* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Two-channel 32-bit floating-point complex image copy.

For common parameter descriptions, see *Common parameters for nppiCopy functions:*.

NppStatus **nppiCopy_32fc_C3R_Ctx**(const *Npp32fc* *pSrc, int nSrcStep, *Npp32fc* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Three-channel 32-bit floating-point complex image copy.

For common parameter descriptions, see *Common parameters for nppiCopy functions:*.

NppStatus **nppiCopy_32fc_C4R_Ctx**(const *Npp32fc* *pSrc, int nSrcStep, *Npp32fc* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four-channel 32-bit floating-point complex image copy.

For common parameter descriptions, see *Common parameters for nppiCopy functions:*.

NppStatus **nppiCopy_32fc_AC4R_Ctx**(const *Npp32fc* *pSrc, int nSrcStep, *Npp32fc* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four-channel 32-bit floating-point complex image copy, ignoring alpha.

For common parameter descriptions, see *Common parameters for nppiCopy functions:*.

1.9.5. Masked Copy

The masked copy primitives have an additional “mask image” input. The mask controls which pixels within the ROI are copied. For details see *Masked Operation*.

1.9.5.1 Common parameters for nppiCopy_CXM functions:

param pSrc
Source-Image Pointer.

param nSrcStep
Source-Image Line Step.

param pDst
Destination-Image Pointer.

param nDstStep
Destination-Image Line Step.

param pMask
Mask-Image Pointer.

param nMaskStep
Mask-Image Line Step.

param oSizeROI
Region-Of-Interest (ROI).

param nppStreamCtx
Application Managed Stream Context.

return
Image Data Related Error Codes, *ROI Related Error Codes*

Functions

NppStatus **nppiCopy_8u_C1MR_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp8u* *pMask, int nMaskStep, *NppStreamContext* nppStreamCtx)

Masked Operation 8-bit unsigned image copy.

For common parameter descriptions, see *Common parameters for nppiCopy_CXM functions:*.

NppStatus **nppiCopy_8u_C3MR_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp8u* *pMask, int nMaskStep, *NppStreamContext* nppStreamCtx)

Masked Operation three channel 8-bit unsigned image copy.

For common parameter descriptions, see *Common parameters for nppiCopy_CXM functions:*.

NppStatus **nppiCopy_8u_C4MR_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp8u* *pMask, int nMaskStep, *NppStreamContext* nppStreamCtx)

Masked Operation four channel 8-bit unsigned image copy.

For common parameter descriptions, see *Common parameters for nppiCopy_CXM functions:*.

NppStatus **nppiCopy_8u_AC4MR_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp8u* *pMask, int nMaskStep, *NppStreamContext* nppStreamCtx)

Masked Operation four channel 8-bit unsigned image copy, ignoring alpha.

For common parameter descriptions, see *Common parameters for nppiCopy_CXM functions:*.

NppStatus **nppiCopy_16u_C1MR_Ctx**(const *Npp16u* *pSrc, int nSrcStep, *Npp16u* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp8u* *pMask, int nMaskStep, *NppStreamContext* nppStreamCtx)

Masked Operation 16-bit unsigned image copy.

For common parameter descriptions, see *Common parameters for nppiCopy_CXM functions:*.

NppStatus **nppiCopy_16u_C3MR_Ctx**(const *Npp16u* *pSrc, int nSrcStep, *Npp16u* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp8u* *pMask, int nMaskStep, *NppStreamContext* nppStreamCtx)

Masked Operation three channel 16-bit unsigned image copy.

For common parameter descriptions, see *Common parameters for nppiCopy_CXM functions:*.

NppStatus **nppiCopy_16u_C4MR_Ctx**(const *Npp16u* *pSrc, int nSrcStep, *Npp16u* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp8u* *pMask, int nMaskStep, *NppStreamContext* nppStreamCtx)

Masked Operation four channel 16-bit unsigned image copy.

For common parameter descriptions, see *Common parameters for nppiCopy_CXM functions:*.

NppStatus **nppiCopy_16u_AC4MR_Ctx**(const *Npp16u* *pSrc, int nSrcStep, *Npp16u* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp8u* *pMask, int nMaskStep, *NppStreamContext* nppStreamCtx)

Masked Operation four channel 16-bit unsigned image copy, ignoring alpha.

For common parameter descriptions, see *Common parameters for nppiCopy_CXM functions:*.

NppStatus **nppiCopy_16s_C1MR_Ctx**(const *Npp16s* *pSrc, int nSrcStep, *Npp16s* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp8u* *pMask, int nMaskStep, *NppStreamContext* nppStreamCtx)

Masked Operation 16-bit signed image copy.

For common parameter descriptions, see *Common parameters for nppiCopy_CXM functions:*.

NppStatus **nppiCopy_16s_C3MR_Ctx**(const *Npp16s* *pSrc, int nSrcStep, *Npp16s* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp8u* *pMask, int nMaskStep, *NppStreamContext* nppStreamCtx)

Masked Operation three channel 16-bit signed image copy.

For common parameter descriptions, see *Common parameters for nppiCopy_CXM functions:*.

NppStatus **nppiCopy_16s_C4MR_Ctx**(const *Npp16s* *pSrc, int nSrcStep, *Npp16s* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp8u* *pMask, int nMaskStep, *NppStreamContext* nppStreamCtx)

Masked Operation four channel 16-bit signed image copy.

For common parameter descriptions, see *Common parameters for nppiCopy_CXM functions:*.

NppStatus **nppiCopy_16s_AC4MR_Ctx**(const *Npp16s* *pSrc, int nSrcStep, *Npp16s* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp8u* *pMask, int nMaskStep, *NppStreamContext* nppStreamCtx)

Masked Operation four channel 16-bit signed image copy, ignoring alpha.

For common parameter descriptions, see *Common parameters for nppiCopy_CXM functions:*.

NppStatus **nppiCopy_32s_C1MR_Ctx**(const *Npp32s* *pSrc, int nSrcStep, *Npp32s* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp8u* *pMask, int nMaskStep, *NppStreamContext* nppStreamCtx)

Masked Operation 32-bit signed image copy.

For common parameter descriptions, see *Common parameters for nppiCopy_CXM functions:*.

NppStatus **nppiCopy_32s_C3MR_Ctx**(const *Npp32s* *pSrc, int nSrcStep, *Npp32s* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp8u* *pMask, int nMaskStep, *NppStreamContext* nppStreamCtx)

Masked Operation three channel 32-bit signed image copy.

For common parameter descriptions, see *Common parameters for nppiCopy_CXM functions:*.

NppStatus **nppiCopy_32s_C4MR_Ctx**(const *Npp32s* *pSrc, int nSrcStep, *Npp32s* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp8u* *pMask, int nMaskStep, *NppStreamContext* nppStreamCtx)

Masked Operation four channel 32-bit signed image copy.

For common parameter descriptions, see *Common parameters for nppiCopy_CXM functions:*.

NppStatus **nppiCopy_32s_AC4MR_Ctx**(const *Npp32s* *pSrc, int nSrcStep, *Npp32s* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp8u* *pMask, int nMaskStep, *NppStreamContext* nppStreamCtx)

Masked Operation four channel 32-bit signed image copy, ignoring alpha.

For common parameter descriptions, see *Common parameters for nppiCopy_CXM functions:*.

NppStatus **nppiCopy_32f_C1MR_Ctx**(const *Npp32f* *pSrc, int nSrcStep, *Npp32f* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp8u* *pMask, int nMaskStep, *NppStreamContext* nppStreamCtx)

Masked Operation 32-bit float image copy.

For common parameter descriptions, see *Common parameters for nppiCopy_CXM functions:*.

NppStatus **nppiCopy_32f_C3MR_Ctx**(const *Npp32f* *pSrc, int nSrcStep, *Npp32f* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp8u* *pMask, int nMaskStep, *NppStreamContext* nppStreamCtx)

Masked Operation three channel 32-bit float image copy.

For common parameter descriptions, see *Common parameters for nppiCopy_CXM functions:*.

NppStatus **nppiCopy_32f_C4MR_Ctx**(const *Npp32f* *pSrc, int nSrcStep, *Npp32f* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp8u* *pMask, int nMaskStep, *NppStreamContext* nppStreamCtx)

Masked Operation four channel 32-bit float image copy.

For common parameter descriptions, see *Common parameters for nppiCopy_CXM functions:*.

NppStatus **nppiCopy_32f_AC4MR_Ctx**(const *Npp32f* *pSrc, int nSrcStep, *Npp32f* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp8u* *pMask, int nMaskStep, *NppStreamContext* nppStreamCtx)

Masked Operation four channel 32-bit float image copy, ignoring alpha.

For common parameter descriptions, see *Common parameters for nppiCopy_CXM functions:*.

1.9.6. Channel Copy

The channel copy primitives copy a single color channel from a multi-channel source image to any other color channel in a multi-channel destination image. The channel is selected by adjusting the respective image pointers to point to the desired color channel (see *Channel-of-Interest API*).

1.9.6.1 Common parameters for nppiCopy_CXC functions:

param pSrc
Select-Channel Source-Image Pointer.

param nSrcStep
Source-Image Line Step.

param pDst
Select-Channel Destination-Image Pointer.

param nDstStep
Destination-Image Line Step.

param oSizeROI
Region-Of-Interest (ROI).

param nppStreamCtx
Application Managed Stream Context.

return
Image Data Related Error Codes, *ROI Related Error Codes*

Functions

NppStatus **nppiCopy_8u_C3CR_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Selected channel 8-bit unsigned image copy for three-channel images.

For common parameter descriptions, see *Common parameters for nppiCopy_CXC functions:*.

NppStatus **nppiCopy_8u_C4CR_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Selected channel 8-bit unsigned image copy for four-channel images.

For common parameter descriptions, see *Common parameters for nppiCopy_CXC functions:*.

NppStatus **nppiCopy_16s_C3CR_Ctx**(const *Npp16s* *pSrc, int nSrcStep, *Npp16s* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Selected channel 16-bit signed image copy for three-channel images.

For common parameter descriptions, see *Common parameters for nppiCopy_CXC functions:*.

NppStatus **nppiCopy_16s_C4CR_Ctx**(const *Npp16s* *pSrc, int nSrcStep, *Npp16s* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Selected channel 16-bit signed image copy for four-channel images.

For common parameter descriptions, see *Common parameters for nppiCopy_CXC functions:*.

NppStatus **nppiCopy_16u_C3CR_Ctx**(const *Npp16u* *pSrc, int nSrcStep, *Npp16u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Selected channel 16-bit unsigned image copy for three-channel images.

For common parameter descriptions, see *Common parameters for nppiCopy_CXC functions:*.

NppStatus **nppiCopy_16u_C4CR_Ctx**(const *Npp16u* *pSrc, int nSrcStep, *Npp16u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Selected channel 16-bit unsigned image copy for four-channel images.

For common parameter descriptions, see *Common parameters for nppiCopy_CXC functions:*.

NppStatus **nppiCopy_32s_C3CR_Ctx**(const *Npp32s* *pSrc, int nSrcStep, *Npp32s* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Selected channel 32-bit signed image copy for three-channel images.

For common parameter descriptions, see *Common parameters for nppiCopy_CXC functions:*.

NppStatus **nppiCopy_32s_C4CR_Ctx**(const *Npp32s* *pSrc, int nSrcStep, *Npp32s* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Selected channel 32-bit signed image copy for four-channel images.

For common parameter descriptions, see *Common parameters for nppiCopy_CXC functions:*.

NppStatus **nppiCopy_32f_C3CR_Ctx**(const *Npp32f* *pSrc, int nSrcStep, *Npp32f* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Selected channel 32-bit float image copy for three-channel images.

For common parameter descriptions, see *Common parameters for nppiCopy_CXC functions:*.

NppStatus **nppiCopy_32f_C4CR_Ctx**(const *Npp32f* *pSrc, int nSrcStep, *Npp32f* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Selected channel 32-bit float image copy for four-channel images.

For common parameter descriptions, see *Common parameters for nppiCopy_CXC functions:*.

1.9.7. Extract Channel Copy

The channel extract primitives copy a single color channel from a multi-channel source image to singl-channel destination image. The channel is selected by adjusting the source image pointer to point to the desired color channel (see *Channel-of-Interest API*).

1.9.7.1 Common parameters for nppiCopy_CXC1 functions:

param pSrc
Select-Channel Source-Image Pointer.

param nSrcStep
Source-Image Line Step.

param pDst
Destination-Image Pointer.

param nDstStep
Destination-Image Line Step.

param oSizeROI
Region-Of-Interest (ROI).

param nppStreamCtx
Application Managed Stream Context.

return
Image Data Related Error Codes, *ROI Related Error Codes*

Functions

NppStatus **nppiCopy_8u_C3C1R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Three-channel to single-channel 8-bit unsigned image copy.

For common parameter descriptions, see *Common parameters for nppiCopy_CXC1 functions:*.

NppStatus **nppiCopy_8u_C4C1R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four-channel to single-channel 8-bit unsigned image copy.

For common parameter descriptions, see *Common parameters for nppiCopy_CXC1 functions:*.

NppStatus **nppiCopy_16s_C3C1R_Ctx**(const *Npp16s* *pSrc, int nSrcStep, *Npp16s* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Three-channel to single-channel 16-bit signed image copy.

For common parameter descriptions, see *Common parameters for nppiCopy_CXC1 functions:*.

NppStatus **nppiCopy_16s_C4C1R_Ctx**(const *Npp16s* *pSrc, int nSrcStep, *Npp16s* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four-channel to single-channel 16-bit signed image copy.

For common parameter descriptions, see *Common parameters for nppiCopy_CXC1 functions:*.

NppStatus **nppiCopy_16u_C3C1R_Ctx**(const *Npp16u* *pSrc, int nSrcStep, *Npp16u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Three-channel to single-channel 16-bit unsigned image copy.

For common parameter descriptions, see *Common parameters for nppiCopy_CXC1 functions:*.

NppStatus **nppiCopy_16u_C4C1R_Ctx**(const *Npp16u* *pSrc, int nSrcStep, *Npp16u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four-channel to single-channel 16-bit unsigned image copy.

For common parameter descriptions, see *Common parameters for nppiCopy_CXC1 functions:*.

NppStatus **nppiCopy_32s_C3C1R_Ctx**(const *Npp32s* *pSrc, int nSrcStep, *Npp32s* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Three-channel to single-channel 32-bit signed image copy.

For common parameter descriptions, see *Common parameters for nppiCopy_CXC1 functions:*.

NppStatus **nppiCopy_32s_C4C1R_Ctx**(const *Npp32s* *pSrc, int nSrcStep, *Npp32s* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four-channel to single-channel 32-bit signed image copy.

For common parameter descriptions, see *Common parameters for nppiCopy_CXC1 functions:*.

NppStatus **nppiCopy_32f_C2C1R_Ctx**(const *Npp32f* *pSrc, int nSrcStep, *Npp32f* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Two-channel to single-channel 32-bit float image copy.

For common parameter descriptions, see *Common parameters for nppiCopy_CXC1 functions:*.

NppStatus **nppiCopy_32f_C3C1R_Ctx**(const *Npp32f* *pSrc, int nSrcStep, *Npp32f* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Three-channel to single-channel 32-bit float image copy.

For common parameter descriptions, see *Common parameters for nppiCopy_CXC1 functions:*.

NppStatus **nppiCopy_32f_C4C1R_Ctx**(const *Npp32f* *pSrc, int nSrcStep, *Npp32f* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four-channel to single-channel 32-bit float image copy.

For common parameter descriptions, see *Common parameters for nppiCopy_CXC1 functions:*.

1.9.8. Insert Channel Copy

The channel insert primitives copy a single-channel source image into one of the color channels in a multi-channel destination image. The channel is selected by adjusting the destination image pointer to point to the desired color channel (see *Channel-of-Interest API*).

1.9.8.1 Common parameters for nppiCopy_C1CX functions:

param pSrc
Source-Image Pointer.

param nSrcStep
Source-Image Line Step.

param pDst
Select-Channel Destination-Image Pointer.

param nDstStep
Destination-Image Line Step.

param oSizeROI
Region-Of-Interest (ROI).

param nppStreamCtx
Application Managed Stream Context.

return
Image Data Related Error Codes, *ROI Related Error Codes*

Functions

NppStatus **nppiCopy_8u_C1C3R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Single-channel to three-channel 8-bit unsigned image copy.

For common parameter descriptions, see *Common parameters for nppiCopy_C1CX functions:*.

NppStatus **nppiCopy_8u_C1C4R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Single-channel to four-channel 8-bit unsigned image copy.

For common parameter descriptions, see *Common parameters for nppiCopy_C1CX functions:*.

NppStatus **nppiCopy_16s_C1C3R_Ctx**(const *Npp16s* *pSrc, int nSrcStep, *Npp16s* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Single-channel to three-channel 16-bit signed image copy.

For common parameter descriptions, see *Common parameters for nppiCopy_C1CX functions:*.

NppStatus **nppiCopy_16s_C1C4R_Ctx**(const *Npp16s* *pSrc, int nSrcStep, *Npp16s* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Single-channel to four-channel 16-bit signed image copy.

For common parameter descriptions, see *Common parameters for nppiCopy_C1CX functions:*.

NppStatus **nppiCopy_16u_C1C3R_Ctx**(const *Npp16u* *pSrc, int nSrcStep, *Npp16u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Single-channel to three-channel 16-bit unsigned image copy.

For common parameter descriptions, see *Common parameters for nppiCopy_C1CX functions:*.

NppStatus **nppiCopy_16u_C1C4R_Ctx**(const *Npp16u* *pSrc, int nSrcStep, *Npp16u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Single-channel to four-channel 16-bit unsigned image copy.

For common parameter descriptions, see *Common parameters for nppiCopy_C1CX functions:*.

NppStatus **nppiCopy_32s_C1C3R_Ctx**(const *Npp32s* *pSrc, int nSrcStep, *Npp32s* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Single-channel to three-channel 32-bit signed image copy.

For common parameter descriptions, see *Common parameters for nppiCopy_C1CX functions:*.

NppStatus **nppiCopy_32s_C1C4R_Ctx**(const *Npp32s* *pSrc, int nSrcStep, *Npp32s* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Single-channel to four-channel 32-bit signed image copy.

For common parameter descriptions, see *Common parameters for nppiCopy_C1CX functions:*.

NppStatus **nppiCopy_32f_C1C2R_Ctx**(const *Npp32f* *pSrc, int nSrcStep, *Npp32f* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Single-channel to two-channel 32-bit float image copy.

For common parameter descriptions, see *Common parameters for nppiCopy_C1CX functions:*.

NppStatus **nppiCopy_32f_C1C3R_Ctx**(const *Npp32f* *pSrc, int nSrcStep, *Npp32f* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Single-channel to three-channel 32-bit float image copy.

For common parameter descriptions, see *Common parameters for nppiCopy_C1CX functions:*.

NppStatus **nppiCopy_32f_C1C4R_Ctx**(const *Npp32f* *pSrc, int nSrcStep, *Npp32f* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Single-channel to four-channel 32-bit float image copy.

For common parameter descriptions, see *Common parameters for nppiCopy_C1CX functions:*.

1.9.9. Packed To Planar Channel Copy

Split a packed multi-channel image into multiple single channel planes.

E.g. copy the three channels of an RGB image into three separate single-channel images.

1.9.9.1 Common parameters for nppiCopy_CXPX functions:

param pSrc
Source-Image Pointer.

param nSrcStep
Source-Image Line Step.

param aDst
Destination-Planar-Image Pointer Array.

param nDstStep
Destination-Image Line Step.

param oSizeROI
Region-Of-Interest (ROI).

param nppStreamCtx
Application Managed Stream Context.

return
Image Data Related Error Codes, *ROI Related Error Codes*

Functions

NppStatus **nppiCopy_8u_C3P3R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *Npp8u* *const aDst[3], int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Three-channel 8-bit unsigned packed to planar image copy.

For common parameter descriptions, see *Common parameters for nppiCopy_CXPX functions:*.

NppStatus **nppiCopy_8u_C4P4R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *Npp8u* *const aDst[4], int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four-channel 8-bit unsigned packed to planar image copy.

For common parameter descriptions, see *Common parameters for nppiCopy_CXPX functions:*.

NppStatus **nppiCopy_16s_C3P3R_Ctx**(const *Npp16s* *pSrc, int nSrcStep, *Npp16s* *const aDst[3], int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Three-channel 16-bit signed packed to planar image copy.

For common parameter descriptions, see *Common parameters for nppiCopy_CXPX functions:*.

NppStatus **nppiCopy_16s_C4P4R_Ctx**(const *Npp16s* *pSrc, int nSrcStep, *Npp16s* *const aDst[4], int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four-channel 16-bit signed packed to planar image copy.

For common parameter descriptions, see *Common parameters for nppiCopy_CXPX functions:*.

NppStatus **nppiCopy_16u_C3P3R_Ctx**(const *Npp16u* *pSrc, int nSrcStep, *Npp16u* *const aDst[3], int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Three-channel 16-bit unsigned packed to planar image copy.

For common parameter descriptions, see *Common parameters for nppiCopy_CXPX functions:*.

NppStatus **nppiCopy_16u_C4P4R_Ctx**(const *Npp16u* *pSrc, int nSrcStep, *Npp16u* *const aDst[4], int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four-channel 16-bit unsigned packed to planar image copy.

For common parameter descriptions, see *Common parameters for nppiCopy_CXPX functions:*.

NppStatus **nppiCopy_32s_C3P3R_Ctx**(const *Npp32s* *pSrc, int nSrcStep, *Npp32s* *const aDst[3], int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Three-channel 32-bit signed packed to planar image copy.

For common parameter descriptions, see *Common parameters for nppiCopy_CXPX functions:*.

NppStatus **nppiCopy_32s_C4P4R_Ctx**(const *Npp32s* *pSrc, int nSrcStep, *Npp32s* *const aDst[4], int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four-channel 32-bit signed packed to planar image copy.

For common parameter descriptions, see *Common parameters for nppiCopy_CXPX functions:*.

NppStatus **nppiCopy_32f_C3P3R_Ctx**(const *Npp32f* *pSrc, int nSrcStep, *Npp32f* *const aDst[3], int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Three-channel 32-bit float packed to planar image copy.

For common parameter descriptions, see *Common parameters for nppiCopy_CXPX functions:*.

NppStatus **nppiCopy_32f_C4P4R_Ctx**(const *Npp32f* *pSrc, int nSrcStep, *Npp32f* *const aDst[4], int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four-channel 32-bit float packed to planar image copy.

For common parameter descriptions, see *Common parameters for nppiCopy_CXPX functions:*.

1.9.10. Planar To Packed Channel Copy

Combine multiple image planes into a packed multi-channel image.

E.g. copy three single-channel images into a single 3-channel image.

1.9.10.1 Common parameters for nppiCopy_PXCX functions:

param aSrc
Planar *Source-Image Pointer*.

param nSrcStep
Source-Planar-Image Pointer Array.

param pDst
Destination-Image Pointer.

param nDstStep
Destination-Image Line Step.

param oSizeROI
Region-Of-Interest (ROI).

param nppStreamCtx
Application Managed Stream Context.

return
Image Data Related Error Codes, *ROI Related Error Codes*

Functions

NppStatus **nppiCopy_8u_P3C3R_Ctx**(const *Npp8u* *const aSrc[3], int nSrcStep, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Three-channel 8-bit unsigned planar to packed image copy.

For common parameter descriptions, see *Common parameters for nppiCopy_PXCX functions:*.

NppStatus **nppiCopy_8u_P4C4R_Ctx**(const *Npp8u* *const aSrc[4], int nSrcStep, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four-channel 8-bit unsigned planar to packed image copy.

For common parameter descriptions, see *Common parameters for nppiCopy_PXCX functions:*.

NppStatus **nppiCopy_16u_P3C3R_Ctx**(const *Npp16u* *const aSrc[3], int nSrcStep, *Npp16u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Three-channel 16-bit unsigned planar to packed image copy.

For common parameter descriptions, see *Common parameters for nppiCopy_PXCX functions:*.

NppStatus **nppiCopy_16u_P4C4R_Ctx**(const *Npp16u* *const aSrc[4], int nSrcStep, *Npp16u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four-channel 16-bit unsigned planar to packed image copy.

For common parameter descriptions, see *Common parameters for nppiCopy_PXCX functions:*.

NppStatus **nppiCopy_16s_P3C3R_Ctx**(const *Npp16s* *const aSrc[3], int nSrcStep, *Npp16s* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Three-channel 16-bit signed planar to packed image copy.

For common parameter descriptions, see *Common parameters for nppiCopy_PXCX functions:*.

NppStatus **nppiCopy_16s_P4C4R_Ctx**(const *Npp16s* *const aSrc[4], int nSrcStep, *Npp16s* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four-channel 16-bit signed planar to packed image copy.

For common parameter descriptions, see *Common parameters for nppiCopy_PXCX functions:*.

NppStatus **nppiCopy_32s_P3C3R_Ctx**(const *Npp32s* *const aSrc[3], int nSrcStep, *Npp32s* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Three-channel 32-bit signed planar to packed image copy.

For common parameter descriptions, see *Common parameters for nppiCopy_PXCX functions:*.

NppStatus **nppiCopy_32s_P4C4R_Ctx**(const *Npp32s* *const aSrc[4], int nSrcStep, *Npp32s* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four-channel 32-bit signed planar to packed image copy.

For common parameter descriptions, see *Common parameters for nppiCopy_PXCX functions:*.

NppStatus **nppiCopy_32f_P3C3R_Ctx**(const *Npp32f* *const aSrc[3], int nSrcStep, *Npp32f* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Three-channel 32-bit float planar to packed image copy.

For common parameter descriptions, see *Common parameters for nppiCopy_PXCX functions:*.

NppStatus **nppiCopy_32f_P4C4R_Ctx**(const *Npp32f* *const aSrc[4], int nSrcStep, *Npp32f* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four-channel 32-bit float planar to packed image copy.

For common parameter descriptions, see *Common parameters for nppiCopy_PXCX functions:*.

1.9.11. Copy Constant Border

Methods for copying images and padding borders with a constant, user-specifiable color.

1.9.11.1 Common parameters for nppiCopyConstBorder functions:

param pSrc
Source-Image Pointer.

param nSrcStep
Source-Image Line Step.

param oSrcSizeROI
Size of the source region of pixels.

param pDst
Destination-Image Pointer.

param nDstStep
Destination-Image Line Step.

param oDstSizeROI
Size (width, height) of the destination region, i.e. the region that gets filled with data from the source image (inner part) and constant border color (outer part).

param nTopBorderHeight
Height (in pixels) of the top border. The number of pixel rows at the top of the destination ROI that will be filled with the constant border color. nBottomBorderHeight = oDstSizeROI.height - nTopBorderHeight - oSrcSizeROI.height.

param nLeftBorderWidth
Width (in pixels) of the left border. The width of the border at the right side of the destination ROI is implicitly defined by the size of the source ROI: nRightBorderWidth = oDstSizeROI.width - nLeftBorderWidth - oSrcSizeROI.width.

param nValue
The pixel value to be set for border pixels for single channel functions.

param aValue
Vector of the RGBA values of the border pixels to be set for multi-channel functions.

param nppStreamCtx
Application Managed Stream Context.

return
Image Data Related Error Codes, *ROI Related Error Codes*

Functions

NppStatus **nppiCopyConstBorder_8u_C1R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *NppiSize* oSrcSizeROI, *Npp8u* *pDst, int nDstStep, *NppiSize* oDstSizeROI, int nTopBorderHeight, int nLeftBorderWidth, *Npp8u* nValue, *NppStreamContext* nppStreamCtx)

1 channel 8-bit unsigned integer image copy with constant border color.

For common parameter descriptions, see *Common parameters for nppiCopyConstBorder functions:*.

NppStatus **nppiCopyConstBorder_8u_C3R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *NppiSize* oSrcSizeROI, *Npp8u* *pDst, int nDstStep, *NppiSize* oDstSizeROI, int nTopBorderHeight, int nLeftBorderWidth, const *Npp8u* aValue[3], *NppStreamContext* nppStreamCtx)

3 channel 8-bit unsigned integer image copy with constant border color.

For common parameter descriptions, see *Common parameters for nppiCopyConstBorder functions:*.

NppStatus **nppiCopyConstBorder_8u_C4R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *NppiSize* oSrcSizeROI, *Npp8u* *pDst, int nDstStep, *NppiSize* oDstSizeROI, int nTopBorderHeight, int nLeftBorderWidth, const *Npp8u* aValue[4], *NppStreamContext* nppStreamCtx)

4 channel 8-bit unsigned integer image copy with constant border color.

For common parameter descriptions, see *Common parameters for nppiCopyConstBorder functions:*.

NppStatus **nppiCopyConstBorder_8u_AC4R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *NppiSize* oSrcSizeROI, *Npp8u* *pDst, int nDstStep, *NppiSize* oDstSizeROI, int nTopBorderHeight, int nLeftBorderWidth, const *Npp8u* aValue[3], *NppStreamContext* nppStreamCtx)

4 channel 8-bit unsigned integer image copy with constant border color with alpha channel unaffected.

For common parameter descriptions, see *Common parameters for nppiCopyConstBorder functions:*.

NppStatus **nppiCopyConstBorder_16u_C1R_Ctx**(const *Npp16u* *pSrc, int nSrcStep, *NppiSize* oSrcSizeROI, *Npp16u* *pDst, int nDstStep, *NppiSize* oDstSizeROI, int nTopBorderHeight, int nLeftBorderWidth, *Npp16u* nValue, *NppStreamContext* nppStreamCtx)

1 channel 16-bit unsigned integer image copy with constant border color.

For common parameter descriptions, see *Common parameters for nppiCopyConstBorder functions:*.

NppStatus **nppiCopyConstBorder_16u_C3R_Ctx**(const *Npp16u* *pSrc, int nSrcStep, *NppiSize* oSrcSizeROI, *Npp16u* *pDst, int nDstStep, *NppiSize* oDstSizeROI, int nTopBorderHeight, int nLeftBorderWidth, const *Npp16u* aValue[3], *NppStreamContext* nppStreamCtx)

3 channel 16-bit unsigned integer image copy with constant border color.

For common parameter descriptions, see *Common parameters for nppiCopyConstBorder functions:*.

NppStatus **nppiCopyConstBorder_16u_C4R_Ctx**(const *Npp16u* *pSrc, int nSrcStep, *NppiSize* oSrcSizeROI, *Npp16u* *pDst, int nDstStep, *NppiSize* oDstSizeROI, int nTopBorderHeight, int nLeftBorderWidth, const *Npp16u* aValue[4], *NppStreamContext* nppStreamCtx)

4 channel 16-bit unsigned integer image copy with constant border color.

For common parameter descriptions, see *Common parameters for nppiCopyConstBorder functions:*.

NppStatus **nppiCopyConstBorder_16u_AC4R_Ctx**(const *Npp16u* *pSrc, int nSrcStep, *NppiSize* oSrcSizeROI, *Npp16u* *pDst, int nDstStep, *NppiSize* oDstSizeROI, int nTopBorderHeight, int nLeftBorderWidth, const *Npp16u* aValue[3], *NppStreamContext* nppStreamCtx)

4 channel 16-bit unsigned integer image copy with constant border color with alpha channel unaffected.

For common parameter descriptions, see *Common parameters for nppiCopyConstBorder functions:*.

NppStatus **nppiCopyConstBorder_16s_C1R_Ctx**(const *Npp16s* *pSrc, int nSrcStep, *NppiSize* oSrcSizeROI, *Npp16s* *pDst, int nDstStep, *NppiSize* oDstSizeROI, int nTopBorderHeight, int nLeftBorderWidth, *Npp16s* nValue, *NppStreamContext* nppStreamCtx)

1 channel 16-bit signed integer image copy with constant border color.

For common parameter descriptions, see *Common parameters for nppiCopyConstBorder functions:*.

NppStatus **nppiCopyConstBorder_16s_C3R_Ctx**(const *Npp16s* *pSrc, int nSrcStep, *NppiSize* oSrcSizeROI, *Npp16s* *pDst, int nDstStep, *NppiSize* oDstSizeROI, int nTopBorderHeight, int nLeftBorderWidth, const *Npp16s* aValue[3], *NppStreamContext* nppStreamCtx)

3 channel 16-bit signed integer image copy with constant border color.

For common parameter descriptions, see *Common parameters for nppiCopyConstBorder functions:*.

NppStatus **nppiCopyConstBorder_16s_C4R_Ctx**(const *Npp16s* *pSrc, int nSrcStep, *NppiSize* oSrcSizeROI, *Npp16s* *pDst, int nDstStep, *NppiSize* oDstSizeROI, int nTopBorderHeight, int nLeftBorderWidth, const *Npp16s* aValue[4], *NppStreamContext* nppStreamCtx)

4 channel 16-bit signed integer image copy with constant border color.

For common parameter descriptions, see *Common parameters for nppiCopyConstBorder functions:*.

NppStatus **nppiCopyConstBorder_16s_AC4R_Ctx**(const *Npp16s* *pSrc, int nSrcStep, *NppiSize* oSrcSizeROI, *Npp16s* *pDst, int nDstStep, *NppiSize* oDstSizeROI, int nTopBorderHeight, int nLeftBorderWidth, const *Npp16s* aValue[3], *NppStreamContext* nppStreamCtx)

4 channel 16-bit signed integer image copy with constant border color with alpha channel unaffected.

For common parameter descriptions, see *Common parameters for nppiCopyConstBorder functions:*.

NppStatus **nppiCopyConstBorder_32s_C1R_Ctx**(const *Npp32s* *pSrc, int nSrcStep, *NppiSize* oSrcSizeROI, *Npp32s* *pDst, int nDstStep, *NppiSize* oDstSizeROI, int nTopBorderHeight, int nLeftBorderWidth, *Npp32s* nValue, *NppStreamContext* nppStreamCtx)

1 channel 32-bit signed integer image copy with constant border color.

For common parameter descriptions, see *Common parameters for nppiCopyConstBorder functions:*.

NppStatus **nppiCopyConstBorder_32s_C3R_Ctx**(const *Npp32s* *pSrc, int nSrcStep, *NppiSize* oSrcSizeROI, *Npp32s* *pDst, int nDstStep, *NppiSize* oDstSizeROI, int nTopBorderHeight, int nLeftBorderWidth, const *Npp32s* aValue[3], *NppStreamContext* nppStreamCtx)

3 channel 32-bit signed integer image copy with constant border color.

For common parameter descriptions, see *Common parameters for nppiCopyConstBorder functions:*.

NppStatus **nppiCopyConstBorder_32s_C4R_Ctx**(const *Npp32s* *pSrc, int nSrcStep, *NppiSize* oSrcSizeROI, *Npp32s* *pDst, int nDstStep, *NppiSize* oDstSizeROI, int nTopBorderHeight, int nLeftBorderWidth, const *Npp32s* aValue[4], *NppStreamContext* nppStreamCtx)

4 channel 32-bit signed integer image copy with constant border color.

For common parameter descriptions, see *Common parameters for nppiCopyConstBorder functions:*.

NppStatus **nppiCopyConstBorder_32s_AC4R_Ctx**(const *Npp32s* *pSrc, int nSrcStep, *NppiSize* oSrcSizeROI, *Npp32s* *pDst, int nDstStep, *NppiSize* oDstSizeROI, int nTopBorderHeight, int nLeftBorderWidth, const *Npp32s* aValue[3], *NppStreamContext* nppStreamCtx)

4 channel 32-bit signed integer image copy with constant border color with alpha channel unaffected.

For common parameter descriptions, see *Common parameters for nppiCopyConstBorder functions:*.

NppStatus **nppiCopyConstBorder_32f_C1R_Ctx**(const *Npp32f* *pSrc, int nSrcStep, *NppiSize* oSrcSizeROI, *Npp32f* *pDst, int nDstStep, *NppiSize* oDstSizeROI, int nTopBorderHeight, int nLeftBorderWidth, *Npp32f* nValue, *NppStreamContext* nppStreamCtx)

1 channel 32-bit floating point image copy with constant border color.

For common parameter descriptions, see *Common parameters for nppiCopyConstBorder functions:*.

NppStatus **nppiCopyConstBorder_32f_C3R_Ctx**(const *Npp32f* *pSrc, int nSrcStep, *NppiSize* oSrcSizeROI, *Npp32f* *pDst, int nDstStep, *NppiSize* oDstSizeROI, int nTopBorderHeight, int nLeftBorderWidth, const *Npp32f* aValue[3], *NppStreamContext* nppStreamCtx)

3 channel 32-bit floating point image copy with constant border color.

For common parameter descriptions, see *Common parameters for nppiCopyConstBorder functions:*.

NppStatus **nppiCopyConstBorder_32f_C4R_Ctx**(const *Npp32f* *pSrc, int nSrcStep, *NppiSize* oSrcSizeROI, *Npp32f* *pDst, int nDstStep, *NppiSize* oDstSizeROI, int nTopBorderHeight, int nLeftBorderWidth, const *Npp32f* aValue[4], *NppStreamContext* nppStreamCtx)

4 channel 32-bit floating point image copy with constant border color.

For common parameter descriptions, see *Common parameters for nppiCopyConstBorder functions:*.

NppStatus **nppiCopyConstBorder_32f_AC4R_Ctx**(const *Npp32f* *pSrc, int nSrcStep, *NppiSize* oSrcSizeROI, *Npp32f* *pDst, int nDstStep, *NppiSize* oDstSizeROI, int nTopBorderHeight, int nLeftBorderWidth, const *Npp32f* aValue[3], *NppStreamContext* nppStreamCtx)

4 channel 32-bit floating point image copy with constant border color with alpha channel unaffected.

For common parameter descriptions, see *Common parameters for nppiCopyConstBorder functions:*.

1.9.12. Copy Replicate Border

Methods for copying images and padding borders with a replicates of the nearest source image pixel color.

1.9.12.1 Common parameters for nppiCopyReplicateBorder functions:

param pSrc
Source-Image Pointer.

param nSrcStep
Source-Image Line Step.

param oSrcSizeROI
Size of the source region of pixels.

param pDst
Destination-Image Pointer.

param nDstStep
Destination-Image Line Step.

param oDstSizeROI
Size (width, height) of the destination region, i.e. the region that gets filled with data from the source image (inner part) and nearest source image pixel color (outer part).

param nTopBorderHeight
Height (in pixels) of the top border. The number of pixel rows at the top of the destination ROI that will be filled with the nearest source image pixel color. nBottomBorderHeight = oDstSizeROI.height - nTopBorderHeight - oSrcSizeROI.height.

param nLeftBorderWidth
Width (in pixels) of the left border. The width of the border at the right side of the destination ROI is implicitly defined by the size of the source ROI: nRightBorderWidth = oDstSizeROI.width - nLeftBorderWidth - oSrcSizeROI.width.

param nppStreamCtx
Application Managed Stream Context.

return
Image Data Related Error Codes, *ROI Related Error Codes*

Functions

NppStatus **nppiCopyReplicateBorder_8u_C1R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *NppiSize* oSrcSizeROI, *Npp8u* *pDst, int nDstStep, *NppiSize* oDstSizeROI, int nTopBorderHeight, int nLeftBorderWidth, *NppStreamContext* nppStreamCtx)

1 channel 8-bit unsigned integer image copy with nearest source image pixel color.

For common parameter descriptions, see *Common parameters for nppiCopyReplicateBorder functions:*.

NppStatus **nppiCopyReplicateBorder_8u_C3R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *NppiSize* oSrcSizeROI, *Npp8u* *pDst, int nDstStep, *NppiSize* oDstSizeROI, int nTopBorderHeight, int nLeftBorderWidth, *NppStreamContext* nppStreamCtx)

3 channel 8-bit unsigned integer image copy with nearest source image pixel color.

For common parameter descriptions, see *Common parameters for nppiCopyReplicateBorder functions:*.

NppStatus **nppiCopyReplicateBorder_8u_C4R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *NppiSize* oSrcSizeROI, *Npp8u* *pDst, int nDstStep, *NppiSize* oDstSizeROI, int nTopBorderHeight, int nLeftBorderWidth, *NppStreamContext* nppStreamCtx)

4 channel 8-bit unsigned integer image copy with nearest source image pixel color.

For common parameter descriptions, see *Common parameters for nppiCopyReplicateBorder functions:*.

NppStatus **nppiCopyReplicateBorder_8u_AC4R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *NppiSize* oSrcSizeROI, *Npp8u* *pDst, int nDstStep, *NppiSize* oDstSizeROI, int nTopBorderHeight, int nLeftBorderWidth, *NppStreamContext* nppStreamCtx)

4 channel 8-bit unsigned integer image copy with nearest source image pixel color with alpha channel unaffected.

For common parameter descriptions, see *Common parameters for nppiCopyReplicateBorder functions:*.

NppStatus **nppiCopyReplicateBorder_16u_C1R_Ctx**(const *Npp16u* *pSrc, int nSrcStep, *NppiSize* oSrcSizeROI, *Npp16u* *pDst, int nDstStep, *NppiSize* oDstSizeROI, int nTopBorderHeight, int nLeftBorderWidth, *NppStreamContext* nppStreamCtx)

1 channel 16-bit unsigned integer image copy with nearest source image pixel color.

For common parameter descriptions, see *Common parameters for nppiCopyReplicateBorder functions:*.

NppStatus **nppiCopyReplicateBorder_16u_C3R_Ctx**(const *Npp16u* *pSrc, int nSrcStep, *NppiSize* oSrcSizeROI, *Npp16u* *pDst, int nDstStep, *NppiSize* oDstSizeROI, int nTopBorderHeight, int nLeftBorderWidth, *NppStreamContext* nppStreamCtx)

3 channel 16-bit unsigned integer image copy with nearest source image pixel color.

For common parameter descriptions, see *Common parameters for nppiCopyReplicateBorder functions:*.

NppStatus **nppiCopyReplicateBorder_16u_C4R_Ctx**(const *Npp16u* *pSrc, int nSrcStep, *NppiSize* oSrcSizeROI, *Npp16u* *pDst, int nDstStep, *NppiSize* oDstSizeROI, int nTopBorderHeight, int nLeftBorderWidth, *NppStreamContext* nppStreamCtx)

4 channel 16-bit unsigned integer image copy with nearest source image pixel color.

For common parameter descriptions, see *Common parameters for nppiCopyReplicateBorder functions:*.

NppStatus **nppiCopyReplicateBorder_16u_AC4R_Ctx**(const *Npp16u* *pSrc, int nSrcStep, *NppiSize* oSrcSizeROI, *Npp16u* *pDst, int nDstStep, *NppiSize* oDstSizeROI, int nTopBorderHeight, int nLeftBorderWidth, *NppStreamContext* nppStreamCtx)

4 channel 16-bit unsigned image copy with nearest source image pixel color with alpha channel unaffected.

For common parameter descriptions, see *Common parameters for nppiCopyReplicateBorder functions:*.

NppStatus **nppiCopyReplicateBorder_16s_C1R_Ctx**(const *Npp16s* *pSrc, int nSrcStep, *NppiSize* oSrcSizeROI, *Npp16s* *pDst, int nDstStep, *NppiSize* oDstSizeROI, int nTopBorderHeight, int nLeftBorderWidth, *NppStreamContext* nppStreamCtx)

1 channel 16-bit signed integer image copy with nearest source image pixel color.

For common parameter descriptions, see *Common parameters for nppiCopyReplicateBorder functions:*.

NppStatus **nppiCopyReplicateBorder_16s_C3R_Ctx**(const *Npp16s* *pSrc, int nSrcStep, *NppiSize* oSrcSizeROI, *Npp16s* *pDst, int nDstStep, *NppiSize* oDstSizeROI, int nTopBorderHeight, int nLeftBorderWidth, *NppStreamContext* nppStreamCtx)

3 channel 16-bit signed integer image copy with nearest source image pixel color.

For common parameter descriptions, see *Common parameters for nppiCopyReplicateBorder functions:*.

NppStatus **nppiCopyReplicateBorder_16s_C4R_Ctx**(const *Npp16s* *pSrc, int nSrcStep, *NppiSize* oSrcSizeROI, *Npp16s* *pDst, int nDstStep, *NppiSize* oDstSizeROI, int nTopBorderHeight, int nLeftBorderWidth, *NppStreamContext* nppStreamCtx)

4 channel 16-bit signed integer image copy with nearest source image pixel color.

For common parameter descriptions, see *Common parameters for nppiCopyReplicateBorder functions:*.

NppStatus **nppiCopyReplicateBorder_16s_AC4R_Ctx**(const *Npp16s* *pSrc, int nSrcStep, *NppiSize* oSrcSizeROI, *Npp16s* *pDst, int nDstStep, *NppiSize* oDstSizeROI, int nTopBorderHeight, int nLeftBorderWidth, *NppStreamContext* nppStreamCtx)

4 channel 16-bit signed integer image copy with nearest source image pixel color with alpha channel unaffected.

For common parameter descriptions, see *Common parameters for nppiCopyReplicateBorder functions:*.

NppStatus **nppiCopyReplicateBorder_32s_C1R_Ctx**(const *Npp32s* *pSrc, int nSrcStep, *NppiSize* oSrcSizeROI, *Npp32s* *pDst, int nDstStep, *NppiSize* oDstSizeROI, int nTopBorderHeight, int nLeftBorderWidth, *NppStreamContext* nppStreamCtx)

1 channel 32-bit signed integer image copy with nearest source image pixel color.

For common parameter descriptions, see *Common parameters for nppiCopyReplicateBorder functions:*.

NppStatus **nppiCopyReplicateBorder_32s_C3R_Ctx**(const *Npp32s* *pSrc, int nSrcStep, *NppiSize* oSrcSizeROI, *Npp32s* *pDst, int nDstStep, *NppiSize* oDstSizeROI, int nTopBorderHeight, int nLeftBorderWidth, *NppStreamContext* nppStreamCtx)

3 channel 32-bit signed image copy with nearest source image pixel color.

For common parameter descriptions, see *Common parameters for nppiCopyReplicateBorder functions:*.

NppStatus **nppiCopyReplicateBorder_32s_C4R_Ctx**(const *Npp32s* *pSrc, int nSrcStep, *NppiSize* oSrcSizeROI, *Npp32s* *pDst, int nDstStep, *NppiSize* oDstSizeROI, int nTopBorderHeight, int nLeftBorderWidth, *NppStreamContext* nppStreamCtx)

4 channel 32-bit signed integer image copy with nearest source image pixel color.

For common parameter descriptions, see *Common parameters for nppiCopyReplicateBorder functions:*.

NppStatus **nppiCopyReplicateBorder_32s_AC4R_Ctx**(const *Npp32s* *pSrc, int nSrcStep, *NppiSize* oSrcSizeROI, *Npp32s* *pDst, int nDstStep, *NppiSize* oDstSizeROI, int nTopBorderHeight, int nLeftBorderWidth, *NppStreamContext* nppStreamCtx)

4 channel 32-bit signed integer image copy with nearest source image pixel color with alpha channel unaffected.

For common parameter descriptions, see *Common parameters for nppiCopyReplicateBorder functions:*.

NppStatus **nppiCopyReplicateBorder_32f_C1R_Ctx**(const *Npp32f* *pSrc, int nSrcStep, *NppiSize* oSrcSizeROI, *Npp32f* *pDst, int nDstStep, *NppiSize* oDstSizeROI, int nTopBorderHeight, int nLeftBorderWidth, *NppStreamContext* nppStreamCtx)

1 channel 32-bit floating point image copy with nearest source image pixel color.

For common parameter descriptions, see *Common parameters for nppiCopyReplicateBorder functions:*.

NppStatus **nppiCopyReplicateBorder_32f_C3R_Ctx**(const *Npp32f* *pSrc, int nSrcStep, *NppiSize* oSrcSizeROI, *Npp32f* *pDst, int nDstStep, *NppiSize* oDstSizeROI, int nTopBorderHeight, int nLeftBorderWidth, *NppStreamContext* nppStreamCtx)

3 channel 32-bit floating point image copy with nearest source image pixel color.

For common parameter descriptions, see *Common parameters for nppiCopyReplicateBorder functions:*.

NppStatus **nppiCopyReplicateBorder_32f_C4R_Ctx**(const *Npp32f* *pSrc, int nSrcStep, *NppiSize* oSrcSizeROI, *Npp32f* *pDst, int nDstStep, *NppiSize* oDstSizeROI, int nTopBorderHeight, int nLeftBorderWidth, *NppStreamContext* nppStreamCtx)

4 channel 32-bit floating point image copy with nearest source image pixel color.

For common parameter descriptions, see *Common parameters for nppiCopyReplicateBorder functions:*.

NppStatus **nppiCopyReplicateBorder_32f_AC4R_Ctx**(const *Npp32f* *pSrc, int nSrcStep, *NppiSize* oSrcSizeROI, *Npp32f* *pDst, int nDstStep, *NppiSize* oDstSizeROI, int nTopBorderHeight, int nLeftBorderWidth, *NppStreamContext* nppStreamCtx)

4 channel 32-bit floating point image copy with nearest source image pixel color with alpha channel unaffected.

For common parameter descriptions, see *Common parameters for nppiCopyReplicateBorder functions:*.

1.9.13. Copy Wrap Border

Methods for copying images and padding borders with wrapped replications of the source image pixel colors.

1.9.13.1 Common parameters for nppiCopyWrapBorder functions:

param pSrc
Source-Image Pointer.

param nSrcStep
Source-Image Line Step.

param oSrcSizeROI
Size of the source region of pixels.

param pDst
Destination-Image Pointer.

param nDstStep
Destination-Image Line Step.

param oDstSizeROI
Size (width, height) of the destination region, i.e. the region that gets filled with data from the source image (inner part) and a border consisting of wrapped replication of the source image pixel colors (outer part).

param nTopBorderHeight
Height (in pixels) of the top border. The number of pixel rows at the top of the destination ROI that will be filled with the wrapped replication of the corresponding column of source image pixels colors. nBottomBorderHeight = oDstSizeROI.height - nTopBorderHeight - oSrcSizeROI.height.

param nLeftBorderWidth
Width (in pixels) of the left border. The width of the border at the right side of the destination ROI is implicitly defined by the size of the source ROI: nRightBorderWidth = oDstSizeROI.width - nLeftBorderWidth - oSrcSizeROI.width.

param nppStreamCtx
Application Managed Stream Context.

return
Image Data Related Error Codes, *ROI Related Error Codes*

Functions

NppStatus **nppiCopyWrapBorder_8u_C1R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *NppiSize* oSrcSizeROI, *Npp8u* *pDst, int nDstStep, *NppiSize* oDstSizeROI, int nTopBorderHeight, int nLeftBorderWidth, *NppStreamContext* nppStreamCtx)

1 channel 8-bit unsigned integer image copy with the borders wrapped by replication of source image pixel colors.

For common parameter descriptions, see *Common parameters for nppiCopyWrapBorder functions:*.

NppStatus **nppiCopyWrapBorder_8u_C3R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *NppiSize* oSrcSizeROI, *Npp8u* *pDst, int nDstStep, *NppiSize* oDstSizeROI, int nTopBorderHeight, int nLeftBorderWidth, *NppStreamContext* nppStreamCtx)

3 channel 8-bit unsigned integer image copy with the borders wrapped by replication of source image pixel colors.

For common parameter descriptions, see *Common parameters for nppiCopyWrapBorder functions:*.

NppStatus **nppiCopyWrapBorder_8u_C4R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *NppiSize* oSrcSizeROI, *Npp8u* *pDst, int nDstStep, *NppiSize* oDstSizeROI, int nTopBorderHeight, int nLeftBorderWidth, *NppStreamContext* nppStreamCtx)

4 channel 8-bit unsigned integer image copy with the borders wrapped by replication of source image pixel colors.

For common parameter descriptions, see *Common parameters for nppiCopyWrapBorder functions:*.

NppStatus **nppiCopyWrapBorder_8u_AC4R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *NppiSize* oSrcSizeROI, *Npp8u* *pDst, int nDstStep, *NppiSize* oDstSizeROI, int nTopBorderHeight, int nLeftBorderWidth, *NppStreamContext* nppStreamCtx)

4 channel 8-bit unsigned integer image copy with the borders wrapped by replication of source image pixel colors with alpha channel unaffected.

For common parameter descriptions, see *Common parameters for nppiCopyWrapBorder functions:*.

NppStatus **nppiCopyWrapBorder_16u_C1R_Ctx**(const *Npp16u* *pSrc, int nSrcStep, *NppiSize* oSrcSizeROI, *Npp16u* *pDst, int nDstStep, *NppiSize* oDstSizeROI, int nTopBorderHeight, int nLeftBorderWidth, *NppStreamContext* nppStreamCtx)

1 channel 16-bit unsigned integer image copy with the borders wrapped by replication of source image pixel colors.

For common parameter descriptions, see *Common parameters for nppiCopyWrapBorder functions:*.

NppStatus **nppiCopyWrapBorder_16u_C3R_Ctx**(const *Npp16u* *pSrc, int nSrcStep, *NppiSize* oSrcSizeROI, *Npp16u* *pDst, int nDstStep, *NppiSize* oDstSizeROI, int nTopBorderHeight, int nLeftBorderWidth, *NppStreamContext* nppStreamCtx)

3 channel 16-bit unsigned integer image copy with the borders wrapped by replication of source image pixel colors.

For common parameter descriptions, see *Common parameters for nppiCopyWrapBorder functions:*.

NppStatus **nppiCopyWrapBorder_16u_C4R_Ctx**(const *Npp16u* *pSrc, int nSrcStep, *NppiSize* oSrcSizeROI, *Npp16u* *pDst, int nDstStep, *NppiSize* oDstSizeROI, int nTopBorderHeight, int nLeftBorderWidth, *NppStreamContext* nppStreamCtx)

4 channel 16-bit unsigned integer image copy with the borders wrapped by replication of source image pixel colors.

For common parameter descriptions, see *Common parameters for nppiCopyWrapBorder functions:*.

NppStatus **nppiCopyWrapBorder_16u_AC4R_Ctx**(const *Npp16u* *pSrc, int nSrcStep, *NppiSize* oSrcSizeROI, *Npp16u* *pDst, int nDstStep, *NppiSize* oDstSizeROI, int nTopBorderHeight, int nLeftBorderWidth, *NppStreamContext* nppStreamCtx)

4 channel 16-bit unsigned integer image copy with the borders wrapped by replication of source image pixel colors with alpha channel unaffected.

For common parameter descriptions, see *Common parameters for nppiCopyWrapBorder functions:*.

NppStatus **nppiCopyWrapBorder_16s_C1R_Ctx**(const *Npp16s* *pSrc, int nSrcStep, *NppiSize* oSrcSizeROI, *Npp16s* *pDst, int nDstStep, *NppiSize* oDstSizeROI, int nTopBorderHeight, int nLeftBorderWidth, *NppStreamContext* nppStreamCtx)

1 channel 16-bit signed integer image copy with the borders wrapped by replication of source image pixel colors.

For common parameter descriptions, see *Common parameters for nppiCopyWrapBorder functions:*.

NppStatus **nppiCopyWrapBorder_16s_C3R_Ctx**(const *Npp16s* *pSrc, int nSrcStep, *NppiSize* oSrcSizeROI, *Npp16s* *pDst, int nDstStep, *NppiSize* oDstSizeROI, int nTopBorderHeight, int nLeftBorderWidth, *NppStreamContext* nppStreamCtx)

3 channel 16-bit signed integer image copy with the borders wrapped by replication of source image pixel colors.

For common parameter descriptions, see *Common parameters for nppiCopyWrapBorder functions:*.

NppStatus **nppiCopyWrapBorder_16s_C4R_Ctx**(const *Npp16s* *pSrc, int nSrcStep, *NppiSize* oSrcSizeROI, *Npp16s* *pDst, int nDstStep, *NppiSize* oDstSizeROI, int nTopBorderHeight, int nLeftBorderWidth, *NppStreamContext* nppStreamCtx)

4 channel 16-bit signed integer image copy with the borders wrapped by replication of source image pixel colors.

For common parameter descriptions, see *Common parameters for nppiCopyWrapBorder functions:*.

NppStatus **nppiCopyWrapBorder_16s_AC4R_Ctx**(const *Npp16s* *pSrc, int nSrcStep, *NppiSize* oSrcSizeROI, *Npp16s* *pDst, int nDstStep, *NppiSize* oDstSizeROI, int nTopBorderHeight, int nLeftBorderWidth, *NppStreamContext* nppStreamCtx)

4 channel 16-bit signed integer image copy with the borders wrapped by replication of source image pixel colors with alpha channel unaffected.

For common parameter descriptions, see *Common parameters for nppiCopyWrapBorder functions:*.

NppStatus **nppiCopyWrapBorder_32s_C1R_Ctx**(const *Npp32s* *pSrc, int nSrcStep, *NppiSize* oSrcSizeROI, *Npp32s* *pDst, int nDstStep, *NppiSize* oDstSizeROI, int nTopBorderHeight, int nLeftBorderWidth, *NppStreamContext* nppStreamCtx)

1 channel 32-bit signed integer image copy with the borders wrapped by replication of source image pixel colors.

For common parameter descriptions, see *Common parameters for nppiCopyWrapBorder functions:*.

NppStatus **nppiCopyWrapBorder_32s_C3R_Ctx**(const *Npp32s* *pSrc, int nSrcStep, *NppiSize* oSrcSizeROI, *Npp32s* *pDst, int nDstStep, *NppiSize* oDstSizeROI, int nTopBorderHeight, int nLeftBorderWidth, *NppStreamContext* nppStreamCtx)

3 channel 32-bit signed integer image copy with the borders wrapped by replication of source image pixel colors.

For common parameter descriptions, see *Common parameters for nppiCopyWrapBorder functions:*.

NppStatus **nppiCopyWrapBorder_32s_C4R_Ctx**(const *Npp32s* *pSrc, int nSrcStep, *NppiSize* oSrcSizeROI, *Npp32s* *pDst, int nDstStep, *NppiSize* oDstSizeROI, int nTopBorderHeight, int nLeftBorderWidth, *NppStreamContext* nppStreamCtx)

4 channel 32-bit signed integer image copy with the borders wrapped by replication of source image pixel colors.

For common parameter descriptions, see *Common parameters for nppiCopyWrapBorder functions:*.

NppStatus **nppiCopyWrapBorder_32s_AC4R_Ctx**(const *Npp32s* *pSrc, int nSrcStep, *NppiSize* oSrcSizeROI, *Npp32s* *pDst, int nDstStep, *NppiSize* oDstSizeROI, int nTopBorderHeight, int nLeftBorderWidth, *NppStreamContext* nppStreamCtx)

4 channel 32-bit signed integer image copy with the borders wrapped by replication of source image pixel colors with alpha channel unaffected.

For common parameter descriptions, see *Common parameters for nppiCopyWrapBorder functions:*.

NppStatus **nppiCopyWrapBorder_32f_C1R_Ctx**(const *Npp32f* *pSrc, int nSrcStep, *NppiSize* oSrcSizeROI, *Npp32f* *pDst, int nDstStep, *NppiSize* oDstSizeROI, int nTopBorderHeight, int nLeftBorderWidth, *NppStreamContext* nppStreamCtx)

1 channel 32-bit floating point image copy with the borders wrapped by replication of source image pixel colors.

For common parameter descriptions, see *Common parameters for nppiCopyWrapBorder functions:*.

NppStatus **nppiCopyWrapBorder_32f_C3R_Ctx**(const *Npp32f* *pSrc, int nSrcStep, *NppiSize* oSrcSizeROI, *Npp32f* *pDst, int nDstStep, *NppiSize* oDstSizeROI, int nTopBorderHeight, int nLeftBorderWidth, *NppStreamContext* nppStreamCtx)

3 channel 32-bit floating point image copy with the borders wrapped by replication of source image pixel colors.

For common parameter descriptions, see *Common parameters for nppiCopyWrapBorder functions:*.

NppStatus **nppiCopyWrapBorder_32f_C4R_Ctx**(const *Npp32f* *pSrc, int nSrcStep, *NppiSize* oSrcSizeROI, *Npp32f* *pDst, int nDstStep, *NppiSize* oDstSizeROI, int nTopBorderHeight, int nLeftBorderWidth, *NppStreamContext* nppStreamCtx)

4 channel 32-bit floating point image copy with the borders wrapped by replication of source image pixel colors.

For common parameter descriptions, see *Common parameters for nppiCopyWrapBorder functions:*.

NppStatus **nppiCopyWrapBorder_32f_AC4R_Ctx**(const *Npp32f* *pSrc, int nSrcStep, *NppiSize* oSrcSizeROI, *Npp32f* *pDst, int nDstStep, *NppiSize* oDstSizeROI, int nTopBorderHeight, int nLeftBorderWidth, *NppStreamContext* nppStreamCtx)

1 channel 32-bit floating point image copy with the borders wrapped by replication of source image pixel colors with alpha channel unaffected.

For common parameter descriptions, see *Common parameters for nppiCopyWrapBorder functions:*.

1.9.14. Copy Sub-Pixel

Functions for copying linearly interpolated images using source image subpixel coordinates.

1.9.14.1 Common parameters for nppiCopySubPix functions:

param pSrc
Source-Image Pointer.

param nSrcStep
Source-Image Line Step.

param pDst
Destination-Image Pointer.

param nDstStep
Destination-Image Line Step.

param oDstSizeROI
Size (width, height) of the destination region, i.e. the region that gets filled with data from the source image, source image ROI is assumed to be same as destination image ROI.

param nDx
Fractional part of source image X coordinate.

param nDy
Fractional part of source image Y coordinate.

param nppStreamCtx
Application Managed Stream Context.

return
Image Data Related Error Codes, *ROI Related Error Codes*

Functions

NppStatus **nppiCopySubpix_8u_C1R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *Npp8u* *pDst, int nDstStep, *NppiSize* oDstSizeROI, *Npp32f* nDx, *Npp32f* nDy, *NppStreamContext* nppStreamCtx)

1 channel 8-bit unsigned integer linearly interpolated source image subpixel coordinate color copy.

For common parameter descriptions, see *Common parameters for nppiCopySubPix functions:*.

NppStatus **nppiCopySubpix_8u_C3R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *Npp8u* *pDst, int nDstStep, *NppiSize* oDstSizeROI, *Npp32f* nDx, *Npp32f* nDy, *NppStreamContext* nppStreamCtx)

3 channel 8-bit unsigned integer linearly interpolated source image subpixel coordinate color copy.

For common parameter descriptions, see *Common parameters for nppiCopySubPix functions:*.

NppStatus **nppiCopySubpix_8u_C4R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *Npp8u* *pDst, int nDstStep, *NppiSize* oDstSizeROI, *Npp32f* nDx, *Npp32f* nDy, *NppStreamContext* nppStreamCtx)

4 channel 8-bit unsigned integer linearly interpolated source image subpixel coordinate color copy.

For common parameter descriptions, see *Common parameters for nppiCopySubPix functions:*.

NppStatus **nppiCopySubpix_8u_AC4R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *Npp8u* *pDst, int nDstStep, *NppiSize* oDstSizeROI, *Npp32f* nDx, *Npp32f* nDy, *NppStreamContext* nppStreamCtx)

4 channel 8-bit unsigned integer linearly interpolated source image subpixel coordinate color copy with alpha channel unaffected.

For common parameter descriptions, see *Common parameters for nppiCopySubPix functions:*.

NppStatus **nppiCopySubpix_16u_C1R_Ctx**(const *Npp16u* *pSrc, int nSrcStep, *Npp16u* *pDst, int nDstStep, *NppiSize* oDstSizeROI, *Npp32f* nDx, *Npp32f* nDy, *NppStreamContext* nppStreamCtx)

1 channel 16-bit unsigned integer linearly interpolated source image subpixel coordinate color copy.

For common parameter descriptions, see *Common parameters for nppiCopySubPix functions:*.

NppStatus **nppiCopySubpix_16u_C3R_Ctx**(const *Npp16u* *pSrc, int nSrcStep, *Npp16u* *pDst, int nDstStep, *NppiSize* oDstSizeROI, *Npp32f* nDx, *Npp32f* nDy, *NppStreamContext* nppStreamCtx)

3 channel 16-bit unsigned integer linearly interpolated source image subpixel coordinate color copy.

For common parameter descriptions, see *Common parameters for nppiCopySubPix functions:*.

NppStatus **nppiCopySubpix_16u_C4R_Ctx**(const *Npp16u* *pSrc, int nSrcStep, *Npp16u* *pDst, int nDstStep, *NppiSize* oDstSizeROI, *Npp32f* nDx, *Npp32f* nDy, *NppStreamContext* nppStreamCtx)

4 channel 16-bit unsigned integer linearly interpolated source image subpixel coordinate color copy.

For common parameter descriptions, see *Common parameters for nppiCopySubPix functions:*.

NppStatus **nppiCopySubpix_16u_AC4R_Ctx**(const *Npp16u* *pSrc, int nSrcStep, *Npp16u* *pDst, int nDstStep, *NppiSize* oDstSizeROI, *Npp32f* nDx, *Npp32f* nDy, *NppStreamContext* nppStreamCtx)

4 channel 16-bit unsigned linearly interpolated source image subpixel coordinate color copy with alpha channel unaffected.

For common parameter descriptions, see *Common parameters for nppiCopySubPix functions:*.

NppStatus **nppiCopySubpix_16s_C1R_Ctx**(const *Npp16s* *pSrc, int nSrcStep, *Npp16s* *pDst, int nDstStep, *NppiSize* oDstSizeROI, *Npp32f* nDx, *Npp32f* nDy, *NppStreamContext* nppStreamCtx)

1 channel 16-bit signed integer linearly interpolated source image subpixel coordinate color copy.

For common parameter descriptions, see *Common parameters for nppiCopySubPix functions:*.

NppStatus **nppiCopySubpix_16s_C3R_Ctx**(const *Npp16s* *pSrc, int nSrcStep, *Npp16s* *pDst, int nDstStep, *NppiSize* oDstSizeROI, *Npp32f* nDx, *Npp32f* nDy, *NppStreamContext* nppStreamCtx)

3 channel 16-bit signed integer linearly interpolated source image subpixel coordinate color copy.

For common parameter descriptions, see *Common parameters for nppiCopySubPix functions:*.

NppStatus **nppiCopySubpix_16s_C4R_Ctx**(const *Npp16s* *pSrc, int nSrcStep, *Npp16s* *pDst, int nDstStep, *NppiSize* oDstSizeROI, *Npp32f* nDx, *Npp32f* nDy, *NppStreamContext* nppStreamCtx)

4 channel 16-bit signed integer linearly interpolated source image subpixel coordinate color copy.

For common parameter descriptions, see *Common parameters for nppiCopySubPix functions:*.

NppStatus **nppiCopySubpix_16s_AC4R_Ctx**(const *Npp16s* *pSrc, int nSrcStep, *Npp16s* *pDst, int nDstStep, *NppiSize* oDstSizeROI, *Npp32f* nDx, *Npp32f* nDy, *NppStreamContext* nppStreamCtx)

4 channel 16-bit signed integer linearly interpolated source image subpixel coordinate color copy with alpha channel unaffected.

For common parameter descriptions, see *Common parameters for nppiCopySubPix functions:*.

NppStatus **nppiCopySubpix_32s_C1R_Ctx**(const *Npp32s* *pSrc, int nSrcStep, *Npp32s* *pDst, int nDstStep, *NppiSize* oDstSizeROI, *Npp32f* nDx, *Npp32f* nDy, *NppStreamContext* nppStreamCtx)

1 channel 32-bit signed integer linearly interpolated source image subpixel coordinate color copy.

For common parameter descriptions, see *Common parameters for nppiCopySubPix functions:*.

NppStatus **nppiCopySubpix_32s_C3R_Ctx**(const *Npp32s* *pSrc, int nSrcStep, *Npp32s* *pDst, int nDstStep, *NppiSize* oDstSizeROI, *Npp32f* nDx, *Npp32f* nDy, *NppStreamContext* nppStreamCtx)

3 channel 32-bit signed linearly interpolated source image subpixel coordinate color copy.

For common parameter descriptions, see *Common parameters for nppiCopySubPix functions:*.

NppStatus **nppiCopySubpix_32s_C4R_Ctx**(const *Npp32s* *pSrc, int nSrcStep, *Npp32s* *pDst, int nDstStep, *NppiSize* oDstSizeROI, *Npp32f* nDx, *Npp32f* nDy, *NppStreamContext* nppStreamCtx)

4 channel 32-bit signed integer linearly interpolated source image subpixel coordinate color copy.

For common parameter descriptions, see *Common parameters for nppiCopySubPix functions:*.

NppStatus **nppiCopySubpix_32s_AC4R_Ctx**(const *Npp32s* *pSrc, int nSrcStep, *Npp32s* *pDst, int nDstStep, *NppiSize* oDstSizeROI, *Npp32f* nDx, *Npp32f* nDy, *NppStreamContext* nppStreamCtx)

4 channel 32-bit signed integer linearly interpolated source image subpixel coordinate color copy with alpha channel unaffected.

For common parameter descriptions, see *Common parameters for nppiCopySubPix functions:*.

NppStatus **nppiCopySubpix_32f_C1R_Ctx**(const *Npp32f* *pSrc, int nSrcStep, *Npp32f* *pDst, int nDstStep, *NppiSize* oDstSizeROI, *Npp32f* nDx, *Npp32f* nDy, *NppStreamContext* nppStreamCtx)

1 channel 32-bit floating point linearly interpolated source image subpixel coordinate color copy.

For common parameter descriptions, see *Common parameters for nppiCopySubPix functions:*.

NppStatus **nppiCopySubpix_32f_C3R_Ctx**(const *Npp32f* *pSrc, int nSrcStep, *Npp32f* *pDst, int nDstStep, *NppiSize* oDstSizeROI, *Npp32f* nDx, *Npp32f* nDy, *NppStreamContext* nppStreamCtx)

3 channel 32-bit floating point linearly interpolated source image subpixel coordinate color copy.

For common parameter descriptions, see *Common parameters for nppiCopySubPix functions:*.

NppStatus **nppiCopySubpix_32f_C4R_Ctx**(const *Npp32f* *pSrc, int nSrcStep, *Npp32f* *pDst, int nDstStep, *NppiSize* oDstSizeROI, *Npp32f* nDx, *Npp32f* nDy, *NppStreamContext* nppStreamCtx)

4 channel 32-bit floating point linearly interpolated source image subpixel coordinate color copy.

For common parameter descriptions, see *Common parameters for nppiCopySubPix functions:*.

NppStatus **nppiCopySubpix_32f_AC4R_Ctx**(const *Npp32f* *pSrc, int nSrcStep, *Npp32f* *pDst, int nDstStep, *NppiSize* oDstSizeROI, *Npp32f* nDx, *Npp32f* nDy, *NppStreamContext* nppStreamCtx)

4 channel 32-bit floating point linearly interpolated source image subpixel coordinate color copy with alpha channel unaffected.

For common parameter descriptions, see *Common parameters for nppiCopySubPix functions:*.

1.9.15. Convert Bit Depth

Functions for converting bit depth without scaling.

1.9.16. Convert To Increased Bit Depth

The integer conversion methods do not involve any scaling. Also, even when increasing the bit-depth loss of information may occur:

- When converting integers (e.g. Npp32u) to float (e.g. Npp32f) integer value not accurately representable by the float are rounded to the closest floating-point value.
- When converting signed integers to unsigned integers all negative values are lost (saturated to 0).

Note that all pointers and step sizes for images with 16f (*Npp16f*) data types perform best when they are at least 16 byte aligned.

1.9.16.1 Common parameters for nppiConvert to increased bit depth functions:

param pSrc
Source-Image Pointer.

param nSrcStep
Source-Image Line Step.

param pDst
Destination-Image Pointer.

param nDstStep
Destination-Image Line Step.

param oSizeROI
Region-Of-Interest (ROI).

param nppStreamCtx
Application Managed Stream Context.

return
Image Data Related Error Codes, *ROI Related Error Codes*

Functions

NppStatus **nppiConvert_8u16u_C1R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *Npp16u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Single channel 8-bit unsigned to 16-bit unsigned conversion.

For common parameter descriptions, see *Common parameters for nppiConvert to increased bit depth functions:*.

NppStatus **nppiConvert_8u16u_C3R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *Npp16u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Three channel 8-bit unsigned to 16-bit unsigned conversion.

For common parameter descriptions, see *Common parameters for nppiConvert to increased bit depth functions:*.

NppStatus **nppiConvert_8u16u_C4R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *Npp16u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four channel 8-bit unsigned to 16-bit unsigned conversion.

For common parameter descriptions, see *Common parameters for nppiConvert to increased bit depth functions:*.

NppStatus **nppiConvert_8u16u_AC4R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *Npp16u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four channel 8-bit unsigned to 16-bit unsigned conversion, not affecting Alpha.

For common parameter descriptions, see *Common parameters for nppiConvert to increased bit depth functions:*.

NppStatus **nppiConvert_8u16s_C1R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *Npp16s* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Single channel 8-bit unsigned to 16-bit signed conversion.

For common parameter descriptions, see *Common parameters for nppiConvert to increased bit depth functions:*.

NppStatus **nppiConvert_8u16s_C3R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *Npp16s* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Three channel 8-bit unsigned to 16-bit signed conversion.

For common parameter descriptions, see *Common parameters for nppiConvert to increased bit depth functions:*.

NppStatus **nppiConvert_8u16s_C4R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *Npp16s* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four channel 8-bit unsigned to 16-bit signed conversion.

For common parameter descriptions, see *Common parameters for nppiConvert to increased bit depth functions:*.

NppStatus **nppiConvert_8u16s_AC4R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *Npp16s* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four channel 8-bit unsigned to 16-bit signed conversion, not affecting Alpha.

For common parameter descriptions, see *Common parameters for nppiConvert to increased bit depth functions:*.

NppStatus **nppiConvert_8u32s_C1R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *Npp32s* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Single channel 8-bit unsigned to 32-bit signed conversion.

For common parameter descriptions, see *Common parameters for nppiConvert to increased bit depth functions:*.

NppStatus **nppiConvert_8u32s_C3R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *Npp32s* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Three channel 8-bit unsigned to 32-bit signed conversion.

For common parameter descriptions, see *Common parameters for nppiConvert to increased bit depth functions:*.

NppStatus **nppiConvert_8u32s_C4R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *Npp32s* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four channel 8-bit unsigned to 32-bit signed conversion.

For common parameter descriptions, see *Common parameters for nppiConvert to increased bit depth functions:*.

NppStatus **nppiConvert_8u32s_AC4R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *Npp32s* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four channel 8-bit unsigned to 32-bit signed conversion, not affecting Alpha.

For common parameter descriptions, see *Common parameters for nppiConvert to increased bit depth functions:*.

NppStatus **nppiConvert_8u32f_C1R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *Npp32f* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Single channel 8-bit unsigned to 32-bit floating-point conversion.

For common parameter descriptions, see *Common parameters for nppiConvert to increased bit depth functions:*.

NppStatus **nppiConvert_8u32f_C3R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *Npp32f* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Three channel 8-bit unsigned to 32-bit floating-point conversion.

For common parameter descriptions, see *Common parameters for nppiConvert to increased bit depth functions:*.

NppStatus **nppiConvert_8u32f_C4R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *Npp32f* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four channel 8-bit unsigned to 32-bit floating-point conversion.

For common parameter descriptions, see *Common parameters for nppiConvert to increased bit depth functions:*.

NppStatus **nppiConvert_8u32f_AC4R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *Npp32f* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four channel 8-bit unsigned to 32-bit floating-point conversion, not affecting Alpha.

For common parameter descriptions, see *Common parameters for nppiConvert to increased bit depth functions:*.

NppStatus **nppiConvert_8s32s_C1R_Ctx**(const *Npp8s* *pSrc, int nSrcStep, *Npp32s* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Single channel 8-bit signed to 32-bit signed conversion.

For common parameter descriptions, see *Common parameters for nppiConvert to increased bit depth functions:*.

NppStatus **nppiConvert_8s32s_C3R_Ctx**(const *Npp8s* *pSrc, int nSrcStep, *Npp32s* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Three channel 8-bit signed to 32-bit signed conversion.

For common parameter descriptions, see *Common parameters for nppiConvert to increased bit depth functions:*.

NppStatus **nppiConvert_8s32s_C4R_Ctx**(const *Npp8s* *pSrc, int nSrcStep, *Npp32s* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four channel 8-bit signed to 32-bit signed conversion.

For common parameter descriptions, see *Common parameters for nppiConvert to increased bit depth functions:*.

NppStatus **nppiConvert_8s32s_AC4R_Ctx**(const *Npp8s* *pSrc, int nSrcStep, *Npp32s* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four channel 8-bit signed to 32-bit signed conversion, not affecting Alpha.

For common parameter descriptions, see *Common parameters for nppiConvert to increased bit depth functions:*.

NppStatus **nppiConvert_8s32f_C1R_Ctx**(const *Npp8s* *pSrc, int nSrcStep, *Npp32f* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Single channel 8-bit signed to 32-bit floating-point conversion.

For common parameter descriptions, see *Common parameters for nppiConvert to increased bit depth functions:*.

NppStatus **nppiConvert_8s32f_C3R_Ctx**(const *Npp8s* *pSrc, int nSrcStep, *Npp32f* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Three channel 8-bit signed to 32-bit floating-point conversion.

For common parameter descriptions, see *Common parameters for nppiConvert to increased bit depth functions:*.

NppStatus **nppiConvert_8s32f_C4R_Ctx**(const *Npp8s* *pSrc, int nSrcStep, *Npp32f* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four channel 8-bit signed to 32-bit floating-point conversion.

For common parameter descriptions, see *Common parameters for nppiConvert to increased bit depth functions:*.

NppStatus **nppiConvert_8s32f_AC4R_Ctx**(const *Npp8s* *pSrc, int nSrcStep, *Npp32f* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four channel 8-bit signed to 32-bit floating-point conversion, not affecting Alpha.

For common parameter descriptions, see *Common parameters for nppiConvert to increased bit depth functions:*.

NppStatus **nppiConvert_16u32s_C1R_Ctx**(const *Npp16u* *pSrc, int nSrcStep, *Npp32s* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Single channel 16-bit unsigned to 32-bit signed conversion.

For common parameter descriptions, see *Common parameters for nppiConvert to increased bit depth functions:*.

NppStatus **nppiConvert_16u32s_C3R_Ctx**(const *Npp16u* *pSrc, int nSrcStep, *Npp32s* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Three channel 16-bit unsigned to 32-bit signed conversion.

For common parameter descriptions, see *Common parameters for nppiConvert to increased bit depth functions:*.

NppStatus **nppiConvert_16u32s_C4R_Ctx**(const *Npp16u* *pSrc, int nSrcStep, *Npp32s* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four channel 16-bit unsigned to 32-bit signed conversion.

For common parameter descriptions, see *Common parameters for nppiConvert to increased bit depth functions:*.

NppStatus **nppiConvert_16u32s_AC4R_Ctx**(const *Npp16u* *pSrc, int nSrcStep, *Npp32s* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four channel 16-bit unsigned to 32-bit signed conversion, not affecting Alpha.

For common parameter descriptions, see *Common parameters for nppiConvert to increased bit depth functions:*.

NppStatus **nppiConvert_16u32f_C1R_Ctx**(const *Npp16u* *pSrc, int nSrcStep, *Npp32f* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Single channel 16-bit unsigned to 32-bit floating-point conversion.

For common parameter descriptions, see *Common parameters for nppiConvert to increased bit depth functions:*.

NppStatus **nppiConvert_16u32f_C3R_Ctx**(const *Npp16u* *pSrc, int nSrcStep, *Npp32f* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Three channel 16-bit unsigned to 32-bit floating-point conversion.

For common parameter descriptions, see *Common parameters for nppiConvert to increased bit depth functions:*.

NppStatus **nppiConvert_16u32f_C4R_Ctx**(const *Npp16u* *pSrc, int nSrcStep, *Npp32f* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four channel 16-bit unsigned to 32-bit floating-point conversion.

For common parameter descriptions, see *Common parameters for nppiConvert to increased bit depth functions:*.

NppStatus **nppiConvert_16u32f_AC4R_Ctx**(const *Npp16u* *pSrc, int nSrcStep, *Npp32f* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four channel 16-bit unsigned to 32-bit floating-point conversion, not affecting Alpha.

For common parameter descriptions, see *Common parameters for nppiConvert to increased bit depth functions:*.

NppStatus **nppiConvert_16s32s_C1R_Ctx**(const *Npp16s* *pSrc, int nSrcStep, *Npp32s* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Single channel 16-bit signed to 32-bit signed conversion.

For common parameter descriptions, see *Common parameters for nppiConvert to increased bit depth functions:*.

NppStatus **nppiConvert_16s32s_C3R_Ctx**(const *Npp16s* *pSrc, int nSrcStep, *Npp32s* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Three channel 16-bit signed to 32-bit signed conversion.

For common parameter descriptions, see *Common parameters for nppiConvert to increased bit depth functions:*.

NppStatus **nppiConvert_16s32s_C4R_Ctx**(const *Npp16s* *pSrc, int nSrcStep, *Npp32s* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four channel 16-bit signed to 32-bit signed conversion.

NppStatus **nppiConvert_16s32s_AC4R_Ctx**(const *Npp16s* *pSrc, int nSrcStep, *Npp32s* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four channel 16-bit signed to 32-bit signed conversion, not affecting Alpha.

For common parameter descriptions, see *Common parameters for nppiConvert to increased bit depth functions:*.

NppStatus **nppiConvert_16s32f_C1R_Ctx**(const *Npp16s* *pSrc, int nSrcStep, *Npp32f* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Single channel 16-bit signed to 32-bit floating-point conversion.

For common parameter descriptions, see *Common parameters for nppiConvert to increased bit depth functions:*.

NppStatus **nppiConvert_16s32f_C3R_Ctx**(const *Npp16s* *pSrc, int nSrcStep, *Npp32f* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Three channel 16-bit signed to 32-bit floating-point conversion.

For common parameter descriptions, see *Common parameters for nppiConvert to increased bit depth functions:*.

NppStatus **nppiConvert_16s32f_C4R_Ctx**(const *Npp16s* *pSrc, int nSrcStep, *Npp32f* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four channel 16-bit signed to 32-bit floating-point conversion.

For common parameter descriptions, see *Common parameters for nppiConvert to increased bit depth functions:*.

NppStatus **nppiConvert_16s32f_AC4R_Ctx**(const *Npp16s* *pSrc, int nSrcStep, *Npp32f* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four channel 16-bit signed to 32-bit floating-point conversion, not affecting Alpha.

For common parameter descriptions, see *Common parameters for nppiConvert to increased bit depth functions:*.

NppStatus **nppiConvert_16f32f_C1R_Ctx**(const *Npp16f* *pSrc, int nSrcStep, *Npp32f* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Single channel 16-bit floating-point to 32-bit floating-point conversion.

For common parameter descriptions, see *Common parameters for nppiConvert to increased bit depth functions:*.

NppStatus **nppiConvert_16f32f_C3R_Ctx**(const *Npp16f* *pSrc, int nSrcStep, *Npp32f* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Three channel 16-bit floating-point to 32-bit floating-point conversion.

Note that all pointers and step sizes for images with 16f (*Npp16f*) data types perform best when they are at least 16 byte aligned

For common parameter descriptions, see *Common parameters for nppiConvert to increased bit depth functions:*.

NppStatus **nppiConvert_16f32f_C4R_Ctx**(const *Npp16f* *pSrc, int nSrcStep, *Npp32f* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four channel 16-bit floating-point to 32-bit floating-point conversion.

Note that all pointers and step sizes for images with 16f (*Npp16f*) data types perform best when they are at least 16 byte aligned.

For common parameter descriptions, see *Common parameters for nppiConvert to increased bit depth functions:*.

NppStatus **nppiConvert_16f32f_AC4R_Ctx**(const *Npp16f* *pSrc, int nSrcStep, *Npp32f* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four channel 16-bit floating-point to 32-bit floating-point conversion, not affecting Alpha.

Note that all pointers and step sizes for images with 16f (*Npp16f*) data types perform best when they are at least 16 byte aligned.

For common parameter descriptions, see *Common parameters for nppiConvert to increased bit depth functions:*.

NppStatus **nppiConvert_8s8u_C1Rs_Ctx**(const *Npp8s* *pSrc, int nSrcStep, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Single channel 8-bit signed to 8-bit unsigned conversion with saturation.

Note that all pointers and step sizes for images with 16f (*Npp16f*) data types perform best when they are at least 16 byte aligned.

For common parameter descriptions, see *Common parameters for nppiConvert to increased bit depth functions:*.

NppStatus **nppiConvert_8s16u_C1Rs_Ctx**(const *Npp8s* *pSrc, int nSrcStep, *Npp16u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Single channel 8-bit signed to 16-bit unsigned conversion with saturation.

For common parameter descriptions, see *Common parameters for nppiConvert to increased bit depth functions:*.

NppStatus **nppiConvert_8s16s_C1R_Ctx**(const *Npp8s* *pSrc, int nSrcStep, *Npp16s* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Single channel 8-bit signed to 16-bit signed conversion.

For common parameter descriptions, see *Common parameters for nppiConvert to increased bit depth functions:*.

NppStatus **nppiConvert_8s32u_C1Rs_Ctx**(const *Npp8s* *pSrc, int nSrcStep, *Npp32u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Single channel 8-bit signed to 32-bit unsigned conversion with saturation.

For common parameter descriptions, see *Common parameters for nppiConvert to increased bit depth functions:*.

NppStatus **nppiConvert_16s16u_C1Rs_Ctx**(const *Npp16s* *pSrc, int nSrcStep, *Npp16u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Single channel 16-bit signed to 16-bit unsigned conversion with saturation.

For common parameter descriptions, see *Common parameters for nppiConvert to increased bit depth functions:*.

NppStatus **nppiConvert_16s32u_C1Rs_Ctx**(const *Npp16s* *pSrc, int nSrcStep, *Npp32u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Single channel 16-bit signed to 32-bit unsigned conversion with saturation.

For common parameter descriptions, see *Common parameters for nppiConvert to increased bit depth functions:*.

NppStatus **nppiConvert_16u32u_C1R_Ctx**(const *Npp16u* *pSrc, int nSrcStep, *Npp32u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Single channel 16-bit unsigned to 32-bit unsigned conversion.

For common parameter descriptions, see *Common parameters for nppiConvert to increased bit depth functions:*.

NppStatus **nppiConvert_32s32u_C1Rs_Ctx**(const *Npp32s* *pSrc, int nSrcStep, *Npp32u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Single channel 32-bit signed to 32-bit unsigned conversion with saturation.

For common parameter descriptions, see *Common parameters for nppiConvert to increased bit depth functions:*.

NppStatus **nppiConvert_32s32f_C1R_Ctx**(const *Npp32s* *pSrc, int nSrcStep, *Npp32f* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Single channel 32-bit signed to 32-bit floating-point conversion.

For common parameter descriptions, see *Common parameters for nppiConvert to increased bit depth functions:*.

NppStatus **nppiConvert_32u32f_C1R_Ctx**(const *Npp32u* *pSrc, int nSrcStep, *Npp32f* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Single channel 32-bit unsigned to 32-bit floating-point conversion.

For common parameter descriptions, see *Common parameters for nppiConvert to increased bit depth functions:*.

1.9.17. Convert To Decreased Bit Depth

The integer conversion methods do not involve any scaling. When converting floating-point values to integers the user may choose the most appropriate rounding-mode. Typically information is lost when converting to lower bit depth:

- All converted values are saturated to the destination type's range. E.g. any values larger than the largest value of the destination type are clamped to the destination's maximum.
- Converting floating-point values to integer also involves rounding, effectively loosing all fractional value information in the process.

Note that all pointers and step sizes for images with 16f (*Npp16f*) data types perform best when they are at least 16 byte aligned.

1.9.17.1 Common parameters for nppiConvert to decreased bit depth functions:

param pSrc
Source-Image Pointer.

param nSrcStep
Source-Image Line Step.

param pDst
Destination-Image Pointer.

param nDstStep
Destination-Image Line Step.

param oSizeROI
Region-Of-Interest (ROI).

param eRoundMode
Rounding Mode Parameter.

param nScaleFactor
Integer Result Scaling.

param nppStreamCtx
Application Managed Stream Context.

return
Image Data Related Error Codes, *ROI Related Error Codes*

Functions

NppStatus **nppiConvert_16u8u_C1R_Ctx**(const *Npp16u* *pSrc, int nSrcStep, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Single channel 16-bit unsigned to 8-bit unsigned conversion.

For common parameter descriptions, see *Common parameters for nppiConvert to decreased bit depth functions:*.

NppStatus **nppiConvert_16u8u_C3R_Ctx**(const *Npp16u* *pSrc, int nSrcStep, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Three channel 16-bit unsigned to 8-bit unsigned conversion.

For common parameter descriptions, see *Common parameters for nppiConvert to decreased bit depth functions:*.

NppStatus **nppiConvert_16u8u_C4R_Ctx**(const *Npp16u* *pSrc, int nSrcStep, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four channel 16-bit unsigned to 8-bit unsigned conversion.

For common parameter descriptions, see *Common parameters for nppiConvert to decreased bit depth functions:*.

NppStatus **nppiConvert_16u8u_AC4R_Ctx**(const *Npp16u* *pSrc, int nSrcStep, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four channel 16-bit unsigned to 8-bit unsigned conversion, not affecting Alpha.

For common parameter descriptions, see *Common parameters for nppiConvert to decreased bit depth functions:*.

NppStatus **nppiConvert_16s8u_C1R_Ctx**(const *Npp16s* *pSrc, int nSrcStep, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Single channel 16-bit signed to 8-bit unsigned conversion.

For common parameter descriptions, see *Common parameters for nppiConvert to decreased bit depth functions:*.

NppStatus **nppiConvert_16s8u_C3R_Ctx**(const *Npp16s* *pSrc, int nSrcStep, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Three channel 16-bit signed to 8-bit unsigned conversion.

For common parameter descriptions, see *Common parameters for nppiConvert to decreased bit depth functions:*.

NppStatus **nppiConvert_16s8u_C4R_Ctx**(const *Npp16s* *pSrc, int nSrcStep, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four channel 16-bit signed to 8-bit unsigned conversion.

For common parameter descriptions, see *Common parameters for nppiConvert to decreased bit depth functions:*.

NppStatus **nppiConvert_16s8u_AC4R_Ctx**(const *Npp16s* *pSrc, int nSrcStep, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four channel 16-bit signed to 8-bit unsigned conversion, not affecting Alpha.

For common parameter descriptions, see *Common parameters for nppiConvert to decreased bit depth functions:*.

NppStatus **nppiConvert_32s8u_C1R_Ctx**(const *Npp32s* *pSrc, int nSrcStep, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Single channel 32-bit signed to 8-bit unsigned conversion.

For common parameter descriptions, see *Common parameters for nppiConvert to decreased bit depth functions:*.

NppStatus **nppiConvert_32s8u_C3R_Ctx**(const *Npp32s* *pSrc, int nSrcStep, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Three channel 32-bit signed to 8-bit unsigned conversion.

For common parameter descriptions, see *Common parameters for nppiConvert to decreased bit depth functions:*.

NppStatus **nppiConvert_32s8u_C4R_Ctx**(const *Npp32s* *pSrc, int nSrcStep, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four channel 32-bit signed to 8-bit unsigned conversion.

For common parameter descriptions, see *Common parameters for nppiConvert to decreased bit depth functions:*.

NppStatus **nppiConvert_32s8u_AC4R_Ctx**(const *Npp32s* *pSrc, int nSrcStep, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four channel 32-bit signed to 8-bit unsigned conversion, not affecting Alpha.

For common parameter descriptions, see *Common parameters for nppiConvert to decreased bit depth functions:*.

NppStatus **nppiConvert_32s8s_C1R_Ctx**(const *Npp32s* *pSrc, int nSrcStep, *Npp8s* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Single channel 32-bit signed to 8-bit signed conversion.

For common parameter descriptions, see *Common parameters for nppiConvert to decreased bit depth functions:*.

NppStatus **nppiConvert_32s8s_C3R_Ctx**(const *Npp32s* *pSrc, int nSrcStep, *Npp8s* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Three channel 32-bit signed to 8-bit signed conversion.

For common parameter descriptions, see *Common parameters for nppiConvert to decreased bit depth functions:*.

NppStatus **nppiConvert_32s8s_C4R_Ctx**(const *Npp32s* *pSrc, int nSrcStep, *Npp8s* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four channel 32-bit signed to 8-bit signed conversion.

For common parameter descriptions, see *Common parameters for nppiConvert to decreased bit depth functions:*.

NppStatus **nppiConvert_32s8s_AC4R_Ctx**(const *Npp32s* *pSrc, int nSrcStep, *Npp8s* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four channel 32-bit signed to 8-bit signed conversion, not affecting Alpha.

For common parameter descriptions, see *Common parameters for nppiConvert to decreased bit depth functions:*.

NppStatus **nppiConvert_8u8s_C1RSfs_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *Npp8s* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppRoundMode* eRoundMode, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Single channel 8-bit unsigned to 8-bit signed conversion.

For common parameter descriptions, see *Common parameters for nppiConvert to decreased bit depth functions:*.

NppStatus **nppiConvert_16u8s_C1RSfs_Ctx**(const *Npp16u* *pSrc, int nSrcStep, *Npp8s* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppRoundMode* eRoundMode, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Single channel 16-bit unsigned to 8-bit signed conversion.

For common parameter descriptions, see *Common parameters for nppiConvert to decreased bit depth functions:*.

NppStatus **nppiConvert_16s8s_C1RSfs_Ctx**(const *Npp16s* *pSrc, int nSrcStep, *Npp8s* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppRoundMode* eRoundMode, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Single channel 16-bit signed to 8-bit signed conversion.

For common parameter descriptions, see *Common parameters for nppiConvert to decreased bit depth functions:*.

NppStatus **nppiConvert_16u16s_C1RSfs_Ctx**(const *Npp16u* *pSrc, int nSrcStep, *Npp16s* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppRoundMode* eRoundMode, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Single channel 16-bit unsigned to 16-bit signed conversion.

For common parameter descriptions, see *Common parameters for nppiConvert to decreased bit depth functions:*.

NppStatus **nppiConvert_32u8u_C1RSfs_Ctx**(const *Npp32u* *pSrc, int nSrcStep, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppRoundMode* eRoundMode, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Single channel 32-bit unsigned to 8-bit unsigned conversion.

For common parameter descriptions, see *Common parameters for nppiConvert to decreased bit depth functions:*.

NppStatus **nppiConvert_32u8s_C1RSfs_Ctx**(const *Npp32u* *pSrc, int nSrcStep, *Npp8s* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppRoundMode* eRoundMode, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Single channel 32-bit unsigned to 8-bit signed conversion.

For common parameter descriptions, see *Common parameters for nppiConvert to decreased bit depth functions:*.

NppStatus **nppiConvert_32u16u_C1RSfs_Ctx**(const *Npp32u* *pSrc, int nSrcStep, *Npp16u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppRoundMode* eRoundMode, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Single channel 32-bit unsigned to 16-bit unsigned conversion.

For common parameter descriptions, see *Common parameters for nppiConvert to decreased bit depth functions:*.

NppStatus **nppiConvert_32u16s_C1RSfs_Ctx**(const *Npp32u* *pSrc, int nSrcStep, *Npp16s* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppRoundMode* eRoundMode, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Single channel 32-bit unsigned to 16-bit signed conversion.

For common parameter descriptions, see *Common parameters for nppiConvert to decreased bit depth functions:*.

NppStatus **nppiConvert_32u32s_C1RSfs_Ctx**(const *Npp32u* *pSrc, int nSrcStep, *Npp32s* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppRoundMode* eRoundMode, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Single channel 32-bit unsigned to 32-bit signed conversion.

For common parameter descriptions, see *Common parameters for nppiConvert to decreased bit depth functions:*.

NppStatus **nppiConvert_32s16u_C1RSfs_Ctx**(const *Npp32s* *pSrc, int nSrcStep, *Npp16u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppRoundMode* eRoundMode, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Single channel 32-bit unsigned to 16-bit unsigned conversion.

For common parameter descriptions, see *Common parameters for nppiConvert to decreased bit depth functions:*.

NppStatus **nppiConvert_32s16s_C1RSfs_Ctx**(const *Npp32s* *pSrc, int nSrcStep, *Npp16s* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppRoundMode* eRoundMode, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Single channel 32-bit unsigned to 16-bit signed conversion.

For common parameter descriptions, see *Common parameters for nppiConvert to decreased bit depth functions:*.

NppStatus **nppiConvert_32f8u_C1R_Ctx**(const *Npp32f* *pSrc, int nSrcStep, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppRoundMode* eRoundMode, *NppStreamContext* nppStreamCtx)

Single channel 32-bit floating point to 8-bit unsigned conversion.

For common parameter descriptions, see *Common parameters for nppiConvert to decreased bit depth functions:*.

NppStatus **nppiConvert_32f8u_C3R_Ctx**(const *Npp32f* *pSrc, int nSrcStep, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppRoundMode* eRoundMode, *NppStreamContext* nppStreamCtx)

Three channel 32-bit floating point to 8-bit unsigned conversion.

For common parameter descriptions, see *Common parameters for nppiConvert to decreased bit depth functions:*.

NppStatus **nppiConvert_32f8u_C4R_Ctx**(const *Npp32f* *pSrc, int nSrcStep, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppRoundMode* eRoundMode, *NppStreamContext* nppStreamCtx)

Four channel 32-bit floating point to 8-bit unsigned conversion.

For common parameter descriptions, see *Common parameters for nppiConvert to decreased bit depth functions:*.

NppStatus **nppiConvert_32f8u_AC4R_Ctx**(const *Npp32f* *pSrc, int nSrcStep, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppRoundMode* eRoundMode, *NppStreamContext* nppStreamCtx)

Four channel 32-bit floating point to 8-bit unsigned conversion, not affecting Alpha.

For common parameter descriptions, see *Common parameters for nppiConvert to decreased bit depth functions:*.

NppStatus **nppiConvert_32f8s_C1R_Ctx**(const *Npp32f* *pSrc, int nSrcStep, *Npp8s* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppRoundMode* eRoundMode, *NppStreamContext* nppStreamCtx)

Single channel 32-bit floating point to 8-bit signed conversion.

For common parameter descriptions, see *Common parameters for nppiConvert to decreased bit depth functions:*.

NppStatus **nppiConvert_32f8s_C3R_Ctx**(const *Npp32f* *pSrc, int nSrcStep, *Npp8s* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppRoundMode* eRoundMode, *NppStreamContext* nppStreamCtx)

Three channel 32-bit floating point to 8-bit signed conversion.

For common parameter descriptions, see *Common parameters for nppiConvert to decreased bit depth functions:*.

NppStatus **nppiConvert_32f8s_C4R_Ctx**(const *Npp32f* *pSrc, int nSrcStep, *Npp8s* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppRoundMode* eRoundMode, *NppStreamContext* nppStreamCtx)

Four channel 32-bit floating point to 8-bit signed conversion.

For common parameter descriptions, see *Common parameters for nppiConvert to decreased bit depth functions:*.

NppStatus **nppiConvert_32f8s_AC4R_Ctx**(const *Npp32f* *pSrc, int nSrcStep, *Npp8s* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppRoundMode* eRoundMode, *NppStreamContext* nppStreamCtx)

Four channel 32-bit floating point to 8-bit signed conversion, not affecting Alpha.

For common parameter descriptions, see *Common parameters for nppiConvert to decreased bit depth functions:*.

NppStatus **nppiConvert_32f16u_C1R_Ctx**(const *Npp32f* *pSrc, int nSrcStep, *Npp16u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppRoundMode* eRoundMode, *NppStreamContext* nppStreamCtx)

Single channel 32-bit floating point to 16-bit unsigned conversion.

For common parameter descriptions, see *Common parameters for nppiConvert to decreased bit depth functions:*.

NppStatus **nppiConvert_32f16u_C3R_Ctx**(const *Npp32f* *pSrc, int nSrcStep, *Npp16u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppRoundMode* eRoundMode, *NppStreamContext* nppStreamCtx)

Three channel 32-bit floating point to 16-bit unsigned conversion.

For common parameter descriptions, see *Common parameters for nppiConvert to decreased bit depth functions:*.

NppStatus **nppiConvert_32f16u_C4R_Ctx**(const *Npp32f* *pSrc, int nSrcStep, *Npp16u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppRoundMode* eRoundMode, *NppStreamContext* nppStreamCtx)

Four channel 32-bit floating point to 16-bit unsigned conversion.

For common parameter descriptions, see *Common parameters for nppiConvert to decreased bit depth functions:*.

NppStatus **nppiConvert_32f16u_AC4R_Ctx**(const *Npp32f* *pSrc, int nSrcStep, *Npp16u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppRoundMode* eRoundMode, *NppStreamContext* nppStreamCtx)

Four channel 32-bit floating point to 16-bit unsigned conversion, not affecting Alpha.

For common parameter descriptions, see *Common parameters for nppiConvert to decreased bit depth functions:*.

NppStatus **nppiConvert_32f16s_C1R_Ctx**(const *Npp32f* *pSrc, int nSrcStep, *Npp16s* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppRoundMode* eRoundMode, *NppStreamContext* nppStreamCtx)

Single channel 32-bit floating point to 16-bit signed conversion.

For common parameter descriptions, see *Common parameters for nppiConvert to decreased bit depth functions:*.

NppStatus **nppiConvert_32f16s_C3R_Ctx**(const *Npp32f* *pSrc, int nSrcStep, *Npp16s* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppRoundMode* eRoundMode, *NppStreamContext* nppStreamCtx)

Three channel 32-bit floating point to 16-bit signed conversion.

For common parameter descriptions, see *Common parameters for nppiConvert to decreased bit depth functions:*.

NppStatus **nppiConvert_32f16s_C4R_Ctx**(const *Npp32f* *pSrc, int nSrcStep, *Npp16s* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppRoundMode* eRoundMode, *NppStreamContext* nppStreamCtx)

Four channel 32-bit floating point to 16-bit signed conversion.

For common parameter descriptions, see *Common parameters for nppiConvert to decreased bit depth functions:*.

NppStatus **nppiConvert_32f16s_AC4R_Ctx**(const *Npp32f* *pSrc, int nSrcStep, *Npp16s* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppRoundMode* eRoundMode, *NppStreamContext* nppStreamCtx)

Four channel 32-bit floating point to 16-bit floating-point conversion.

For common parameter descriptions, see *Common parameters for nppiConvert to decreased bit depth functions:*.

NppStatus **nppiConvert_32f16f_C1R_Ctx**(const *Npp32f* *pSrc, int nSrcStep, *Npp16f* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppRoundMode* eRoundMode, *NppStreamContext* nppStreamCtx)

Single channel 32-bit floating point to 16-bit floating-point conversion.

Note that all pointers and step sizes for images with 16f (*Npp16f*) data types perform best when they are at least 16 byte aligned.

For common parameter descriptions, see *Common parameters for nppiConvert to decreased bit depth functions:*.

NppStatus **nppiConvert_32f16f_C3R_Ctx**(const *Npp32f* *pSrc, int nSrcStep, *Npp16f* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppRoundMode* eRoundMode, *NppStreamContext* nppStreamCtx)

Three channel 32-bit floating point to 16-bit floating-point conversion.

Note that all pointers and step sizes for images with 16f (*Npp16f*) data types perform best when they are at least 16 byte aligned.

For common parameter descriptions, see *Common parameters for nppiConvert to decreased bit depth functions:*.

NppStatus **nppiConvert_32f16f_C4R_Ctx**(const *Npp32f* *pSrc, int nSrcStep, *Npp16f* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppRoundMode* eRoundMode, *NppStreamContext* nppStreamCtx)

Four channel 32-bit floating point to 16-bit floating-point conversion.

Note that all pointers and step sizes for images with 16f (*Npp16f*) data types perform best when they are at least 16 byte aligned.

For common parameter descriptions, see *Common parameters for nppiConvert to decreased bit depth functions:*.

NppStatus **nppiConvert_32f16f_AC4R_Ctx**(const *Npp32f* *pSrc, int nSrcStep, *Npp16f* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppRoundMode* eRoundMode, *NppStreamContext* nppStreamCtx)

Four channel 32-bit floating point to 16-bit floating-point conversion.

Note that all pointers and step sizes for images with 16f (*Npp16f*) data types perform best when they are at least 16 byte aligned.

For common parameter descriptions, see *Common parameters for nppiConvert to decreased bit depth functions:*.

NppStatus **nppiConvert_32f8u_C1RSfs_Ctx**(const *Npp32f* *pSrc, int nSrcStep, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppRoundMode* eRoundMode, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Single channel 32-bit floating point to 8-bit unsigned conversion.

For common parameter descriptions, see *Common parameters for nppiConvert to decreased bit depth functions:*.

NppStatus **nppiConvert_32f8s_C1RSfs_Ctx**(const *Npp32f* *pSrc, int nSrcStep, *Npp8s* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppRoundMode* eRoundMode, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Single channel 32-bit floating point to 8-bit signed conversion.

For common parameter descriptions, see *Common parameters for nppiConvert to decreased bit depth functions:*.

NppStatus **nppiConvert_32f16u_C1RSfs_Ctx**(const *Npp32f* *pSrc, int nSrcStep, *Npp16u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppRoundMode* eRoundMode, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Single channel 32-bit floating point to 16-bit unsigned conversion.

For common parameter descriptions, see *Common parameters for nppiConvert to decreased bit depth functions:*.

NppStatus **nppiConvert_32f16s_C1RSfs_Ctx**(const *Npp32f* *pSrc, int nSrcStep, *Npp16s* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppRoundMode* eRoundMode, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Single channel 32-bit floating point to 16-bit signed conversion.

For common parameter descriptions, see *Common parameters for nppiConvert to decreased bit depth functions:*.

NppStatus **nppiConvert_32f32u_C1RSfs_Ctx**(const *Npp32f* *pSrc, int nSrcStep, *Npp32u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppRoundMode* eRoundMode, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Single channel 32-bit floating point to 32-bit unsigned conversion.

For common parameter descriptions, see *Common parameters for nppiConvert to decreased bit depth functions:*.

NppStatus **nppiConvert_32f32s_C1RSfs_Ctx**(const *Npp32f* *pSrc, int nSrcStep, *Npp32s* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppRoundMode* eRoundMode, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Single channel 32-bit floating point to 32-bit signed conversion.

For common parameter descriptions, see *Common parameters for nppiConvert to decreased bit depth functions:*.

1.9.18. Scale Bit Depth

Functions for scaling bit depth up or down.

1.9.19. Scale To Higher Bit Depth

Functions for scaling images to higher bit depth.

To map source pixel srcPixelValue to destination pixel dstPixelValue the following equation is used:

```
dstPixelValue = dstMinRangeValue + scaleFactor * (srcPixelValue - srcMinRangeValue)
```

where scaleFactor = (dstMaxRangeValue - dstMinRangeValue) / (srcMaxRangeValue - srcMinRangeValue).

For conversions between integer data types, the entire integer numeric range of the input data type is mapped onto the entire integer numeric range of the output data type.

For conversions to floating point data types the floating point data range is defined by the user supplied floating point values of nMax and nMin which are used as the dstMaxRangeValue and dstMinRangeValue respectively in the scaleFactor and dstPixelValue calculations and also as the saturation values to which output data is clamped.

When converting from floating-point values to integer values, nMax and nMin are used as the srcMaxRangeValue and srcMinRangeValue respectively in the scaleFactor and dstPixelValue calculations. Output values are saturated and clamped to the full output integer pixel value range.

1.9.19.1 Common parameters for nppiScale to higher bit depth functions:

param pSrc
Source-Image Pointer.

param nSrcStep
Source-Image Line Step.

param pDst
Destination-Image Pointer.

param nDstStep
Destination-Image Line Step.

param oSizeROI
Region-Of-Interest (ROI).

param nMin
specifies the minimum saturation value to which every output value will be clamped.

param nMax
specifies the maximum saturation value to which every output value will be clamped.

param nppStreamCtx
Application Managed Stream Context.

return
Image Data Related Error Codes, *ROI Related Error Codes*, NPP_SCALE_RANGE_ERROR indicates an error condition if nMax <= nMin.

Functions

NppStatus **nppiScale_8u16u_C1R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *Npp16u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Single channel 8-bit unsigned to 16-bit unsigned conversion.

For common parameter descriptions, see *Common parameters for nppiScale to higher bit depth functions:*.

NppStatus **nppiScale_8u16u_C3R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *Npp16u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Three channel 8-bit unsigned to 16-bit unsigned conversion.

For common parameter descriptions, see *Common parameters for nppiScale to higher bit depth functions:*.

NppStatus **nppiScale_8u16u_C4R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *Npp16u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four channel 8-bit unsigned to 16-bit unsigned conversion.

For common parameter descriptions, see *Common parameters for nppiScale to higher bit depth functions:*.

NppStatus **nppiScale_8u16u_AC4R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *Npp16u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four channel 8-bit unsigned to 16-bit unsigned conversion, not affecting Alpha.

For common parameter descriptions, see *Common parameters for nppiScale to higher bit depth functions:*.

NppStatus **nppiScale_8u16s_C1R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *Npp16s* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Single channel 8-bit unsigned to 16-bit signed conversion.

For common parameter descriptions, see *Common parameters for nppiScale to higher bit depth functions:*.

NppStatus **nppiScale_8u16s_C3R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *Npp16s* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Three channel 8-bit unsigned to 16-bit signed conversion.

For common parameter descriptions, see *Common parameters for nppiScale to higher bit depth functions:*.

NppStatus **nppiScale_8u16s_C4R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *Npp16s* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four channel 8-bit unsigned to 16-bit signed conversion.

For common parameter descriptions, see *Common parameters for nppiScale to higher bit depth functions:*.

NppStatus **nppiScale_8u16s_AC4R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *Npp16s* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four channel 8-bit unsigned to 16-bit signed conversion, not affecting Alpha.

For common parameter descriptions, see *Common parameters for nppiScale to higher bit depth functions:*.

NppStatus **nppiScale_8u32s_C1R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *Npp32s* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Single channel 8-bit unsigned to 32-bit signed conversion.

For common parameter descriptions, see *Common parameters for nppiScale to higher bit depth functions:*.

NppStatus **nppiScale_8u32s_C3R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *Npp32s* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Three channel 8-bit unsigned to 32-bit signed conversion.

For common parameter descriptions, see *Common parameters for nppiScale to higher bit depth functions:*.

NppStatus **nppiScale_8u32s_C4R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *Npp32s* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four channel 8-bit unsigned to 32-bit signed conversion.

For common parameter descriptions, see *Common parameters for nppiScale to higher bit depth functions:*.

NppStatus **nppiScale_8u32s_AC4R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *Npp32s* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four channel 8-bit unsigned to 32-bit signed conversion, not affecting Alpha.

For common parameter descriptions, see *Common parameters for nppiScale to higher bit depth functions:*.

NppStatus **nppiScale_8u32f_C1R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *Npp32f* *pDst, int nDstStep, *NppiSize* oSizeROI, *Npp32f* nMin, *Npp32f* nMax, *NppStreamContext* nppStreamCtx)

Single channel 8-bit unsigned to 32-bit floating-point conversion.

For common parameter descriptions, see *Common parameters for nppiScale to higher bit depth functions:*.

NppStatus **nppiScale_8u32f_C3R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *Npp32f* *pDst, int nDstStep, *NppiSize* oSizeROI, *Npp32f* nMin, *Npp32f* nMax, *NppStreamContext* nppStreamCtx)

Three channel 8-bit unsigned to 32-bit floating-point conversion.

For common parameter descriptions, see *Common parameters for nppiScale to higher bit depth functions:*.

NppStatus **nppiScale_8u32f_C4R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *Npp32f* *pDst, int nDstStep, *NppiSize* oSizeROI, *Npp32f* nMin, *Npp32f* nMax, *NppStreamContext* nppStreamCtx)

Four channel 8-bit unsigned to 32-bit floating-point conversion.

For common parameter descriptions, see *Common parameters for nppiScale to higher bit depth functions:*.

NppStatus **nppiScale_8u32f_AC4R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *Npp32f* *pDst, int nDstStep, *NppiSize* oSizeROI, *Npp32f* nMin, *Npp32f* nMax, *NppStreamContext* nppStreamCtx)

Four channel 8-bit unsigned to 32-bit floating-point conversion, not affecting Alpha.

For common parameter descriptions, see *Common parameters for nppiScale to higher bit depth functions:*.

1.9.20. Scale To Lower Bit Depth

Functions for scaling images to lower bit depth.

To map source pixel srcPixelValue to destination pixel dstPixelValue the following equation is used:

```
dstPixelValue = dstMinRangeValue + scaleFactor * (srcPixelValue - srcMinRangeValue)
```

where scaleFactor = (dstMaxRangeValue - dstMinRangeValue) / (srcMaxRangeValue - srcMinRangeValue).

For conversions between integer data types, the entire integer numeric range of the input data type is mapped onto the entire integer numeric range of the output data type.

For conversions to floating point data types the floating point data range is defined by the user supplied floating point values of nMax and nMin which are used as the dstMaxRangeValue and dstMinRangeValue respectively in the scaleFactor and dstPixelValue calculations and also as the saturation values to which output data is clamped.

When converting from floating-point values to integer values, nMax and nMin are used as the srcMaxRangeValue and srcMinRangeValue respectively in the scaleFactor and dstPixelValue calculations. Output values are saturated and clamped to the full output integer pixel value range.

1.9.20.1 Common parameters for nppiScale to lower bit depth functions:

param pSrc
Source-Image Pointer.

param nSrcStep
Source-Image Line Step.

param pDst
Destination-Image Pointer.

param nDstStep
Destination-Image Line Step.

param oSizeROI
Region-Of-Interest (ROI).

param hint
algorithm performance or accuracy selector, currently ignored

param nMin
specifies the minimum saturation value to which every output value will be clamped.

param nMax
specifies the maximum saturation value to which every output value will be clamped.

param nppStreamCtx
Application Managed Stream Context.

return
Image Data Related Error Codes, *ROI Related Error Codes*, NPP_SCALE_RANGE_ERROR indicates an error condition if nMax <= nMin.

Functions

NppStatus **nppiScale_16u8u_C1R_Ctx**(const *Npp16u* *pSrc, int nSrcStep, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppHintAlgorithm* hint, *NppStreamContext* nppStreamCtx)

Single channel 16-bit unsigned to 8-bit unsigned conversion.

For common parameter descriptions, see *Common parameters for nppiScale to lower bit depth functions:*.

NppStatus **nppiScale_16u8u_C3R_Ctx**(const *Npp16u* *pSrc, int nSrcStep, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppHintAlgorithm* hint, *NppStreamContext* nppStreamCtx)

Three channel 16-bit unsigned to 8-bit unsigned conversion.

For common parameter descriptions, see *Common parameters for nppiScale to lower bit depth functions:*.

NppStatus **nppiScale_16u8u_C4R_Ctx**(const *Npp16u* *pSrc, int nSrcStep, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppHintAlgorithm* hint, *NppStreamContext* nppStreamCtx)

Four channel 16-bit unsigned to 8-bit unsigned conversion.

For common parameter descriptions, see *Common parameters for nppiScale to lower bit depth functions:*.

NppStatus **nppiScale_16u8u_AC4R_Ctx**(const *Npp16u* *pSrc, int nSrcStep, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppHintAlgorithm* hint, *NppStreamContext* nppStreamCtx)

Four channel 16-bit unsigned to 8-bit unsigned conversion, not affecting Alpha.

For common parameter descriptions, see *Common parameters for nppiScale to lower bit depth functions:*.

NppStatus **nppiScale_16s8u_C1R_Ctx**(const *Npp16s* *pSrc, int nSrcStep, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppHintAlgorithm* hint, *NppStreamContext* nppStreamCtx)

Single channel 16-bit signed to 8-bit unsigned conversion.

For common parameter descriptions, see *Common parameters for nppiScale to lower bit depth functions:*.

NppStatus **nppiScale_16s8u_C3R_Ctx**(const *Npp16s* *pSrc, int nSrcStep, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppHintAlgorithm* hint, *NppStreamContext* nppStreamCtx)

Three channel 16-bit signed to 8-bit unsigned conversion.

For common parameter descriptions, see *Common parameters for nppiScale to lower bit depth functions:*.

NppStatus **nppiScale_16s8u_C4R_Ctx**(const *Npp16s* *pSrc, int nSrcStep, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppHintAlgorithm* hint, *NppStreamContext* nppStreamCtx)

Four channel 16-bit signed to 8-bit unsigned conversion.

For common parameter descriptions, see *Common parameters for nppiScale to lower bit depth functions:*.

NppStatus **nppiScale_16s8u_AC4R_Ctx**(const *Npp16s* *pSrc, int nSrcStep, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppHintAlgorithm* hint, *NppStreamContext* nppStreamCtx)

Four channel 16-bit signed to 8-bit unsigned conversion, not affecting Alpha.

For common parameter descriptions, see *Common parameters for nppiScale to lower bit depth functions:*.

NppStatus **nppiScale_32s8u_C1R_Ctx**(const *Npp32s* *pSrc, int nSrcStep, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppHintAlgorithm* hint, *NppStreamContext* nppStreamCtx)

Single channel 32-bit signed to 8-bit unsigned conversion.

For common parameter descriptions, see *Common parameters for nppiScale to lower bit depth functions:*.

NppStatus **nppiScale_32s8u_C3R_Ctx**(const *Npp32s* *pSrc, int nSrcStep, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppHintAlgorithm* hint, *NppStreamContext* nppStreamCtx)

Three channel 32-bit signed to 8-bit unsigned conversion.

For common parameter descriptions, see *Common parameters for nppiScale to lower bit depth functions:*.

NppStatus **nppiScale_32s8u_C4R_Ctx**(const *Npp32s* *pSrc, int nSrcStep, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppHintAlgorithm* hint, *NppStreamContext* nppStreamCtx)

Four channel 32-bit signed to 8-bit unsigned conversion.

For common parameter descriptions, see *Common parameters for nppiScale to lower bit depth functions:*.

NppStatus **nppiScale_32s8u_AC4R_Ctx**(const *Npp32s* *pSrc, int nSrcStep, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppHintAlgorithm* hint, *NppStreamContext* nppStreamCtx)

Four channel 32-bit signed to 8-bit unsigned conversion, not affecting Alpha.

For common parameter descriptions, see *Common parameters for nppiScale to lower bit depth functions:*.

NppStatus **nppiScale_32f8u_C1R_Ctx**(const *Npp32f* *pSrc, int nSrcStep, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, *Npp32f* nMin, *Npp32f* nMax, *NppStreamContext* nppStreamCtx)

Single channel 32-bit floating point to 8-bit unsigned conversion.

For common parameter descriptions, see *Common parameters for nppiScale to lower bit depth functions:*.

NppStatus **nppiScale_32f8u_C3R_Ctx**(const *Npp32f* *pSrc, int nSrcStep, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, *Npp32f* nMin, *Npp32f* nMax, *NppStreamContext* nppStreamCtx)

Three channel 32-bit floating point to 8-bit unsigned conversion.

For common parameter descriptions, see *Common parameters for nppiScale to lower bit depth functions:*.

NppStatus **nppiScale_32f8u_C4R_Ctx**(const *Npp32f* *pSrc, int nSrcStep, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, *Npp32f* nMin, *Npp32f* nMax, *NppStreamContext* nppStreamCtx)

Four channel 32-bit floating point to 8-bit unsigned conversion.

For common parameter descriptions, see *Common parameters for nppiScale to lower bit depth functions:*.

NppStatus **nppiScale_32f8u_AC4R_Ctx**(const *Npp32f* *pSrc, int nSrcStep, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, *Npp32f* nMin, *Npp32f* nMax, *NppStreamContext* nppStreamCtx)

Four channel 32-bit floating point to 8-bit unsigned conversion, not affecting Alpha.

For common parameter descriptions, see *Common parameters for nppiScale to lower bit depth functions:*.

1.9.21. Duplicate Channel

Functions for duplicating a single channel image in a multiple channel image.

1.9.21.1 Common parameters for nppiDup functions:

param pSrc
Source-Image Pointer.

param nSrcStep
Source-Image Line Step.

param pDst
Destination-Image Pointer.

param nDstStep
Destination-Image Line Step.

param oDstSizeROI
Size (width, height) of the destination region, i.e. the region that gets filled with data from the source image, source image ROI is assumed to be same as destination image ROI.

param nppStreamCtx
Application Managed Stream Context.

return
Image Data Related Error Codes, *ROI Related Error Codes*

Functions

NppStatus **nppiDup_8u_C1C3R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *Npp8u* *pDst, int nDstStep, *NppiSize* oDstSizeROI, *NppStreamContext* nppStreamCtx)

1 channel 8-bit unsigned integer source image duplicated in all 3 channels of destination image.

For common parameter descriptions, see *Common parameters for nppiDup functions:*.

NppStatus **nppiDup_8u_C1C4R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *Npp8u* *pDst, int nDstStep, *NppiSize* oDstSizeROI, *NppStreamContext* nppStreamCtx)

1 channel 8-bit unsigned integer source image duplicated in all 4 channels of destination image.

For common parameter descriptions, see *Common parameters for nppiDup functions:*.

NppStatus **nppiDup_8u_C1AC4R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *Npp8u* *pDst, int nDstStep, *NppiSize* oDstSizeROI, *NppStreamContext* nppStreamCtx)

1 channel 8-bit unsigned integer source image duplicated in 3 channels of 4 channel destination image with alpha channel unaffected.

For common parameter descriptions, see *Common parameters for nppiDup functions:*.

NppStatus **nppiDup_16u_C1C3R_Ctx**(const *Npp16u* *pSrc, int nSrcStep, *Npp16u* *pDst, int nDstStep, *NppiSize* oDstSizeROI, *NppStreamContext* nppStreamCtx)

1 channel 16-bit unsigned integer source image duplicated in all 3 channels of destination image.

For common parameter descriptions, see *Common parameters for nppiDup functions:*.

NppStatus **nppiDup_16u_C1C4R_Ctx**(const *Npp16u* *pSrc, int nSrcStep, *Npp16u* *pDst, int nDstStep, *NppiSize* oDstSizeROI, *NppStreamContext* nppStreamCtx)

1 channel 16-bit unsigned integer source image duplicated in all 4 channels of destination image.

For common parameter descriptions, see *Common parameters for nppiDup functions:*.

NppStatus **nppiDup_16u_C1AC4R_Ctx**(const *Npp16u* *pSrc, int nSrcStep, *Npp16u* *pDst, int nDstStep, *NppiSize* oDstSizeROI, *NppStreamContext* nppStreamCtx)

1 channel 16-bit unsigned integer source image duplicated in 3 channels of 4 channel destination image with alpha channel unaffected.

For common parameter descriptions, see *Common parameters for nppiDup functions:*.

NppStatus **nppiDup_16s_C1C3R_Ctx**(const *Npp16s* *pSrc, int nSrcStep, *Npp16s* *pDst, int nDstStep, *NppiSize* oDstSizeROI, *NppStreamContext* nppStreamCtx)

1 channel 16-bit signed integer source image duplicated in all 3 channels of destination image.

For common parameter descriptions, see *Common parameters for nppiDup functions:*.

NppStatus **nppiDup_16s_C1C4R_Ctx**(const *Npp16s* *pSrc, int nSrcStep, *Npp16s* *pDst, int nDstStep, *NppiSize* oDstSizeROI, *NppStreamContext* nppStreamCtx)

1 channel 16-bit signed integer source image duplicated in all 4 channels of destination image.

For common parameter descriptions, see *Common parameters for nppiDup functions:*.

NppStatus **nppiDup_16s_C1AC4R_Ctx**(const *Npp16s* *pSrc, int nSrcStep, *Npp16s* *pDst, int nDstStep, *NppiSize* oDstSizeROI, *NppStreamContext* nppStreamCtx)

1 channel 16-bit signed integer source image duplicated in 3 channels of 4 channel destination image with alpha channel unaffected.

For common parameter descriptions, see *Common parameters for nppiDup functions:*.

NppStatus **nppiDup_32s_C1C3R_Ctx**(const *Npp32s* *pSrc, int nSrcStep, *Npp32s* *pDst, int nDstStep, *NppiSize* oDstSizeROI, *NppStreamContext* nppStreamCtx)

1 channel 32-bit signed integer source image duplicated in all 3 channels of destination image.

For common parameter descriptions, see *Common parameters for nppiDup functions:*.

NppStatus **nppiDup_32s_C1C4R_Ctx**(const *Npp32s* *pSrc, int nSrcStep, *Npp32s* *pDst, int nDstStep, *NppiSize* oDstSizeROI, *NppStreamContext* nppStreamCtx)

1 channel 32-bit signed integer source image duplicated in all 4 channels of destination image.

For common parameter descriptions, see *Common parameters for nppiDup functions:*.

NppStatus **nppiDup_32s_C1AC4R_Ctx**(const *Npp32s* *pSrc, int nSrcStep, *Npp32s* *pDst, int nDstStep, *NppiSize* oDstSizeROI, *NppStreamContext* nppStreamCtx)

1 channel 32-bit signed integer source image duplicated in 3 channels of 4 channel destination image with alpha channel unaffected.

For common parameter descriptions, see *Common parameters for nppiDup functions:*.

NppStatus **nppiDup_32f_C1C3R_Ctx**(const *Npp32f* *pSrc, int nSrcStep, *Npp32f* *pDst, int nDstStep, *NppiSize* oDstSizeROI, *NppStreamContext* nppStreamCtx)

1 channel 32-bit floating point source image duplicated in all 3 channels of destination image.

For common parameter descriptions, see *Common parameters for nppiDup functions:*.

NppStatus **nppiDup_32f_C1C4R_Ctx**(const *Npp32f* *pSrc, int nSrcStep, *Npp32f* *pDst, int nDstStep, *NppiSize* oDstSizeROI, *NppStreamContext* nppStreamCtx)

1 channel 32-bit floating point source image duplicated in all 4 channels of destination image.

For common parameter descriptions, see *Common parameters for nppiDup functions:*.

NppStatus **nppiDup_32f_C1AC4R_Ctx**(const *Npp32f* *pSrc, int nSrcStep, *Npp32f* *pDst, int nDstStep, *NppiSize* oDstSizeROI, *NppStreamContext* nppStreamCtx)

1 channel 32-bit floating point source image duplicated in 3 channels of 4 channel destination image with alpha channel unaffected.

For common parameter descriptions, see *Common parameters for nppiDup functions:*.

1.9.22. Transpose

Functions for transposing images of various types. Like matrix transpose, image transpose is a mirror along the image's diagonal (upper-left to lower-right corner).

1.9.22.1 Common parameters for nppiTranspose functions:

param pSrc
Source-Image Pointer.

param nSrcStep
Source-Image Line Step.

param pDst
Pointer to the destination ROI.

param nDstStep
Destination-Image Line Step.

param oSrcROI
Region-Of-Interest (ROI).

param nppStreamCtx
Application Managed Stream Context.

return
Image Data Related Error Codes, *ROI Related Error Codes*

Functions

NppStatus **nppiTranspose_8u_C1R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *Npp8u* *pDst, int nDstStep, *NppiSize* oSrcROI, *NppStreamContext* nppStreamCtx)

1 channel 8-bit unsigned int image transpose.

For common parameter descriptions, see *Common parameters for nppiTranspose functions:*.

NppStatus **nppiTranspose_8u_C3R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *Npp8u* *pDst, int nDstStep, *NppiSize* oSrcROI, *NppStreamContext* nppStreamCtx)

3 channel 8-bit unsigned int image transpose.

For common parameter descriptions, see *Common parameters for nppiTranspose functions:*.

NppStatus **nppiTranspose_8u_C4R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *Npp8u* *pDst, int nDstStep, *NppiSize* oSrcROI, *NppStreamContext* nppStreamCtx)

4 channel 8-bit unsigned int image transpose.

For common parameter descriptions, see *Common parameters for nppiTranspose functions:*.

NppStatus **nppiTranspose_16u_C1R_Ctx**(const *Npp16u* *pSrc, int nSrcStep, *Npp16u* *pDst, int nDstStep, *NppiSize* oSrcROI, *NppStreamContext* nppStreamCtx)

1 channel 16-bit unsigned int image transpose.

For common parameter descriptions, see *Common parameters for nppiTranspose functions:*.

NppStatus **nppiTranspose_16u_C3R_Ctx**(const *Npp16u* *pSrc, int nSrcStep, *Npp16u* *pDst, int nDstStep, *NppiSize* oSrcROI, *NppStreamContext* nppStreamCtx)

3 channel 16-bit unsigned int image transpose.

For common parameter descriptions, see *Common parameters for nppiTranspose functions:*.

NppStatus **nppiTranspose_16u_C4R_Ctx**(const *Npp16u* *pSrc, int nSrcStep, *Npp16u* *pDst, int nDstStep, *NppiSize* oSrcROI, *NppStreamContext* nppStreamCtx)

4 channel 16-bit unsigned int image transpose.

For common parameter descriptions, see *Common parameters for nppiTranspose functions:*.

NppStatus **nppiTranspose_16s_C1R_Ctx**(const *Npp16s* *pSrc, int nSrcStep, *Npp16s* *pDst, int nDstStep, *NppiSize* oSrcROI, *NppStreamContext* nppStreamCtx)

1 channel 16-bit signed int image transpose.

For common parameter descriptions, see *Common parameters for nppiTranspose functions:*.

NppStatus **nppiTranspose_16s_C3R_Ctx**(const *Npp16s* *pSrc, int nSrcStep, *Npp16s* *pDst, int nDstStep, *NppiSize* oSrcROI, *NppStreamContext* nppStreamCtx)

3 channel 16-bit signed int image transpose.

For common parameter descriptions, see *Common parameters for nppiTranspose functions:*.

NppStatus **nppiTranspose_16s_C4R_Ctx**(const *Npp16s* *pSrc, int nSrcStep, *Npp16s* *pDst, int nDstStep, *NppiSize* oSrcROI, *NppStreamContext* nppStreamCtx)

4 channel 16-bit signed int image transpose.

For common parameter descriptions, see *Common parameters for nppiTranspose functions:*.

NppStatus **nppiTranspose_32s_C1R_Ctx**(const *Npp32s* *pSrc, int nSrcStep, *Npp32s* *pDst, int nDstStep, *NppiSize* oSrcROI, *NppStreamContext* nppStreamCtx)

1 channel 32-bit signed int image transpose.

For common parameter descriptions, see *Common parameters for nppiTranspose functions:*.

NppStatus **nppiTranspose_32s_C3R_Ctx**(const *Npp32s* *pSrc, int nSrcStep, *Npp32s* *pDst, int nDstStep, *NppiSize* oSrcROI, *NppStreamContext* nppStreamCtx)

3 channel 32-bit signed int image transpose.

For common parameter descriptions, see *Common parameters for nppiTranspose functions:*.

NppStatus **nppiTranspose_32s_C4R_Ctx**(const *Npp32s* *pSrc, int nSrcStep, *Npp32s* *pDst, int nDstStep, *NppiSize* oSrcROI, *NppStreamContext* nppStreamCtx)

4 channel 32-bit signed int image transpose.

For common parameter descriptions, see *Common parameters for nppiTranspose functions:*.

NppStatus **nppiTranspose_32f_C1R_Ctx**(const *Npp32f* *pSrc, int nSrcStep, *Npp32f* *pDst, int nDstStep, *NppiSize* oSrcROI, *NppStreamContext* nppStreamCtx)

1 channel 32-bit floating point image transpose.

For common parameter descriptions, see *Common parameters for nppiTranspose functions:*.

NppStatus **nppiTranspose_32f_C3R_Ctx**(const *Npp32f* *pSrc, int nSrcStep, *Npp32f* *pDst, int nDstStep, *NppiSize* oSrcROI, *NppStreamContext* nppStreamCtx)

3 channel 32-bit floating point image transpose.

For common parameter descriptions, see *Common parameters for nppiTranspose functions:*.

NppStatus **nppiTranspose_32f_C4R_Ctx**(const *Npp32f* *pSrc, int nSrcStep, *Npp32f* *pDst, int nDstStep, *NppiSize* oSrcROI, *NppStreamContext* nppStreamCtx)

4 channel 32-bit floating point image transpose.

For common parameter descriptions, see *Common parameters for nppiTranspose functions:*.

1.9.23. Swap Channels

Functions for swapping and duplicating channels in multiple channel images. The methods support arbitrary permutations of the original channels, including replication and setting one or more channels to a constant value.

Functions

NppStatus **nppiSwapChannels_8u_C3R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, const int aDstOrder[3], *NppStreamContext* nppStreamCtx)

3 channel 8-bit unsigned integer source image to 3 channel destination image.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **aDstOrder** – Host memory integer array describing how channel values are permutated. The n-th entry of the array contains the number of the channel that is stored in the n-th channel of the output image. E.g. Given an RGB image, aDstOrder = [2,1,0] converts this to BGR channel order.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiSwapChannels_8u_C3IR_Ctx**(*Npp8u* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, const int aDstOrder[3], *NppStreamContext* nppStreamCtx)

3 channel 8-bit unsigned integer in place image.

Parameters

- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **aDstOrder** – Host memory integer array describing how channel values are permutated. The n-th entry of the array contains the number of the channel that is stored in the n-th channel of the output image. E.g. Given an RGB image, aDstOrder = [2,1,0] converts this to BGR channel order.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiSwapChannels_8u_C4C3R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, const int aDstOrder[3], *NppStreamContext* nppStreamCtx)

4 channel 8-bit unsigned integer source image to 3 channel destination image.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **aDstOrder** – Host memory integer array describing how channel values are permutated. The n-th entry of the array contains the number of the channel that is stored in the n-th channel of the output image. E.g. Given an RGBA image, aDstOrder = [2,1,0] converts this to a 3 channel BGR channel order.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiSwapChannels_8u_C4R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, const int aDstOrder[4], *NppStreamContext* nppStreamCtx)

4 channel 8-bit unsigned integer source image to 4 channel destination image.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.

- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **aDstOrder** – Host memory integer array describing how channel values are permutated. The n-th entry of the array contains the number of the channel that is stored in the n-th channel of the output image. E.g. Given an ARGB image, aDstOrder = [3,2,1,0] converts this to BGRA channel order.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiSwapChannels_8u_C4IR_Ctx**(*Npp8u* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, const int aDstOrder[4], *NppStreamContext* nppStreamCtx)

4 channel 8-bit unsigned integer in place image.

Parameters

- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **aDstOrder** – Host memory integer array describing how channel values are permutated. The n-th entry of the array contains the number of the channel that is stored in the n-th channel of the output image. E.g. Given an ARGB image, aDstOrder = [3,2,1,0] converts this to BGRA channel order.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiSwapChannels_8u_C3C4R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, const int aDstOrder[4], const *Npp8u* nValue, *NppStreamContext* nppStreamCtx)

3 channel 8-bit unsigned integer source image to 4 channel destination image.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **aDstOrder** – Host memory integer array describing how channel values are permutated. The n-th entry of the array contains the number of the channel that is stored in the n-th channel of the output image. E.g. Given an RGB image, aDstOrder = [3,2,1,0] converts this to VBGR channel order.

- **nValue** – (V) Single channel constant value that can be replicated in one or more of the 4 destination channels. nValue is either written or not written to a particular channel depending on the aDstOrder entry for that destination channel. An aDstOrder value of 3 will output nValue to that channel, an aDstOrder value greater than 3 will leave that particular destination channel value unmodified.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiSwapChannels_8u_AC4R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, const int aDstOrder[3], *NppStreamContext* nppStreamCtx)

4 channel 8-bit unsigned integer source image to 4 channel destination image with destination alpha channel unaffected.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **aDstOrder** – Host memory integer array describing how channel values are permutated. The n-th entry of the array contains the number of the channel that is stored in the n-th channel of the output image. E.g. Given an RGB image, aDstOrder = [3,2,1,0] converts this to VBGR channel order. of the array contains the number of the channel that is stored in the n-th channel of the output image. E.g. Given an RGBA image, aDstOrder = [2,1,0] converts this to BGRA channel order. In the AC4R case, the alpha channel is always assumed to be channel 3.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiSwapChannels_16u_C3R_Ctx**(const *Npp16u* *pSrc, int nSrcStep, *Npp16u* *pDst, int nDstStep, *NppiSize* oSizeROI, const int aDstOrder[3], *NppStreamContext* nppStreamCtx)

3 channel 16-bit unsigned integer source image to 3 channel destination image.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.

- **aDstOrder** – Host memory integer array describing how channel values are permutated. The n-th entry of the array contains the number of the channel that is stored in the n-th channel of the output image. E.g. Given an RGB image, aDstOrder = [2,1,0] converts this to BGR channel order.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiSwapChannels_16u_C3IR_Ctx**(*Npp16u* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, const int aDstOrder[3], *NppStreamContext* nppStreamCtx)

3 channel 16-bit unsigned integer in place image.

Parameters

- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **aDstOrder** – Host memory integer array describing how channel values are permutated. The n-th entry of the array contains the number of the channel that is stored in the n-th channel of the output image. E.g. Given an RGB image, aDstOrder = [2,1,0] converts this to BGR channel order.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiSwapChannels_16u_C4C3R_Ctx**(const *Npp16u* *pSrc, int nSrcStep, *Npp16u* *pDst, int nDstStep, *NppiSize* oSizeROI, const int aDstOrder[3], *NppStreamContext* nppStreamCtx)

4 channel 16-bit unsigned integer source image to 3 channel destination image.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **aDstOrder** – Host memory integer array describing how channel values are permutated. The n-th entry of the array contains the number of the channel that is stored in the n-th channel of the output image. E.g. Given an RGBA image, aDstOrder = [2,1,0] converts this to a 3 channel BGR channel order.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiSwapChannels_16u_C4R_Ctx**(const *Npp16u* *pSrc, int nSrcStep, *Npp16u* *pDst, int nDstStep, *NppiSize* oSizeROI, const int aDstOrder[4], *NppStreamContext* nppStreamCtx)

4 channel 16-bit unsigned integer source image to 4 channel destination image.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **aDstOrder** – Host memory integer array describing how channel values are permutated. The n-th entry of the array contains the number of the channel that is stored in the n-th channel of the output image. E.g. Given an ARGB image, aDstOrder = [3,2,1,0] converts this to BGRA channel order.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiSwapChannels_16u_C4IR_Ctx**(*Npp16u* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, const int aDstOrder[4], *NppStreamContext* nppStreamCtx)

4 channel 16-bit unsigned integer in place image.

Parameters

- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **aDstOrder** – Host memory integer array describing how channel values are permutated. The n-th entry of the array contains the number of the channel that is stored in the n-th channel of the output image. E.g. Given an ARGB image, aDstOrder = [3,2,1,0] converts this to BGRA channel order.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiSwapChannels_16u_C3C4R_Ctx**(const *Npp16u* *pSrc, int nSrcStep, *Npp16u* *pDst, int nDstStep, *NppiSize* oSizeROI, const int aDstOrder[4], const *Npp16u* nValue, *NppStreamContext* nppStreamCtx)

3 channel 16-bit unsigned integer source image to 4 channel destination image.

Parameters

- **pSrc** – *Source-Image Pointer*.

- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **aDstOrder** – Host memory integer array describing how channel values are permutated. The n-th entry of the array contains the number of the channel that is stored in the n-th channel of the output image. E.g. Given an RGB image, aDstOrder = [3,2,1,0] converts this to VBGR channel order.
- **nValue** – (V) Single channel constant value that can be replicated in one or more of the 4 destination channels. nValue is either written or not written to a particular channel depending on the aDstOrder entry for that destination channel. An aDstOrder value of 3 will output nValue to that channel, an aDstOrder value greater than 3 will leave that particular destination channel value unmodified.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiSwapChannels_16u_AC4R_Ctx**(const *Npp16u* *pSrc, int nSrcStep, *Npp16u* *pDst, int nDstStep, *NppiSize* oSizeROI, const int aDstOrder[3], *NppStreamContext* nppStreamCtx)

4 channel 16-bit unsigned integer source image to 4 channel destination image with destination alpha channel unaffected.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **aDstOrder** – Host memory integer array describing how channel values are permutated. The n-th entry of the array contains the number of the channel that is stored in the n-th channel of the output image. E.g. Given an RGBA image, aDstOrder = [2,1,0] converts this to BGRA channel order. In the AC4R case, the alpha channel is always assumed to be channel 3.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiSwapChannels_16s_C3R_Ctx**(const *Npp16s* *pSrc, int nSrcStep, *Npp16s* *pDst, int nDstStep, *NppiSize* oSizeROI, const int aDstOrder[3], *NppStreamContext* nppStreamCtx)

3 channel 16-bit signed integer source image to 3 channel destination image.

Parameters

- **pSrc** – *Source-Image Pointer*.

- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **aDstOrder** – Host memory integer array describing how channel values are permutated. The n-th entry of the array contains the number of the channel that is stored in the n-th channel of the output image. E.g. Given an RGB image, aDstOrder = [2,1,0] converts this to BGR channel order.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiSwapChannels_16s_C3IR_Ctx**(*Npp16s* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, const int aDstOrder[3], *NppStreamContext* nppStreamCtx)

3 channel 16-bit signed integer in place image.

Parameters

- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **aDstOrder** – Host memory integer array describing how channel values are permutated. The n-th entry of the array contains the number of the channel that is stored in the n-th channel of the output image. E.g. Given an RGB image, aDstOrder = [2,1,0] converts this to BGR channel order.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiSwapChannels_16s_C4C3R_Ctx**(const *Npp16s* *pSrc, int nSrcStep, *Npp16s* *pDst, int nDstStep, *NppiSize* oSizeROI, const int aDstOrder[3], *NppStreamContext* nppStreamCtx)

4 channel 16-bit signed integer source image to 3 channel destination image.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **aDstOrder** – Host memory integer array describing how channel values are permutated. The n-th entry of the array contains the number of the channel that is stored in the n-th channel of the output image. E.g. Given an RGBA image, aDstOrder = [2,1,0] converts this to a 3 channel BGR channel order.

- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiSwapChannels_16s_C4R_Ctx**(const *Npp16s* *pSrc, int nSrcStep, *Npp16s* *pDst, int nDstStep, *NppiSize* oSizeROI, const int aDstOrder[4], *NppStreamContext* nppStreamCtx)

4 channel 16-bit signed integer source image to 4 channel destination image.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **aDstOrder** – Host memory integer array describing how channel values are permutated. The n-th entry of the array contains the number of the channel that is stored in the n-th channel of the output image. E.g. Given an ARGB image, aDstOrder = [3,2,1,0] converts this to BGRA channel order.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiSwapChannels_16s_C4IR_Ctx**(*Npp16s* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, const int aDstOrder[4], *NppStreamContext* nppStreamCtx)

4 channel 16-bit signed integer in place image.

Parameters

- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **aDstOrder** – Host memory integer array describing how channel values are permutated. The n-th entry of the array contains the number of the channel that is stored in the n-th channel of the output image. E.g. Given an ARGB image, aDstOrder = [3,2,1,0] converts this to BGRA channel order.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiSwapChannels_16s_C3C4R_Ctx**(const *Npp16s* *pSrc, int nSrcStep, *Npp16s* *pDst, int nDstStep, *NppiSize* oSizeROI, const int aDstOrder[4], const *Npp16s* nValue, *NppStreamContext* nppStreamCtx)

3 channel 16-bit signed integer source image to 4 channel destination image.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **aDstOrder** – Host memory integer array describing how channel values are permutated. The n-th entry of the array contains the number of the channel that is stored in the n-th channel of the output image. E.g. Given an RGB image, aDstOrder = [3,2,1,0] converts this to VBGR channel order.
- **nValue** – (V) Single channel constant value that can be replicated in one or more of the 4 destination channels. nValue is either written or not written to a particular channel depending on the aDstOrder entry for that destination channel. An aDstOrder value of 3 will output nValue to that channel, an aDstOrder value greater than 3 will leave that particular destination channel value unmodified.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiSwapChannels_16s_AC4R_Ctx**(const *Npp16s* *pSrc, int nSrcStep, *Npp16s* *pDst, int nDstStep, *NppiSize* oSizeROI, const int aDstOrder[3], *NppStreamContext* nppStreamCtx)

4 channel 16-bit signed integer source image to 4 channel destination image with destination alpha channel unaffected.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **aDstOrder** – Host memory integer array describing how channel values are permutated. The n-th entry of the array contains the number of the channel that is stored in the n-th channel of the output image. E.g. Given an RGBA image, aDstOrder = [2,1,0] converts this to BGRA channel order. In the AC4R case, the alpha channel is always assumed to be channel 3.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiSwapChannels_32s_C3R_Ctx**(const *Npp32s* *pSrc, int nSrcStep, *Npp32s* *pDst, int nDstStep, *NppiSize* oSizeROI, const int aDstOrder[3], *NppStreamContext* nppStreamCtx)

3 channel 32-bit signed integer source image to 3 channel destination image.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **aDstOrder** – Host memory integer array describing how channel values are permutated. The n-th entry of the array contains the number of the channel that is stored in the n-th channel of the output image. E.g. Given an RGB image, aDstOrder = [2,1,0] converts this to BGR channel order.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiSwapChannels_32s_C3IR_Ctx**(*Npp32s* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, const int aDstOrder[3], *NppStreamContext* nppStreamCtx)

3 channel 32-bit signed integer in place image.

Parameters

- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **aDstOrder** – Host memory integer array describing how channel values are permutated. The n-th entry of the array contains the number of the channel that is stored in the n-th channel of the output image. E.g. Given an RGB image, aDstOrder = [2,1,0] converts this to BGR channel order.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiSwapChannels_32s_C4C3R_Ctx**(const *Npp32s* *pSrc, int nSrcStep, *Npp32s* *pDst, int nDstStep, *NppiSize* oSizeROI, const int aDstOrder[3], *NppStreamContext* nppStreamCtx)

4 channel 32-bit signed integer source image to 3 channel destination image.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.

- **aDstOrder** – Host memory integer array describing how channel values are permutated. The n-th entry of the array contains the number of the channel that is stored in the n-th channel of the output image. E.g. Given an RGBA image, aDstOrder = [2,1,0] converts this to a 3 channel BGR channel order.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiSwapChannels_32s_C4R_Ctx**(const *Npp32s* *pSrc, int nSrcStep, *Npp32s* *pDst, int nDstStep, *NppiSize* oSizeROI, const int aDstOrder[4], *NppStreamContext* nppStreamCtx)

4 channel 32-bit signed integer source image to 4 channel destination image.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **aDstOrder** – Host memory integer array describing how channel values are permutated. The n-th entry of the array contains the number of the channel that is stored in the n-th channel of the output image. E.g. Given an ARGB image, aDstOrder = [3,2,1,0] converts this to BGRA channel order.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiSwapChannels_32s_C4IR_Ctx**(*Npp32s* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, const int aDstOrder[4], *NppStreamContext* nppStreamCtx)

4 channel 32-bit signed integer in place image.

Parameters

- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **aDstOrder** – Host memory integer array describing how channel values are permutated. The n-th entry of the array contains the number of the channel that is stored in the n-th channel of the output image. E.g. Given an ARGB image, aDstOrder = [3,2,1,0] converts this to BGRA channel order.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiSwapChannels_32s_C3C4R_Ctx**(const *Npp32s* *pSrc, int nSrcStep, *Npp32s* *pDst, int nDstStep, *NppiSize* oSizeROI, const int aDstOrder[4], const *Npp32s* nValue, *NppStreamContext* nppStreamCtx)

3 channel 32-bit signed integer source image to 4 channel destination image.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **aDstOrder** – Host memory integer array describing how channel values are permutated. The n-th entry of the array contains the number of the channel that is stored in the n-th channel of the output image. E.g. Given an RGB image, aDstOrder = [3,2,1,0] converts this to VBGR channel order.
- **nValue** – (V) Single channel constant value that can be replicated in one or more of the 4 destination channels. nValue is either written or not written to a particular channel depending on the aDstOrder entry for that destination channel. An aDstOrder value of 3 will output nValue to that channel, an aDstOrder value greater than 3 will leave that particular destination channel value unmodified.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiSwapChannels_32s_AC4R_Ctx**(const *Npp32s* *pSrc, int nSrcStep, *Npp32s* *pDst, int nDstStep, *NppiSize* oSizeROI, const int aDstOrder[3], *NppStreamContext* nppStreamCtx)

4 channel 32-bit signed integer source image to 4 channel destination image with destination alpha channel unaffected.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **aDstOrder** – Host memory integer array describing how channel values are permutated. The n-th entry of the array contains the number of the channel that is stored in the n-th channel of the output image. E.g. Given an RGBA image, aDstOrder = [2,1,0] converts this to BGRA channel order. In the AC4R case, the alpha channel is always assumed to be channel 3.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiSwapChannels_32f_C3R_Ctx**(const *Npp32f* *pSrc, int nSrcStep, *Npp32f* *pDst, int nDstStep, *NppiSize* oSizeROI, const int aDstOrder[3], *NppStreamContext* nppStreamCtx)

3 channel 32-bit floating point source image to 3 channel destination image.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **aDstOrder** – Host memory integer array describing how channel values are permutated. The n-th entry of the array contains the number of the channel that is stored in the n-th channel of the output image. E.g. Given an RGB image, aDstOrder = [2,1,0] converts this to BGR channel order.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiSwapChannels_32f_C3IR_Ctx**(*Npp32f* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, const int aDstOrder[3], *NppStreamContext* nppStreamCtx)

3 channel 32-bit floating point in place image.

Parameters

- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – oSizeROI *Region-Of-Interest (ROI)*.
- **aDstOrder** – Host memory integer array describing how channel values are permutated. The n-th entry of the array contains the number of the channel that is stored in the n-th channel of the output image. E.g. Given an RGB image, aDstOrder = [2,1,0] converts this to BGR channel order.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiSwapChannels_32f_C4C3R_Ctx**(const *Npp32f* *pSrc, int nSrcStep, *Npp32f* *pDst, int nDstStep, *NppiSize* oSizeROI, const int aDstOrder[3], *NppStreamContext* nppStreamCtx)

4 channel 32-bit floating point source image to 3 channel destination image.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **aDstOrder** – Host memory integer array describing how channel values are permutated. The n-th entry of the array contains the number of the channel that is stored in the n-th channel of the output image. E.g. Given an RGBA image, aDstOrder = [2,1,0] converts this to a 3 channel BGR channel order.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiSwapChannels_32f_C4R_Ctx**(const *Npp32f* *pSrc, int nSrcStep, *Npp32f* *pDst, int nDstStep, *NppiSize* oSizeROI, const int aDstOrder[4], *NppStreamContext* nppStreamCtx)

4 channel 32-bit floating point source image to 4 channel destination image.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **aDstOrder** – Host memory integer array describing how channel values are permutated. The n-th entry of the array contains the number of the channel that is stored in the n-th channel of the output image. E.g. Given an ARGB image, aDstOrder = [3,2,1,0] converts this to BGRA channel order.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiSwapChannels_32f_C4IR_Ctx**(*Npp32f* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, const int aDstOrder[4], *NppStreamContext* nppStreamCtx)

4 channel 32-bit floating point in place image.

Parameters

- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **aDstOrder** – Host memory integer array describing how channel values are permutated. The n-th entry of the array contains the number of the channel that

is stored in the n-th channel of the output image. E.g. Given an ARGB image, aDstOrder = [3,2,1,0] converts this to BGRA channel order.

- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiSwapChannels_32f_C3C4R_Ctx**(const *Npp32f* *pSrc, int nSrcStep, *Npp32f* *pDst, int nDstStep, *NppiSize* oSizeROI, const int aDstOrder[4], const *Npp32f* nValue, *NppStreamContext* nppStreamCtx)

3 channel 32-bit floating point source image to 4 channel destination image.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **aDstOrder** – Host memory integer array describing how channel values are permutated. The n-th entry of the array contains the number of the channel that is stored in the n-th channel of the output image. E.g. Given an RGB image, aDstOrder = [3,2,1,0] converts this to VBGR channel order.
- **nValue** – (V) Single channel constant value that can be replicated in one or more of the 4 destination channels. nValue is either written or not written to a particular channel depending on the aDstOrder entry for that destination channel. An aDstOrder value of 3 will output nValue to that channel, an aDstOrder value greater than 3 will leave that particular destination channel value unmodified.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiSwapChannels_32f_AC4R_Ctx**(const *Npp32f* *pSrc, int nSrcStep, *Npp32f* *pDst, int nDstStep, *NppiSize* oSizeROI, const int aDstOrder[3], *NppStreamContext* nppStreamCtx)

4 channel 32-bit floating point source image to 4 channel destination image with destination alpha channel unaffected.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.

- **aDstOrder** – Host memory integer array describing how channel values are permutated. The n-th entry of the array contains the number of the channel that is stored in the n-th channel of the output image. E.g. Given an RGBA image, aDstOrder = [2,1,0] converts this to BGRA channel order. In the AC4R case, the alpha channel is always assumed to be channel 3.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

1.10. Image Filtering Functions

Linear and non-linear image filtering functions.

Filtering functions are classified as *Neighborhood Operations*. It is the user's responsibility to avoid *Sampling Beyond Image Boundaries* .

These functions can be found in the nppif library. Linking to only the sub-libraries that you use can significantly save link time, application load time, and CUDA runtime startup time when using dynamic libraries.

1.10.1. Image 1D Linear Filters

1.10.1.1 1DLinearFilter

The set of 1D linear filtering functions available in the library.

1.10.1.2 Image Filter Column

1.10.1.2.1 FilterColumn

Apply convolution filter with user specified 1D column of weights.

1.10.1.2.1.1 Common parameters for nppiFilterColumn functions:

Result pixel is equal to the sum of the products between the kernel coefficients (pKernel array) and corresponding neighboring column pixel values in the source image defined by nKernelDim and nAnchorY, divided by nDivisor.

param pSrc
Source-Image Pointer.

param nSrcStep
Source-Image Line Step.

param pDst
Destination-Image Pointer.

param nDstStep
Destination-Image Line Step.

param oROI
Region-Of-Interest (ROI).

param pKernel
Device memory pointer to the start address of the kernel coefficient array. Coefficients are expected to be stored in reverse order.

param nMaskSize
Length of the linear kernel array.

param nAnchor
Y offset of the kernel origin frame of reference relative to the source pixel.

param nDivisor
The factor by which the convolved summation from the Filter operation should be divided. If equal to the sum of coefficients, this will keep the maximum result value within full scale.

param nppStreamCtx
Application Managed Stream Context.

return
Image Data Related Error Codes, *ROI Related Error Codes*

Functions

NppStatus **nppiFilterColumn_8u_C1R_Ctx**(const *Npp8u* *pSrc, *Npp32s* nSrcStep, *Npp8u* *pDst, *Npp32s* nDstStep, *NppiSize* oROI, const *Npp32s* *pKernel, *Npp32s* nMaskSize, *Npp32s* nAnchor, *Npp32s* nDivisor, *NppStreamContext* nppStreamCtx)

8-bit unsigned single-channel 1D column convolution.

For common parameter descriptions, see *Common parameters for nppiFilterColumn functions:*.

NppStatus **nppiFilterColumn_8u_C3R_Ctx**(const *Npp8u* *pSrc, *Npp32s* nSrcStep, *Npp8u* *pDst, *Npp32s* nDstStep, *NppiSize* oROI, const *Npp32s* *pKernel, *Npp32s* nMaskSize, *Npp32s* nAnchor, *Npp32s* nDivisor, *NppStreamContext* nppStreamCtx)

8-bit unsigned three-channel 1D column convolution.

For common parameter descriptions, see *Common parameters for nppiFilterColumn functions:*.

NppStatus **nppiFilterColumn_8u_C4R_Ctx**(const *Npp8u* *pSrc, *Npp32s* nSrcStep, *Npp8u* *pDst, *Npp32s* nDstStep, *NppiSize* oROI, const *Npp32s* *pKernel, *Npp32s* nMaskSize, *Npp32s* nAnchor, *Npp32s* nDivisor, *NppStreamContext* nppStreamCtx)

8-bit unsigned four-channel 1D column convolution.

For common parameter descriptions, see *Common parameters for nppiFilterColumn functions:*.

NppStatus **nppiFilterColumn_8u_AC4R_Ctx**(const *Npp8u* *pSrc, *Npp32s* nSrcStep, *Npp8u* *pDst, *Npp32s* nDstStep, *NppiSize* oROI, const *Npp32s* *pKernel, *Npp32s* nMaskSize, *Npp32s* nAnchor, *Npp32s* nDivisor, *NppStreamContext* nppStreamCtx)

8-bit unsigned four-channel 1D column convolution ignoring alpha-channel.

For common parameter descriptions, see *Common parameters for nppiFilterColumn functions:*.

NppStatus **nppiFilterColumn_16u_C1R_Ctx**(const *Npp16u* *pSrc, *Npp32s* nSrcStep, *Npp16u* *pDst, *Npp32s* nDstStep, *NppiSize* oROI, const *Npp32s* *pKernel, *Npp32s* nMaskSize, *Npp32s* nAnchor, *Npp32s* nDivisor, *NppStreamContext* nppStreamCtx)

16-bit unsigned single-channel 1D column convolution.

For common parameter descriptions, see *Common parameters for nppiFilterColumn functions:*.

NppStatus **nppiFilterColumn_16u_C3R_Ctx**(const *Npp16u* *pSrc, *Npp32s* nSrcStep, *Npp16u* *pDst, *Npp32s* nDstStep, *NppiSize* oROI, const *Npp32s* *pKernel, *Npp32s* nMaskSize, *Npp32s* nAnchor, *Npp32s* nDivisor, *NppStreamContext* nppStreamCtx)

16-bit unsigned three-channel 1D column convolution.

For common parameter descriptions, see *Common parameters for nppiFilterColumn functions:*.

NppStatus **nppiFilterColumn_16u_C4R_Ctx**(const *Npp16u* *pSrc, *Npp32s* nSrcStep, *Npp16u* *pDst, *Npp32s* nDstStep, *NppiSize* oROI, const *Npp32s* *pKernel, *Npp32s* nMaskSize, *Npp32s* nAnchor, *Npp32s* nDivisor, *NppStreamContext* nppStreamCtx)

16-bit unsigned four-channel 1D column convolution.

For common parameter descriptions, see *Common parameters for nppiFilterColumn functions:*.

NppStatus **nppiFilterColumn_16u_AC4R_Ctx**(const *Npp16u* *pSrc, *Npp32s* nSrcStep, *Npp16u* *pDst, *Npp32s* nDstStep, *NppiSize* oROI, const *Npp32s* *pKernel, *Npp32s* nMaskSize, *Npp32s* nAnchor, *Npp32s* nDivisor, *NppStreamContext* nppStreamCtx)

16-bit unsigned four-channel 1D column convolution ignoring alpha-channel.

For common parameter descriptions, see *Common parameters for nppiFilterColumn functions:*.

NppStatus **nppiFilterColumn_16s_C1R_Ctx**(const *Npp16s* *pSrc, *Npp32s* nSrcStep, *Npp16s* *pDst, *Npp32s* nDstStep, *NppiSize* oROI, const *Npp32s* *pKernel, *Npp32s* nMaskSize, *Npp32s* nAnchor, *Npp32s* nDivisor, *NppStreamContext* nppStreamCtx)

16-bit single-channel 1D column convolution.

For common parameter descriptions, see *Common parameters for nppiFilterColumn functions:*.

NppStatus **nppiFilterColumn_16s_C3R_Ctx**(const *Npp16s* *pSrc, *Npp32s* nSrcStep, *Npp16s* *pDst, *Npp32s* nDstStep, *NppiSize* oROI, const *Npp32s* *pKernel, *Npp32s* nMaskSize, *Npp32s* nAnchor, *Npp32s* nDivisor, *NppStreamContext* nppStreamCtx)

16-bit three-channel 1D column convolution.

For common parameter descriptions, see *Common parameters for nppiFilterColumn functions:*.

NppStatus **nppiFilterColumn_16s_C4R_Ctx**(const *Npp16s* *pSrc, *Npp32s* nSrcStep, *Npp16s* *pDst, *Npp32s* nDstStep, *NppiSize* oROI, const *Npp32s* *pKernel, *Npp32s* nMaskSize, *Npp32s* nAnchor, *Npp32s* nDivisor, *NppStreamContext* nppStreamCtx)

16-bit four-channel 1D column convolution.

For common parameter descriptions, see *Common parameters for nppiFilterColumn functions:*.

NppStatus **nppiFilterColumn_16s_AC4R_Ctx**(const *Npp16s* *pSrc, *Npp32s* nSrcStep, *Npp16s* *pDst, *Npp32s* nDstStep, *NppiSize* oROI, const *Npp32s* *pKernel, *Npp32s* nMaskSize, *Npp32s* nAnchor, *Npp32s* nDivisor, *NppStreamContext* nppStreamCtx)

16-bit four-channel 1D column convolution ignoring alpha-channel.

For common parameter descriptions, see *Common parameters for nppiFilterColumn functions:*.

NppStatus **nppiFilterColumn_32f_C1R_Ctx**(const *Npp32f* *pSrc, *Npp32s* nSrcStep, *Npp32f* *pDst, *Npp32s* nDstStep, *NppiSize* oROI, const *Npp32f* *pKernel, *Npp32s* nMaskSize, *Npp32s* nAnchor, *NppStreamContext* nppStreamCtx)

32-bit float single-channel 1D column convolution.

For common parameter descriptions, see *Common parameters for nppiFilterColumn functions:*.

NppStatus **nppiFilterColumn_32f_C3R_Ctx**(const *Npp32f* *pSrc, *Npp32s* nSrcStep, *Npp32f* *pDst, *Npp32s* nDstStep, *NppiSize* oROI, const *Npp32f* *pKernel, *Npp32s* nMaskSize, *Npp32s* nAnchor, *NppStreamContext* nppStreamCtx)

32-bit float three-channel 1D column convolution.

For common parameter descriptions, see *Common parameters for nppiFilterColumn functions:*.

NppStatus **nppiFilterColumn_32f_C4R_Ctx**(const *Npp32f* *pSrc, *Npp32s* nSrcStep, *Npp32f* *pDst, *Npp32s* nDstStep, *NppiSize* oROI, const *Npp32f* *pKernel, *Npp32s* nMaskSize, *Npp32s* nAnchor, *NppStreamContext* nppStreamCtx)

32-bit float four-channel 1D column convolution.

For common parameter descriptions, see *Common parameters for nppiFilterColumn functions:*.

NppStatus **nppiFilterColumn_32f_AC4R_Ctx**(const *Npp32f* *pSrc, *Npp32s* nSrcStep, *Npp32f* *pDst, *Npp32s* nDstStep, *NppiSize* oROI, const *Npp32f* *pKernel, *Npp32s* nMaskSize, *Npp32s* nAnchor, *NppStreamContext* nppStreamCtx)

32-bit float four-channel 1D column convolution ignoring alpha-channel.

For common parameter descriptions, see *Common parameters for nppiFilterColumn functions:*.

NppStatus **nppiFilterColumn_64f_C1R_Ctx**(const *Npp64f* *pSrc, *Npp32s* nSrcStep, *Npp64f* *pDst, *Npp32s* nDstStep, *NppiSize* oROI, const *Npp64f* *pKernel, *Npp32s* nMaskSize, *Npp32s* nAnchor, *NppStreamContext* nppStreamCtx)

64-bit float single-channel 1D column convolution.

For common parameter descriptions, see *Common parameters for nppiFilterColumn functions:*.

1.10.1.3 Image Filter Column Border

1.10.1.3.1 FilterColumnBorder

General purpose 1D convolution column filter with border control.

Pixels under the mask are multiplied by the respective weights in the mask and the results are summed. Before writing the result pixel the sum is scaled back via division by nDivisor. If any portion of the mask overlaps the source image boundary the requested border type operation is applied to all mask pixels which fall outside of the source image.

Currently only the NPP_BORDER_REPLICATE border type operation is supported.

1.10.1.3.1.1 Common parameters for nppiFilterColumnBorder functions:

param pSrc
Source-Image Pointer.

param nSrcStep
Source-Image Line Step.

param oSrcSize
Source image width and height in pixels relative to pSrc.

param oSrcOffset
The pixel offset that pSrc points to relative to the origin of the source image.

param pDst
Destination-Image Pointer.

param nDstStep
Destination-Image Line Step.

param oSizeROI
Region-Of-Interest (ROI).

param pKernel
Device memory pointer to the start address of the kernel coefficient array. Coeffcients are expected to be stored in reverse order.

param nMaskSize
Width of the kernel.

param nAnchor
X offset of the kernel origin frame of reference relative to the source pixel.

param nDivisor
The factor by which the convolved summation from the Filter operation should be divided. If equal to the sum of coefficients, this will keep the maximum result value within full scale.

param eBorderType
The border type operation to be applied at source image border boundaries.

param nppStreamCtx
Application Managed Stream Context.

return
Image Data Related Error Codes, *ROI Related Error Codes*

Functions

NppStatus **nppiFilterColumnBorder_8u_C1R_Ctx**(const *Npp8u* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp8u* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, const *Npp32s* *pKernel, *Npp32s* nMaskSize, *Npp32s* nAnchor, *Npp32s* nDivisor, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Single channel 8-bit unsigned 1D column convolution filter with border control.

For common parameter descriptions, see *Common parameters for nppiFilterColumnBorder functions:*.

NppStatus **nppiFilterColumnBorder_8u_C3R_Ctx**(const *Npp8u* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp8u* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, const *Npp32s* *pKernel, *Npp32s* nMaskSize, *Npp32s* nAnchor, *Npp32s* nDivisor, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Three channel 8-bit unsigned 1D column convolution filter with border control.

For common parameter descriptions, see *Common parameters for nppiFilterColumnBorder functions:*.

NppStatus **nppiFilterColumnBorder_8u_C4R_Ctx**(const *Npp8u* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp8u* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, const *Npp32s* *pKernel, *Npp32s* nMaskSize, *Npp32s* nAnchor, *Npp32s* nDivisor, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Four channel channel 8-bit unsigned 1D column convolution filter with border control.

For common parameter descriptions, see *Common parameters for nppiFilterColumnBorder functions:*.

NppStatus **nppiFilterColumnBorder_8u_AC4R_Ctx**(const *Npp8u* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp8u* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, const *Npp32s* *pKernel, *Npp32s* nMaskSize, *Npp32s* nAnchor, *Npp32s* nDivisor, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Four channel 8-bit unsigned convolution 1D column filter with border control, ignoring alpha channel.

For common parameter descriptions, see *Common parameters for nppiFilterColumnBorder functions:*.

NppStatus **nppiFilterColumnBorder_16u_C1R_Ctx**(const *Npp16u* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp16u* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, const *Npp32s* *pKernel, *Npp32s* nMaskSize, *Npp32s* nAnchor, *Npp32s* nDivisor, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Single channel 16-bit unsigned convolution 1D column filter with border control.

For common parameter descriptions, see *Common parameters for nppiFilterColumnBorder functions:*.

NppStatus **nppiFilterColumnBorder_16u_C3R_Ctx**(const *Npp16u* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp16u* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, const *Npp32s* *pKernel, *Npp32s* nMaskSize, *Npp32s* nAnchor, *Npp32s* nDivisor, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Three channel 16-bit unsigned 1D column convolution filter with border control.

For common parameter descriptions, see *Common parameters for nppiFilterColumnBorder functions:*.

NppStatus **nppiFilterColumnBorder_16u_C4R_Ctx**(const *Npp16u* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp16u* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, const *Npp32s* *pKernel, *Npp32s* nMaskSize, *Npp32s* nAnchor, *Npp32s* nDivisor, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Four channel channel 16-bit 1D column unsigned convolution filter with border control.

For common parameter descriptions, see *Common parameters for nppiFilterColumnBorder functions:*.

NppStatus **nppiFilterColumnBorder_16u_AC4R_Ctx**(const *Npp16u* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp16u* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, const *Npp32s* *pKernel, *Npp32s* nMaskSize, *Npp32s* nAnchor, *Npp32s* nDivisor, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Four channel 16-bit unsigned 1D column convolution filter with border control, ignoring alpha channel.

For common parameter descriptions, see *Common parameters for nppiFilterColumnBorder functions:*.

NppStatus **nppiFilterColumnBorder_16s_C1R_Ctx**(const *Npp16s* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp16s* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, const *Npp32s* *pKernel, *Npp32s* nMaskSize, *Npp32s* nAnchor, *Npp32s* nDivisor, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Single channel 16-bit 1D column convolution filter with border control.

For common parameter descriptions, see *Common parameters for nppiFilterColumnBorder functions:*.

NppStatus **nppiFilterColumnBorder_16s_C3R_Ctx**(const *Npp16s* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp16s* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, const *Npp32s* *pKernel, *Npp32s* nMaskSize, *Npp32s* nAnchor, *Npp32s* nDivisor, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Three channel 16-bit 1D column convolution filter with border control.

For common parameter descriptions, see *Common parameters for nppiFilterColumnBorder functions:*.

NppStatus **nppiFilterColumnBorder_16s_C4R_Ctx**(const *Npp16s* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp16s* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, const *Npp32s* *pKernel, *Npp32s* nMaskSize, *Npp32s* nAnchor, *Npp32s* nDivisor, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Four channel channel 16-bit 1D column convolution filter with border control.

For common parameter descriptions, see *Common parameters for nppiFilterColumnBorder functions:*.

NppStatus **nppiFilterColumnBorder_16s_AC4R_Ctx**(const *Npp16s* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp16s* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, const *Npp32s* *pKernel, *Npp32s* nMaskSize, *Npp32s* nAnchor, *Npp32s* nDivisor, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Four channel 16-bit 1D column convolution filter with border control, ignoring alpha channel.

For common parameter descriptions, see *Common parameters for nppiFilterColumnBorder functions:*.

NppStatus **nppiFilterColumnBorder_32f_C1R_Ctx**(const *Npp32f* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp32f* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, const *Npp32f* *pKernel, *Npp32s* nMaskSize, *Npp32s* nAnchor, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Single channel 32-bit float 1D column convolution filter with border control.

For common parameter descriptions, see *Common parameters for nppiFilterColumnBorder functions:*.

NppStatus **nppiFilterColumnBorder_32f_C3R_Ctx**(const *Npp32f* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp32f* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, const *Npp32f* *pKernel, *Npp32s* nMaskSize, *Npp32s* nAnchor, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Three channel 32-bit float 1D column convolution filter with border control.

For common parameter descriptions, see *Common parameters for nppiFilterColumnBorder functions:*.

NppStatus **nppiFilterColumnBorder_32f_C4R_Ctx**(const *Npp32f* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp32f* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, const *Npp32f* *pKernel, *Npp32s* nMaskSize, *Npp32s* nAnchor, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Four channel 32-bit float 1D column convolution filter with border control.

For common parameter descriptions, see *Common parameters for nppiFilterColumnBorder functions:*.

NppStatus **nppiFilterColumnBorder_32f_AC4R_Ctx**(const *Npp32f* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp32f* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, const *Npp32f* *pKernel, *Npp32s* nMaskSize, *Npp32s* nAnchor, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Four channel 32-bit float 1D column convolution filter with border control, ignoring alpha channel.

For common parameter descriptions, see *Common parameters for nppiFilterColumnBorder functions:*.

1.10.1.4 Image Filter Column 32f

1.10.1.4.1 FilterColumn32f

FilterColumn using floating-point weights.

1.10.1.4.1.1 Common parameters for nppiFilterColumn32f functions:

param pSrc
Source-Image Pointer.

param nSrcStep
Source-Image Line Step.

param pDst
Destination-Image Pointer.

param nDstStep
Destination-Image Line Step.

param oROI
Region-Of-Interest (ROI).

param pKernel
Device memory pointer to the start address of the kernel coefficient array. Coefficients are expected to be stored in reverse order.

param nMaskSize
Length of the linear kernel array.

param nAnchor
Y offset of the kernel origin frame of reference relative to the source pixel.

param nppStreamCtx
Application Managed Stream Context.

return
Image Data Related Error Codes, *ROI Related Error Codes*

Functions

NppStatus **nppiFilterColumn32f_8u_C1R_Ctx**(const *Npp8u* *pSrc, *Npp32s* nSrcStep, *Npp8u* *pDst, *Npp32s* nDstStep, *NppiSize* oROI, const *Npp32f* *pKernel, *Npp32s* nMaskSize, *Npp32s* nAnchor, *NppStreamContext* nppStreamCtx)

8-bit unsigned single-channel 1D column convolution.

For common parameter descriptions, see *Common parameters for nppiFilterColumn32f functions:*.

NppStatus **nppiFilterColumn32f_8u_C3R_Ctx**(const *Npp8u* *pSrc, *Npp32s* nSrcStep, *Npp8u* *pDst, *Npp32s* nDstStep, *NppiSize* oROI, const *Npp32f* *pKernel, *Npp32s* nMaskSize, *Npp32s* nAnchor, *NppStreamContext* nppStreamCtx)

8-bit unsigned three-channel 1D column convolution.

For common parameter descriptions, see *Common parameters for nppiFilterColumn32f functions:*.

NppStatus **nppiFilterColumn32f_8u_C4R_Ctx**(const *Npp8u* *pSrc, *Npp32s* nSrcStep, *Npp8u* *pDst, *Npp32s* nDstStep, *NppiSize* oROI, const *Npp32f* *pKernel, *Npp32s* nMaskSize, *Npp32s* nAnchor, *NppStreamContext* nppStreamCtx)

8-bit unsigned four-channel 1D column convolution.

For common parameter descriptions, see *Common parameters for nppiFilterColumn32f functions:*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiFilterColumn32f_8u_AC4R_Ctx**(const *Npp8u* *pSrc, *Npp32s* nSrcStep, *Npp8u* *pDst, *Npp32s* nDstStep, *NppiSize* oROI, const *Npp32f* *pKernel, *Npp32s* nMaskSize, *Npp32s* nAnchor, *NppStreamContext* nppStreamCtx)

8-bit unsigned four-channel 1D column convolution ignoring alpha-channel.

For common parameter descriptions, see *Common parameters for nppiFilterColumn32f functions:*.

NppStatus **nppiFilterColumn32f_16u_C1R_Ctx**(const *Npp16u* *pSrc, *Npp32s* nSrcStep, *Npp16u* *pDst, *Npp32s* nDstStep, *NppiSize* oROI, const *Npp32f* *pKernel, *Npp32s* nMaskSize, *Npp32s* nAnchor, *NppStreamContext* nppStreamCtx)

16-bit unsigned single-channel 1D column convolution.

For common parameter descriptions, see *Common parameters for nppiFilterColumn32f functions:*.

NppStatus **nppiFilterColumn32f_16u_C3R_Ctx**(const *Npp16u* *pSrc, *Npp32s* nSrcStep, *Npp16u* *pDst, *Npp32s* nDstStep, *NppiSize* oROI, const *Npp32f* *pKernel, *Npp32s* nMaskSize, *Npp32s* nAnchor, *NppStreamContext* nppStreamCtx)

16-bit unsigned three-channel 1D column convolution.

For common parameter descriptions, see *Common parameters for nppiFilterColumn32f functions:*.

NppStatus **nppiFilterColumn32f_16u_C4R_Ctx**(const *Npp16u* *pSrc, *Npp32s* nSrcStep, *Npp16u* *pDst, *Npp32s* nDstStep, *NppiSize* oROI, const *Npp32f* *pKernel, *Npp32s* nMaskSize, *Npp32s* nAnchor, *NppStreamContext* nppStreamCtx)

16-bit unsigned four-channel 1D column convolution.

For common parameter descriptions, see *Common parameters for nppiFilterColumn32f functions:*.

NppStatus **nppiFilterColumn32f_16u_AC4R_Ctx**(const *Npp16u* *pSrc, *Npp32s* nSrcStep, *Npp16u* *pDst, *Npp32s* nDstStep, *NppiSize* oROI, const *Npp32f* *pKernel, *Npp32s* nMaskSize, *Npp32s* nAnchor, *NppStreamContext* nppStreamCtx)

16-bit unsigned four-channel 1D column convolution ignoring alpha-channel.

For common parameter descriptions, see *Common parameters for nppiFilterColumn32f functions:*.

NppStatus **nppiFilterColumn32f_16s_C1R_Ctx**(const *Npp16s* *pSrc, *Npp32s* nSrcStep, *Npp16s* *pDst, *Npp32s* nDstStep, *NppiSize* oROI, const *Npp32f* *pKernel, *Npp32s* nMaskSize, *Npp32s* nAnchor, *NppStreamContext* nppStreamCtx)

16-bit single-channel 1D column convolution.

For common parameter descriptions, see *Common parameters for nppiFilterColumn32f functions:*.

NppStatus **nppiFilterColumn32f_16s_C3R_Ctx**(const *Npp16s* *pSrc, *Npp32s* nSrcStep, *Npp16s* *pDst, *Npp32s* nDstStep, *NppiSize* oROI, const *Npp32f* *pKernel, *Npp32s* nMaskSize, *Npp32s* nAnchor, *NppStreamContext* nppStreamCtx)

16-bit three-channel 1D column convolution.

For common parameter descriptions, see *Common parameters for nppiFilterColumn32f functions:*.

NppStatus **nppiFilterColumn32f_16s_C4R_Ctx**(const *Npp16s* *pSrc, *Npp32s* nSrcStep, *Npp16s* *pDst, *Npp32s* nDstStep, *NppiSize* oROI, const *Npp32f* *pKernel, *Npp32s* nMaskSize, *Npp32s* nAnchor, *NppStreamContext* nppStreamCtx)

16-bit four-channel 1D column convolution.

For common parameter descriptions, see *Common parameters for nppiFilterColumn32f functions:*.

NppStatus **nppiFilterColumn32f_16s_AC4R_Ctx**(const *Npp16s* *pSrc, *Npp32s* nSrcStep, *Npp16s* *pDst, *Npp32s* nDstStep, *NppiSize* oROI, const *Npp32f* *pKernel, *Npp32s* nMaskSize, *Npp32s* nAnchor, *NppStreamContext* nppStreamCtx)

16-bit four-channel 1D column convolution ignoring alpha-channel.

For common parameter descriptions, see *Common parameters for nppiFilterColumn32f functions:*.

1.10.1.5 Image Filter Column Border 32f

1.10.1.5.1 FilterColumnBorder32f

General purpose 1D column convolution filter using floating-point weights with border control.

Pixels under the mask are multiplied by the respective weights in the mask and the results are summed. If any portion of the mask overlaps the source image boundary the requested border type operation is applied to all mask pixels which fall outside of the source image.

Currently only the NPP_BORDER_REPLICATE border type operation is supported.

1.10.1.5.1.1 Common parameters for nppiFilterColumnBorder32f functions:

param pSrc
Source-Image Pointer.

param nSrcStep
Source-Image Line Step.

param oSrcSize
Source image width and height in pixels relative to pSrc.

param oSrcOffset
The pixel offset that pSrc points to relative to the origin of the source image.

param pDst
Destination-Image Pointer.

param nDstStep
Destination-Image Line Step.

param oSizeROI
Region-Of-Interest (ROI).

param pKernel
Device memory pointer to the start address of the kernel coefficient array. Coeffcients are expected to be stored in reverse order.

param nMaskSize
Width of the kernel.

param nAnchor
X offset of the kernel origin frame of reference relative to the source pixel.

param eBorderType
The border type operation to be applied at source image border boundaries.

param nppStreamCtx
Application Managed Stream Context.

return
Image Data Related Error Codes, *ROI Related Error Codes*

Functions

NppStatus **nppiFilterColumnBorder32f_8u_C1R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp32f* *pKernel, *Npp32s* nMaskSize, *Npp32s* nAnchor, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Single channel 8-bit unsigned 1D column convolution filter with border control.

For common parameter descriptions, see *Common parameters for nppiFilterColumnBorder32f functions:*.

NppStatus **nppiFilterColumnBorder32f_8u_C3R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp32f* *pKernel, *Npp32s* nMaskSize, *Npp32s* nAnchor, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Three channel 8-bit unsigned 1D column convolution filter with border control.

For common parameter descriptions, see *Common parameters for nppiFilterColumnBorder32f functions:*.

NppStatus **nppiFilterColumnBorder32f_8u_C4R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp32f* *pKernel, *Npp32s* nMaskSize, *Npp32s* nAnchor, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Four channel 8-bit unsigned 1D column convolution filter with border control.

For common parameter descriptions, see *Common parameters for nppiFilterColumnBorder32f functions:*.

NppStatus **nppiFilterColumnBorder32f_8u_AC4R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp32f* *pKernel, *Npp32s* nMaskSize, *Npp32s* nAnchor, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Four channel 8-bit unsigned 1D column convolution filter with border control, ignorint alpha channel.

For common parameter descriptions, see *Common parameters for nppiFilterColumnBorder32f functions:*.

NppStatus **nppiFilterColumnBorder32f_16u_C1R_Ctx**(const *Npp16u* *pSrc, int nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp16u* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp32f* *pKernel, *Npp32s* nMaskSize, *Npp32s* nAnchor, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Single channel 16-bit unsigned 1D column convolution filter with border control.

For common parameter descriptions, see *Common parameters for nppiFilterColumnBorder32f functions:*.

NppStatus **nppiFilterColumnBorder32f_16u_C3R_Ctx**(const *Npp16u* *pSrc, int nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp16u* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp32f* *pKernel, *Npp32s* nMaskSize, *Npp32s* nAnchor, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Three channel 16-bit unsigned 1D column convolution filter with border control.

For common parameter descriptions, see *Common parameters for nppiFilterColumnBorder32f functions:*.

NppStatus **nppiFilterColumnBorder32f_16u_C4R_Ctx**(const *Npp16u* *pSrc, int nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp16u* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp32f* *pKernel, *Npp32s* nMaskSize, *Npp32s* nAnchor, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Four channel 16-bit unsigned 1D column convolution filter with border control.

For common parameter descriptions, see *Common parameters for nppiFilterColumnBorder32f functions:*.

NppStatus **nppiFilterColumnBorder32f_16u_AC4R_Ctx**(const *Npp16u* *pSrc, int nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp16u* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp32f* *pKernel, *Npp32s* nMaskSize, *Npp32s* nAnchor, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Four channel 16-bit unsigned 1D column convolution filter with border control, ignoring alpha channel.

For common parameter descriptions, see *Common parameters for nppiFilterColumnBorder32f functions:*.

NppStatus **nppiFilterColumnBorder32f_16s_C1R_Ctx**(const *Npp16s* *pSrc, int nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp16s* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp32f* *pKernel, *Npp32s* nMaskSize, *Npp32s* nAnchor, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Single channel 16-bit 1D column convolution filter with border control.

For common parameter descriptions, see *Common parameters for nppiFilterColumnBorder32f functions:*.

NppStatus **nppiFilterColumnBorder32f_16s_C3R_Ctx**(const *Npp16s* *pSrc, int nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp16s* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp32f* *pKernel, *Npp32s* nMaskSize, *Npp32s* nAnchor, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Three channel 16-bit 1D column convolution filter with border control.

For common parameter descriptions, see *Common parameters for nppiFilterColumnBorder32f functions:*.

NppStatus **nppiFilterColumnBorder32f_16s_C4R_Ctx**(const *Npp16s* *pSrc, int nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp16s* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp32f* *pKernel, *Npp32s* nMaskSize, *Npp32s* nAnchor, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Four channel 16-bit 1D column convolution filter with border control.

For common parameter descriptions, see *Common parameters for nppiFilterColumnBorder32f functions:*.

NppStatus **nppiFilterColumnBorder32f_16s_AC4R_Ctx**(const *Npp16s* *pSrc, int nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp16s* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp32f* *pKernel, *Npp32s* nMaskSize, *Npp32s* nAnchor, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Four channel 16-bit 1D column convolution filter with border control, ignoring alpha channel.

For common parameter descriptions, see *Common parameters for nppiFilterColumnBorder32f functions:*.

1.10.1.6 Image Filter Row

1.10.1.6.1 FilterRow

Apply convolution filter with user specified 1D row of weights.

Result pixel is equal to the sum of the products between the kernel coefficients (pKernel array) and corresponding neighboring row pixel values in the source image defined by nKernelDim and nAnchorX, divided by nDivisor.

1.10.1.6.1.1 Common parameters for nppiFilterRow functions:

param pSrc
Source-Image Pointer.

param nSrcStep
Source-Image Line Step.

param pDst
Destination-Image Pointer.

param nDstStep
Destination-Image Line Step.

param oROI
Region-Of-Interest (ROI).

param pKernel
Device memory pointer to the start address of the kernel coefficient array. Coefficients are expected to be stored in reverse order.

param nMaskSize
Length of the linear kernel array.

param nAnchor
X offset of the kernel origin frame of reference relative to the source pixel.

param nDivisor
The factor by which the convolved summation from the Filter operation should be divided. If equal to the sum of coefficients, this will keep the maximum result value within full scale.

param nppStreamCtx
Application Managed Stream Context.

return
Image Data Related Error Codes, *ROI Related Error Codes*

Functions

NppStatus **nppiFilterRow_8u_C1R_Ctx**(const *Npp8u* *pSrc, *Npp32s* nSrcStep, *Npp8u* *pDst, *Npp32s* nDstStep, *NppiSize* oROI, const *Npp32s* *pKernel, *Npp32s* nMaskSize, *Npp32s* nAnchor, *Npp32s* nDivisor, *NppStreamContext* nppStreamCtx)

8-bit unsigned single-channel 1D row convolution.

For common parameter descriptions, see *Common parameters for nppiFilterRow functions:*.

NppStatus **nppiFilterRow_8u_C3R_Ctx**(const *Npp8u* *pSrc, *Npp32s* nSrcStep, *Npp8u* *pDst, *Npp32s* nDstStep, *NppiSize* oROI, const *Npp32s* *pKernel, *Npp32s* nMaskSize, *Npp32s* nAnchor, *Npp32s* nDivisor, *NppStreamContext* nppStreamCtx)

8-bit unsigned three-channel 1D row convolution.

For common parameter descriptions, see *Common parameters for nppiFilterRow functions:*.

NppStatus **nppiFilterRow_8u_C4R_Ctx**(const *Npp8u* *pSrc, *Npp32s* nSrcStep, *Npp8u* *pDst, *Npp32s* nDstStep, *NppiSize* oROI, const *Npp32s* *pKernel, *Npp32s* nMaskSize, *Npp32s* nAnchor, *Npp32s* nDivisor, *NppStreamContext* nppStreamCtx)

8-bit unsigned four-channel 1D row convolution.

For common parameter descriptions, see *Common parameters for nppiFilterRow functions:*.

NppStatus **nppiFilterRow_8u_AC4R_Ctx**(const *Npp8u* *pSrc, *Npp32s* nSrcStep, *Npp8u* *pDst, *Npp32s* nDstStep, *NppiSize* oROI, const *Npp32s* *pKernel, *Npp32s* nMaskSize, *Npp32s* nAnchor, *Npp32s* nDivisor, *NppStreamContext* nppStreamCtx)

8-bit unsigned four-channel 1D row convolution ignoring alpha-channel.

For common parameter descriptions, see *Common parameters for nppiFilterRow functions:*.

NppStatus **nppiFilterRow_16u_C1R_Ctx**(const *Npp16u* *pSrc, *Npp32s* nSrcStep, *Npp16u* *pDst, *Npp32s* nDstStep, *NppiSize* oROI, const *Npp32s* *pKernel, *Npp32s* nMaskSize, *Npp32s* nAnchor, *Npp32s* nDivisor, *NppStreamContext* nppStreamCtx)

16-bit unsigned single-channel 1D row convolution.

For common parameter descriptions, see *Common parameters for nppiFilterRow functions:*.

NppStatus **nppiFilterRow_16u_C3R_Ctx**(const *Npp16u* *pSrc, *Npp32s* nSrcStep, *Npp16u* *pDst, *Npp32s* nDstStep, *NppiSize* oROI, const *Npp32s* *pKernel, *Npp32s* nMaskSize, *Npp32s* nAnchor, *Npp32s* nDivisor, *NppStreamContext* nppStreamCtx)

16-bit unsigned three-channel 1D row convolution.

For common parameter descriptions, see *Common parameters for nppiFilterRow functions:*.

NppStatus **nppiFilterRow_16u_C4R_Ctx**(const *Npp16u* *pSrc, *Npp32s* nSrcStep, *Npp16u* *pDst, *Npp32s* nDstStep, *NppiSize* oROI, const *Npp32s* *pKernel, *Npp32s* nMaskSize, *Npp32s* nAnchor, *Npp32s* nDivisor, *NppStreamContext* nppStreamCtx)

16-bit unsigned four-channel 1D row convolution.

For common parameter descriptions, see *Common parameters for nppiFilterRow functions:*.

NppStatus **nppiFilterRow_16u_AC4R_Ctx**(const *Npp16u* *pSrc, *Npp32s* nSrcStep, *Npp16u* *pDst, *Npp32s* nDstStep, *NppiSize* oROI, const *Npp32s* *pKernel, *Npp32s* nMaskSize, *Npp32s* nAnchor, *Npp32s* nDivisor, *NppStreamContext* nppStreamCtx)

16-bit unsigned four-channel 1D row convolution ignoring alpha-channel.

For common parameter descriptions, see *Common parameters for nppiFilterRow functions:*.

NppStatus **nppiFilterRow_16s_C1R_Ctx**(const *Npp16s* *pSrc, *Npp32s* nSrcStep, *Npp16s* *pDst, *Npp32s* nDstStep, *NppiSize* oROI, const *Npp32s* *pKernel, *Npp32s* nMaskSize, *Npp32s* nAnchor, *Npp32s* nDivisor, *NppStreamContext* nppStreamCtx)

16-bit single-channel 1D row convolution.

For common parameter descriptions, see *Common parameters for nppiFilterRow functions:*.

NppStatus **nppiFilterRow_16s_C3R_Ctx**(const *Npp16s* *pSrc, *Npp32s* nSrcStep, *Npp16s* *pDst, *Npp32s* nDstStep, *NppiSize* oROI, const *Npp32s* *pKernel, *Npp32s* nMaskSize, *Npp32s* nAnchor, *Npp32s* nDivisor, *NppStreamContext* nppStreamCtx)

16-bit three-channel 1D row convolution.

For common parameter descriptions, see *Common parameters for nppiFilterRow functions:*.

NppStatus **nppiFilterRow_16s_C4R_Ctx**(const *Npp16s* *pSrc, *Npp32s* nSrcStep, *Npp16s* *pDst, *Npp32s* nDstStep, *NppiSize* oROI, const *Npp32s* *pKernel, *Npp32s* nMaskSize, *Npp32s* nAnchor, *Npp32s* nDivisor, *NppStreamContext* nppStreamCtx)

16-bit four-channel 1D row convolution.

For common parameter descriptions, see *Common parameters for nppiFilterRow functions:*.

NppStatus **nppiFilterRow_16s_AC4R_Ctx**(const *Npp16s* *pSrc, *Npp32s* nSrcStep, *Npp16s* *pDst, *Npp32s* nDstStep, *NppiSize* oROI, const *Npp32s* *pKernel, *Npp32s* nMaskSize, *Npp32s* nAnchor, *Npp32s* nDivisor, *NppStreamContext* nppStreamCtx)

16-bit four-channel 1D row convolution ignoring alpha-channel.

For common parameter descriptions, see *Common parameters for nppiFilterRow functions:*.

NppStatus **nppiFilterRow_32f_C1R_Ctx**(const *Npp32f* *pSrc, *Npp32s* nSrcStep, *Npp32f* *pDst, *Npp32s* nDstStep, *NppiSize* oROI, const *Npp32f* *pKernel, *Npp32s* nMaskSize, *Npp32s* nAnchor, *NppStreamContext* nppStreamCtx)

32-bit float single-channel 1D row convolution.

For common parameter descriptions, see *Common parameters for nppiFilterRow functions:*.

NppStatus **nppiFilterRow_32f_C3R_Ctx**(const *Npp32f* *pSrc, *Npp32s* nSrcStep, *Npp32f* *pDst, *Npp32s* nDstStep, *NppiSize* oROI, const *Npp32f* *pKernel, *Npp32s* nMaskSize, *Npp32s* nAnchor, *NppStreamContext* nppStreamCtx)

32-bit float three-channel 1D row convolution.

For common parameter descriptions, see *Common parameters for nppiFilterRow functions:*.

NppStatus **nppiFilterRow_32f_C4R_Ctx**(const *Npp32f* *pSrc, *Npp32s* nSrcStep, *Npp32f* *pDst, *Npp32s* nDstStep, *NppiSize* oROI, const *Npp32f* *pKernel, *Npp32s* nMaskSize, *Npp32s* nAnchor, *NppStreamContext* nppStreamCtx)

32-bit float four-channel 1D row convolution.

For common parameter descriptions, see *Common parameters for nppiFilterRow functions:*.

NppStatus **nppiFilterRow_32f_AC4R_Ctx**(const *Npp32f* *pSrc, *Npp32s* nSrcStep, *Npp32f* *pDst, *Npp32s* nDstStep, *NppiSize* oROI, const *Npp32f* *pKernel, *Npp32s* nMaskSize, *Npp32s* nAnchor, *NppStreamContext* nppStreamCtx)

32-bit float four-channel 1D row convolution ignoring alpha-channel.

For common parameter descriptions, see *Common parameters for nppiFilterRow functions:*.

NppStatus **nppiFilterRow_64f_C1R_Ctx**(const *Npp64f* *pSrc, *Npp32s* nSrcStep, *Npp64f* *pDst, *Npp32s* nDstStep, *NppiSize* oROI, const *Npp64f* *pKernel, *Npp32s* nMaskSize, *Npp32s* nAnchor, *NppStreamContext* nppStreamCtx)

64-bit float single-channel 1D row convolution.

For common parameter descriptions, see *Common parameters for nppiFilterRow functions:*.

1.10.1.7 Image Filter Row Border

1.10.1.7.1 FilterRowBorder

General purpose 1D convolution row filter with border control.

Pixels under the mask are multiplied by the respective weights in the mask and the results are summed. Before writing the result pixel the sum is scaled back via division by nDivisor. If any portion of the mask overlaps the source image boundary the requested border type operation is applied to all mask pixels which fall outside of the source image.

Currently only the NPP_BORDER_REPLICATE border type operation is supported.

1.10.1.7.1.1 Common parameters for nppiFilterRowBorder functions:

param pSrc
Source-Image Pointer.

param nSrcStep
Source-Image Line Step.

param oSrcSize
Source image width and height in pixels relative to pSrc.

param oSrcOffset
The pixel offset that pSrc points to relative to the origin of the source image.

param pDst
Destination-Image Pointer.

param nDstStep
Destination-Image Line Step.

param oSizeROI
Region-Of-Interest (ROI).

param pKernel
Device memory pointer to the start address of the kernel coefficient array. Coeffcients are expected to be stored in reverse order.

param nMaskSize
Width of the kernel.

param nAnchor
X offset of the kernel origin frame of reference relative to the source pixel.

param nDivisor
The factor by which the convolved summation from the Filter operation should be divided. If equal to the sum of coefficients, this will keep the maximum result value within full scale.

param eBorderType
The border type operation to be applied at source image border boundaries.

param nppStreamCtx
Application Managed Stream Context.

return
Image Data Related Error Codes, *ROI Related Error Codes*

Functions

NppStatus **nppiFilterRowBorder_8u_C1R_Ctx**(const *Npp8u* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp8u* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, const *Npp32s* *pKernel, *Npp32s* nMaskSize, *Npp32s* nAnchor, *Npp32s* nDivisor, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Single channel 8-bit unsigned 1D row convolution filter with border control.

For common parameter descriptions, see *Common parameters for nppiFilterRowBorder functions:*.

NppStatus **nppiFilterRowBorder_8u_C3R_Ctx**(const *Npp8u* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp8u* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, const *Npp32s* *pKernel, *Npp32s* nMaskSize, *Npp32s* nAnchor, *Npp32s* nDivisor, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Three channel 8-bit unsigned 1D row convolution filter with border control.

For common parameter descriptions, see *Common parameters for nppiFilterRowBorder functions:*.

NppStatus **nppiFilterRowBorder_8u_C4R_Ctx**(const *Npp8u* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp8u* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, const *Npp32s* *pKernel, *Npp32s* nMaskSize, *Npp32s* nAnchor, *Npp32s* nDivisor, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Four channel channel 8-bit unsigned 1D row convolution filter with border control.

For common parameter descriptions, see *Common parameters for nppiFilterRowBorder functions:*.

NppStatus **nppiFilterRowBorder_8u_AC4R_Ctx**(const *Npp8u* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp8u* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, const *Npp32s* *pKernel, *Npp32s* nMaskSize, *Npp32s* nAnchor, *Npp32s* nDivisor, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Four channel 8-bit unsigned convolution 1D row filter with border control, ignoring alpha channel.

For common parameter descriptions, see *Common parameters for nppiFilterRowBorder functions:*.

NppStatus **nppiFilterRowBorder_16u_C1R_Ctx**(const *Npp16u* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp16u* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, const *Npp32s* *pKernel, *Npp32s* nMaskSize, *Npp32s* nAnchor, *Npp32s* nDivisor, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Single channel 16-bit unsigned convolution 1D row filter with border control.

For common parameter descriptions, see *Common parameters for nppiFilterRowBorder functions:*.

NppStatus **nppiFilterRowBorder_16u_C3R_Ctx**(const *Npp16u* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp16u* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, const *Npp32s* *pKernel, *Npp32s* nMaskSize, *Npp32s* nAnchor, *Npp32s* nDivisor, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Three channel 16-bit unsigned 1D row convolution filter with border control.

For common parameter descriptions, see *Common parameters for nppiFilterRowBorder functions:*.

NppStatus **nppiFilterRowBorder_16u_C4R_Ctx**(const *Npp16u* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp16u* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, const *Npp32s* *pKernel, *Npp32s* nMaskSize, *Npp32s* nAnchor, *Npp32s* nDivisor, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Four channel channel 16-bit 1D row unsigned convolution filter with border control.

For common parameter descriptions, see *Common parameters for nppiFilterRowBorder functions:*.

NppStatus **nppiFilterRowBorder_16u_AC4R_Ctx**(const *Npp16u* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp16u* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, const *Npp32s* *pKernel, *Npp32s* nMaskSize, *Npp32s* nAnchor, *Npp32s* nDivisor, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Four channel 16-bit unsigned 1D row convolution filter with border control, ignoring alpha channel.

For common parameter descriptions, see *Common parameters for nppiFilterRowBorder functions:*.

NppStatus **nppiFilterRowBorder_16s_C1R_Ctx**(const *Npp16s* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp16s* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, const *Npp32s* *pKernel, *Npp32s* nMaskSize, *Npp32s* nAnchor, *Npp32s* nDivisor, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Single channel 16-bit 1D row convolution filter with border control.

For common parameter descriptions, see *Common parameters for nppiFilterRowBorder functions:*.

NppStatus **nppiFilterRowBorder_16s_C3R_Ctx**(const *Npp16s* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp16s* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, const *Npp32s* *pKernel, *Npp32s* nMaskSize, *Npp32s* nAnchor, *Npp32s* nDivisor, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Three channel 16-bit 1D row convolution filter with border control.

For common parameter descriptions, see *Common parameters for nppiFilterRowBorder functions:*.

NppStatus **nppiFilterRowBorder_16s_C4R_Ctx**(const *Npp16s* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp16s* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, const *Npp32s* *pKernel, *Npp32s* nMaskSize, *Npp32s* nAnchor, *Npp32s* nDivisor, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Four channel channel 16-bit 1D row convolution filter with border control.

For common parameter descriptions, see *Common parameters for nppiFilterRowBorder functions:*.

NppStatus **nppiFilterRowBorder_16s_AC4R_Ctx**(const *Npp16s* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp16s* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, const *Npp32s* *pKernel, *Npp32s* nMaskSize, *Npp32s* nAnchor, *Npp32s* nDivisor, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Four channel 16-bit 1D row convolution filter with border control, ignoring alpha channel.

For common parameter descriptions, see *Common parameters for nppiFilterRowBorder functions:*.

NppStatus **nppiFilterRowBorder_32f_C1R_Ctx**(const *Npp32f* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp32f* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, const *Npp32f* *pKernel, *Npp32s* nMaskSize, *Npp32s* nAnchor, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Single channel 32-bit float 1D row convolution filter with border control.

For common parameter descriptions, see *Common parameters for nppiFilterRowBorder functions:*.

NppStatus **nppiFilterRowBorder_32f_C3R_Ctx**(const *Npp32f* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp32f* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, const *Npp32f* *pKernel, *Npp32s* nMaskSize, *Npp32s* nAnchor, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Three channel 32-bit float 1D row convolution filter with border control.

For common parameter descriptions, see *Common parameters for nppiFilterRowBorder functions:*.

NppStatus **nppiFilterRowBorder_32f_C4R_Ctx**(const *Npp32f* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp32f* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, const *Npp32f* *pKernel, *Npp32s* nMaskSize, *Npp32s* nAnchor, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Four channel 32-bit float 1D row convolution filter with border control.

For common parameter descriptions, see *Common parameters for nppiFilterRowBorder functions:*.

NppStatus **nppiFilterRowBorder_32f_AC4R_Ctx**(const *Npp32f* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp32f* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, const *Npp32f* *pKernel, *Npp32s* nMaskSize, *Npp32s* nAnchor, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Four channel 32-bit float 1D row convolution filter with border control, ignoring alpha channel.

For common parameter descriptions, see *Common parameters for nppiFilterRowBorder functions:*.

1.10.1.8 Image Filter Row 32f

1.10.1.8.1 FilterRow32f

FilterRow using floating-point weights.

1.10.1.8.1.1 Common parameters for nppiFilterRow32f functions:

param pSrc
Source-Image Pointer.

param nSrcStep
Source-Image Line Step.

param pDst
Destination-Image Pointer.

param nDstStep
Destination-Image Line Step.

param oROI
Region-Of-Interest (ROI).

param pKernel
Device memory pointer to the start address of the kernel coefficient array. Coefficients are expected to be stored in reverse order.

param nMaskSize
Length of the linear kernel array.

param nAnchor
X offset of the kernel origin frame of reference relative to the source pixel.

param nppStreamCtx
Application Managed Stream Context.

return
Image Data Related Error Codes, *ROI Related Error Codes*

Functions

NppStatus **nppiFilterRow32f_8u_C1R_Ctx**(const *Npp8u* *pSrc, *Npp32s* nSrcStep, *Npp8u* *pDst, *Npp32s* nDstStep, *NppiSize* oROI, const *Npp32f* *pKernel, *Npp32s* nMaskSize, *Npp32s* nAnchor, *NppStreamContext* nppStreamCtx)

8-bit unsigned single-channel 1D row convolution.

For common parameter descriptions, see *Common parameters for nppiFilterRow32f functions:*.

NppStatus **nppiFilterRow32f_8u_C3R_Ctx**(const *Npp8u* *pSrc, *Npp32s* nSrcStep, *Npp8u* *pDst, *Npp32s* nDstStep, *NppiSize* oROI, const *Npp32f* *pKernel, *Npp32s* nMaskSize, *Npp32s* nAnchor, *NppStreamContext* nppStreamCtx)

8-bit unsigned three-channel 1D row convolution.

For common parameter descriptions, see *Common parameters for nppiFilterRow32f functions:*.

NppStatus **nppiFilterRow32f_8u_C4R_Ctx**(const *Npp8u* *pSrc, *Npp32s* nSrcStep, *Npp8u* *pDst, *Npp32s* nDstStep, *NppiSize* oROI, const *Npp32f* *pKernel, *Npp32s* nMaskSize, *Npp32s* nAnchor, *NppStreamContext* nppStreamCtx)

8-bit unsigned four-channel 1D row convolution.

For common parameter descriptions, see *Common parameters for nppiFilterRow32f functions:*.

NppStatus **nppiFilterRow32f_8u_AC4R_Ctx**(const *Npp8u* *pSrc, *Npp32s* nSrcStep, *Npp8u* *pDst, *Npp32s* nDstStep, *NppiSize* oROI, const *Npp32f* *pKernel, *Npp32s* nMaskSize, *Npp32s* nAnchor, *NppStreamContext* nppStreamCtx)

8-bit unsigned four-channel 1D row convolution ignoring alpha-channel.

For common parameter descriptions, see *Common parameters for nppiFilterRow32f functions:*.

NppStatus **nppiFilterRow32f_16u_C1R_Ctx**(const *Npp16u* *pSrc, *Npp32s* nSrcStep, *Npp16u* *pDst, *Npp32s* nDstStep, *NppiSize* oROI, const *Npp32f* *pKernel, *Npp32s* nMaskSize, *Npp32s* nAnchor, *NppStreamContext* nppStreamCtx)

16-bit unsigned single-channel 1D row convolution.

For common parameter descriptions, see *Common parameters for nppiFilterRow32f functions:*.

NppStatus **nppiFilterRow32f_16u_C3R_Ctx**(const *Npp16u* *pSrc, *Npp32s* nSrcStep, *Npp16u* *pDst, *Npp32s* nDstStep, *NppiSize* oROI, const *Npp32f* *pKernel, *Npp32s* nMaskSize, *Npp32s* nAnchor, *NppStreamContext* nppStreamCtx)

16-bit unsigned three-channel 1D row convolution.

For common parameter descriptions, see *Common parameters for nppiFilterRow32f functions:*.

NppStatus **nppiFilterRow32f_16u_C4R_Ctx**(const *Npp16u* *pSrc, *Npp32s* nSrcStep, *Npp16u* *pDst, *Npp32s* nDstStep, *NppiSize* oROI, const *Npp32f* *pKernel, *Npp32s* nMaskSize, *Npp32s* nAnchor, *NppStreamContext* nppStreamCtx)

16-bit unsigned four-channel 1D row convolution.

For common parameter descriptions, see *Common parameters for nppiFilterRow32f functions:*.

NppStatus **nppiFilterRow32f_16u_AC4R_Ctx**(const *Npp16u* *pSrc, *Npp32s* nSrcStep, *Npp16u* *pDst, *Npp32s* nDstStep, *NppiSize* oROI, const *Npp32f* *pKernel, *Npp32s* nMaskSize, *Npp32s* nAnchor, *NppStreamContext* nppStreamCtx)

16-bit unsigned four-channel 1D row convolution ignoring alpha-channel.

For common parameter descriptions, see *Common parameters for nppiFilterRow32f functions:*.

NppStatus **nppiFilterRow32f_16s_C1R_Ctx**(const *Npp16s* *pSrc, *Npp32s* nSrcStep, *Npp16s* *pDst, *Npp32s* nDstStep, *NppiSize* oROI, const *Npp32f* *pKernel, *Npp32s* nMaskSize, *Npp32s* nAnchor, *NppStreamContext* nppStreamCtx)

16-bit single-channel 1D row convolution.

For common parameter descriptions, see *Common parameters for nppiFilterRow32f functions:*.

NppStatus **nppiFilterRow32f_16s_C3R_Ctx**(const *Npp16s* *pSrc, *Npp32s* nSrcStep, *Npp16s* *pDst, *Npp32s* nDstStep, *NppiSize* oROI, const *Npp32f* *pKernel, *Npp32s* nMaskSize, *Npp32s* nAnchor, *NppStreamContext* nppStreamCtx)

16-bit three-channel 1D row convolution.

For common parameter descriptions, see *Common parameters for nppiFilterRow32f functions:*.

NppStatus **nppiFilterRow32f_16s_C4R_Ctx**(const *Npp16s* *pSrc, *Npp32s* nSrcStep, *Npp16s* *pDst, *Npp32s* nDstStep, *NppiSize* oROI, const *Npp32f* *pKernel, *Npp32s* nMaskSize, *Npp32s* nAnchor, *NppStreamContext* nppStreamCtx)

16-bit four-channel 1D row convolution.

For common parameter descriptions, see *Common parameters for nppiFilterRow32f functions:*.

NppStatus **nppiFilterRow32f_16s_AC4R_Ctx**(const *Npp16s* *pSrc, *Npp32s* nSrcStep, *Npp16s* *pDst, *Npp32s* nDstStep, *NppiSize* oROI, const *Npp32f* *pKernel, *Npp32s* nMaskSize, *Npp32s* nAnchor, *NppStreamContext* nppStreamCtx)

16-bit four-channel 1D row convolution ignoring alpha-channel.

For common parameter descriptions, see *Common parameters for nppiFilterRow32f functions:*.

1.10.1.9 Image Filter Row Border 32f

1.10.1.9.1 FilterRowBorder32f

General purpose 1D row convolution filter using floating-point weights with border control.

Pixels under the mask are multiplied by the respective weights in the mask and the results are summed. If any portion of the mask overlaps the source image boundary the requested border type operation is applied to all mask pixels which fall outside of the source image.

Currently only the NPP_BORDER_REPLICATE border type operation is supported.

1.10.1.9.1.1 Common parameters for nppiFilterRowBorder32f functions:

param pSrc
Source-Image Pointer.

param nSrcStep
Source-Image Line Step.

param oSrcSize
Source image width and height in pixels relative to pSrc.

param oSrcOffset
The pixel offset that pSrc points to relative to the origin of the source image.

param pDst
Destination-Image Pointer.

param nDstStep
Destination-Image Line Step.

param oSizeROI
Region-Of-Interest (ROI).

param pKernel
Device memory pointer to the start address of the kernel coefficient array. Coeffcients are expected to be stored in reverse order.

param nMaskSize
Width of the kernel.

param nAnchor
X offset of the kernel origin frame of reference relative to the source pixel.

param eBorderType
The border type operation to be applied at source image border boundaries.

param nppStreamCtx
Application Managed Stream Context.

return
Image Data Related Error Codes, *ROI Related Error Codes*

Functions

NppStatus **nppiFilterRowBorder32f_8u_C1R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp32f* *pKernel, *Npp32s* nMaskSize, *Npp32s* nAnchor, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Single channel 8-bit unsigned 1D row convolution filter with border control.

For common parameter descriptions, see *Common parameters for nppiFilterRowBorder32f functions:*.

NppStatus **nppiFilterRowBorder32f_8u_C3R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp32f* *pKernel, *Npp32s* nMaskSize, *Npp32s* nAnchor, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Three channel 8-bit unsigned 1D row convolution filter with border control.

For common parameter descriptions, see *Common parameters for nppiFilterRowBorder32f functions:*.

NppStatus **nppiFilterRowBorder32f_8u_C4R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp32f* *pKernel, *Npp32s* nMaskSize, *Npp32s* nAnchor, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Four channel 8-bit unsigned 1D row convolution filter with border control.

For common parameter descriptions, see *Common parameters for nppiFilterRowBorder32f functions:*.

NppStatus **nppiFilterRowBorder32f_8u_AC4R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp32f* *pKernel, *Npp32s* nMaskSize, *Npp32s* nAnchor, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Four channel 8-bit unsigned 1D row convolution filter with border control, ignorint alpha channel.

For common parameter descriptions, see *Common parameters for nppiFilterRowBorder32f functions:*.

NppStatus **nppiFilterRowBorder32f_16u_C1R_Ctx**(const *Npp16u* *pSrc, int nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp16u* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp32f* *pKernel, *Npp32s* nMaskSize, *Npp32s* nAnchor, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Single channel 16-bit unsigned 1D row convolution filter with border control.

For common parameter descriptions, see *Common parameters for nppiFilterRowBorder32f functions:*.

NppStatus **nppiFilterRowBorder32f_16u_C3R_Ctx**(const *Npp16u* *pSrc, int nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp16u* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp32f* *pKernel, *Npp32s* nMaskSize, *Npp32s* nAnchor, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Three channel 16-bit unsigned 1D row convolution filter with border control.

For common parameter descriptions, see *Common parameters for nppiFilterRowBorder32f functions:*.

NppStatus **nppiFilterRowBorder32f_16u_C4R_Ctx**(const *Npp16u* *pSrc, int nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp16u* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp32f* *pKernel, *Npp32s* nMaskSize, *Npp32s* nAnchor, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Four channel 16-bit unsigned 1D row convolution filter with border control.

For common parameter descriptions, see *Common parameters for nppiFilterRowBorder32f functions:*.

NppStatus **nppiFilterRowBorder32f_16u_AC4R_Ctx**(const *Npp16u* *pSrc, int nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp16u* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp32f* *pKernel, *Npp32s* nMaskSize, *Npp32s* nAnchor, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Four channel 16-bit unsigned 1D row convolution filter with border control, ignoring alpha channel.

For common parameter descriptions, see *Common parameters for nppiFilterRowBorder32f functions:*.

NppStatus **nppiFilterRowBorder32f_16s_C1R_Ctx**(const *Npp16s* *pSrc, int nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp16s* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp32f* *pKernel, *Npp32s* nMaskSize, *Npp32s* nAnchor, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Single channel 16-bit 1D row convolution filter with border control.

For common parameter descriptions, see *Common parameters for nppiFilterRowBorder32f functions:*.

NppStatus **nppiFilterRowBorder32f_16s_C3R_Ctx**(const *Npp16s* *pSrc, int nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp16s* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp32f* *pKernel, *Npp32s* nMaskSize, *Npp32s* nAnchor, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Three channel 16-bit 1D row convolution filter with border control.

For common parameter descriptions, see *Common parameters for nppiFilterRowBorder32f functions:*.

NppStatus **nppiFilterRowBorder32f_16s_C4R_Ctx**(const *Npp16s* *pSrc, int nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp16s* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp32f* *pKernel, *Npp32s* nMaskSize, *Npp32s* nAnchor, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Four channel 16-bit 1D row convolution filter with border control.

For common parameter descriptions, see *Common parameters for nppiFilterRowBorder32f functions:*.

NppStatus **nppiFilterRowBorder32f_16s_AC4R_Ctx**(const *Npp16s* *pSrc, int nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp16s* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp32f* *pKernel, *Npp32s* nMaskSize, *Npp32s* nAnchor, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Four channel 16-bit 1D row convolution filter with border control, ignoring alpha channel.

For common parameter descriptions, see *Common parameters for nppiFilterRowBorder32f functions:*.

1.10.1.10 Image Filter 1D Window Sum

1.10.1.10.1 1D Window Sum

The set of 1D window sum functions available in the library.

1.10.1.11 Image Filter 1D Window Column Sum

1.10.1.11.1 1D Window Column Sum

1D mask Window Column Sum for 8 and 16 bit images.

1.10.1.11.1.1 Common parameters for nppiFilterSumWindowColumn functions:

param pSrc
Source-Image Pointer.

param nSrcStep
Source-Image Line Step.

param pDst
Destination-Image Pointer.

param nDstStep
Destination-Image Line Step.

param oROI
Region-Of-Interest (ROI).

param nMaskSize
Length of the linear kernel array.

param nAnchor
Y offset of the kernel origin frame of reference relative to the source pixel.

param nppStreamCtx
Application Managed Stream Context.

return
Image Data Related Error Codes, *ROI Related Error Codes*

Functions

NppStatus **nppiSumWindowColumn_8u32f_C1R_Ctx**(const *Npp8u* *pSrc, *Npp32s* nSrcStep, *Npp32f* *pDst, *Npp32s* nDstStep, *NppiSize* oROI, *Npp32s* nMaskSize, *Npp32s* nAnchor, *NppStreamContext* nppStreamCtx)

One channel 8-bit unsigned 1D (column) sum to 32f.

Apply Column Window Summation filter over a 1D mask region around each source pixel for 1-channel 8 bit/pixel input images with 32-bit floating point output.

Result 32-bit floating point pixel is equal to the sum of the corresponding and neighboring column pixel values in a mask region of the source image defined by nMaskSize and nAnchor.

For common parameter descriptions, see *Common parameters for nppiFilterSumWindowColumn functions:*.

NppStatus **nppiSumWindowColumn_8u32f_C3R_Ctx**(const *Npp8u* *pSrc, *Npp32s* nSrcStep, *Npp32f* *pDst, *Npp32s* nDstStep, *NppiSize* oROI, *Npp32s* nMaskSize, *Npp32s* nAnchor, *NppStreamContext* nppStreamCtx)

Three channel 8-bit unsigned 1D (column) sum to 32f.

Apply Column Window Summation filter over a 1D mask region around each source pixel for 3-channel 8 bit/pixel input images with 32-bit floating point output.

Result 32-bit floating point pixel is equal to the sum of the corresponding and neighboring column pixel values in a mask region of the source image defined by nMaskSize and nAnchor.

For common parameter descriptions, see *Common parameters for nppiFilterSumWindowColumn functions:*.

NppStatus **nppiSumWindowColumn_8u32f_C4R_Ctx**(const *Npp8u* *pSrc, *Npp32s* nSrcStep, *Npp32f* *pDst, *Npp32s* nDstStep, *NppiSize* oROI, *Npp32s* nMaskSize, *Npp32s* nAnchor, *NppStreamContext* nppStreamCtx)

Four channel 8-bit unsigned 1D (column) sum to 32f.

Apply Column Window Summation filter over a 1D mask region around each source pixel for 4-channel 8 bit/pixel input images with 32-bit floating point output.

Result 32-bit floating point pixel is equal to the sum of the corresponding and neighboring column pixel values in a mask region of the source image defined by nMaskSize and nAnchor.

For common parameter descriptions, see *Common parameters for nppiFilterSumWindowColumn functions:*.

NppStatus **nppiSumWindowColumn_16u32f_C1R_Ctx**(const *Npp16u* *pSrc, *Npp32s* nSrcStep, *Npp32f* *pDst, *Npp32s* nDstStep, *NppiSize* oROI, *Npp32s* nMaskSize, *Npp32s* nAnchor, *NppStreamContext* nppStreamCtx)

One channel 16-bit unsigned 1D (column) sum to 32f.

Apply Column Window Summation filter over a 1D mask region around each source pixel for 1-channel 16 bit/pixel input images with 32-bit floating point output.

Result 32-bit floating point pixel is equal to the sum of the corresponding and neighboring column pixel values in a mask region of the source image defined by nMaskSize and nAnchor.

For common parameter descriptions, see *Common parameters for nppiFilterSumWindowColumn functions:*.

NppStatus **nppiSumWindowColumn_16u32f_C3R_Ctx**(const *Npp16u* *pSrc, *Npp32s* nSrcStep, *Npp32f* *pDst, *Npp32s* nDstStep, *NppiSize* oROI, *Npp32s* nMaskSize, *Npp32s* nAnchor, *NppStreamContext* nppStreamCtx)

Three channel 16-bit unsigned 1D (column) sum to 32f.

Apply Column Window Summation filter over a 1D mask region around each source pixel for 3-channel 16 bit/pixel input images with 32-bit floating point output.

Result 32-bit floating point pixel is equal to the sum of the corresponding and neighboring column pixel values in a mask region of the source image defined by nMaskSize and nAnchor.

For common parameter descriptions, see *Common parameters for nppiFilterSumWindowColumn functions:*.

NppStatus **nppiSumWindowColumn_16u32f_C4R_Ctx**(const *Npp16u* *pSrc, *Npp32s* nSrcStep, *Npp32f* *pDst, *Npp32s* nDstStep, *NppiSize* oROI, *Npp32s* nMaskSize, *Npp32s* nAnchor, *NppStreamContext* nppStreamCtx)

Four channel 16-bit unsigned 1D (column) sum to 32f.

Apply Column Window Summation filter over a 1D mask region around each source pixel for 4-channel 16 bit/pixel input images with 32-bit floating point output.

Result 32-bit floating point pixel is equal to the sum of the corresponding and neighboring column pixel values in a mask region of the source image defined by nMaskSize and nAnchor.

For common parameter descriptions, see *Common parameters for nppiFilterSumWindowColumn functions:*.

NppStatus **nppiSumWindowColumn_16s32f_C1R_Ctx**(const *Npp16s* *pSrc, *Npp32s* nSrcStep, *Npp32f* *pDst, *Npp32s* nDstStep, *NppiSize* oROI, *Npp32s* nMaskSize, *Npp32s* nAnchor, *NppStreamContext* nppStreamCtx)

One channel 16-bit signed 1D (column) sum to 32f.

Apply Column Window Summation filter over a 1D mask region around each source pixel for 1-channel 16 bit/pixel input images with 32-bit floating point output.

Result 32-bit floating point pixel is equal to the sum of the corresponding and neighboring column pixel values in a mask region of the source image defined by nMaskSize and nAnchor.

For common parameter descriptions, see *Common parameters for nppiFilterSumWindowColumn functions:*.

NppStatus **nppiSumWindowColumn_16s32f_C3R_Ctx**(const *Npp16s* *pSrc, *Npp32s* nSrcStep, *Npp32f* *pDst, *Npp32s* nDstStep, *NppiSize* oROI, *Npp32s* nMaskSize, *Npp32s* nAnchor, *NppStreamContext* nppStreamCtx)

Three channel 16-bit signed 1D (column) sum to 32f.

Apply Column Window Summation filter over a 1D mask region around each source pixel for 1-channel 16 bit/pixel input images with 32-bit floating point output.

Result 32-bit floating point pixel is equal to the sum of the corresponding and neighboring column pixel values in a mask region of the source image defined by nMaskSize and nAnchor.

For common parameter descriptions, see *Common parameters for nppiFilterSumWindowColumn functions:*.

NppStatus **nppiSumWindowColumn_16s32f_C4R_Ctx**(const *Npp16s* *pSrc, *Npp32s* nSrcStep, *Npp32f* *pDst, *Npp32s* nDstStep, *NppiSize* oROI, *Npp32s* nMaskSize, *Npp32s* nAnchor, *NppStreamContext* nppStreamCtx)

Four channel 16-bit signed 1D (column) sum to 32f.

Apply Column Window Summation filter over a 1D mask region around each source pixel for 4-channel 16 bit/pixel input images with 32-bit floating point output.

Result 32-bit floating point pixel is equal to the sum of the corresponding and neighboring column pixel values in a mask region of the source image defined by nMaskSize and nAnchor.

For common parameter descriptions, see *Common parameters for nppiFilterSumWindowColumn functions:*.

1.10.1.12 Image Filter 1D Window Row Sum

1.10.1.12.1 1D Window Row Sum

1D mask Window Row Sum for 8 and 16 bit images.

1.10.1.12.1.1 Common parameters for nppiFilterSumWindowRow functions:

param pSrc
Source-Image Pointer.

param nSrcStep
Source-Image Line Step.

param pDst
Destination-Image Pointer.

param nDstStep
Destination-Image Line Step.

param oROI
Region-Of-Interest (ROI).

param nMaskSize
Length of the linear kernel array.

param nAnchor
X offset of the kernel origin frame of reference relative to the source pixel.

param nppStreamCtx
Application Managed Stream Context.

return
Image Data Related Error Codes, *ROI Related Error Codes*

Functions

NppStatus **nppiSumWindowRow_8u32f_C1R_Ctx**(const *Npp8u* *pSrc, *Npp32s* nSrcStep, *Npp32f* *pDst, *Npp32s* nDstStep, *NppiSize* oROI, *Npp32s* nMaskSize, *Npp32s* nAnchor, *NppStreamContext* nppStreamCtx)

One channel 8-bit unsigned 1D (row) sum to 32f.

Apply Row Window Summation filter over a 1D mask region around each source pixel for 1-channel 8-bit pixel input images with 32-bit floating point output.

Result 32-bit floating point pixel is equal to the sum of the corresponding and neighboring row pixel values in a mask region of the source image defined by nMaskSize and nAnchor.

For common parameter descriptions, see *Common parameters for nppiFilterSumWindowRow functions:*.

NppStatus **nppiSumWindowRow_8u32f_C3R_Ctx**(const *Npp8u* *pSrc, *Npp32s* nSrcStep, *Npp32f* *pDst, *Npp32s* nDstStep, *NppiSize* oROI, *Npp32s* nMaskSize, *Npp32s* nAnchor, *NppStreamContext* nppStreamCtx)

Three channel 8-bit unsigned 1D (row) sum to 32f.

Apply Row Window Summation filter over a 1D mask region around each source pixel for 3-channel 8-bit pixel input images with 32-bit floating point output.

Result 32-bit floating point pixel is equal to the sum of the corresponding and neighboring row pixel values in a mask region of the source image defined by nMaskSize and nAnchor.

For common parameter descriptions, see *Common parameters for nppiFilterSumWindowRow functions:*.

NppStatus **nppiSumWindowRow_8u32f_C4R_Ctx**(const *Npp8u* *pSrc, *Npp32s* nSrcStep, *Npp32f* *pDst, *Npp32s* nDstStep, *NppiSize* oROI, *Npp32s* nMaskSize, *Npp32s* nAnchor, *NppStreamContext* nppStreamCtx)

Four channel 8-bit unsigned 1D (row) sum to 32f.

Apply Row Window Summation filter over a 1D mask region around each source pixel for 4-channel 8-bit pixel input images with 32-bit floating point output.

Result 32-bit floating point pixel is equal to the sum of the corresponding and neighboring row pixel values in a mask region of the source image defined by nMaskSize and nAnchor.

For common parameter descriptions, see *Common parameters for nppiFilterSumWindowRow functions:*.

NppStatus **nppiSumWindowRow_16u32f_C1R_Ctx**(const *Npp16u* *pSrc, *Npp32s* nSrcStep, *Npp32f* *pDst, *Npp32s* nDstStep, *NppiSize* oROI, *Npp32s* nMaskSize, *Npp32s* nAnchor, *NppStreamContext* nppStreamCtx)

One channel 16-bit unsigned 1D (row) sum to 32f.

Apply Row Window Summation filter over a 1D mask region around each source pixel for 1-channel 16-bit pixel input images with 32-bit floating point output.

Result 32-bit floating point pixel is equal to the sum of the corresponding and neighboring row pixel values in a mask region of the source image defined by nMaskSize and nAnchor.

For common parameter descriptions, see *Common parameters for nppiFilterSumWindowRow functions:*.

NppStatus **nppiSumWindowRow_16u32f_C3R_Ctx**(const *Npp16u* *pSrc, *Npp32s* nSrcStep, *Npp32f* *pDst, *Npp32s* nDstStep, *NppiSize* oROI, *Npp32s* nMaskSize, *Npp32s* nAnchor, *NppStreamContext* nppStreamCtx)

Three channel 16-bit unsigned 1D (row) sum to 32f.

Apply Row Window Summation filter over a 1D mask region around each source pixel for 3-channel 16-bit pixel input images with 32-bit floating point output.

Result 32-bit floating point pixel is equal to the sum of the corresponding and neighboring row pixel values in a mask region of the source image defined by nMaskSize and nAnchor.

For common parameter descriptions, see *Common parameters for nppiFilterSumWindowRow functions:*.

NppStatus **nppiSumWindowRow_16u32f_C4R_Ctx**(const *Npp16u* *pSrc, *Npp32s* nSrcStep, *Npp32f* *pDst, *Npp32s* nDstStep, *NppiSize* oROI, *Npp32s* nMaskSize, *Npp32s* nAnchor, *NppStreamContext* nppStreamCtx)

Four channel 16-bit unsigned 1D (row) sum to 32f.

Apply Row Window Summation filter over a 1D mask region around each source pixel for 4-channel 16-bit pixel input images with 32-bit floating point output.

Result 32-bit floating point pixel is equal to the sum of the corresponding and neighboring row pixel values in a mask region of the source image defined by nMaskSize and nAnchor.

For common parameter descriptions, see *Common parameters for nppiFilterSumWindowRow functions:*.

NppStatus **nppiSumWindowRow_16s32f_C1R_Ctx**(const *Npp16s* *pSrc, *Npp32s* nSrcStep, *Npp32f* *pDst, *Npp32s* nDstStep, *NppiSize* oROI, *Npp32s* nMaskSize, *Npp32s* nAnchor, *NppStreamContext* nppStreamCtx)

One channel 16-bit signed 1D (row) sum to 32f.

Apply Row Window Summation filter over a 1D mask region around each source pixel for 1-channel 16-bit pixel input images with 32-bit floating point output.

Result 32-bit floating point pixel is equal to the sum of the corresponding and neighboring row pixel values in a mask region of the source image defined by nMaskSize and nAnchor.

For common parameter descriptions, see *Common parameters for nppiFilterSumWindowRow functions:*.

NppStatus **nppiSumWindowRow_16s32f_C3R_Ctx**(const *Npp16s* *pSrc, *Npp32s* nSrcStep, *Npp32f* *pDst, *Npp32s* nDstStep, *NppiSize* oROI, *Npp32s* nMaskSize, *Npp32s* nAnchor, *NppStreamContext* nppStreamCtx)

Three channel 16-bit signed 1D (row) sum to 32f.

Apply Row Window Summation filter over a 1D mask region around each source pixel for 3-channel 16-bit pixel input images with 32-bit floating point output.

Result 32-bit floating point pixel is equal to the sum of the corresponding and neighboring row pixel values in a mask region of the source image defined by nMaskSize and nAnchor.

For common parameter descriptions, see *Common parameters for nppiFilterSumWindowRow functions:*.

NppStatus **nppiSumWindowRow_16s32f_C4R_Ctx**(const *Npp16s* *pSrc, *Npp32s* nSrcStep, *Npp32f* *pDst, *Npp32s* nDstStep, *NppiSize* oROI, *Npp32s* nMaskSize, *Npp32s* nAnchor, *NppStreamContext* nppStreamCtx)

Four channel 16-bit signed 1D (row) sum to 32f.

Apply Row Window Summation filter over a 1D mask region around each source pixel for 4-channel 16-bit pixel input images with 32-bit floating point output.

Result 32-bit floating point pixel is equal to the sum of the corresponding and neighboring row pixel values in a mask region of the source image defined by nMaskSize and nAnchor.

For common parameter descriptions, see *Common parameters for nppiFilterSumWindowRow functions:*.

1.10.1.13 Image Filter 1D Window Sum Border

1.10.1.13.1 1D Window Sum with Border Control

The set of 1D window sum functions with border control available in the library.

1.10.1.14 Image Filter 1D Window Column Sum Border

1.10.1.14.1 1D Window Column Sum Border

1D mask Window Column Sum for 8 and 16 bit images with border control.

If any portion of the mask overlaps the source image boundary the requested border type operation is applied to all mask pixels which fall outside of the source image.

Currently only the NPP_BORDER_REPLICATE border type operation is supported.

1.10.1.14.1.1 Common parameters for nppiFilterSumWindowColumnBorder functions:

param pSrc
Source-Image Pointer.

param nSrcStep
Source-Image Line Step.

param oSrcSize
Source image width and height in pixels relative to pSrc.

param oSrcOffset
The pixel offset that pSrc points to relative to the origin of the source image.

param pDst
Destination-Image Pointer.

param nDstStep
Destination-Image Line Step.

param oROI
Region-Of-Interest (ROI).

param nMaskSize
Length of the linear kernel array.

param nAnchor
Y offset of the kernel origin frame of reference relative to the source pixel.

param eBorderType
The border type operation to be applied at source image border boundaries.

param nppStreamCtx
Application Managed Stream Context.

return
Image Data Related Error Codes, *ROI Related Error Codes*

Functions

NppStatus **nppiSumWindowColumnBorder_8u32f_C1R_Ctx**(const *Npp8u* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp32f* *pDst, *Npp32s* nDstStep, *NppiSize* oROI, *Npp32s* nMaskSize, *Npp32s* nAnchor, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

One channel 8-bit unsigned 1D (column) sum to 32f with border control.

Apply Column Window Summation filter over a 1D mask region around each source pixel for 1-channel 8 bit/pixel input images with 32-bit floating point output.

Result 32-bit floating point pixel is equal to the sum of the corresponding and neighboring column pixel values in a mask region of the source image defined by nMaskSize and nAnchor.

For common parameter descriptions, see *Common parameters for nppiFilterSumWindowColumnBorder functions:*.

NppStatus **nppiSumWindowColumnBorder_8u32f_C3R_Ctx**(const *Npp8u* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp32f* *pDst, *Npp32s* nDstStep, *NppiSize* oROI, *Npp32s* nMaskSize, *Npp32s* nAnchor, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Three channel 8-bit unsigned 1D (column) sum to 32f with border control.

Apply Column Window Summation filter over a 1D mask region around each source pixel for 3-channel 8 bit/pixel input images with 32-bit floating point output.

Result 32-bit floating point pixel is equal to the sum of the corresponding and neighboring column pixel values in a mask region of the source image defined by nMaskSize and nAnchor.

For common parameter descriptions, see *Common parameters for nppiFilterSumWindowColumnBorder functions:*.

NppStatus **nppiSumWindowColumnBorder_8u32f_C4R_Ctx**(const *Npp8u* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp32f* *pDst, *Npp32s* nDstStep, *NppiSize* oROI, *Npp32s* nMaskSize, *Npp32s* nAnchor, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Four channel 8-bit unsigned 1D (column) sum to 32f with border control.

Apply Column Window Summation filter over a 1D mask region around each source pixel for 4-channel 8 bit/pixel input images with 32-bit floating point output.

Result 32-bit floating point pixel is equal to the sum of the corresponding and neighboring column pixel values in a mask region of the source image defined by nMaskSize and nAnchor.

For common parameter descriptions, see *Common parameters for nppiFilterSumWindowColumnBorder functions:*.

NppStatus **nppiSumWindowColumnBorder_16u32f_C1R_Ctx**(const *Npp16u* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp32f* *pDst, *Npp32s* nDstStep, *NppiSize* oROI, *Npp32s* nMaskSize, *Npp32s* nAnchor, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

One channel 16-bit unsigned 1D (column) sum to 32f with border control.

Apply Column Window Summation filter over a 1D mask region around each source pixel for 1-channel 16 bit/pixel input images with 32-bit floating point output.

Result 32-bit floating point pixel is equal to the sum of the corresponding and neighboring column pixel values in a mask region of the source image defined by nMaskSize and nAnchor.

For common parameter descriptions, see *Common parameters for nppiFilterSumWindowColumnBorder functions:*.

NppStatus **nppiSumWindowColumnBorder_16u32f_C3R_Ctx**(const *Npp16u* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp32f* *pDst, *Npp32s* nDstStep, *NppiSize* oROI, *Npp32s* nMaskSize, *Npp32s* nAnchor, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Three channel 16-bit unsigned 1D (column) sum to 32f with border control.

Apply Column Window Summation filter over a 1D mask region around each source pixel for 3-channel 16 bit/pixel input images with 32-bit floating point output.

Result 32-bit floating point pixel is equal to the sum of the corresponding and neighboring column pixel values in a mask region of the source image defined by nMaskSize and nAnchor.

For common parameter descriptions, see *Common parameters for nppiFilterSumWindowColumnBorder functions:*.

NppStatus **nppiSumWindowColumnBorder_16u32f_C4R_Ctx**(const *Npp16u* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp32f* *pDst, *Npp32s* nDstStep, *NppiSize* oROI, *Npp32s* nMaskSize, *Npp32s* nAnchor, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Four channel 16-bit unsigned 1D (column) sum to 32f with border control.

Apply Column Window Summation filter over a 1D mask region around each source pixel for 4-channel 16 bit/pixel input images with 32-bit floating point output.

Result 32-bit floating point pixel is equal to the sum of the corresponding and neighboring column pixel values in a mask region of the source image defined by nMaskSize and nAnchor.

For common parameter descriptions, see *Common parameters for nppiFilterSumWindowColumnBorder functions:*.

NppStatus **nppiSumWindowColumnBorder_16s32f_C1R_Ctx**(const *Npp16s* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp32f* *pDst, *Npp32s* nDstStep, *NppiSize* oROI, *Npp32s* nMaskSize, *Npp32s* nAnchor, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

One channel 16-bit signed 1D (column) sum to 32f with border control.

Apply Column Window Summation filter over a 1D mask region around each source pixel for 1-channel 16 bit/pixel input images with 32-bit floating point output.

Result 32-bit floating point pixel is equal to the sum of the corresponding and neighboring column pixel values in a mask region of the source image defined by nMaskSize and nAnchor.

For common parameter descriptions, see *Common parameters for nppiFilterSumWindowColumnBorder functions:*.

NppStatus **nppiSumWindowColumnBorder_16s32f_C3R_Ctx**(const *Npp16s* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp32f* *pDst, *Npp32s* nDstStep, *NppiSize* oROI, *Npp32s* nMaskSize, *Npp32s* nAnchor, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Three channel 16-bit signed 1D (column) sum to 32f with border control.

Apply Column Window Summation filter over a 1D mask region around each source pixel for 1-channel 16 bit/pixel input images with 32-bit floating point output.

Result 32-bit floating point pixel is equal to the sum of the corresponding and neighboring column pixel values in a mask region of the source image defined by nMaskSize and nAnchor.

For common parameter descriptions, see *Common parameters for nppiFilterSumWindowColumnBorder functions:*.

NppStatus **nppiSumWindowColumnBorder_16s32f_C4R_Ctx**(const *Npp16s* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp32f* *pDst, *Npp32s* nDstStep, *NppiSize* oROI, *Npp32s* nMaskSize, *Npp32s* nAnchor, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Four channel 16-bit signed 1D (column) sum to 32f with border control.

Apply Column Window Summation filter over a 1D mask region around each source pixel for 4-channel 16 bit/pixel input images with 32-bit floating point output.

Result 32-bit floating point pixel is equal to the sum of the corresponding and neighboring column pixel values in a mask region of the source image defined by nMaskSize and nAnchor.

For common parameter descriptions, see *Common parameters for nppiFilterSumWindowColumnBorder functions:*.

1.10.1.15 Image Filter 1D Window Row Sum Border

1.10.1.15.1 1D Window Row Sum Border

1D mask Window Row Sum for 8 and 16 bit images with border control.

1.10.1.15.1.1 Common parameters for nppiFilterSumWindowRowBorder functions:

param pSrc
Source-Image Pointer.

param nSrcStep
Source-Image Line Step.

param oSrcSize
Source image width and height in pixels relative to pSrc.

param oSrcOffset
The pixel offset that pSrc points to relative to the origin of the source image.

param pDst
Destination-Image Pointer.

param nDstStep
Destination-Image Line Step.

param oROI
Region-Of-Interest (ROI).

param nMaskSize
Length of the linear kernel array.

param nAnchor
X offset of the kernel origin frame of reference relative to the source pixel.

param eBorderType
The border type operation to be applied at source image border boundaries.

param nppStreamCtx
Application Managed Stream Context.

return
Image Data Related Error Codes, *ROI Related Error Codes*

Functions

NppStatus **nppiSumWindowRowBorder_8u32f_C1R_Ctx**(const *Npp8u* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp32f* *pDst, *Npp32s* nDstStep, *NppiSize* oROI, *Npp32s* nMaskSize, *Npp32s* nAnchor, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

One channel 8-bit unsigned 1D (row) sum to 32f with border control.

Apply Row Window Summation filter over a 1D mask region around each source pixel for 1-channel 8-bit pixel input images with 32-bit floating point output.

Result 32-bit floating point pixel is equal to the sum of the corresponding and neighboring row pixel values in a mask region of the source image defined by nMaskSize and nAnchor.

For common parameter descriptions, see *Common parameters for nppiFilterSumWindowRowBorder functions:*.

NppStatus **nppiSumWindowRowBorder_8u32f_C3R_Ctx**(const *Npp8u* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp32f* *pDst, *Npp32s* nDstStep, *NppiSize* oROI, *Npp32s* nMaskSize, *Npp32s* nAnchor, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Three channel 8-bit unsigned 1D (row) sum to 32f with border control.

Apply Row Window Summation filter over a 1D mask region around each source pixel for 3-channel 8-bit pixel input images with 32-bit floating point output.

Result 32-bit floating point pixel is equal to the sum of the corresponding and neighboring row pixel values in a mask region of the source image defined by nMaskSize and nAnchor.

For common parameter descriptions, see *Common parameters for nppiFilterSumWindowRowBorder functions:*.

NppStatus **nppiSumWindowRowBorder_8u32f_C4R_Ctx**(const *Npp8u* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp32f* *pDst, *Npp32s* nDstStep, *NppiSize* oROI, *Npp32s* nMaskSize, *Npp32s* nAnchor, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Four channel 8-bit unsigned 1D (row) sum to 32f with border control.

Apply Row Window Summation filter over a 1D mask region around each source pixel for 4-channel 8-bit pixel input images with 32-bit floating point output.

Result 32-bit floating point pixel is equal to the sum of the corresponding and neighboring row pixel values in a mask region of the source image defined by nMaskSize and nAnchor.

For common parameter descriptions, see *Common parameters for nppiFilterSumWindowRowBorder functions:*.

NppStatus **nppiSumWindowRowBorder_16u32f_C1R_Ctx**(const *Npp16u* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp32f* *pDst, *Npp32s* nDstStep, *NppiSize* oROI, *Npp32s* nMaskSize, *Npp32s* nAnchor, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

One channel 16-bit unsigned 1D (row) sum to 32f with border control.

Apply Row Window Summation filter over a 1D mask region around each source pixel for 1-channel 16-bit pixel input images with 32-bit floating point output.

Result 32-bit floating point pixel is equal to the sum of the corresponding and neighboring row pixel values in a mask region of the source image defined by nMaskSize and nAnchor.

For common parameter descriptions, see *Common parameters for nppiFilterSumWindowRowBorder functions:*.

NppStatus **nppiSumWindowRowBorder_16u32f_C3R_Ctx**(const *Npp16u* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp32f* *pDst, *Npp32s* nDstStep, *NppiSize* oROI, *Npp32s* nMaskSize, *Npp32s* nAnchor, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Three channel 16-bit unsigned 1D (row) sum to 32f with border control.

Apply Row Window Summation filter over a 1D mask region around each source pixel for 3-channel 16-bit pixel input images with 32-bit floating point output.

Result 32-bit floating point pixel is equal to the sum of the corresponding and neighboring row pixel values in a mask region of the source image defined by nMaskSize and nAnchor.

For common parameter descriptions, see *Common parameters for nppiFilterSumWindowRowBorder functions:*.

NppStatus **nppiSumWindowRowBorder_16u32f_C4R_Ctx**(const *Npp16u* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp32f* *pDst, *Npp32s* nDstStep, *NppiSize* oROI, *Npp32s* nMaskSize, *Npp32s* nAnchor, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Four channel 16-bit unsigned 1D (row) sum to 32f with border control.

Apply Row Window Summation filter over a 1D mask region around each source pixel for 4-channel 16-bit pixel input images with 32-bit floating point output.

Result 32-bit floating point pixel is equal to the sum of the corresponding and neighboring row pixel values in a mask region of the source image defined by nMaskSize and nAnchor.

For common parameter descriptions, see *Common parameters for nppiFilterSumWindowRowBorder functions:*.

NppStatus **nppiSumWindowRowBorder_16s32f_C1R_Ctx**(const *Npp16s* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp32f* *pDst, *Npp32s* nDstStep, *NppiSize* oROI, *Npp32s* nMaskSize, *Npp32s* nAnchor, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

One channel 16-bit signed 1D (row) sum to 32f with border control.

Apply Row Window Summation filter over a 1D mask region around each source pixel for 1-channel 16-bit pixel input images with 32-bit floating point output.

Result 32-bit floating point pixel is equal to the sum of the corresponding and neighboring row pixel values in a mask region of the source image defined by nMaskSize and nAnchor.

For common parameter descriptions, see *Common parameters for nppiFilterSumWindowRowBorder functions:*.

NppStatus **nppiSumWindowRowBorder_16s32f_C3R_Ctx**(const *Npp16s* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp32f* *pDst, *Npp32s* nDstStep, *NppiSize* oROI, *Npp32s* nMaskSize, *Npp32s* nAnchor, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Three channel 16-bit signed 1D (row) sum to 32f with border control.

Apply Row Window Summation filter over a 1D mask region around each source pixel for 3-channel 16-bit pixel input images with 32-bit floating point output.

Result 32-bit floating point pixel is equal to the sum of the corresponding and neighboring row pixel values in a mask region of the source image defined by nMaskSize and nAnchor.

For common parameter descriptions, see *Common parameters for nppiFilterSumWindowRowBorder functions:*.

NppStatus **nppiSumWindowRowBorder_16s32f_C4R_Ctx**(const *Npp16s* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp32f* *pDst, *Npp32s* nDstStep, *NppiSize* oROI, *Npp32s* nMaskSize, *Npp32s* nAnchor, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Four channel 16-bit signed 1D (row) sum to 32f with border control.

Apply Row Window Summation filter over a 1D mask region around each source pixel for 4-channel 16-bit pixel input images with 32-bit floating point output.

Result 32-bit floating point pixel is equal to the sum of the corresponding and neighboring row pixel values in a mask region of the source image defined by nMaskSize and nAnchor.

For common parameter descriptions, see *Common parameters for nppiFilterSumWindowRowBorder functions:*.

1.10.2. Image Convolution

1.10.2.1 Convolution

The set convolution functions available in the library.

1.10.2.2 Image Filter

1.10.2.2.1 Filter

General purpose 2D convolution filter.

Pixels under the mask are multiplied by the respective weights in the mask and the results are summed. Before writing the result pixel the sum is scaled back via division by nDivisor.

1.10.2.2.1.1 Common parameters for nppiFilter functions:

param pSrc
Source-Image Pointer.

param nSrcStep
Source-Image Line Step.

param pDst
Destination-Image Pointer.

param nDstStep
Destination-Image Line Step.

param oSizeROI
Region-Of-Interest (ROI).

param pKernel
Device memory pointer to the start address of the kernel coefficient array. Coeffcients are expected to be stored in reverse order.

param oKernelSize
Width and Height of the rectangular kernel.

param oAnchor
X and Y offsets of the kernel origin frame of reference relative to the source pixel.

param nDivisor
The factor by which the convolved summation from the Filter operation should be divided. If equal to the sum of coefficients, this will keep the maximum result value within full scale.

param nppStreamCtx
Application Managed Stream Context.

return
Image Data Related Error Codes, *ROI Related Error Codes*

Functions

NppStatus **nppiFilter_8u_C1R_Ctx**(const *Npp8u* *pSrc, *Npp32s* nSrcStep, *Npp8u* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, const *Npp32s* *pKernel, *NppiSize* oKernelSize, *NppiPoint* oAnchor, *Npp32s* nDivisor, *NppStreamContext* nppStreamCtx)

Single channel 8-bit unsigned convolution filter.

For common parameter descriptions, see *Common parameters for nppiFilter functions:*.

NppStatus **nppiFilter_8u_C3R_Ctx**(const *Npp8u* *pSrc, *Npp32s* nSrcStep, *Npp8u* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, const *Npp32s* *pKernel, *NppiSize* oKernelSize, *NppiPoint* oAnchor, *Npp32s* nDivisor, *NppStreamContext* nppStreamCtx)

Three channel 8-bit unsigned convolution filter.

For common parameter descriptions, see *Common parameters for nppiFilter functions:*.

NppStatus **nppiFilter_8u_C4R_Ctx**(const *Npp8u* *pSrc, *Npp32s* nSrcStep, *Npp8u* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, const *Npp32s* *pKernel, *NppiSize* oKernelSize, *NppiPoint* oAnchor, *Npp32s* nDivisor, *NppStreamContext* nppStreamCtx)

Four channel channel 8-bit unsigned convolution filter.

For common parameter descriptions, see *Common parameters for nppiFilter functions:*.

NppStatus **nppiFilter_8u_AC4R_Ctx**(const *Npp8u* *pSrc, *Npp32s* nSrcStep, *Npp8u* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, const *Npp32s* *pKernel, *NppiSize* oKernelSize, *NppiPoint* oAnchor, *Npp32s* nDivisor, *NppStreamContext* nppStreamCtx)

Four channel 8-bit unsigned convolution filter, ignoring alpha channel.

For common parameter descriptions, see *Common parameters for nppiFilter functions:*.

NppStatus **nppiFilter_16u_C1R_Ctx**(const *Npp16u* *pSrc, *Npp32s* nSrcStep, *Npp16u* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, const *Npp32s* *pKernel, *NppiSize* oKernelSize, *NppiPoint* oAnchor, *Npp32s* nDivisor, *NppStreamContext* nppStreamCtx)

Single channel 16-bit unsigned convolution filter.

For common parameter descriptions, see *Common parameters for nppiFilter functions:*.

NppStatus **nppiFilter_16u_C3R_Ctx**(const *Npp16u* *pSrc, *Npp32s* nSrcStep, *Npp16u* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, const *Npp32s* *pKernel, *NppiSize* oKernelSize, *NppiPoint* oAnchor, *Npp32s* nDivisor, *NppStreamContext* nppStreamCtx)

Three channel 16-bit unsigned convolution filter.

For common parameter descriptions, see *Common parameters for nppiFilter functions:*.

NppStatus **nppiFilter_16u_C4R_Ctx**(const *Npp16u* *pSrc, *Npp32s* nSrcStep, *Npp16u* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, const *Npp32s* *pKernel, *NppiSize* oKernelSize, *NppiPoint* oAnchor, *Npp32s* nDivisor, *NppStreamContext* nppStreamCtx)

Four channel channel 16-bit unsigned convolution filter.

For common parameter descriptions, see *Common parameters for nppiFilter functions:*.

NppStatus **nppiFilter_16u_AC4R_Ctx**(const *Npp16u* *pSrc, *Npp32s* nSrcStep, *Npp16u* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, const *Npp32s* *pKernel, *NppiSize* oKernelSize, *NppiPoint* oAnchor, *Npp32s* nDivisor, *NppStreamContext* nppStreamCtx)

Four channel 16-bit unsigned convolution filter, ignoring alpha channel.

For common parameter descriptions, see *Common parameters for nppiFilter functions:*.

NppStatus **nppiFilter_16s_C1R_Ctx**(const *Npp16s* *pSrc, *Npp32s* nSrcStep, *Npp16s* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, const *Npp32s* *pKernel, *NppiSize* oKernelSize, *NppiPoint* oAnchor, *Npp32s* nDivisor, *NppStreamContext* nppStreamCtx)

Single channel 16-bit convolution filter.

For common parameter descriptions, see *Common parameters for nppiFilter functions:*.

NppStatus **nppiFilter_16s_C3R_Ctx**(const *Npp16s* *pSrc, *Npp32s* nSrcStep, *Npp16s* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, const *Npp32s* *pKernel, *NppiSize* oKernelSize, *NppiPoint* oAnchor, *Npp32s* nDivisor, *NppStreamContext* nppStreamCtx)

Three channel 16-bit convolution filter.

For common parameter descriptions, see *Common parameters for nppiFilter functions:*.

NppStatus **nppiFilter_16s_C4R_Ctx**(const *Npp16s* *pSrc, *Npp32s* nSrcStep, *Npp16s* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, const *Npp32s* *pKernel, *NppiSize* oKernelSize, *NppiPoint* oAnchor, *Npp32s* nDivisor, *NppStreamContext* nppStreamCtx)

Four channel channel 16-bit convolution filter.

For common parameter descriptions, see *Common parameters for nppiFilter functions:*.

NppStatus **nppiFilter_16s_AC4R_Ctx**(const *Npp16s* *pSrc, *Npp32s* nSrcStep, *Npp16s* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, const *Npp32s* *pKernel, *NppiSize* oKernelSize, *NppiPoint* oAnchor, *Npp32s* nDivisor, *NppStreamContext* nppStreamCtx)

Four channel 16-bit convolution filter, ignoring alpha channel.

For common parameter descriptions, see *Common parameters for nppiFilter functions:*.

NppStatus **nppiFilter_32f_C1R_Ctx**(const *Npp32f* *pSrc, *Npp32s* nSrcStep, *Npp32f* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, const *Npp32f* *pKernel, *NppiSize* oKernelSize, *NppiPoint* oAnchor, *NppStreamContext* nppStreamCtx)

Single channel 32-bit float convolution filter.

For common parameter descriptions, see *Common parameters for nppiFilter functions:*.

NppStatus **nppiFilter_32f_C2R_Ctx**(const *Npp32f* *pSrc, *Npp32s* nSrcStep, *Npp32f* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, const *Npp32f* *pKernel, *NppiSize* oKernelSize, *NppiPoint* oAnchor, *NppStreamContext* nppStreamCtx)

Two channel 32-bit float convolution filter.

For common parameter descriptions, see *Common parameters for nppiFilter functions:*.

NppStatus **nppiFilter_32f_C3R_Ctx**(const *Npp32f* *pSrc, *Npp32s* nSrcStep, *Npp32f* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, const *Npp32f* *pKernel, *NppiSize* oKernelSize, *NppiPoint* oAnchor, *NppStreamContext* nppStreamCtx)

Three channel 32-bit float convolution filter.

For common parameter descriptions, see *Common parameters for nppiFilter functions:*.

NppStatus **nppiFilter_32f_C4R_Ctx**(const *Npp32f* *pSrc, *Npp32s* nSrcStep, *Npp32f* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, const *Npp32f* *pKernel, *NppiSize* oKernelSize, *NppiPoint* oAnchor, *NppStreamContext* nppStreamCtx)

Four channel 32-bit float convolution filter.

For common parameter descriptions, see *Common parameters for nppiFilter functions:*.

NppStatus **nppiFilter_32f_AC4R_Ctx**(const *Npp32f* *pSrc, *Npp32s* nSrcStep, *Npp32f* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, const *Npp32f* *pKernel, *NppiSize* oKernelSize, *NppiPoint* oAnchor, *NppStreamContext* nppStreamCtx)

Four channel 32-bit float convolution filter, ignoring alpha channel.

For common parameter descriptions, see *Common parameters for nppiFilter functions:*.

NppStatus **nppiFilter_64f_C1R_Ctx**(const *Npp64f* *pSrc, *Npp32s* nSrcStep, *Npp64f* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, const *Npp64f* *pKernel, *NppiSize* oKernelSize, *NppiPoint* oAnchor, *NppStreamContext* nppStreamCtx)

Single channel 64-bit float convolution filter.

For common parameter descriptions, see *Common parameters for nppiFilter functions:*.

1.10.2.3 Image Filter 32f

1.10.2.3.1 Filter32f

General purpose 2D convolution filter using floating point weights.

Pixels under the mask are multiplied by the respective weights in the mask and the results are summed.

1.10.2.3.1.1 Common parameters for nppiFilter32f functions:

param pSrc
Source-Image Pointer.

param nSrcStep
Source-Image Line Step.

param pDst
Destination-Image Pointer.

param nDstStep
Destination-Image Line Step.

param oSizeROI
Region-Of-Interest (ROI).

param pKernel
Device memory pointer to the start address of the kernel coefficient array. Coeffcients are expected to be stored in reverse order.

param oKernelSize
Width and Height of the rectangular kernel.

param oAnchor
X and Y offsets of the kernel origin frame of reference relative to the source pixel.

param nppStreamCtx
Application Managed Stream Context.

return
Image Data Related Error Codes, *ROI Related Error Codes*

Functions

NppStatus **nppiFilter32f_8u_C1R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp32f* *pKernel, *NppiSize* oKernelSize, *NppiPoint* oAnchor, *NppStreamContext* nppStreamCtx)

Single channel 8-bit unsigned convolution filter.

For common parameter descriptions, see *Common parameters for nppiFilter32f functions:*.

NppStatus **nppiFilter32f_8u_C2R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp32f* *pKernel, *NppiSize* oKernelSize, *NppiPoint* oAnchor, *NppStreamContext* nppStreamCtx)

Two channel 8-bit unsigned convolution filter.

For common parameter descriptions, see *Common parameters for nppiFilter32f functions:*.

NppStatus **nppiFilter32f_8u_C3R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp32f* *pKernel, *NppiSize* oKernelSize, *NppiPoint* oAnchor, *NppStreamContext* nppStreamCtx)

Three channel 8-bit unsigned convolution filter.

For common parameter descriptions, see *Common parameters for nppiFilter32f functions:*.

NppStatus **nppiFilter32f_8u_C4R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp32f* *pKernel, *NppiSize* oKernelSize, *NppiPoint* oAnchor, *NppStreamContext* nppStreamCtx)

Four channel 8-bit unsigned convolution filter.

For common parameter descriptions, see *Common parameters for nppiFilter32f functions:*.

NppStatus **nppiFilter32f_8u_AC4R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp32f* *pKernel, *NppiSize* oKernelSize, *NppiPoint* oAnchor, *NppStreamContext* nppStreamCtx)

Four channel 8-bit unsigned convolution filter, ignorint alpha channel.

For common parameter descriptions, see *Common parameters for nppiFilter32f functions:*.

NppStatus **nppiFilter32f_8s_C1R_Ctx**(const *Npp8s* *pSrc, int nSrcStep, *Npp8s* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp32f* *pKernel, *NppiSize* oKernelSize, *NppiPoint* oAnchor, *NppStreamContext* nppStreamCtx)

Single channel 8-bit signed convolution filter.

For common parameter descriptions, see *Common parameters for nppiFilter32f functions:*.

NppStatus **nppiFilter32f_8s_C2R_Ctx**(const *Npp8s* *pSrc, int nSrcStep, *Npp8s* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp32f* *pKernel, *NppiSize* oKernelSize, *NppiPoint* oAnchor, *NppStreamContext* nppStreamCtx)

Two channel 8-bit signed convolution filter.

For common parameter descriptions, see *Common parameters for nppiFilter32f functions:*.

NppStatus **nppiFilter32f_8s_C3R_Ctx**(const *Npp8s* *pSrc, int nSrcStep, *Npp8s* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp32f* *pKernel, *NppiSize* oKernelSize, *NppiPoint* oAnchor, *NppStreamContext* nppStreamCtx)

Three channel 8-bit signed convolution filter.

For common parameter descriptions, see *Common parameters for nppiFilter32f functions:*.

NppStatus **nppiFilter32f_8s_C4R_Ctx**(const *Npp8s* *pSrc, int nSrcStep, *Npp8s* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp32f* *pKernel, *NppiSize* oKernelSize, *NppiPoint* oAnchor, *NppStreamContext* nppStreamCtx)

Four channel 8-bit signed convolution filter.

For common parameter descriptions, see *Common parameters for nppiFilter32f functions:*.

NppStatus **nppiFilter32f_8s_AC4R_Ctx**(const *Npp8s* *pSrc, int nSrcStep, *Npp8s* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp32f* *pKernel, *NppiSize* oKernelSize, *NppiPoint* oAnchor, *NppStreamContext* nppStreamCtx)

Four channel 8-bit signed convolution filter, ignoring alpha channel.

For common parameter descriptions, see *Common parameters for nppiFilter32f functions:*.

NppStatus **nppiFilter32f_16u_C1R_Ctx**(const *Npp16u* *pSrc, int nSrcStep, *Npp16u* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp32f* *pKernel, *NppiSize* oKernelSize, *NppiPoint* oAnchor, *NppStreamContext* nppStreamCtx)

Single channel 16-bit unsigned convolution filter.

For common parameter descriptions, see *Common parameters for nppiFilter32f functions:*.

NppStatus **nppiFilter32f_16u_C3R_Ctx**(const *Npp16u* *pSrc, int nSrcStep, *Npp16u* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp32f* *pKernel, *NppiSize* oKernelSize, *NppiPoint* oAnchor, *NppStreamContext* nppStreamCtx)

Three channel 16-bit unsigned convolution filter.

For common parameter descriptions, see *Common parameters for nppiFilter32f functions:*.

NppStatus **nppiFilter32f_16u_C4R_Ctx**(const *Npp16u* *pSrc, int nSrcStep, *Npp16u* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp32f* *pKernel, *NppiSize* oKernelSize, *NppiPoint* oAnchor, *NppStreamContext* nppStreamCtx)

Four channel 16-bit unsigned convolution filter.

For common parameter descriptions, see *Common parameters for nppiFilter32f functions:*.

NppStatus **nppiFilter32f_16u_AC4R_Ctx**(const *Npp16u* *pSrc, int nSrcStep, *Npp16u* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp32f* *pKernel, *NppiSize* oKernelSize, *NppiPoint* oAnchor, *NppStreamContext* nppStreamCtx)

Four channel 16-bit unsigned convolution filter, ignoring alpha channel.

For common parameter descriptions, see *Common parameters for nppiFilter32f functions:*.

NppStatus **nppiFilter32f_16s_C1R_Ctx**(const *Npp16s* *pSrc, int nSrcStep, *Npp16s* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp32f* *pKernel, *NppiSize* oKernelSize, *NppiPoint* oAnchor, *NppStreamContext* nppStreamCtx)

Single channel 16-bit convolution filter.

For common parameter descriptions, see *Common parameters for nppiFilter32f functions:*.

NppStatus **nppiFilter32f_16s_C3R_Ctx**(const *Npp16s* *pSrc, int nSrcStep, *Npp16s* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp32f* *pKernel, *NppiSize* oKernelSize, *NppiPoint* oAnchor, *NppStreamContext* nppStreamCtx)

Three channel 16-bit convolution filter.

For common parameter descriptions, see *Common parameters for nppiFilter32f functions:*.

NppStatus **nppiFilter32f_16s_C4R_Ctx**(const *Npp16s* *pSrc, int nSrcStep, *Npp16s* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp32f* *pKernel, *NppiSize* oKernelSize, *NppiPoint* oAnchor, *NppStreamContext* nppStreamCtx)

Four channel 16-bit convolution filter.

For common parameter descriptions, see *Common parameters for nppiFilter32f functions:*.

NppStatus **nppiFilter32f_16s_AC4R_Ctx**(const *Npp16s* *pSrc, int nSrcStep, *Npp16s* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp32f* *pKernel, *NppiSize* oKernelSize, *NppiPoint* oAnchor, *NppStreamContext* nppStreamCtx)

Four channel 16-bit convolution filter, ignoring alpha channel.

For common parameter descriptions, see *Common parameters for nppiFilter32f functions:*.

NppStatus **nppiFilter32f_32s_C1R_Ctx**(const *Npp32s* *pSrc, int nSrcStep, *Npp32s* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp32f* *pKernel, *NppiSize* oKernelSize, *NppiPoint* oAnchor, *NppStreamContext* nppStreamCtx)

Single channel 32-bit convolution filter.

For common parameter descriptions, see *Common parameters for nppiFilter32f functions:*.

NppStatus **nppiFilter32f_32s_C3R_Ctx**(const *Npp32s* *pSrc, int nSrcStep, *Npp32s* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp32f* *pKernel, *NppiSize* oKernelSize, *NppiPoint* oAnchor, *NppStreamContext* nppStreamCtx)

Three channel 32-bit convolution filter.

For common parameter descriptions, see *Common parameters for nppiFilter32f functions:*.

NppStatus **nppiFilter32f_32s_C4R_Ctx**(const *Npp32s* *pSrc, int nSrcStep, *Npp32s* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp32f* *pKernel, *NppiSize* oKernelSize, *NppiPoint* oAnchor, *NppStreamContext* nppStreamCtx)

Four channel 32-bit convolution filter.

For common parameter descriptions, see *Common parameters for nppiFilter32f functions:*.

NppStatus **nppiFilter32f_32s_AC4R_Ctx**(const *Npp32s* *pSrc, int nSrcStep, *Npp32s* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp32f* *pKernel, *NppiSize* oKernelSize, *NppiPoint* oAnchor, *NppStreamContext* nppStreamCtx)

Four channel 32-bit convolution filter, ignoring alpha channel.

For common parameter descriptions, see *Common parameters for nppiFilter32f functions:*.

NppStatus **nppiFilter32f_16f_C1R_Ctx**(const *Npp16f* *pSrc, int nSrcStep, *Npp16f* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp32f* *pKernel, *NppiSize* oKernelSize, *NppiPoint* oAnchor, *NppStreamContext* nppStreamCtx)

Single channel 16-bit floating point convolution filter.

For common parameter descriptions, see *Common parameters for nppiFilter32f functions:*.

NppStatus **nppiFilter32f_16f_C3R_Ctx**(const *Npp16f* *pSrc, int nSrcStep, *Npp16f* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp32f* *pKernel, *NppiSize* oKernelSize, *NppiPoint* oAnchor, *NppStreamContext* nppStreamCtx)

Three channel 16-bit floating point convolution filter.

For common parameter descriptions, see *Common parameters for nppiFilter32f functions:*.

NppStatus **nppiFilter32f_16f_C4R_Ctx**(const *Npp16f* *pSrc, int nSrcStep, *Npp16f* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp32f* *pKernel, *NppiSize* oKernelSize, *NppiPoint* oAnchor, *NppStreamContext* nppStreamCtx)

Four channel 16-bit floating point convolution filter.

For common parameter descriptions, see *Common parameters for nppiFilter32f functions:*.

NppStatus **nppiFilter32f_8u16s_C1R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *Npp16s* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp32f* *pKernel, *NppiSize* oKernelSize, *NppiPoint* oAnchor, *NppStreamContext* nppStreamCtx)

Single channel 8-bit unsigned to 16-bit signed convolution filter.

For common parameter descriptions, see *Common parameters for nppiFilter32f functions:*.

NppStatus **nppiFilter32f_8u16s_C3R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *Npp16s* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp32f* *pKernel, *NppiSize* oKernelSize, *NppiPoint* oAnchor, *NppStreamContext* nppStreamCtx)

Three channel 8-bit unsigned to 16-bit signed convolution filter.

For common parameter descriptions, see *Common parameters for nppiFilter32f functions:*.

NppStatus **nppiFilter32f_8u16s_C4R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *Npp16s* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp32f* *pKernel, *NppiSize* oKernelSize, *NppiPoint* oAnchor, *NppStreamContext* nppStreamCtx)

Four channel 8-bit unsigned to 16-bit signed convolution filter.

For common parameter descriptions, see *Common parameters for nppiFilter32f functions:*.

NppStatus **nppiFilter32f_8u16s_AC4R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *Npp16s* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp32f* *pKernel, *NppiSize* oKernelSize, *NppiPoint* oAnchor, *NppStreamContext* nppStreamCtx)

Four channel 8-bit unsigned to 16-bit signed convolution filter, ignoring alpha channel.

For common parameter descriptions, see *Common parameters for nppiFilter32f functions:*.

NppStatus **nppiFilter32f_8s16s_C1R_Ctx**(const *Npp8s* *pSrc, int nSrcStep, *Npp16s* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp32f* *pKernel, *NppiSize* oKernelSize, *NppiPoint* oAnchor, *NppStreamContext* nppStreamCtx)

Single channel 8-bit to 16-bit signed convolution filter.

For common parameter descriptions, see *Common parameters for nppiFilter32f functions:*.

NppStatus **nppiFilter32f_8s16s_C3R_Ctx**(const *Npp8s* *pSrc, int nSrcStep, *Npp16s* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp32f* *pKernel, *NppiSize* oKernelSize, *NppiPoint* oAnchor, *NppStreamContext* nppStreamCtx)

Three channel 8-bit to 16-bit signed convolution filter.

For common parameter descriptions, see *Common parameters for nppiFilter32f functions:*.

NppStatus **nppiFilter32f_8s16s_C4R_Ctx**(const *Npp8s* *pSrc, int nSrcStep, *Npp16s* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp32f* *pKernel, *NppiSize* oKernelSize, *NppiPoint* oAnchor, *NppStreamContext* nppStreamCtx)

Four channel 8-bit to 16-bit signed convolution filter.

For common parameter descriptions, see *Common parameters for nppiFilter32f functions:*.

NppStatus **nppiFilter32f_8s16s_AC4R_Ctx**(const *Npp8s* *pSrc, int nSrcStep, *Npp16s* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp32f* *pKernel, *NppiSize* oKernelSize, *NppiPoint* oAnchor, *NppStreamContext* nppStreamCtx)

Four channel 8-bit to 16-bit signed convolution filter, ignoring alpha channel.

For common parameter descriptions, see *Common parameters for nppiFilter32f functions:*.

1.10.2.4 Image Filter Border

1.10.2.4.1 FilterBorder

General purpose 2D convolution filter with border control.

Pixels under the mask are multiplied by the respective weights in the mask and the results are summed. Before writing the result pixel the sum is scaled back via division by nDivisor. If any portion of the mask overlaps the source image boundary the requested border type operation is applied to all mask pixels which fall outside of the source image.

Currently only the NPP_BORDER_REPLICATE border type operation is supported.

1.10.2.4.1.1 Common parameters for nppiFilterBorder functions:

param pSrc
Source-Image Pointer.

param nSrcStep
Source-Image Line Step.

param oSrcSize
Source image width and height in pixels relative to pSrc.

param oSrcOffset
The pixel offset that pSrc points to relative to the origin of the source image.

param pDst
Destination-Image Pointer.

param nDstStep
Destination-Image Line Step.

param oSizeROI
Region-Of-Interest (ROI).

param pKernel
Device memory pointer to the start address of the kernel coefficient array. Coeffcients are expected to be stored in reverse order.

param oKernelSize
Width and Height of the rectangular kernel.

param oAnchor
X and Y offsets of the kernel origin frame of reference relative to the source pixel.

param nDivisor
The factor by which the convolved summation from the Filter operation should be divided. If equal to the sum of coefficients, this will keep the maximum result value within full scale.

param eBorderType
The border type operation to be applied at source image border boundaries.

param nppStreamCtx
Application Managed Stream Context.

return
Image Data Related Error Codes, *ROI Related Error Codes*

Functions

NppStatus **nppiFilterBorder_8u_C1R_Ctx**(const *Npp8u* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp8u* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, const *Npp32s* *pKernel, *NppiSize* oKernelSize, *NppiPoint* oAnchor, *Npp32s* nDivisor, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Single channel 8-bit unsigned convolution filter with border control.

For common parameter descriptions, see *Common parameters for nppiFilterBorder functions:*.

NppStatus **nppiFilterBorder_8u_C3R_Ctx**(const *Npp8u* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp8u* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, const *Npp32s* *pKernel, *NppiSize* oKernelSize, *NppiPoint* oAnchor, *Npp32s* nDivisor, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Three channel 8-bit unsigned convolution filter with border control.

For common parameter descriptions, see *Common parameters for nppiFilterBorder functions:*.

NppStatus **nppiFilterBorder_8u_C4R_Ctx**(const *Npp8u* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp8u* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, const *Npp32s* *pKernel, *NppiSize* oKernelSize, *NppiPoint* oAnchor, *Npp32s* nDivisor, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Four channel channel 8-bit unsigned convolution filter with border control.

For common parameter descriptions, see *Common parameters for nppiFilterBorder functions:*.

NppStatus **nppiFilterBorder_8u_AC4R_Ctx**(const *Npp8u* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp8u* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, const *Npp32s* *pKernel, *NppiSize* oKernelSize, *NppiPoint* oAnchor, *Npp32s* nDivisor, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Four channel 8-bit unsigned convolution filter with border control, ignoring alpha channel.

For common parameter descriptions, see *Common parameters for nppiFilterBorder functions:*.

NppStatus **nppiFilterBorder_16u_C1R_Ctx**(const *Npp16u* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp16u* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, const *Npp32s* *pKernel, *NppiSize* oKernelSize, *NppiPoint* oAnchor, *Npp32s* nDivisor, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Single channel 16-bit unsigned convolution filter with border control.

For common parameter descriptions, see *Common parameters for nppiFilterBorder functions:*.

NppStatus **nppiFilterBorder_16u_C3R_Ctx**(const *Npp16u* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp16u* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, const *Npp32s* *pKernel, *NppiSize* oKernelSize, *NppiPoint* oAnchor, *Npp32s* nDivisor, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Three channel 16-bit unsigned convolution filter with border control.

For common parameter descriptions, see *Common parameters for nppiFilterBorder functions:*.

NppStatus **nppiFilterBorder_16u_C4R_Ctx**(const *Npp16u* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp16u* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, const *Npp32s* *pKernel, *NppiSize* oKernelSize, *NppiPoint* oAnchor, *Npp32s* nDivisor, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Four channel channel 16-bit unsigned convolution filter with border control.

For common parameter descriptions, see *Common parameters for nppiFilterBorder functions:*.

NppStatus **nppiFilterBorder_16u_AC4R_Ctx**(const *Npp16u* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp16u* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, const *Npp32s* *pKernel, *NppiSize* oKernelSize, *NppiPoint* oAnchor, *Npp32s* nDivisor, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Four channel 16-bit unsigned convolution filter with border control, ignoring alpha channel.

For common parameter descriptions, see *Common parameters for nppiFilterBorder functions:*.

NppStatus **nppiFilterBorder_16s_C1R_Ctx**(const *Npp16s* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp16s* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, const *Npp32s* *pKernel, *NppiSize* oKernelSize, *NppiPoint* oAnchor, *Npp32s* nDivisor, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Single channel 16-bit convolution filter with border control.

For common parameter descriptions, see *Common parameters for nppiFilterBorder functions:*.

NppStatus **nppiFilterBorder_16s_C3R_Ctx**(const *Npp16s* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp16s* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, const *Npp32s* *pKernel, *NppiSize* oKernelSize, *NppiPoint* oAnchor, *Npp32s* nDivisor, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Three channel 16-bit convolution filter with border control.

For common parameter descriptions, see *Common parameters for nppiFilterBorder functions:*.

NppStatus **nppiFilterBorder_16s_C4R_Ctx**(const *Npp16s* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp16s* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, const *Npp32s* *pKernel, *NppiSize* oKernelSize, *NppiPoint* oAnchor, *Npp32s* nDivisor, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Four channel channel 16-bit convolution filter with border control.

For common parameter descriptions, see *Common parameters for nppiFilterBorder functions:*.

NppStatus **nppiFilterBorder_16s_AC4R_Ctx**(const *Npp16s* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp16s* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, const *Npp32s* *pKernel, *NppiSize* oKernelSize, *NppiPoint* oAnchor, *Npp32s* nDivisor, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Four channel 16-bit convolution filter with border control, ignoring alpha channel.

For common parameter descriptions, see *Common parameters for nppiFilterBorder functions:*.

NppStatus **nppiFilterBorder_32f_C1R_Ctx**(const *Npp32f* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp32f* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, const *Npp32f* *pKernel, *NppiSize* oKernelSize, *NppiPoint* oAnchor, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Single channel 32-bit float convolution filter with border control.

For common parameter descriptions, see *Common parameters for nppiFilterBorder functions:*.

NppStatus **nppiFilterBorder_32f_C2R_Ctx**(const *Npp32f* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp32f* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, const *Npp32f* *pKernel, *NppiSize* oKernelSize, *NppiPoint* oAnchor, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Two channel 32-bit float convolution filter with border control.

For common parameter descriptions, see *Common parameters for nppiFilterBorder functions:*.

NppStatus **nppiFilterBorder_32f_C3R_Ctx**(const *Npp32f* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp32f* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, const *Npp32f* *pKernel, *NppiSize* oKernelSize, *NppiPoint* oAnchor, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Three channel 32-bit float convolution filter with border control.

For common parameter descriptions, see *Common parameters for nppiFilterBorder functions:*.

NppStatus **nppiFilterBorder_32f_C4R_Ctx**(const *Npp32f* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp32f* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, const *Npp32f* *pKernel, *NppiSize* oKernelSize, *NppiPoint* oAnchor, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Four channel 32-bit float convolution filter with border control.

For common parameter descriptions, see *Common parameters for nppiFilterBorder functions:*.

NppStatus **nppiFilterBorder_32f_AC4R_Ctx**(const *Npp32f* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp32f* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, const *Npp32f* *pKernel, *NppiSize* oKernelSize, *NppiPoint* oAnchor, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Four channel 32-bit float convolution filter with border control, ignoring alpha channel.

For common parameter descriptions, see *Common parameters for nppiFilterBorder functions:*.

1.10.2.5 Image Filter Border 32f

1.10.2.5.1 FilterBorder32f

General purpose 2D convolution filter using floating-point weights with border control.

Pixels under the mask are multiplied by the respective weights in the mask and the results are summed. Before writing the result pixel the sum is scaled back via division by nDivisor. If any portion of the mask overlaps the source image boundary the requested border type operation is applied to all mask pixels which fall outside of the source image.

Currently only the NPP_BORDER_REPLICATE border type operation is supported.

1.10.2.5.1.1 Common parameters for nppiFilterBorder32f functions:

param pSrc
Source-Image Pointer.

param nSrcStep
Source-Image Line Step.

param oSrcSize
Source image width and height in pixels relative to pSrc.

param oSrcOffset
The pixel offset that pSrc points to relative to the origin of the source image.

param pDst
Destination-Image Pointer.

param nDstStep
Destination-Image Line Step.

param oSizeROI
Region-Of-Interest (ROI).

param pKernel
Device memory pointer to the start address of the kernel coefficient array. Coeffcients are expected to be stored in reverse order.

param oKernelSize
Width and Height of the rectangular kernel.

param oAnchor
X and Y offsets of the kernel origin frame of reference relative to the source pixel.

param eBorderType
The border type operation to be applied at source image border boundaries.

param nppStreamCtx
Application Managed Stream Context.

return
Image Data Related Error Codes, *ROI Related Error Codes*

Functions

NppStatus **nppiFilterBorder32f_8u_C1R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp32f* *pKernel, *NppiSize* oKernelSize, *NppiPoint* oAnchor, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Single channel 8-bit unsigned convolution filter with border control.

For common parameter descriptions, see *Common parameters for nppiFilterBorder32f functions:*.

NppStatus **nppiFilterBorder32f_8u_C2R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp32f* *pKernel, *NppiSize* oKernelSize, *NppiPoint* oAnchor, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Two channel 8-bit unsigned convolution filter with border control.

For common parameter descriptions, see *Common parameters for nppiFilterBorder32f functions:*.

NppStatus **nppiFilterBorder32f_8u_C3R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp32f* *pKernel, *NppiSize* oKernelSize, *NppiPoint* oAnchor, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Three channel 8-bit unsigned convolution filter with border control.

For common parameter descriptions, see *Common parameters for nppiFilterBorder32f functions:*.

NppStatus **nppiFilterBorder32f_8u_C4R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp32f* *pKernel, *NppiSize* oKernelSize, *NppiPoint* oAnchor, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Four channel 8-bit unsigned convolution filter with border control.

For common parameter descriptions, see *Common parameters for nppiFilterBorder32f functions:*.

NppStatus **nppiFilterBorder32f_8u_AC4R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp32f* *pKernel, *NppiSize* oKernelSize, *NppiPoint* oAnchor, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Four channel 8-bit unsigned convolution filter with border control, ignorint alpha channel.

For common parameter descriptions, see *Common parameters for nppiFilterBorder32f functions:*.

NppStatus **nppiFilterBorder32f_8s_C1R_Ctx**(const *Npp8s* *pSrc, int nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp8s* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp32f* *pKernel, *NppiSize* oKernelSize, *NppiPoint* oAnchor, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Single channel 8-bit signed convolution filter with border control.

For common parameter descriptions, see *Common parameters for nppiFilterBorder32f functions:*.

NppStatus **nppiFilterBorder32f_8s_C2R_Ctx**(const *Npp8s* *pSrc, int nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp8s* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp32f* *pKernel, *NppiSize* oKernelSize, *NppiPoint* oAnchor, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Two channel 8-bit signed convolution filter with border control.

For common parameter descriptions, see *Common parameters for nppiFilterBorder32f functions:*.

NppStatus **nppiFilterBorder32f_8s_C3R_Ctx**(const *Npp8s* *pSrc, int nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp8s* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp32f* *pKernel, *NppiSize* oKernelSize, *NppiPoint* oAnchor, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Three channel 8-bit signed convolution filter with border control.

For common parameter descriptions, see *Common parameters for nppiFilterBorder32f functions:*.

NppStatus **nppiFilterBorder32f_8s_C4R_Ctx**(const *Npp8s* *pSrc, int nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp8s* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp32f* *pKernel, *NppiSize* oKernelSize, *NppiPoint* oAnchor, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Four channel 8-bit signed convolution filter with border control.

For common parameter descriptions, see *Common parameters for nppiFilterBorder32f functions:*.

NppStatus **nppiFilterBorder32f_8s_AC4R_Ctx**(const *Npp8s* *pSrc, int nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp8s* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp32f* *pKernel, *NppiSize* oKernelSize, *NppiPoint* oAnchor, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Four channel 8-bit signed convolution filter with border control, ignoring alpha channel.

For common parameter descriptions, see *Common parameters for nppiFilterBorder32f functions:*.

NppStatus **nppiFilterBorder32f_16u_C1R_Ctx**(const *Npp16u* *pSrc, int nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp16u* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp32f* *pKernel, *NppiSize* oKernelSize, *NppiPoint* oAnchor, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Single channel 16-bit unsigned convolution filter with border control.

For common parameter descriptions, see *Common parameters for nppiFilterBorder32f functions:*.

NppStatus **nppiFilterBorder32f_16u_C3R_Ctx**(const *Npp16u* *pSrc, int nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp16u* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp32f* *pKernel, *NppiSize* oKernelSize, *NppiPoint* oAnchor, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Three channel 16-bit unsigned convolution filter with border control.

For common parameter descriptions, see *Common parameters for nppiFilterBorder32f functions:*.

NppStatus **nppiFilterBorder32f_16u_C4R_Ctx**(const *Npp16u* *pSrc, int nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp16u* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp32f* *pKernel, *NppiSize* oKernelSize, *NppiPoint* oAnchor, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Four channel 16-bit unsigned convolution filter with border control.

For common parameter descriptions, see *Common parameters for nppiFilterBorder32f functions:*.

NppStatus **nppiFilterBorder32f_16u_AC4R_Ctx**(const *Npp16u* *pSrc, int nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp16u* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp32f* *pKernel, *NppiSize* oKernelSize, *NppiPoint* oAnchor, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Four channel 16-bit unsigned convolution filter with border control, ignoring alpha channel.

For common parameter descriptions, see *Common parameters for nppiFilterBorder32f functions:*.

NppStatus **nppiFilterBorder32f_16s_C1R_Ctx**(const *Npp16s* *pSrc, int nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp16s* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp32f* *pKernel, *NppiSize* oKernelSize, *NppiPoint* oAnchor, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Single channel 16-bit convolution filter with border control.

For common parameter descriptions, see *Common parameters for nppiFilterBorder32f functions:*.

NppStatus **nppiFilterBorder32f_16s_C3R_Ctx**(const *Npp16s* *pSrc, int nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp16s* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp32f* *pKernel, *NppiSize* oKernelSize, *NppiPoint* oAnchor, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Three channel 16-bit convolution filter with border control.

For common parameter descriptions, see *Common parameters for nppiFilterBorder32f functions:*.

NppStatus **nppiFilterBorder32f_16s_C4R_Ctx**(const *Npp16s* *pSrc, int nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp16s* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp32f* *pKernel, *NppiSize* oKernelSize, *NppiPoint* oAnchor, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Four channel 16-bit convolution filter with border control.

For common parameter descriptions, see *Common parameters for nppiFilterBorder32f functions:*.

NppStatus **nppiFilterBorder32f_16s_AC4R_Ctx**(const *Npp16s* *pSrc, int nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp16s* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp32f* *pKernel, *NppiSize* oKernelSize, *NppiPoint* oAnchor, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Four channel 16-bit convolution filter with border control, ignoring alpha channel.

For common parameter descriptions, see *Common parameters for nppiFilterBorder32f functions:*.

NppStatus **nppiFilterBorder32f_32s_C1R_Ctx**(const *Npp32s* *pSrc, int nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp32s* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp32f* *pKernel, *NppiSize* oKernelSize, *NppiPoint* oAnchor, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Single channel 32-bit convolution filter with border control.

For common parameter descriptions, see *Common parameters for nppiFilterBorder32f functions:*.

NppStatus **nppiFilterBorder32f_32s_C3R_Ctx**(const *Npp32s* *pSrc, int nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp32s* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp32f* *pKernel, *NppiSize* oKernelSize, *NppiPoint* oAnchor, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Three channel 32-bit convolution filter with border control.

For common parameter descriptions, see *Common parameters for nppiFilterBorder32f functions:*.

NppStatus **nppiFilterBorder32f_32s_C4R_Ctx**(const *Npp32s* *pSrc, int nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp32s* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp32f* *pKernel, *NppiSize* oKernelSize, *NppiPoint* oAnchor, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Four channel 32-bit convolution filter with border control.

For common parameter descriptions, see *Common parameters for nppiFilterBorder32f functions:*.

NppStatus **nppiFilterBorder32f_32s_AC4R_Ctx**(const *Npp32s* *pSrc, int nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp32s* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp32f* *pKernel, *NppiSize* oKernelSize, *NppiPoint* oAnchor, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Four channel 32-bit convolution filter with border control, ignoring alpha channel.

For common parameter descriptions, see *Common parameters for nppiFilterBorder32f functions:*.

NppStatus **nppiFilterBorder32f_16f_C1R_Ctx**(const *Npp16f* *pSrc, int nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp16f* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp32f* *pKernel, *NppiSize* oKernelSize, *NppiPoint* oAnchor, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Single channel 16-bit floating point convolution filter with border control.

For common parameter descriptions, see *Common parameters for nppiFilterBorder32f functions:*.

NppStatus **nppiFilterBorder32f_16f_C3R_Ctx**(const *Npp16f* *pSrc, int nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp16f* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp32f* *pKernel, *NppiSize* oKernelSize, *NppiPoint* oAnchor, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Three channel 16-bit floating point convolution filter with border control.

For common parameter descriptions, see *Common parameters for nppiFilterBorder32f functions:*.

NppStatus **nppiFilterBorder32f_16f_C4R_Ctx**(const *Npp16f* *pSrc, int nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp16f* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp32f* *pKernel, *NppiSize* oKernelSize, *NppiPoint* oAnchor, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Four channel 16-bit floating point convolution filter with border control.

For common parameter descriptions, see *Common parameters for nppiFilterBorder32f functions:*.

NppStatus **nppiFilterBorder32f_8u16s_C1R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp16s* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp32f* *pKernel, *NppiSize* oKernelSize, *NppiPoint* oAnchor, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Single channel 8-bit unsigned to 16-bit signed convolution filter with border control.

For common parameter descriptions, see *Common parameters for nppiFilterBorder32f functions:*.

NppStatus **nppiFilterBorder32f_8u16s_C3R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp16s* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp32f* *pKernel, *NppiSize* oKernelSize, *NppiPoint* oAnchor, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Three channel 8-bit unsigned to 16-bit signed convolution filter with border control.

For common parameter descriptions, see *Common parameters for nppiFilterBorder32f functions:*.

NppStatus **nppiFilterBorder32f_8u16s_C4R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp16s* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp32f* *pKernel, *NppiSize* oKernelSize, *NppiPoint* oAnchor, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Four channel 8-bit unsigned to 16-bit signed convolution filter with border control.

For common parameter descriptions, see *Common parameters for nppiFilterBorder32f functions:*.

NppStatus **nppiFilterBorder32f_8u16s_AC4R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp16s* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp32f* *pKernel, *NppiSize* oKernelSize, *NppiPoint* oAnchor, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Four channel 8-bit unsigned to 16-bit signed convolution filter with border control, ignoring alpha channel.

For common parameter descriptions, see *Common parameters for nppiFilterBorder32f functions:*.

NppStatus **nppiFilterBorder32f_8s16s_C1R_Ctx**(const *Npp8s* *pSrc, int nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp16s* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp32f* *pKernel, *NppiSize* oKernelSize, *NppiPoint* oAnchor, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Single channel 8-bit to 16-bit signed convolution filter with border control.

For common parameter descriptions, see *Common parameters for nppiFilterBorder32f functions:*.

NppStatus **nppiFilterBorder32f_8s16s_C3R_Ctx**(const *Npp8s* *pSrc, int nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp16s* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp32f* *pKernel, *NppiSize* oKernelSize, *NppiPoint* oAnchor, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Three channel 8-bit to 16-bit signed convolution filter with border control.

For common parameter descriptions, see *Common parameters for nppiFilterBorder32f functions:*.

NppStatus **nppiFilterBorder32f_8s16s_C4R_Ctx**(const *Npp8s* *pSrc, int nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp16s* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp32f* *pKernel, *NppiSize* oKernelSize, *NppiPoint* oAnchor, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Four channel 8-bit to 16-bit signed convolution filter with border control.

For common parameter descriptions, see *Common parameters for nppiFilterBorder32f functions:*.

NppStatus **nppiFilterBorder32f_8s16s_AC4R_Ctx**(const *Npp8s* *pSrc, int nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp16s* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp32f* *pKernel, *NppiSize* oKernelSize, *NppiPoint* oAnchor, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Four channel 8-bit to 16-bit signed convolution filter with border control, ignoring alpha channel.

For common parameter descriptions, see *Common parameters for nppiFilterBorder32f functions:*.

1.10.3. 2D Fixed Linear Filters

1.10.3.1 2D Fixed Linear Filters

The set of 2D fixed linear filtering functions available in the library.

1.10.3.2 Image Filter Box

1.10.3.2.1 FilterBox

Computes the average pixel values of the pixels under a rectangular mask.

1.10.3.2.1.1 Common parameters for nppiFilterBox functions:

param pSrc
Source-Image Pointer.

param nSrcStep
Source-Image Line Step.

param pDst
Destination-Image Pointer.

param nDstStep
Destination-Image Line Step.

param oSizeROI
Region-Of-Interest (ROI).

param oMaskSize
Width and Height of the neighborhood region for the local Avg operation.

param oAnchor
X and Y offsets of the kernel origin frame of reference relative to the source pixel.

param nppStreamCtx
Application Managed Stream Context.

return
Image Data Related Error Codes, *ROI Related Error Codes*

Functions

NppStatus **nppiFilterBox_8u_C1R_Ctx**(const *Npp8u* *pSrc, *Npp32s* nSrcStep, *Npp8u* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiSize* oMaskSize, *NppiPoint* oAnchor, *NppStreamContext* nppStreamCtx)

Single channel 8-bit unsigned box filter.

For common parameter descriptions, see *Common parameters for nppiFilterBox functions:*.

NppStatus **nppiFilterBox_8u_C3R_Ctx**(const *Npp8u* *pSrc, *Npp32s* nSrcStep, *Npp8u* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiSize* oMaskSize, *NppiPoint* oAnchor, *NppStreamContext* nppStreamCtx)

Three channel 8-bit unsigned box filter.

For common parameter descriptions, see *Common parameters for nppiFilterBox functions:*.

NppStatus **nppiFilterBox_8u_C4R_Ctx**(const *Npp8u* *pSrc, *Npp32s* nSrcStep, *Npp8u* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiSize* oMaskSize, *NppiPoint* oAnchor, *NppStreamContext* nppStreamCtx)

Four channel 8-bit unsigned box filter.

For common parameter descriptions, see *Common parameters for nppiFilterBox functions:*.

NppStatus **nppiFilterBox_8u_AC4R_Ctx**(const *Npp8u* *pSrc, *Npp32s* nSrcStep, *Npp8u* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiSize* oMaskSize, *NppiPoint* oAnchor, *NppStreamContext* nppStreamCtx)

Four channel 8-bit unsigned box filter, ignorting alpha channel.

For common parameter descriptions, see *Common parameters for nppiFilterBox functions:*.

NppStatus **nppiFilterBox_16u_C1R_Ctx**(const *Npp16u* *pSrc, *Npp32s* nSrcStep, *Npp16u* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiSize* oMaskSize, *NppiPoint* oAnchor, *NppStreamContext* nppStreamCtx)

Single channel 16-bit unsigned box filter.

For common parameter descriptions, see *Common parameters for nppiFilterBox functions:*.

NppStatus **nppiFilterBox_16u_C3R_Ctx**(const *Npp16u* *pSrc, *Npp32s* nSrcStep, *Npp16u* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiSize* oMaskSize, *NppiPoint* oAnchor, *NppStreamContext* nppStreamCtx)

Three channel 16-bit unsigned box filter.

For common parameter descriptions, see *Common parameters for nppiFilterBox functions:*.

NppStatus **nppiFilterBox_16u_C4R_Ctx**(const *Npp16u* *pSrc, *Npp32s* nSrcStep, *Npp16u* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiSize* oMaskSize, *NppiPoint* oAnchor, *NppStreamContext* nppStreamCtx)

Four channel 16-bit unsigned box filter.

For common parameter descriptions, see *Common parameters for nppiFilterBox functions:*.

NppStatus **nppiFilterBox_16u_AC4R_Ctx**(const *Npp16u* *pSrc, *Npp32s* nSrcStep, *Npp16u* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiSize* oMaskSize, *NppiPoint* oAnchor, *NppStreamContext* nppStreamCtx)

Four channel 16-bit unsigned box filter, ignorting alpha channel.

For common parameter descriptions, see *Common parameters for nppiFilterBox functions:*.

NppStatus **nppiFilterBox_16s_C1R_Ctx**(const *Npp16s* *pSrc, *Npp32s* nSrcStep, *Npp16s* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiSize* oMaskSize, *NppiPoint* oAnchor, *NppStreamContext* nppStreamCtx)

Single channel 16-bit box filter.

For common parameter descriptions, see *Common parameters for nppiFilterBox functions:*.

NppStatus **nppiFilterBox_16s_C3R_Ctx**(const *Npp16s* *pSrc, *Npp32s* nSrcStep, *Npp16s* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiSize* oMaskSize, *NppiPoint* oAnchor, *NppStreamContext* nppStreamCtx)

Three channel 16-bit box filter.

For common parameter descriptions, see *Common parameters for nppiFilterBox functions:*.

NppStatus **nppiFilterBox_16s_C4R_Ctx**(const *Npp16s* *pSrc, *Npp32s* nSrcStep, *Npp16s* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiSize* oMaskSize, *NppiPoint* oAnchor, *NppStreamContext* nppStreamCtx)

Four channel 16-bit box filter.

For common parameter descriptions, see *Common parameters for nppiFilterBox functions:*.

NppStatus **nppiFilterBox_16s_AC4R_Ctx**(const *Npp16s* *pSrc, *Npp32s* nSrcStep, *Npp16s* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiSize* oMaskSize, *NppiPoint* oAnchor, *NppStreamContext* nppStreamCtx)

Four channel 16-bit box filter, ignorting alpha channel.

For common parameter descriptions, see *Common parameters for nppiFilterBox functions:*.

NppStatus **nppiFilterBox_32f_C1R_Ctx**(const *Npp32f* *pSrc, *Npp32s* nSrcStep, *Npp32f* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiSize* oMaskSize, *NppiPoint* oAnchor, *NppStreamContext* nppStreamCtx)

Single channel 32-bit floating-point box filter.

For common parameter descriptions, see *Common parameters for nppiFilterBox functions:*.

NppStatus **nppiFilterBox_32f_C3R_Ctx**(const *Npp32f* *pSrc, *Npp32s* nSrcStep, *Npp32f* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiSize* oMaskSize, *NppiPoint* oAnchor, *NppStreamContext* nppStreamCtx)

Three channel 32-bit floating-point box filter.

For common parameter descriptions, see *Common parameters for nppiFilterBox functions:*.

NppStatus **nppiFilterBox_32f_C4R_Ctx**(const *Npp32f* *pSrc, *Npp32s* nSrcStep, *Npp32f* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiSize* oMaskSize, *NppiPoint* oAnchor, *NppStreamContext* nppStreamCtx)

Four channel 32-bit floating-point box filter.

For common parameter descriptions, see *Common parameters for nppiFilterBox functions:*.

NppStatus **nppiFilterBox_32f_AC4R_Ctx**(const *Npp32f* *pSrc, *Npp32s* nSrcStep, *Npp32f* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiSize* oMaskSize, *NppiPoint* oAnchor, *NppStreamContext* nppStreamCtx)

Four channel 32-bit floating-point box filter, ignorting alpha channel.

For common parameter descriptions, see *Common parameters for nppiFilterBox functions:*.

NppStatus **nppiFilterBox_64f_C1R_Ctx**(const *Npp64f* *pSrc, *Npp32s* nSrcStep, *Npp64f* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiSize* oMaskSize, *NppiPoint* oAnchor, *NppStreamContext* nppStreamCtx)

Single channel 64-bit floating-point box filter.

For common parameter descriptions, see *Common parameters for nppiFilterBox functions:*.

1.10.3.3 Image Filter Box Border

1.10.3.3.1 FilterBoxBorder

Computes the average pixel values of the pixels under a rectangular mask with border control. If any portion of the mask overlaps the source image boundary the requested border type operation is applied to all mask pixels which fall outside of the source image.

Currently only the NPP_BORDER_REPLICATE border type operation is supported. *

1.10.3.3.1.1 Common parameters for nppiFilterBoxBorder functions:

param pSrc
Source-Image Pointer.

param nSrcStep
Source-Image Line Step.

param oSrcSize
Source image width and height in pixels relative to pSrc.

param oSrcOffset
The pixel offset that pSrc points to relative to the origin of the source image.

param pDst
Destination-Image Pointer.

param nDstStep
Destination-Image Line Step.

param oSizeROI
Region-Of-Interest (ROI).

param oMaskSize
Width and Height of the neighborhood region for the local Avg operation.

param oAnchor
X and Y offsets of the kernel origin frame of reference relative to the source pixel.

param eBorderType
The border type operation to be applied at source image border boundaries.

param nppStreamCtx
Application Managed Stream Context.

return
Image Data Related Error Codes, *ROI Related Error Codes*

Functions

NppStatus **nppiFilterBoxBorder_8u_C1R_Ctx**(const *Npp8u* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp8u* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiSize* oMaskSize, *NppiPoint* oAnchor, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Single channel 8-bit unsigned box filter with border control.

For common parameter descriptions, see *Common parameters for nppiFilterBoxBorder functions:*.

NppStatus **nppiFilterBoxBorder_8u_C3R_Ctx**(const *Npp8u* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp8u* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiSize* oMaskSize, *NppiPoint* oAnchor, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Three channel 8-bit unsigned box filter with border control.

For common parameter descriptions, see *Common parameters for nppiFilterBoxBorder functions:*.

NppStatus **nppiFilterBoxBorder_8u_C4R_Ctx**(const *Npp8u* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp8u* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiSize* oMaskSize, *NppiPoint* oAnchor, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Four channel 8-bit unsigned box filter with border control.

For common parameter descriptions, see *Common parameters for nppiFilterBoxBorder functions:*.

NppStatus **nppiFilterBoxBorder_8u_AC4R_Ctx**(const *Npp8u* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp8u* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiSize* oMaskSize, *NppiPoint* oAnchor, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Four channel 8-bit unsigned box filter with border control, ignoring alpha channel.

For common parameter descriptions, see *Common parameters for nppiFilterBoxBorder functions:*.

NppStatus **nppiFilterBoxBorder_16u_C1R_Ctx**(const *Npp16u* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp16u* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiSize* oMaskSize, *NppiPoint* oAnchor, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Single channel 16-bit unsigned box filter with border control.

For common parameter descriptions, see *Common parameters for nppiFilterBoxBorder functions:*.

NppStatus **nppiFilterBoxBorder_16u_C3R_Ctx**(const *Npp16u* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp16u* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiSize* oMaskSize, *NppiPoint* oAnchor, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Three channel 16-bit unsigned box filter with border control.

For common parameter descriptions, see *Common parameters for nppiFilterBoxBorder functions:*.

NppStatus **nppiFilterBoxBorder_16u_C4R_Ctx**(const *Npp16u* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp16u* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiSize* oMaskSize, *NppiPoint* oAnchor, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Four channel 16-bit unsigned box filter with border control.

For common parameter descriptions, see *Common parameters for nppiFilterBoxBorder functions:*.

NppStatus **nppiFilterBoxBorder_16u_AC4R_Ctx**(const *Npp16u* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp16u* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiSize* oMaskSize, *NppiPoint* oAnchor, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Four channel 16-bit unsigned box filter with border control, ignoring alpha channel.

For common parameter descriptions, see *Common parameters for nppiFilterBoxBorder functions:*.

NppStatus **nppiFilterBoxBorder_16s_C1R_Ctx**(const *Npp16s* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp16s* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiSize* oMaskSize, *NppiPoint* oAnchor, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Single channel 16-bit box filter with border control.

For common parameter descriptions, see *Common parameters for nppiFilterBoxBorder functions:*.

NppStatus **nppiFilterBoxBorder_16s_C3R_Ctx**(const *Npp16s* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp16s* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiSize* oMaskSize, *NppiPoint* oAnchor, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Three channel 16-bit box filter with border control.

For common parameter descriptions, see *Common parameters for nppiFilterBoxBorder functions:*.

NppStatus **nppiFilterBoxBorder_16s_C4R_Ctx**(const *Npp16s* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp16s* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiSize* oMaskSize, *NppiPoint* oAnchor, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Four channel 16-bit box filter with border control.

For common parameter descriptions, see *Common parameters for nppiFilterBoxBorder functions:*.

NppStatus **nppiFilterBoxBorder_16s_AC4R_Ctx**(const *Npp16s* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp16s* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiSize* oMaskSize, *NppiPoint* oAnchor, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Four channel 16-bit box filter with border control, ignoring alpha channel.

For common parameter descriptions, see *Common parameters for nppiFilterBoxBorder functions:*.

NppStatus **nppiFilterBoxBorder_32f_C1R_Ctx**(const *Npp32f* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp32f* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiSize* oMaskSize, *NppiPoint* oAnchor, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Single channel 32-bit floating-point box filter with border control.

For common parameter descriptions, see *Common parameters for nppiFilterBoxBorder functions:*.

NppStatus **nppiFilterBoxBorder_32f_C3R_Ctx**(const *Npp32f* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp32f* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiSize* oMaskSize, *NppiPoint* oAnchor, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Three channel 32-bit floating-point box filter with border control.

For common parameter descriptions, see *Common parameters for nppiFilterBoxBorder functions:*.

NppStatus **nppiFilterBoxBorder_32f_C4R_Ctx**(const *Npp32f* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp32f* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiSize* oMaskSize, *NppiPoint* oAnchor, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Four channel 32-bit floating-point box filter with border control.

For common parameter descriptions, see *Common parameters for nppiFilterBoxBorder functions:*.

NppStatus **nppiFilterBoxBorder_32f_AC4R_Ctx**(const *Npp32f* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp32f* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiSize* oMaskSize, *NppiPoint* oAnchor, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Four channel 32-bit floating-point box filter with border control, ignoring alpha channel.

For common parameter descriptions, see *Common parameters for nppiFilterBoxBorder functions:*.

1.10.3.4 Image Filter Box Border Advanced

1.10.3.4.1 FilterBoxBorderAdvanced

Computes the average pixel values of the pixels under a rectangular mask with border control. If any portion of the mask overlaps the source image boundary the requested border type operation is applied to all mask pixels which fall outside of the source image. These versions of the functions are intended to significantly improve performance when very large mask sizes are used.

Currently only the NPP_BORDER_REPLICATE border type operation is supported. *

1.10.3.4.1.1 Common parameters for nppiFilterBoxBorderAdvanced functions:

param pSrc
Source-Image Pointer.

param nSrcStep
Source-Image Line Step.

param oSrcSize
Source image width and height in pixels relative to pSrc.

param oSrcOffset
The pixel offset that pSrc points to relative to the origin of the source image.

param pDst
Destination-Image Pointer.

param nDstStep
Destination-Image Line Step.

param oSizeROI
Region-Of-Interest (ROI).

param oMaskSize
Width and Height of the neighborhood region for the local Avg operation.

param oAnchor
X and Y offsets of the kernel origin frame of reference relative to the source pixel.

param eBorderType
The border type operation to be applied at source image border boundaries.

param pBuffer
Pointer to device memory buffer of size hpBufferSize bytes returned by calling nppiFilterBoxBorderAdvancedGetDeviceBufferSize.

param nppStreamCtx
Application Managed Stream Context.

return
Image Data Related Error Codes, *ROI Related Error Codes*

Functions

NppStatus **nppiFilterBoxBorderAdvancedGetDeviceBufferSize**(*NppiSize* oSizeROI, int nChannels, int *hpBufferSize)

Returns the required size of host memory buffer needed by most nppiFilterBoxBorderAdvanced functions.

Parameters

- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nChannels** – The number of channels in the image to be filtered (1, 3, or 4).
- **hpBufferSize** – Required buffer size. Important: hpBufferSize is a *host pointer. Scratch Buffer and Host Pointer*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiFilterBoxBorderAdvancedGetDeviceBufferSize_64**(*NppiSize* oSizeROI, int nChannels, int *hpBufferSize)

Returns the required size of host memory buffer needed by nppiFilterBoxBorderAdvanced functions with 64-bit image data.

Parameters

- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nChannels** – The number of channels in the image to be filtered (1, 3, or 4).
- **hpBufferSize** – Required buffer size. Important: hpBufferSize is a *host pointer. Scratch Buffer and Host Pointer*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiFilterBoxBorderAdvanced_8u_C1R_Ctx**(const *Npp8u* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp8u* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiSize* oMaskSize, *NppiPoint* oAnchor, *NppiBorderType* eBorderType, *Npp8u* *pBuffer, *NppStreamContext* nppStreamCtx)

Single channel 8-bit unsigned box filter with border control.

For common parameter descriptions, see *Common parameters for nppiFilterBoxBorderAdvanced functions:*.

NppStatus **nppiFilterBoxBorderAdvanced_8u_C3R_Ctx**(const *Npp8u* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp8u* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiSize* oMaskSize, *NppiPoint* oAnchor, *NppiBorderType* eBorderType, *Npp8u* *pBuffer, *NppStreamContext* nppStreamCtx)

Three channel 8-bit unsigned box filter with border control.

For common parameter descriptions, see *Common parameters for nppiFilterBoxBorderAdvanced functions:*.

NppStatus **nppiFilterBoxBorderAdvanced_8u_C4R_Ctx**(const *Npp8u* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp8u* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiSize* oMaskSize, *NppiPoint* oAnchor, *NppiBorderType* eBorderType, *Npp8u* *pBuffer, *NppStreamContext* nppStreamCtx)

Four channel 8-bit unsigned box filter with border control.

For common parameter descriptions, see *Common parameters for nppiFilterBoxBorderAdvanced functions:*.

NppStatus **nppiFilterBoxBorderAdvanced_16u_C1R_Ctx**(const *Npp16u* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp16u* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiSize* oMaskSize, *NppiPoint* oAnchor, *NppiBorderType* eBorderType, *Npp8u* *pBuffer, *NppStreamContext* nppStreamCtx)

Single channel 16-bit unsigned box filter with border control.

For common parameter descriptions, see *Common parameters for nppiFilterBoxBorderAdvanced functions:*.

NppStatus **nppiFilterBoxBorderAdvanced_16u_C3R_Ctx**(const *Npp16u* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp16u* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiSize* oMaskSize, *NppiPoint* oAnchor, *NppiBorderType* eBorderType, *Npp8u* *pBuffer, *NppStreamContext* nppStreamCtx)

Three channel 16-bit unsigned box filter with border control.

For common parameter descriptions, see *Common parameters for nppiFilterBoxBorderAdvanced functions:*.

NppStatus **nppiFilterBoxBorderAdvanced_16u_C4R_Ctx**(const *Npp16u* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp16u* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiSize* oMaskSize, *NppiPoint* oAnchor, *NppiBorderType* eBorderType, *Npp8u* *pBuffer, *NppStreamContext* nppStreamCtx)

Four channel 16-bit unsigned box filter with border control.

For common parameter descriptions, see *Common parameters for nppiFilterBoxBorderAdvanced functions:*.

NppStatus **nppiFilterBoxBorderAdvanced_16s_C1R_Ctx**(const *Npp16s* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp16s* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiSize* oMaskSize, *NppiPoint* oAnchor, *NppiBorderType* eBorderType, *Npp8u* *pBuffer, *NppStreamContext* nppStreamCtx)

Single channel 16-bit box filter with border control.

For common parameter descriptions, see *Common parameters for nppiFilterBoxBorderAdvanced functions:*.

NppStatus **nppiFilterBoxBorderAdvanced_16s_C3R_Ctx**(const *Npp16s* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp16s* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiSize* oMaskSize, *NppiPoint* oAnchor, *NppiBorderType* eBorderType, *Npp8u* *pBuffer, *NppStreamContext* nppStreamCtx)

Three channel 16-bit box filter with border control.

For common parameter descriptions, see *Common parameters for nppiFilterBoxBorderAdvanced functions:*.

NppStatus **nppiFilterBoxBorderAdvanced_16s_C4R_Ctx**(const *Npp16s* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp16s* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiSize* oMaskSize, *NppiPoint* oAnchor, *NppiBorderType* eBorderType, *Npp8u* *pBuffer, *NppStreamContext* nppStreamCtx)

Four channel 16-bit box filter with border control.

For common parameter descriptions, see *Common parameters for nppiFilterBoxBorderAdvanced functions:*.

NppStatus **nppiFilterBoxBorderAdvanced_32f_C1R_Ctx**(const *Npp32f* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp32f* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiSize* oMaskSize, *NppiPoint* oAnchor, *NppiBorderType* eBorderType, *Npp8u* *pBuffer, *NppStreamContext* nppStreamCtx)

Single channel 32-bit floating-point box filter with border control.

For common parameter descriptions, see *Common parameters for nppiFilterBoxBorderAdvanced functions:*.

NppStatus **nppiFilterBoxBorderAdvanced_32f_C3R_Ctx**(const *Npp32f* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp32f* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiSize* oMaskSize, *NppiPoint* oAnchor, *NppiBorderType* eBorderType, *Npp8u* *pBuffer, *NppStreamContext* nppStreamCtx)

Three channel 32-bit floating-point box filter with border control.

For common parameter descriptions, see *Common parameters for nppiFilterBoxBorderAdvanced functions:*.

NppStatus **nppiFilterBoxBorderAdvanced_32f_C4R_Ctx**(const *Npp32f* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp32f* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiSize* oMaskSize, *NppiPoint* oAnchor, *NppiBorderType* eBorderType, *Npp8u* *pBuffer, *NppStreamContext* nppStreamCtx)

Four channel 32-bit floating-point box filter with border control.

For common parameter descriptions, see *Common parameters for nppiFilterBoxBorderAdvanced functions:*.

NppStatus **nppiFilterBoxBorderAdvanced_64f_C1R_Ctx**(const *Npp64f* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp64f* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiSize* oMaskSize, *NppiPoint* oAnchor, *NppiBorderType* eBorderType, *Npp8u* *pBuffer64, *NppStreamContext* nppStreamCtx)

Single channel 64-bit floating-point box filter with border control.

For common parameter descriptions, see *Common parameters for nppiFilterBoxBorderAdvanced functions:*.

1.10.3.5 Image Filter Threshold Adaptive Box Border

1.10.3.5.1 FilterThresholdAdaptiveBoxBorder

Computes the average pixel values of the pixels under a square mask with border control. If any portion of the mask overlaps the source image boundary the requested border type operation is applied to all mask pixels which fall outside of the source image. Once the neighborhood average around a source pixel is determined the source pixel is compared to the average - nDelta and if the source pixel is greater than that average the corresponding destination pixel is set to nValGT, otherwise nValLE.

Currently only the NPP_BORDER_REPLICATE border type operation is supported.

param pSrc
Source-Image Pointer.

param nSrcStep
Source-Image Line Step.

param oSrcSize
Source image width and height in pixels relative to pSrc.

param oSrcOffset
The pixel offset that pSrc points to relative to the origin of the source image.

param pDst
Destination-Image Pointer.

param nDstStep
Destination-Image Line Step.

param oSizeROI
Region-Of-Interest (ROI).

param oMaskSize
Width and Height of the neighborhood region for the local Avg operation, Width and Height must be equal and odd.

param nDelta
Neighborhood average adjustment value

param nValGT
Destination output value if source pixel is greater than average.

param nValLE
Destination output value if source pixel is less than or equal to average.

param eBorderType
The border type operation to be applied at source image border boundaries.

param nppStreamCtx
Application Managed Stream Context.

return
Image Data Related Error Codes, *ROI Related Error Codes*

Functions

NppStatus **nppiFilterThresholdAdaptiveBoxBorder_8u_C1R_Ctx**(const *Npp8u* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp8u* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiSize* oMaskSize, *Npp32f* nDelta, *Npp8u* nValGT, *Npp8u* nValLE, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Single channel 8-bit unsigned threshold adaptive box filter with border control.

1.10.4. Rank Filters

1.10.4.1 Rank Filters

The set of functions providing min/max/median values for rectangular mask region with/without border available in the library.

1.10.4.2 Image Filter Max

1.10.4.2.1 FilterMax

Result pixel value is the maximum of pixel values under the rectangular mask region.

1.10.4.2.1.1 Common parameters for nppiFilterMax functions:

param pSrc
Source-Image Pointer.

param nSrcStep
Source-Image Line Step.

param pDst
Destination-Image Pointer.

param nDstStep
Destination-Image Line Step plus mask size width.

param oSizeROI
Region-Of-Interest (ROI).

param oMaskSize
Width and Height of the neighborhood region for the local Max operation.

param oAnchor
X and Y offsets of the kernel origin frame of reference relative to the source pixel.

param nppStreamCtx
Application Managed Stream Context.

return
Image Data Related Error Codes, *ROI Related Error Codes*

Functions

NppStatus **nppiFilterMax_8u_C1R_Ctx**(const *Npp8u* *pSrc, *Npp32s* nSrcStep, *Npp8u* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiSize* oMaskSize, *NppiPoint* oAnchor, *NppStreamContext* nppStreamCtx)

Single channel 8-bit unsigned maximum filter.

For common parameter descriptions, see *Common parameters for nppiFilterMax functions:*.

NppStatus **nppiFilterMax_8u_C3R_Ctx**(const *Npp8u* *pSrc, *Npp32s* nSrcStep, *Npp8u* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiSize* oMaskSize, *NppiPoint* oAnchor, *NppStreamContext* nppStreamCtx)

Three channel 8-bit unsigned maximum filter.

For common parameter descriptions, see *Common parameters for nppiFilterMax functions:*.

NppStatus **nppiFilterMax_8u_C4R_Ctx**(const *Npp8u* *pSrc, *Npp32s* nSrcStep, *Npp8u* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiSize* oMaskSize, *NppiPoint* oAnchor, *NppStreamContext* nppStreamCtx)

Four channel 8-bit unsigned maximum filter.

For common parameter descriptions, see *Common parameters for nppiFilterMax functions:*.

NppStatus **nppiFilterMax_8u_AC4R_Ctx**(const *Npp8u* *pSrc, *Npp32s* nSrcStep, *Npp8u* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiSize* oMaskSize, *NppiPoint* oAnchor, *NppStreamContext* nppStreamCtx)

Four channel 8-bit unsigned maximum filter, ignoring alpha channel.

For common parameter descriptions, see *Common parameters for nppiFilterMax functions:*.

NppStatus **nppiFilterMax_16u_C1R_Ctx**(const *Npp16u* *pSrc, *Npp32s* nSrcStep, *Npp16u* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiSize* oMaskSize, *NppiPoint* oAnchor, *NppStreamContext* nppStreamCtx)

Single channel 16-bit unsigned maximum filter.

For common parameter descriptions, see *Common parameters for nppiFilterMax functions:*.

NppStatus **nppiFilterMax_16u_C3R_Ctx**(const *Npp16u* *pSrc, *Npp32s* nSrcStep, *Npp16u* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiSize* oMaskSize, *NppiPoint* oAnchor, *NppStreamContext* nppStreamCtx)

Three channel 16-bit unsigned maximum filter.

For common parameter descriptions, see *Common parameters for nppiFilterMax functions:*.

NppStatus **nppiFilterMax_16u_C4R_Ctx**(const *Npp16u* *pSrc, *Npp32s* nSrcStep, *Npp16u* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiSize* oMaskSize, *NppiPoint* oAnchor, *NppStreamContext* nppStreamCtx)

Four channel 16-bit unsigned maximum filter.

For common parameter descriptions, see *Common parameters for nppiFilterMax functions:*.

NppStatus **nppiFilterMax_16u_AC4R_Ctx**(const *Npp16u* *pSrc, *Npp32s* nSrcStep, *Npp16u* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiSize* oMaskSize, *NppiPoint* oAnchor, *NppStreamContext* nppStreamCtx)

Four channel 16-bit unsigned maximum filter, ignoring alpha channel.

For common parameter descriptions, see *Common parameters for nppiFilterMax functions:*.

NppStatus **nppiFilterMax_16s_C1R_Ctx**(const *Npp16s* *pSrc, *Npp32s* nSrcStep, *Npp16s* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiSize* oMaskSize, *NppiPoint* oAnchor, *NppStreamContext* nppStreamCtx)

Single channel 16-bit signed maximum filter.

For common parameter descriptions, see *Common parameters for nppiFilterMax functions:*.

NppStatus **nppiFilterMax_16s_C3R_Ctx**(const *Npp16s* *pSrc, *Npp32s* nSrcStep, *Npp16s* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiSize* oMaskSize, *NppiPoint* oAnchor, *NppStreamContext* nppStreamCtx)

Three channel 16-bit signed maximum filter.

For common parameter descriptions, see *Common parameters for nppiFilterMax functions:*.

NppStatus **nppiFilterMax_16s_C4R_Ctx**(const *Npp16s* *pSrc, *Npp32s* nSrcStep, *Npp16s* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiSize* oMaskSize, *NppiPoint* oAnchor, *NppStreamContext* nppStreamCtx)

Four channel 16-bit signed maximum filter.

For common parameter descriptions, see *Common parameters for nppiFilterMax functions:*.

NppStatus **nppiFilterMax_16s_AC4R_Ctx**(const *Npp16s* *pSrc, *Npp32s* nSrcStep, *Npp16s* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiSize* oMaskSize, *NppiPoint* oAnchor, *NppStreamContext* nppStreamCtx)

Four channel 16-bit signed maximum filter, ignoring alpha channel.

For common parameter descriptions, see *Common parameters for nppiFilterMax functions:*.

NppStatus **nppiFilterMax_32f_C1R_Ctx**(const *Npp32f* *pSrc, *Npp32s* nSrcStep, *Npp32f* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiSize* oMaskSize, *NppiPoint* oAnchor, *NppStreamContext* nppStreamCtx)

Single channel 32-bit floating-point maximum filter.

For common parameter descriptions, see *Common parameters for nppiFilterMax functions:*.

NppStatus **nppiFilterMax_32f_C3R_Ctx**(const *Npp32f* *pSrc, *Npp32s* nSrcStep, *Npp32f* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiSize* oMaskSize, *NppiPoint* oAnchor, *NppStreamContext* nppStreamCtx)

Three channel 32-bit floating-point maximum filter.

For common parameter descriptions, see *Common parameters for nppiFilterMax functions:*.

NppStatus **nppiFilterMax_32f_C4R_Ctx**(const *Npp32f* *pSrc, *Npp32s* nSrcStep, *Npp32f* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiSize* oMaskSize, *NppiPoint* oAnchor, *NppStreamContext* nppStreamCtx)

Four channel 32-bit floating-point maximum filter.

For common parameter descriptions, see *Common parameters for nppiFilterMax functions:*.

NppStatus **nppiFilterMax_32f_AC4R_Ctx**(const *Npp32f* *pSrc, *Npp32s* nSrcStep, *Npp32f* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiSize* oMaskSize, *NppiPoint* oAnchor, *NppStreamContext* nppStreamCtx)

Four channel 32-bit floating-point maximum filter, ignoring alpha channel.

For common parameter descriptions, see *Common parameters for nppiFilterMax functions:*.

1.10.4.3 Image Filter Max Border

1.10.4.3.1 FilterMaxBorder

Result pixel value is the maximum of pixel values under the rectangular mask region with border control.

If any portion of the mask overlaps the source image boundary the requested border type operation is applied to all mask pixels which fall outside of the source image.

Currently only the NPP_BORDER_REPLICATE border type operation is supported.

1.10.4.3.1.1 Common parameters for nppiFilterMaxBorder functions:

param pSrc
Source-Image Pointer.

param nSrcStep
Source-Image Line Step.

param oSrcSize
Source image width and height in pixels relative to pSrc.

param oSrcOffset
The pixel offset that pSrc points to relative to the origin of the source image.

param pDst
Destination-Image Pointer.

param nDstStep
Destination-Image Line Step.

param oSizeROI
Region-Of-Interest (ROI).

param oMaskSize
Width and Height of the neighborhood region for the local Max operation.

param oAnchor
X and Y offsets of the kernel origin frame of reference relative to the source pixel.

param eBorderType
The border type operation to be applied at source image border boundaries.

param nppStreamCtx
Application Managed Stream Context.

return
Image Data Related Error Codes, *ROI Related Error Codes*

Functions

NppStatus **nppiFilterMaxBorder_8u_C1R_Ctx**(const *Npp8u* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp8u* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiSize* oMaskSize, *NppiPoint* oAnchor, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Single channel 8-bit unsigned maximum filter with border control.

For common parameter descriptions, see *Common parameters for nppiFilterMaxBorder functions:*.

NppStatus **nppiFilterMaxBorder_8u_C3R_Ctx**(const *Npp8u* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp8u* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiSize* oMaskSize, *NppiPoint* oAnchor, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Three channel 8-bit unsigned maximum filter with border control.

For common parameter descriptions, see *Common parameters for nppiFilterMaxBorder functions:*.

NppStatus **nppiFilterMaxBorder_8u_C4R_Ctx**(const *Npp8u* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp8u* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiSize* oMaskSize, *NppiPoint* oAnchor, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Four channel 8-bit unsigned maximum filter with border control.

For common parameter descriptions, see *Common parameters for nppiFilterMaxBorder functions:*.

NppStatus **nppiFilterMaxBorder_8u_AC4R_Ctx**(const *Npp8u* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp8u* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiSize* oMaskSize, *NppiPoint* oAnchor, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Four channel 8-bit unsigned maximum filter with border control, ignoring alpha channel.

For common parameter descriptions, see *Common parameters for nppiFilterMaxBorder functions:*.

NppStatus **nppiFilterMaxBorder_16u_C1R_Ctx**(const *Npp16u* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp16u* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiSize* oMaskSize, *NppiPoint* oAnchor, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Single channel 16-bit unsigned maximum filter with border control.

For common parameter descriptions, see *Common parameters for nppiFilterMaxBorder functions:*.

NppStatus **nppiFilterMaxBorder_16u_C3R_Ctx**(const *Npp16u* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp16u* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiSize* oMaskSize, *NppiPoint* oAnchor, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Three channel 16-bit unsigned maximum filter with border control.

For common parameter descriptions, see *Common parameters for nppiFilterMaxBorder functions:*.

NppStatus **nppiFilterMaxBorder_16u_C4R_Ctx**(const *Npp16u* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp16u* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiSize* oMaskSize, *NppiPoint* oAnchor, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Four channel 16-bit unsigned maximum filter with border control.

For common parameter descriptions, see *Common parameters for nppiFilterMaxBorder functions:*.

NppStatus **nppiFilterMaxBorder_16u_AC4R_Ctx**(const *Npp16u* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp16u* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiSize* oMaskSize, *NppiPoint* oAnchor, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Four channel 16-bit unsigned maximum filter with border control, ignoring alpha channel.

For common parameter descriptions, see *Common parameters for nppiFilterMaxBorder functions:*.

NppStatus **nppiFilterMaxBorder_16s_C1R_Ctx**(const *Npp16s* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp16s* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiSize* oMaskSize, *NppiPoint* oAnchor, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Single channel 16-bit signed maximum filter with border control.

For common parameter descriptions, see *Common parameters for nppiFilterMaxBorder functions:*.

NppStatus **nppiFilterMaxBorder_16s_C3R_Ctx**(const *Npp16s* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp16s* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiSize* oMaskSize, *NppiPoint* oAnchor, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Three channel 16-bit signed maximum filter with border control.

For common parameter descriptions, see *Common parameters for nppiFilterMaxBorder functions:*.

NppStatus **nppiFilterMaxBorder_16s_C4R_Ctx**(const *Npp16s* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp16s* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiSize* oMaskSize, *NppiPoint* oAnchor, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Four channel 16-bit signed maximum filter with border control.

For common parameter descriptions, see *Common parameters for nppiFilterMaxBorder functions:*.

NppStatus **nppiFilterMaxBorder_16s_AC4R_Ctx**(const *Npp16s* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp16s* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiSize* oMaskSize, *NppiPoint* oAnchor, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Four channel 16-bit signed maximum filter with border control, ignoring alpha channel.

For common parameter descriptions, see *Common parameters for nppiFilterMaxBorder functions:*.

NppStatus **nppiFilterMaxBorder_32f_C1R_Ctx**(const *Npp32f* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp32f* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiSize* oMaskSize, *NppiPoint* oAnchor, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Single channel 32-bit floating-point maximum filter with border control.

For common parameter descriptions, see *Common parameters for nppiFilterMaxBorder functions:*.

NppStatus **nppiFilterMaxBorder_32f_C3R_Ctx**(const *Npp32f* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp32f* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiSize* oMaskSize, *NppiPoint* oAnchor, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Three channel 32-bit floating-point maximum filter with border control.

For common parameter descriptions, see *Common parameters for nppiFilterMaxBorder functions:*.

NppStatus **nppiFilterMaxBorder_32f_C4R_Ctx**(const *Npp32f* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp32f* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiSize* oMaskSize, *NppiPoint* oAnchor, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Four channel 32-bit floating-point maximum filter with border control.

For common parameter descriptions, see *Common parameters for nppiFilterMaxBorder functions:*.

NppStatus **nppiFilterMaxBorder_32f_AC4R_Ctx**(const *Npp32f* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp32f* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiSize* oMaskSize, *NppiPoint* oAnchor, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Four channel 32-bit floating-point maximum filter with border control, ignoring alpha channel.

For common parameter descriptions, see *Common parameters for nppiFilterMaxBorder functions:*.

1.10.4.4 Image Filter Min

1.10.4.4.1 FilterMin

Result pixel value is the minimum of pixel values under the rectangular mask region.

1.10.4.4.1.1 Common parameters for nppiFilterMin functions:

param pSrc
Source-Image Pointer.

param nSrcStep
Source-Image Line Step.

param pDst
Destination-Image Pointer.

param nDstStep
Destination-Image Line Step plus mask size width.

param oSizeROI
Region-Of-Interest (ROI).

param oMaskSize
Width and Height of the neighborhood region for the local Min operation.

param oAnchor
X and Y offsets of the kernel origin frame of reference relative to the source pixel.

param nppStreamCtx
Application Managed Stream Context.

return
Image Data Related Error Codes, *ROI Related Error Codes*

Functions

NppStatus **nppiFilterMin_8u_C1R_Ctx**(const *Npp8u* *pSrc, *Npp32s* nSrcStep, *Npp8u* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiSize* oMaskSize, *NppiPoint* oAnchor, *NppStreamContext* nppStreamCtx)

Single channel 8-bit unsigned minimum filter.

For common parameter descriptions, see *Common parameters for nppiFilterMin functions:*.

NppStatus **nppiFilterMin_8u_C3R_Ctx**(const *Npp8u* *pSrc, *Npp32s* nSrcStep, *Npp8u* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiSize* oMaskSize, *NppiPoint* oAnchor, *NppStreamContext* nppStreamCtx)

Three channel 8-bit unsigned minimum filter.

For common parameter descriptions, see *Common parameters for nppiFilterMin functions:*.

NppStatus **nppiFilterMin_8u_C4R_Ctx**(const *Npp8u* *pSrc, *Npp32s* nSrcStep, *Npp8u* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiSize* oMaskSize, *NppiPoint* oAnchor, *NppStreamContext* nppStreamCtx)

Four channel 8-bit unsigned minimum filter.

For common parameter descriptions, see *Common parameters for nppiFilterMin functions:*.

NppStatus **nppiFilterMin_8u_AC4R_Ctx**(const *Npp8u* *pSrc, *Npp32s* nSrcStep, *Npp8u* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiSize* oMaskSize, *NppiPoint* oAnchor, *NppStreamContext* nppStreamCtx)

Four channel 8-bit unsigned minimum filter, ignoring alpha channel.

For common parameter descriptions, see *Common parameters for nppiFilterMin functions:*.

NppStatus **nppiFilterMin_16u_C1R_Ctx**(const *Npp16u* *pSrc, *Npp32s* nSrcStep, *Npp16u* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiSize* oMaskSize, *NppiPoint* oAnchor, *NppStreamContext* nppStreamCtx)

Single channel 16-bit unsigned minimum filter.

For common parameter descriptions, see *Common parameters for nppiFilterMin functions:*.

NppStatus **nppiFilterMin_16u_C3R_Ctx**(const *Npp16u* *pSrc, *Npp32s* nSrcStep, *Npp16u* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiSize* oMaskSize, *NppiPoint* oAnchor, *NppStreamContext* nppStreamCtx)

Three channel 16-bit unsigned minimum filter.

For common parameter descriptions, see *Common parameters for nppiFilterMin functions:*.

NppStatus **nppiFilterMin_16u_C4R_Ctx**(const *Npp16u* *pSrc, *Npp32s* nSrcStep, *Npp16u* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiSize* oMaskSize, *NppiPoint* oAnchor, *NppStreamContext* nppStreamCtx)

Four channel 16-bit unsigned minimum filter.

For common parameter descriptions, see *Common parameters for nppiFilterMin functions:*.

NppStatus **nppiFilterMin_16u_AC4R_Ctx**(const *Npp16u* *pSrc, *Npp32s* nSrcStep, *Npp16u* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiSize* oMaskSize, *NppiPoint* oAnchor, *NppStreamContext* nppStreamCtx)

Four channel 16-bit unsigned minimum filter, ignoring alpha channel.

For common parameter descriptions, see *Common parameters for nppiFilterMin functions:*.

NppStatus **nppiFilterMin_16s_C1R_Ctx**(const *Npp16s* *pSrc, *Npp32s* nSrcStep, *Npp16s* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiSize* oMaskSize, *NppiPoint* oAnchor, *NppStreamContext* nppStreamCtx)

Single channel 16-bit signed minimum filter.

For common parameter descriptions, see *Common parameters for nppiFilterMin functions:*.

NppStatus **nppiFilterMin_16s_C3R_Ctx**(const *Npp16s* *pSrc, *Npp32s* nSrcStep, *Npp16s* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiSize* oMaskSize, *NppiPoint* oAnchor, *NppStreamContext* nppStreamCtx)

Three channel 16-bit signed minimum filter.

For common parameter descriptions, see *Common parameters for nppiFilterMin functions:*.

NppStatus **nppiFilterMin_16s_C4R_Ctx**(const *Npp16s* *pSrc, *Npp32s* nSrcStep, *Npp16s* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiSize* oMaskSize, *NppiPoint* oAnchor, *NppStreamContext* nppStreamCtx)

Four channel 16-bit signed minimum filter.

For common parameter descriptions, see *Common parameters for nppiFilterMin functions:*.

NppStatus **nppiFilterMin_16s_AC4R_Ctx**(const *Npp16s* *pSrc, *Npp32s* nSrcStep, *Npp16s* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiSize* oMaskSize, *NppiPoint* oAnchor, *NppStreamContext* nppStreamCtx)

Four channel 16-bit signed minimum filter, ignoring alpha channel.

For common parameter descriptions, see *Common parameters for nppiFilterMin functions:*.

NppStatus **nppiFilterMin_32f_C1R_Ctx**(const *Npp32f* *pSrc, *Npp32s* nSrcStep, *Npp32f* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiSize* oMaskSize, *NppiPoint* oAnchor, *NppStreamContext* nppStreamCtx)

Single channel 32-bit floating-point minimum filter.

For common parameter descriptions, see *Common parameters for nppiFilterMin functions:*.

NppStatus **nppiFilterMin_32f_C3R_Ctx**(const *Npp32f* *pSrc, *Npp32s* nSrcStep, *Npp32f* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiSize* oMaskSize, *NppiPoint* oAnchor, *NppStreamContext* nppStreamCtx)

Three channel 32-bit floating-point minimum filter.

For common parameter descriptions, see *Common parameters for nppiFilterMin functions:*.

NppStatus **nppiFilterMin_32f_C4R_Ctx**(const *Npp32f* *pSrc, *Npp32s* nSrcStep, *Npp32f* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiSize* oMaskSize, *NppiPoint* oAnchor, *NppStreamContext* nppStreamCtx)

Four channel 32-bit floating-point minimum filter.

For common parameter descriptions, see *Common parameters for nppiFilterMin functions:*.

NppStatus **nppiFilterMin_32f_AC4R_Ctx**(const *Npp32f* *pSrc, *Npp32s* nSrcStep, *Npp32f* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiSize* oMaskSize, *NppiPoint* oAnchor, *NppStreamContext* nppStreamCtx)

Four channel 32-bit floating-point minimum filter, ignoring alpha channel.

For common parameter descriptions, see *Common parameters for nppiFilterMin functions:*.

1.10.4.5 Image Filter Min Border

1.10.4.5.1 FilterMinBorder

Result pixel value is the minimum of pixel values under the rectangular mask region with border control.

If any portion of the mask overlaps the source image boundary the requested border type operation is applied to all mask pixels which fall outside of the source image.

Currently only the NPP_BORDER_REPLICATE border type operation is supported.

1.10.4.5.1.1 Common parameters for nppiFilterMinBorder functions:

param pSrc
Source-Image Pointer.

param nSrcStep
Source-Image Line Step.

param oSrcSize
Source image width and height in pixels relative to pSrc.

param oSrcOffset
The pixel offset that pSrc points to relative to the origin of the source image.

param pDst
Destination-Image Pointer.

param nDstStep
Destination-Image Line Step.

param oSizeROI
Region-Of-Interest (ROI).

param oMaskSize
Width and Height of the neighborhood region for the local Min operation.

param oAnchor
X and Y offsets of the kernel origin frame of reference relative to the source pixel.

param eBorderType
The border type operation to be applied at source image border boundaries.

param nppStreamCtx
Application Managed Stream Context.

return
Image Data Related Error Codes, *ROI Related Error Codes*

Functions

NppStatus **nppiFilterMinBorder_8u_C1R_Ctx**(const *Npp8u* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp8u* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiSize* oMaskSize, *NppiPoint* oAnchor, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Single channel 8-bit unsigned minimum filter with border control.

For common parameter descriptions, see *Common parameters for nppiFilterMinBorder functions:*.

NppStatus **nppiFilterMinBorder_8u_C3R_Ctx**(const *Npp8u* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp8u* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiSize* oMaskSize, *NppiPoint* oAnchor, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Three channel 8-bit unsigned minimum filter with border control.

For common parameter descriptions, see *Common parameters for nppiFilterMinBorder functions:*.

NppStatus **nppiFilterMinBorder_8u_C4R_Ctx**(const *Npp8u* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp8u* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiSize* oMaskSize, *NppiPoint* oAnchor, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Four channel 8-bit unsigned minimum filter with border control.

For common parameter descriptions, see *Common parameters for nppiFilterMinBorder functions:*.

NppStatus **nppiFilterMinBorder_8u_AC4R_Ctx**(const *Npp8u* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp8u* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiSize* oMaskSize, *NppiPoint* oAnchor, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Four channel 8-bit unsigned minimum filter with border control, ignoring alpha channel.

For common parameter descriptions, see *Common parameters for nppiFilterMinBorder functions:*.

NppStatus **nppiFilterMinBorder_16u_C1R_Ctx**(const *Npp16u* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp16u* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiSize* oMaskSize, *NppiPoint* oAnchor, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Single channel 16-bit unsigned minimum filter with border control.

For common parameter descriptions, see *Common parameters for nppiFilterMinBorder functions:*.

NppStatus **nppiFilterMinBorder_16u_C3R_Ctx**(const *Npp16u* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp16u* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiSize* oMaskSize, *NppiPoint* oAnchor, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Three channel 16-bit unsigned minimum filter with border control.

For common parameter descriptions, see *Common parameters for nppiFilterMinBorder functions:*.

NppStatus **nppiFilterMinBorder_16u_C4R_Ctx**(const *Npp16u* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp16u* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiSize* oMaskSize, *NppiPoint* oAnchor, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Four channel 16-bit unsigned minimum filter with border control.

For common parameter descriptions, see *Common parameters for nppiFilterMinBorder functions:*.

NppStatus **nppiFilterMinBorder_16u_AC4R_Ctx**(const *Npp16u* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp16u* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiSize* oMaskSize, *NppiPoint* oAnchor, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Four channel 16-bit unsigned minimum filter with border control, ignoring alpha channel.

For common parameter descriptions, see *Common parameters for nppiFilterMinBorder functions:*.

NppStatus **nppiFilterMinBorder_16s_C1R_Ctx**(const *Npp16s* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp16s* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiSize* oMaskSize, *NppiPoint* oAnchor, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Single channel 16-bit signed minimum filter with border control.

For common parameter descriptions, see *Common parameters for nppiFilterMinBorder functions:*.

NppStatus **nppiFilterMinBorder_16s_C3R_Ctx**(const *Npp16s* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp16s* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiSize* oMaskSize, *NppiPoint* oAnchor, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Three channel 16-bit signed minimum filter with border control.

For common parameter descriptions, see *Common parameters for nppiFilterMinBorder functions:*.

NppStatus **nppiFilterMinBorder_16s_C4R_Ctx**(const *Npp16s* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp16s* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiSize* oMaskSize, *NppiPoint* oAnchor, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Four channel 16-bit signed minimum filter with border control.

For common parameter descriptions, see *Common parameters for nppiFilterMinBorder functions:*.

NppStatus **nppiFilterMinBorder_16s_AC4R_Ctx**(const *Npp16s* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp16s* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiSize* oMaskSize, *NppiPoint* oAnchor, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Four channel 16-bit signed minimum filter with border control, ignoring alpha channel.

For common parameter descriptions, see *Common parameters for nppiFilterMinBorder functions:*.

NppStatus **nppiFilterMinBorder_32f_C1R_Ctx**(const *Npp32f* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp32f* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiSize* oMaskSize, *NppiPoint* oAnchor, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Single channel 32-bit floating-point minimum filter with border control.

For common parameter descriptions, see *Common parameters for nppiFilterMinBorder functions:*.

NppStatus **nppiFilterMinBorder_32f_C3R_Ctx**(const *Npp32f* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp32f* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiSize* oMaskSize, *NppiPoint* oAnchor, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Three channel 32-bit floating-point minimum filter with border control.

For common parameter descriptions, see *Common parameters for nppiFilterMinBorder functions:*.

NppStatus **nppiFilterMinBorder_32f_C4R_Ctx**(const *Npp32f* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp32f* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiSize* oMaskSize, *NppiPoint* oAnchor, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Four channel 32-bit floating-point minimum filter with border control.

For common parameter descriptions, see *Common parameters for nppiFilterMinBorder functions:*.

NppStatus **nppiFilterMinBorder_32f_AC4R_Ctx**(const *Npp32f* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp32f* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiSize* oMaskSize, *NppiPoint* oAnchor, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Four channel 32-bit floating-point minimum filter with border control, ignoring alpha channel.

For common parameter descriptions, see *Common parameters for nppiFilterMinBorder functions:*.

1.10.4.6 Image Filter Median

1.10.4.6.1 FilterMedian

Result pixel value is the median of pixel values under the rectangular mask region.

1.10.4.6.1.1 Common parameters for nppiFilterMedian functions:

1.10.4.6.1.2 Common parameters for nppiFilterMedianGetBufferSize functions:

param pSrc
Source-Image Pointer.

param nSrcStep
Source-Image Line Step.

param pDst
Destination-Image Pointer.

param nDstStep
Destination-Image Line Step.

param oSizeROI
Region-Of-Interest (ROI).

param oMaskSize
Width and Height of the neighborhood region for the local Median operation.

param oAnchor
X and Y offsets of the kernel origin frame of reference relative to the source pixel.

param pBuffer
Device memory pointer to the user-allocated scratch buffer required for the Median operation.

param nppStreamCtx
Application Managed Stream Context.

return
Image Data Related Error Codes, *ROI Related Error Codes*

param oSizeROI
Region-Of-Interest (ROI).

param oMaskSize
Width and Height of the neighborhood region for the local Median operation.

param nBufferSize
Pointer to the size of the scratch buffer required for the Median operation.

return
Image Data Related Error Codes

Functions

NppStatus **nppiFilterMedian_8u_C1R_Ctx**(const *Npp8u* *pSrc, *Npp32s* nSrcStep, *Npp8u* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiSize* oMaskSize, *NppiPoint* oAnchor, *Npp8u* *pBuffer, *NppStreamContext* nppStreamCtx)

Single channel 8-bit unsigned median filter.

For common parameter descriptions, see *Common parameters for nppiFilterMedian functions:*.

NppStatus **nppiFilterMedian_8u_C3R_Ctx**(const *Npp8u* *pSrc, *Npp32s* nSrcStep, *Npp8u* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiSize* oMaskSize, *NppiPoint* oAnchor, *Npp8u* *pBuffer, *NppStreamContext* nppStreamCtx)

Three channel 8-bit unsigned median filter.

For common parameter descriptions, see *Common parameters for nppiFilterMedian functions:*.

NppStatus **nppiFilterMedian_8u_C4R_Ctx**(const *Npp8u* *pSrc, *Npp32s* nSrcStep, *Npp8u* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiSize* oMaskSize, *NppiPoint* oAnchor, *Npp8u* *pBuffer, *NppStreamContext* nppStreamCtx)

Four channel 8-bit unsigned median filter.

For common parameter descriptions, see *Common parameters for nppiFilterMedian functions:*.

NppStatus **nppiFilterMedian_8u_AC4R_Ctx**(const *Npp8u* *pSrc, *Npp32s* nSrcStep, *Npp8u* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiSize* oMaskSize, *NppiPoint* oAnchor, *Npp8u* *pBuffer, *NppStreamContext* nppStreamCtx)

Four channel 8-bit unsigned median filter, ignoring alpha channel.

For common parameter descriptions, see *Common parameters for nppiFilterMedian functions:*.

NppStatus **nppiFilterMedian_16u_C1R_Ctx**(const *Npp16u* *pSrc, *Npp32s* nSrcStep, *Npp16u* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiSize* oMaskSize, *NppiPoint* oAnchor, *Npp8u* *pBuffer, *NppStreamContext* nppStreamCtx)

Single channel 16-bit unsigned median filter.

For common parameter descriptions, see *Common parameters for nppiFilterMedian functions:*.

NppStatus **nppiFilterMedian_16u_C3R_Ctx**(const *Npp16u* *pSrc, *Npp32s* nSrcStep, *Npp16u* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiSize* oMaskSize, *NppiPoint* oAnchor, *Npp8u* *pBuffer, *NppStreamContext* nppStreamCtx)

Three channel 16-bit unsigned median filter.

For common parameter descriptions, see *Common parameters for nppiFilterMedian functions:*.

NppStatus **nppiFilterMedian_16u_C4R_Ctx**(const *Npp16u* *pSrc, *Npp32s* nSrcStep, *Npp16u* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiSize* oMaskSize, *NppiPoint* oAnchor, *Npp8u* *pBuffer, *NppStreamContext* nppStreamCtx)

Four channel 16-bit unsigned median filter.

For common parameter descriptions, see *Common parameters for nppiFilterMedian functions:*.

NppStatus **nppiFilterMedian_16u_AC4R_Ctx**(const *Npp16u* *pSrc, *Npp32s* nSrcStep, *Npp16u* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiSize* oMaskSize, *NppiPoint* oAnchor, *Npp8u* *pBuffer, *NppStreamContext* nppStreamCtx)

Four channel 16-bit unsigned median filter, ignoring alpha channel.

For common parameter descriptions, see *Common parameters for nppiFilterMedian functions:*.

NppStatus **nppiFilterMedian_16s_C1R_Ctx**(const *Npp16s* *pSrc, *Npp32s* nSrcStep, *Npp16s* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiSize* oMaskSize, *NppiPoint* oAnchor, *Npp8u* *pBuffer, *NppStreamContext* nppStreamCtx)

Single channel 16-bit signed median filter.

For common parameter descriptions, see *Common parameters for nppiFilterMedian functions:*.

NppStatus **nppiFilterMedian_16s_C3R_Ctx**(const *Npp16s* *pSrc, *Npp32s* nSrcStep, *Npp16s* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiSize* oMaskSize, *NppiPoint* oAnchor, *Npp8u* *pBuffer, *NppStreamContext* nppStreamCtx)

Three channel 16-bit signed median filter.

For common parameter descriptions, see *Common parameters for nppiFilterMedian functions:*.

NppStatus **nppiFilterMedian_16s_C4R_Ctx**(const *Npp16s* *pSrc, *Npp32s* nSrcStep, *Npp16s* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiSize* oMaskSize, *NppiPoint* oAnchor, *Npp8u* *pBuffer, *NppStreamContext* nppStreamCtx)

Four channel 16-bit signed median filter.

For common parameter descriptions, see *Common parameters for nppiFilterMedian functions:*.

NppStatus **nppiFilterMedian_16s_AC4R_Ctx**(const *Npp16s* *pSrc, *Npp32s* nSrcStep, *Npp16s* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiSize* oMaskSize, *NppiPoint* oAnchor, *Npp8u* *pBuffer, *NppStreamContext* nppStreamCtx)

Four channel 16-bit signed median filter, ignoring alpha channel.

For common parameter descriptions, see *Common parameters for nppiFilterMedian functions:*.

NppStatus **nppiFilterMedian_32f_C1R_Ctx**(const *Npp32f* *pSrc, *Npp32s* nSrcStep, *Npp32f* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiSize* oMaskSize, *NppiPoint* oAnchor, *Npp8u* *pBuffer, *NppStreamContext* nppStreamCtx)

Single channel 32-bit floating-point median filter.

For common parameter descriptions, see *Common parameters for nppiFilterMedian functions:*.

NppStatus **nppiFilterMedian_32f_C3R_Ctx**(const *Npp32f* *pSrc, *Npp32s* nSrcStep, *Npp32f* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiSize* oMaskSize, *NppiPoint* oAnchor, *Npp8u* *pBuffer, *NppStreamContext* nppStreamCtx)

Three channel 32-bit floating-point median filter.

For common parameter descriptions, see *Common parameters for nppiFilterMedian functions:*.

NppStatus **nppiFilterMedian_32f_C4R_Ctx**(const *Npp32f* *pSrc, *Npp32s* nSrcStep, *Npp32f* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiSize* oMaskSize, *NppiPoint* oAnchor, *Npp8u* *pBuffer, *NppStreamContext* nppStreamCtx)

Four channel 32-bit floating-point median filter.

For common parameter descriptions, see *Common parameters for nppiFilterMedian functions:*.

NppStatus **nppiFilterMedian_32f_AC4R_Ctx**(const *Npp32f* *pSrc, *Npp32s* nSrcStep, *Npp32f* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiSize* oMaskSize, *NppiPoint* oAnchor, *Npp8u* *pBuffer, *NppStreamContext* nppStreamCtx)

Four channel 32-bit floating-point median filter, ignoring alpha channel.

For common parameter descriptions, see *Common parameters for nppiFilterMedian functions:*.

NppStatus **nppiFilterMedianGetBufferSize_8u_C1R_Ctx**(*NppiSize* oSizeROI, *NppiSize* oMaskSize, *Npp32u* *nBufferSize, *NppStreamContext* nppStreamCtx)

Single channel 8-bit unsigned median filter scratch memory size.

For common parameter descriptions, see *Common parameters for nppiFilterMedianGetBufferSize functions:*.

NppStatus **nppiFilterMedianGetBufferSize_8u_C3R_Ctx**(*NppiSize* oSizeROI, *NppiSize* oMaskSize, *Npp32u* *nBufferSize, *NppStreamContext* nppStreamCtx)

Three channel 8-bit unsigned median filter scratch memory size.

For common parameter descriptions, see *Common parameters for nppiFilterMedianGetBufferSize functions:*.

NppStatus **nppiFilterMedianGetBufferSize_8u_C4R_Ctx**(*NppiSize* oSizeROI, *NppiSize* oMaskSize, *Npp32u* *nBufferSize, *NppStreamContext* nppStreamCtx)

Four channel 8-bit unsigned median filter scratch memory size.

For common parameter descriptions, see *Common parameters for nppiFilterMedianGetBufferSize functions:*.

NppStatus **nppiFilterMedianGetBufferSize_8u_AC4R_Ctx**(*NppiSize* oSizeROI, *NppiSize* oMaskSize, *Npp32u* *nBufferSize, *NppStreamContext* nppStreamCtx)

Four channel 8-bit unsigned median filter, ignoring alpha channel.

For common parameter descriptions, see *Common parameters for nppiFilterMedianGetBufferSize functions:*.

NppStatus **nppiFilterMedianGetBufferSize_16u_C1R_Ctx**(*NppiSize* oSizeROI, *NppiSize* oMaskSize, *Npp32u* *nBufferSize, *NppStreamContext* nppStreamCtx)

Single channel 16-bit unsigned median filter scratch memory size.

For common parameter descriptions, see *Common parameters for nppiFilterMedianGetBufferSize functions:*.

NppStatus **nppiFilterMedianGetBufferSize_16u_C3R_Ctx**(*NppiSize* oSizeROI, *NppiSize* oMaskSize, *Npp32u* *nBufferSize, *NppStreamContext* nppStreamCtx)

Three channel 16-bit unsigned median filter scratch memory size.

For common parameter descriptions, see *Common parameters for nppiFilterMedianGetBufferSize functions:*.

NppStatus **nppiFilterMedianGetBufferSize_16u_C4R_Ctx**(*NppiSize* oSizeROI, *NppiSize* oMaskSize, *Npp32u* *nBufferSize, *NppStreamContext* nppStreamCtx)

Four channel 16-bit unsigned median filter scratch memory size.

For common parameter descriptions, see *Common parameters for nppiFilterMedianGetBufferSize functions:*.

NppStatus **nppiFilterMedianGetBufferSize_16u_AC4R_Ctx**(*NppiSize* oSizeROI, *NppiSize* oMaskSize, *Npp32u* *nBufferSize, *NppStreamContext* nppStreamCtx)

Four channel 16-bit unsigned median filter, ignoring alpha channel.

For common parameter descriptions, see *Common parameters for nppiFilterMedianGetBufferSize functions:*.

NppStatus **nppiFilterMedianGetBufferSize_16s_C1R_Ctx**(*NppiSize* oSizeROI, *NppiSize* oMaskSize, *Npp32u* *nBufferSize, *NppStreamContext* nppStreamCtx)

Single channel 16-bit signed median filter scratch memory size.

For common parameter descriptions, see *Common parameters for nppiFilterMedianGetBufferSize functions:*.

NppStatus **nppiFilterMedianGetBufferSize_16s_C3R_Ctx**(*NppiSize* oSizeROI, *NppiSize* oMaskSize, *Npp32u* *nBufferSize, *NppStreamContext* nppStreamCtx)

Three channel 16-bit signed median filter scratch memory size.

For common parameter descriptions, see *Common parameters for nppiFilterMedianGetBufferSize functions:*.

NppStatus **nppiFilterMedianGetBufferSize_16s_C4R_Ctx**(*NppiSize* oSizeROI, *NppiSize* oMaskSize, *Npp32u* *nBufferSize, *NppStreamContext* nppStreamCtx)

Four channel 16-bit signed median filter scratch memory size.

For common parameter descriptions, see *Common parameters for nppiFilterMedianGetBufferSize functions:*.

NppStatus **nppiFilterMedianGetBufferSize_16s_AC4R_Ctx**(*NppiSize* oSizeROI, *NppiSize* oMaskSize, *Npp32u* *nBufferSize, *NppStreamContext* nppStreamCtx)

Four channel 16-bit signed median filter, ignoring alpha channel.

For common parameter descriptions, see *Common parameters for nppiFilterMedianGetBufferSize functions:*.

NppStatus **nppiFilterMedianGetBufferSize_32f_C1R_Ctx**(*NppiSize* oSizeROI, *NppiSize* oMaskSize, *Npp32u* *nBufferSize, *NppStreamContext* nppStreamCtx)

Single channel 32-bit floating-point median filter scratch memory size.

For common parameter descriptions, see *Common parameters for nppiFilterMedianGetBufferSize functions:*.

NppStatus **nppiFilterMedianGetBufferSize_32f_C3R_Ctx**(*NppiSize* oSizeROI, *NppiSize* oMaskSize, *Npp32u* *nBufferSize, *NppStreamContext* nppStreamCtx)

Three channel 32-bit floating-point median filter scratch memory size.

For common parameter descriptions, see *Common parameters for nppiFilterMedianGetBufferSize functions:*.

NppStatus **nppiFilterMedianGetBufferSize_32f_C4R_Ctx**(*NppiSize* oSizeROI, *NppiSize* oMaskSize, *Npp32u* *nBufferSize, *NppStreamContext* nppStreamCtx)

Four channel 32-bit floating-point median filter scratch memory size.

For common parameter descriptions, see *Common parameters for nppiFilterMedianGetBufferSize functions:*.

NppStatus **nppiFilterMedianGetBufferSize_32f_AC4R_Ctx**(*NppiSize* oSizeROI, *NppiSize* oMaskSize, *Npp32u* *nBufferSize, *NppStreamContext* nppStreamCtx)

Four channel 32-bit floating-point median filter, ignoring alpha channel.

For common parameter descriptions, see *Common parameters for nppiFilterMedianGetBufferSize functions:*.

1.10.4.7 Image Filter Median Border

1.10.4.7.1 FilterMedianBorder

Result pixel value is the median of pixel values under the rectangular mask region.

1.10.4.7.1.1 Common parameters for nppiFilterMedianBorder functions:

1.10.4.7.1.2 Common parameters for nppiFilterMedianBorderGetBufferSize functions:

param pSrc
Source-Image Pointer.

param nSrcStep
Source-Image Line Step.

param pDst
Destination-Image Pointer.

param nDstStep
Destination-Image Line Step.

param oSizeROI
Region-Of-Interest (ROI).

param oMaskSize
Width and Height of the neighborhood region for the local Median operation.

param oAnchor
X and Y offsets of the kernel origin frame of reference relative to the source pixel.

param pBuffer
Device memory pointer to the user-allocated scratch buffer required for the Median operation.

param eBorderType
The border type operation to be applied at source image border boundaries.

param nppStreamCtx
Application Managed Stream Context.

return
Image Data Related Error Codes, *ROI Related Error Codes*

param oSizeROI
Region-Of-Interest (ROI).

param oMaskSize
Width and Height of the neighborhood region for the local Median operation.

param nBufferSize
Pointer to the size of the scratch buffer required for the Median operation.

return
Image Data Related Error Codes

Functions

NppStatus **nppiFilterMedianBorder_8u_C1R_Ctx**(const *Npp8u* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp8u* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiSize* oMaskSize, *NppiPoint* oAnchor, *Npp8u* *pBuffer, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Single channel 8-bit unsigned median filter.

For common parameter descriptions, see *Common parameters for nppiFilterMedian functions:*.

NppStatus **nppiFilterMedianBorder_8u_C3R_Ctx**(const *Npp8u* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp8u* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiSize* oMaskSize, *NppiPoint* oAnchor, *Npp8u* *pBuffer, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Three channel 8-bit unsigned median filter.

For common parameter descriptions, see *Common parameters for nppiFilterMedian functions:*.

NppStatus **nppiFilterMedianBorder_8u_C4R_Ctx**(const *Npp8u* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp8u* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiSize* oMaskSize, *NppiPoint* oAnchor, *Npp8u* *pBuffer, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Four channel 8-bit unsigned median filter.

For common parameter descriptions, see *Common parameters for nppiFilterMedian functions:*.

NppStatus **nppiFilterMedianBorder_8u_AC4R_Ctx**(const *Npp8u* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp8u* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiSize* oMaskSize, *NppiPoint* oAnchor, *Npp8u* *pBuffer, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Four channel 8-bit unsigned median filter, ignoring alpha channel.

For common parameter descriptions, see *Common parameters for nppiFilterMedian functions:*.

NppStatus **nppiFilterMedianBorder_16u_C1R_Ctx**(const *Npp16u* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp16u* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiSize* oMaskSize, *NppiPoint* oAnchor, *Npp8u* *pBuffer, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Single channel 16-bit unsigned median filter.

For common parameter descriptions, see *Common parameters for nppiFilterMedian functions:*.

NppStatus **nppiFilterMedianBorder_16u_C3R_Ctx**(const *Npp16u* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp16u* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiSize* oMaskSize, *NppiPoint* oAnchor, *Npp8u* *pBuffer, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Three channel 16-bit unsigned median filter.

For common parameter descriptions, see *Common parameters for nppiFilterMedian functions:*.

NppStatus **nppiFilterMedianBorder_16u_C4R_Ctx**(const *Npp16u* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp16u* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiSize* oMaskSize, *NppiPoint* oAnchor, *Npp8u* *pBuffer, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Four channel 16-bit unsigned median filter.

For common parameter descriptions, see *Common parameters for nppiFilterMedian functions:*.

NppStatus **nppiFilterMedianBorder_16u_AC4R_Ctx**(const *Npp16u* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp16u* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiSize* oMaskSize, *NppiPoint* oAnchor, *Npp8u* *pBuffer, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Four channel 16-bit unsigned median filter, ignoring alpha channel.

For common parameter descriptions, see *Common parameters for nppiFilterMedian functions:*.

NppStatus **nppiFilterMedianBorder_16s_C1R_Ctx**(const *Npp16s* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp16s* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiSize* oMaskSize, *NppiPoint* oAnchor, *Npp8u* *pBuffer, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Single channel 16-bit signed median filter.

For common parameter descriptions, see *Common parameters for nppiFilterMedian functions:*.

NppStatus **nppiFilterMedianBorder_16s_C3R_Ctx**(const *Npp16s* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp16s* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiSize* oMaskSize, *NppiPoint* oAnchor, *Npp8u* *pBuffer, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Three channel 16-bit signed median filter.

For common parameter descriptions, see *Common parameters for nppiFilterMedian functions:*.

NppStatus **nppiFilterMedianBorder_16s_C4R_Ctx**(const *Npp16s* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp16s* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiSize* oMaskSize, *NppiPoint* oAnchor, *Npp8u* *pBuffer, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Four channel 16-bit signed median filter.

For common parameter descriptions, see *Common parameters for nppiFilterMedian functions:*.

NppStatus **nppiFilterMedianBorder_16s_AC4R_Ctx**(const *Npp16s* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp16s* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiSize* oMaskSize, *NppiPoint* oAnchor, *Npp8u* *pBuffer, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Four channel 16-bit signed median filter, ignoring alpha channel.

For common parameter descriptions, see *Common parameters for nppiFilterMedian functions:*.

NppStatus **nppiFilterMedianBorder_32f_C1R_Ctx**(const *Npp32f* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp32f* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiSize* oMaskSize, *NppiPoint* oAnchor, *Npp8u* *pBuffer, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Single channel 32-bit floating-point median filter.

For common parameter descriptions, see *Common parameters for nppiFilterMedian functions:*.

NppStatus **nppiFilterMedianBorder_32f_C3R_Ctx**(const *Npp32f* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp32f* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiSize* oMaskSize, *NppiPoint* oAnchor, *Npp8u* *pBuffer, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Three channel 32-bit floating-point median filter.

For common parameter descriptions, see *Common parameters for nppiFilterMedian functions:*.

NppStatus **nppiFilterMedianBorder_32f_C4R_Ctx**(const *Npp32f* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp32f* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiSize* oMaskSize, *NppiPoint* oAnchor, *Npp8u* *pBuffer, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Four channel 32-bit floating-point median filter.

For common parameter descriptions, see *Common parameters for nppiFilterMedian functions:*.

NppStatus **nppiFilterMedianBorder_32f_AC4R_Ctx**(const *Npp32f* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp32f* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiSize* oMaskSize, *NppiPoint* oAnchor, *Npp8u* *pBuffer, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Four channel 32-bit floating-point median filter, ignoring alpha channel.

For common parameter descriptions, see *Common parameters for nppiFilterMedian functions:*.

NppStatus **nppiFilterMedianBorderGetBufferSize_8u_C1R_Ctx**(*NppiSize* oSizeROI, *NppiSize* oMaskSize, *Npp32u* *nBufferSize, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Single channel 8-bit unsigned median filter scratch memory size.

For common parameter descriptions, see *Common parameters for nppiFilterMedianBorderGetBufferSize functions:*.

NppStatus **nppiFilterMedianBorderGetBufferSize_8u_C3R_Ctx**(*NppiSize* oSizeROI, *NppiSize* oMaskSize, *Npp32u* *nBufferSize, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Three channel 8-bit unsigned median filter scratch memory size.

For common parameter descriptions, see *Common parameters for nppiFilterMedianBorderGetBufferSize functions:*.

NppStatus **nppiFilterMedianBorderGetBufferSize_8u_C4R_Ctx**(*NppiSize* oSizeROI, *NppiSize* oMaskSize, *Npp32u* *nBufferSize, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Four channel 8-bit unsigned median filter scratch memory size.

For common parameter descriptions, see *Common parameters for nppiFilterMedianBorderGetBufferSize functions:*.

NppStatus **nppiFilterMedianBorderGetBufferSize_8u_AC4R_Ctx**(*NppiSize* oSizeROI, *NppiSize* oMaskSize, *Npp32u* *nBufferSize, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Four channel 8-bit unsigned median filter, ignoring alpha channel.

For common parameter descriptions, see *Common parameters for nppiFilterMedianBorderGetBufferSize functions:*.

NppStatus **nppiFilterMedianBorderGetBufferSize_16u_C1R_Ctx**(*NppiSize* oSizeROI, *NppiSize* oMaskSize, *Npp32u* *nBufferSize, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Single channel 16-bit unsigned median filter scratch memory size.

For common parameter descriptions, see *Common parameters for nppiFilterMedianBorderGetBufferSize functions:*.

NppStatus **nppiFilterMedianBorderGetBufferSize_16u_C3R_Ctx**(*NppiSize* oSizeROI, *NppiSize* oMaskSize, *Npp32u* *nBufferSize, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Three channel 16-bit unsigned median filter scratch memory size.

For common parameter descriptions, see *Common parameters for nppiFilterMedianBorderGetBufferSize functions:*.

NppStatus **nppiFilterMedianBorderGetBufferSize_16u_C4R_Ctx**(*NppiSize* oSizeROI, *NppiSize* oMaskSize, *Npp32u* *nBufferSize, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Four channel 16-bit unsigned median filter scratch memory size.

For common parameter descriptions, see *Common parameters for nppiFilterMedianBorderGetBufferSize functions:*.

NppStatus **nppiFilterMedianBorderGetBufferSize_16u_AC4R_Ctx**(*NppiSize* oSizeROI, *NppiSize* oMaskSize, *Npp32u* *nBufferSize, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Four channel 16-bit unsigned median filter, ignoring alpha channel.

For common parameter descriptions, see *Common parameters for nppiFilterMedianBorderGetBufferSize functions:*.

NppStatus **nppiFilterMedianBorderGetBufferSize_16s_C1R_Ctx**(*NppiSize* oSizeROI, *NppiSize* oMaskSize, *Npp32u* *nBufferSize, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Single channel 16-bit signed median filter scratch memory size.

For common parameter descriptions, see *Common parameters for nppiFilterMedianBorderGetBufferSize functions:*.

NppStatus **nppiFilterMedianBorderGetBufferSize_16s_C3R_Ctx**(*NppiSize* oSizeROI, *NppiSize* oMaskSize, *Npp32u* *nBufferSize, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Three channel 16-bit signed median filter scratch memory size.

For common parameter descriptions, see *Common parameters for nppiFilterMedianBorderGetBufferSize functions:*.

NppStatus **nppiFilterMedianBorderGetBufferSize_16s_C4R_Ctx**(*NppiSize* oSizeROI, *NppiSize* oMaskSize, *Npp32u* *nBufferSize, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Four channel 16-bit signed median filter scratch memory size.

For common parameter descriptions, see *Common parameters for nppiFilterMedianBorderGetBufferSize functions:*.

NppStatus **nppiFilterMedianBorderGetBufferSize_16s_AC4R_Ctx**(*NppiSize* oSizeROI, *NppiSize* oMaskSize, *Npp32u* *nBufferSize, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Four channel 16-bit signed median filter, ignoring alpha channel.

For common parameter descriptions, see *Common parameters for nppiFilterMedianBorderGetBufferSize functions:*.

NppStatus **nppiFilterMedianBorderGetBufferSize_32f_C1R_Ctx**(*NppiSize* oSizeROI, *NppiSize* oMaskSize, *Npp32u* *nBufferSize, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Single channel 32-bit floating-point median filter scratch memory size.

For common parameter descriptions, see *Common parameters for nppiFilterMedianBorderGetBufferSize functions:*.

NppStatus **nppiFilterMedianBorderGetBufferSize_32f_C3R_Ctx**(*NppiSize* oSizeROI, *NppiSize* oMaskSize, *Npp32u* *nBufferSize, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Three channel 32-bit floating-point median filter scratch memory size.

For common parameter descriptions, see *Common parameters for nppiFilterMedianBorderGetBufferSize functions:*.

NppStatus **nppiFilterMedianBorderGetBufferSize_32f_C4R_Ctx**(*NppiSize* oSizeROI, *NppiSize* oMaskSize, *Npp32u* *nBufferSize, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Four channel 32-bit floating-point median filter scratch memory size.

For common parameter descriptions, see *Common parameters for nppiFilterMedianBorderGetBufferSize functions:*.

NppStatus **nppiFilterMedianBorderGetBufferSize_32f_AC4R_Ctx**(*NppiSize* oSizeROI, *NppiSize* oMaskSize, *Npp32u* *nBufferSize, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Four channel 32-bit floating-point median filter, ignoring alpha channel.

For common parameter descriptions, see *Common parameters for nppiFilterMedianBorderGetBufferSize functions:*.

1.10.5. Fixed Filters

1.10.5.1 Fixed Filters

Fixed filters perform linear filtering operations (such as convolutions) with predefined kernels of fixed sizes. Note that this section also contains a few dynamic kernel filters, namely GaussAdvanced and Bilateral.

Some of the fixed filters have versions with border control. For these functions, if any portion of the mask overlaps the source image boundary the requested border type operation is applied to all mask pixels which fall outside of the source image.

Currently only the NPP_BORDER_REPLICATE border type operation is supported for these functions.

1.10.5.2 Image Filter Prewitt

1.10.5.2.1 FilterPrewitt

Filters the image using a Prewitt filter kernel.

1.10.5.2.1.1 Common parameters for nppiFilterPrewitt functions:

param pSrc
Source-Image Pointer.

param nSrcStep
Source-Image Line Step.

param pDst
Destination-Image Pointer.

param nDstStep
Destination-Image Line Step.

param oSizeROI
Region-Of-Interest (ROI).

param nppStreamCtx
Application Managed Stream Context.

return
Image Data Related Error Codes, *ROI Related Error Codes*

FilterPrewittHoriz

Filters the image using a horizontal Prewitt filter kernel:

$$\begin{pmatrix} 1 & 1 & 1 \\ 0 & 0 & 0 \\ -1 & -1 & -1 \end{pmatrix}$$

NppStatus **nppiFilterPrewittHoriz_8u_C1R_Ctx**(const *Npp8u* *pSrc, *Npp32s* nSrcStep, *Npp8u* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Single channel 8-bit unsigned horizontal Prewitt filter.

For common parameter descriptions, see *Common parameters for nppiFilterPrewitt functions:*.

NppStatus **nppiFilterPrewittHoriz_8u_C3R_Ctx**(const *Npp8u* *pSrc, *Npp32s* nSrcStep, *Npp8u* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Three channel 8-bit unsigned horizontal Prewitt filter.

For common parameter descriptions, see *Common parameters for nppiFilterPrewitt functions:*.

NppStatus **nppiFilterPrewittHoriz_8u_C4R_Ctx**(const *Npp8u* *pSrc, *Npp32s* nSrcStep, *Npp8u* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four channel 8-bit unsigned horizontal Prewitt filter.

For common parameter descriptions, see *Common parameters for nppiFilterPrewitt functions:*.

NppStatus **nppiFilterPrewittHoriz_8u_AC4R_Ctx**(const *Npp8u* *pSrc, *Npp32s* nSrcStep, *Npp8u* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four channel 8-bit unsigned horizontal Prewitt filter, ignoring alpha channel.

For common parameter descriptions, see *Common parameters for nppiFilterPrewitt functions:*.

NppStatus **nppiFilterPrewittHoriz_16s_C1R_Ctx**(const *Npp16s* *pSrc, *Npp32s* nSrcStep, *Npp16s* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Single channel 16-bit signed horizontal Prewitt filter.

For common parameter descriptions, see *Common parameters for nppiFilterPrewitt functions:*.

NppStatus **nppiFilterPrewittHoriz_16s_C3R_Ctx**(const *Npp16s* *pSrc, *Npp32s* nSrcStep, *Npp16s* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Three channel 16-bit signed horizontal Prewitt filter.

For common parameter descriptions, see *Common parameters for nppiFilterPrewitt functions:*.

NppStatus **nppiFilterPrewittHoriz_16s_C4R_Ctx**(const *Npp16s* *pSrc, *Npp32s* nSrcStep, *Npp16s* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four channel 16-bit signed horizontal Prewitt filter.

For common parameter descriptions, see *Common parameters for nppiFilterPrewitt functions:*.

NppStatus **nppiFilterPrewittHoriz_16s_AC4R_Ctx**(const *Npp16s* *pSrc, *Npp32s* nSrcStep, *Npp16s* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four channel 16-bit signed horizontal Prewitt filter, ignoring alpha channel.

For common parameter descriptions, see *Common parameters for nppiFilterPrewitt functions:*.

NppStatus **nppiFilterPrewittHoriz_32f_C1R_Ctx**(const *Npp32f* *pSrc, *Npp32s* nSrcStep, *Npp32f* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Single channel 32-bit floating-point horizontal Prewitt filter.

For common parameter descriptions, see *Common parameters for nppiFilterPrewitt functions:*.

NppStatus **nppiFilterPrewittHoriz_32f_C3R_Ctx**(const *Npp32f* *pSrc, *Npp32s* nSrcStep, *Npp32f* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Three channel 32-bit floating-point horizontal Prewitt filter.

For common parameter descriptions, see *Common parameters for nppiFilterPrewitt functions:*.

NppStatus **nppiFilterPrewittHoriz_32f_C4R_Ctx**(const *Npp32f* *pSrc, *Npp32s* nSrcStep, *Npp32f* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four channel 32-bit floating-point horizontal Prewitt filter.

For common parameter descriptions, see *Common parameters for nppiFilterPrewitt functions:*.

NppStatus **nppiFilterPrewittHoriz_32f_AC4R_Ctx**(const *Npp32f* *pSrc, *Npp32s* nSrcStep, *Npp32f* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four channel 32-bit floating-point horizontal Prewitt filter, ignoring alpha channel.

For common parameter descriptions, see *Common parameters for nppiFilterPrewitt functions:*.

FilterPrewittVert

Filters the image using a vertical Prewitt filter kernel:

$$\begin{pmatrix} -1 & 0 & 1 \\ -1 & 0 & 1 \\ -1 & 0 & 1 \end{pmatrix}$$

NppStatus **nppiFilterPrewittVert_8u_C1R_Ctx**(const *Npp8u* *pSrc, *Npp32s* nSrcStep, *Npp8u* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Single channel 8-bit unsigned vertical Prewitt filter.

For common parameter descriptions, see *Common parameters for nppiFilterPrewitt functions:*.

NppStatus **nppiFilterPrewittVert_8u_C3R_Ctx**(const *Npp8u* *pSrc, *Npp32s* nSrcStep, *Npp8u* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Three channel 8-bit unsigned vertical Prewitt filter.

For common parameter descriptions, see *Common parameters for nppiFilterPrewitt functions:*.

NppStatus **nppiFilterPrewittVert_8u_C4R_Ctx**(const *Npp8u* *pSrc, *Npp32s* nSrcStep, *Npp8u* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four channel 8-bit unsigned vertical Prewitt filter.

For common parameter descriptions, see *Common parameters for nppiFilterPrewitt functions:*.

NppStatus **nppiFilterPrewittVert_8u_AC4R_Ctx**(const *Npp8u* *pSrc, *Npp32s* nSrcStep, *Npp8u* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four channel 8-bit unsigned vertical Prewitt filter, ignoring alpha channel.

For common parameter descriptions, see *Common parameters for nppiFilterPrewitt functions:*.

NppStatus **nppiFilterPrewittVert_16s_C1R_Ctx**(const *Npp16s* *pSrc, *Npp32s* nSrcStep, *Npp16s* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Single channel 16-bit signed vertical Prewitt filter.

For common parameter descriptions, see *Common parameters for nppiFilterPrewitt functions:*.

NppStatus **nppiFilterPrewittVert_16s_C3R_Ctx**(const *Npp16s* *pSrc, *Npp32s* nSrcStep, *Npp16s* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Three channel 16-bit signed vertical Prewitt filter.

For common parameter descriptions, see *Common parameters for nppiFilterPrewitt functions:*.

NppStatus **nppiFilterPrewittVert_16s_C4R_Ctx**(const *Npp16s* *pSrc, *Npp32s* nSrcStep, *Npp16s* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four channel 16-bit signed vertical Prewitt filter.

For common parameter descriptions, see *Common parameters for nppiFilterPrewitt functions:*.

NppStatus **nppiFilterPrewittVert_16s_AC4R_Ctx**(const *Npp16s* *pSrc, *Npp32s* nSrcStep, *Npp16s* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four channel 16-bit signed vertical Prewitt filter, ignoring alpha channel.

For common parameter descriptions, see *Common parameters for nppiFilterPrewitt functions:*.

NppStatus **nppiFilterPrewittVert_32f_C1R_Ctx**(const *Npp32f* *pSrc, *Npp32s* nSrcStep, *Npp32f* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Single channel 32-bit floating-point vertical Prewitt filter.

For common parameter descriptions, see *Common parameters for nppiFilterPrewitt functions:*.

NppStatus **nppiFilterPrewittVert_32f_C3R_Ctx**(const *Npp32f* *pSrc, *Npp32s* nSrcStep, *Npp32f* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Three channel 32-bit floating-point vertical Prewitt filter.

For common parameter descriptions, see *Common parameters for nppiFilterPrewitt functions:*.

NppStatus **nppiFilterPrewittVert_32f_C4R_Ctx**(const *Npp32f* *pSrc, *Npp32s* nSrcStep, *Npp32f* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four channel 32-bit floating-point vertical Prewitt filter.

For common parameter descriptions, see *Common parameters for nppiFilterPrewitt functions:*.

NppStatus **nppiFilterPrewittVert_32f_AC4R_Ctx**(const *Npp32f* *pSrc, *Npp32s* nSrcStep, *Npp32f* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four channel 32-bit floating-point vertical Prewitt filter, ignoring alpha channel.

For common parameter descriptions, see *Common parameters for nppiFilterPrewitt functions:*.

1.10.5.3 Image Filter Prewitt Border

1.10.5.3.1 FilterPrewittBorder

Filters the image using a Prewitt filter kernel with border control.

1.10.5.3.1.1 Common parameters for nppiFilterPrewittBorder functions:

param pSrc
Source-Image Pointer.

param nSrcStep
Source-Image Line Step.

param oSrcSize
Source image width and height in pixels relative to pSrc.

param oSrcOffset
The pixel offset that pSrc points to relative to the origin of the source image.

param pDst
Destination-Image Pointer.

param nDstStep
Destination-Image Line Step.

param oSizeROI
Region-Of-Interest (ROI).

param eBorderType
The border type operation to be applied at source image border boundaries.

param nppStreamCtx
Application Managed Stream Context.

return
Image Data Related Error Codes, *ROI Related Error Codes*

FilterPrewittHorizBorder

Filters the image using a horizontal Prewitt filter kernel with border control.

If any portion of the mask overlaps the source image boundary the requested border type operation is applied to all mask pixels which fall outside of the source image.

Currently only the NPP_BORDER_REPLICATE border type operation is supported.

$$\begin{pmatrix} 1 & 1 & 1 \\ 0 & 0 & 0 \\ -1 & -1 & -1 \end{pmatrix}$$

NppStatus **nppiFilterPrewittHorizBorder_8u_C1R_Ctx**(const *Npp8u* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp8u* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Single channel 8-bit unsigned horizontal Prewitt filter with border control.

For common parameter descriptions, see *Common parameters for nppiFilterPrewittBorder functions:*.

NppStatus **nppiFilterPrewittHorizBorder_8u_C3R_Ctx**(const *Npp8u* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp8u* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Three channel 8-bit unsigned horizontal Prewitt filter with border control.

For common parameter descriptions, see *Common parameters for nppiFilterPrewittBorder functions:*.

NppStatus **nppiFilterPrewittHorizBorder_8u_C4R_Ctx**(const *Npp8u* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp8u* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Four channel 8-bit unsigned horizontal Prewitt filter with border control.

For common parameter descriptions, see *Common parameters for nppiFilterPrewittBorder functions:*.

NppStatus **nppiFilterPrewittHorizBorder_8u_AC4R_Ctx**(const *Npp8u* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp8u* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Four channel 8-bit unsigned horizontal Prewitt filter with border control, ignoring alpha channel.

For common parameter descriptions, see *Common parameters for nppiFilterPrewittBorder functions:*.

NppStatus **nppiFilterPrewittHorizBorder_16s_C1R_Ctx**(const *Npp16s* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp16s* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Single channel 16-bit signed horizontal Prewitt filter with border control.

For common parameter descriptions, see *Common parameters for nppiFilterPrewittBorder functions:*.

NppStatus **nppiFilterPrewittHorizBorder_16s_C3R_Ctx**(const *Npp16s* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp16s* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Three channel 16-bit signed horizontal Prewitt filter with border control.

For common parameter descriptions, see *Common parameters for nppiFilterPrewittBorder functions:*.

NppStatus **nppiFilterPrewittHorizBorder_16s_C4R_Ctx**(const *Npp16s* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp16s* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Four channel 16-bit signed horizontal Prewitt filter with border control.

For common parameter descriptions, see *Common parameters for nppiFilterPrewittBorder functions:*.

NppStatus **nppiFilterPrewittHorizBorder_16s_AC4R_Ctx**(const *Npp16s* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp16s* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Four channel 16-bit signed horizontal Prewitt filter with border control, ignoring alpha channel.

For common parameter descriptions, see *Common parameters for nppiFilterPrewittBorder functions:*.

NppStatus **nppiFilterPrewittHorizBorder_32f_C1R_Ctx**(const *Npp32f* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp32f* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Single channel 32-bit floating-point horizontal Prewitt filter with border control.

For common parameter descriptions, see *Common parameters for nppiFilterPrewittBorder functions:*.

NppStatus **nppiFilterPrewittHorizBorder_32f_C3R_Ctx**(const *Npp32f* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp32f* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Three channel 32-bit floating-point horizontal Prewitt filter with border control.

For common parameter descriptions, see *Common parameters for nppiFilterPrewittBorder functions:*.

NppStatus **nppiFilterPrewittHorizBorder_32f_C4R_Ctx**(const *Npp32f* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp32f* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Four channel 32-bit floating-point horizontal Prewitt filter with border control.

For common parameter descriptions, see *Common parameters for nppiFilterPrewittBorder functions:*.

NppStatus **nppiFilterPrewittHorizBorder_32f_AC4R_Ctx**(const *Npp32f* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp32f* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Four channel 32-bit floating-point horizontal Prewitt filter with border control, ignoring alpha channel.

For common parameter descriptions, see *Common parameters for nppiFilterPrewittBorder functions:*.

FilterPrewittVertBorder

Filters the image using a vertical Prewitt filter kernel with border control.

If any portion of the mask overlaps the source image boundary the requested border type operation is applied to all mask pixels which fall outside of the source image.

Currently only the NPP_BORDER_REPLICATE border type operation is supported.

$$\begin{pmatrix} -1 & 0 & 1 \\ -1 & 0 & 1 \\ -1 & 0 & 1 \end{pmatrix};$$

NppStatus **nppiFilterPrewittVertBorder_8u_C1R_Ctx**(const *Npp8u* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp8u* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Single channel 8-bit unsigned vertical Prewitt filter with border control.

For common parameter descriptions, see *Common parameters for nppiFilterPrewittBorder functions:*.

NppStatus **nppiFilterPrewittVertBorder_8u_C3R_Ctx**(const *Npp8u* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp8u* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Three channel 8-bit unsigned vertical Prewitt filter with border control.

For common parameter descriptions, see *Common parameters for nppiFilterPrewittBorder functions:*.

NppStatus **nppiFilterPrewittVertBorder_8u_C4R_Ctx**(const *Npp8u* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp8u* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Four channel 8-bit unsigned vertical Prewitt filter with border control.

For common parameter descriptions, see *Common parameters for nppiFilterPrewittBorder functions:*.

NppStatus **nppiFilterPrewittVertBorder_8u_AC4R_Ctx**(const *Npp8u* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp8u* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Four channel 8-bit unsigned vertical Prewitt filter with border control, ignoring alpha channel.

For common parameter descriptions, see *Common parameters for nppiFilterPrewittBorder functions:*.

NppStatus **nppiFilterPrewittVertBorder_16s_C1R_Ctx**(const *Npp16s* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp16s* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Single channel 16-bit signed vertical Prewitt filter with border control.

For common parameter descriptions, see *Common parameters for nppiFilterPrewittBorder functions:*.

NppStatus **nppiFilterPrewittVertBorder_16s_C3R_Ctx**(const *Npp16s* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp16s* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Three channel 16-bit signed vertical Prewitt filter with border control.

For common parameter descriptions, see *Common parameters for nppiFilterPrewittBorder functions:*.

NppStatus **nppiFilterPrewittVertBorder_16s_C4R_Ctx**(const *Npp16s* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp16s* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Four channel 16-bit signed vertical Prewitt filter with border control.

For common parameter descriptions, see *Common parameters for nppiFilterPrewittBorder functions:*.

NppStatus **nppiFilterPrewittVertBorder_16s_AC4R_Ctx**(const *Npp16s* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp16s* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Four channel 16-bit signed vertical Prewitt filter with border control, ignoring alpha channel.

For common parameter descriptions, see *Common parameters for nppiFilterPrewittBorder functions:*.

NppStatus **nppiFilterPrewittVertBorder_32f_C1R_Ctx**(const *Npp32f* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp32f* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Single channel 32-bit floating-point vertical Prewitt filter with border control.

For common parameter descriptions, see *Common parameters for nppiFilterPrewittBorder functions:*.

NppStatus **nppiFilterPrewittVertBorder_32f_C3R_Ctx**(const *Npp32f* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp32f* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Three channel 32-bit floating-point vertical Prewitt filter with border control.

For common parameter descriptions, see *Common parameters for nppiFilterPrewittBorder functions:*.

NppStatus **nppiFilterPrewittVertBorder_32f_C4R_Ctx**(const *Npp32f* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp32f* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Four channel 32-bit floating-point vertical Prewitt filter with border control.

For common parameter descriptions, see *Common parameters for nppiFilterPrewittBorder functions:*.

NppStatus **nppiFilterPrewittVertBorder_32f_AC4R_Ctx**(const *Npp32f* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp32f* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Four channel 32-bit floating-point vertical Prewitt filter with border control, ignoring alpha channel.

For common parameter descriptions, see *Common parameters for nppiFilterPrewittBorder functions:*.

1.10.5.4 Image Filter Scharr

1.10.5.4.1 FilterScharr

Filters the image using a Scharr filter kernel.

1.10.5.4.1.1 Common parameters for nppiFilterScharr functions:

param pSrc
Source-Image Pointer.

param nSrcStep
Source-Image Line Step.

param pDst
Destination-Image Pointer.

param nDstStep
Destination-Image Line Step.

param oSizeROI
Region-Of-Interest (ROI).

param nppStreamCtx
Application Managed Stream Context.

return
Image Data Related Error Codes, *ROI Related Error Codes*

FilterScharrHoriz

Filters the image using a horizontal Scharr filter kernel:

$$\begin{pmatrix} 3 & 10 & 3 \\ 0 & 0 & 0 \\ -3 & -10 & -3 \end{pmatrix}$$

NppStatus **nppiFilterScharrHoriz_8u16s_C1R_Ctx**(const *Npp8u* *pSrc, *Npp32s* nSrcStep, *Npp16s* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Single channel 8-bit unsigned to 16-bit signed horizontal Scharr filter.

For common parameter descriptions, see *Common parameters for nppiFilterScharr functions:*.

NppStatus **nppiFilterScharrHoriz_8s16s_C1R_Ctx**(const *Npp8s* *pSrc, *Npp32s* nSrcStep, *Npp16s* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Single channel 8-bit signed to 16-bit signed horizontal Scharr filter.

For common parameter descriptions, see *Common parameters for nppiFilterScharr functions:*.

NppStatus **nppiFilterScharrHoriz_32f_C1R_Ctx**(const *Npp32f* *pSrc, *Npp32s* nSrcStep, *Npp32f* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Single channel 32-bit floating-point horizontal Scharr filter.

For common parameter descriptions, see *Common parameters for nppiFilterScharr functions:*.

FilterScharrVert

Filters the image using a vertical Scharr filter kernel:

$$\begin{pmatrix} -3 & 0 & 3 \\ -10 & 0 & 10 \\ -3 & 0 & 3 \end{pmatrix}$$

NppStatus **nppiFilterScharrVert_8u16s_C1R_Ctx**(const *Npp8u* *pSrc, *Npp32s* nSrcStep, *Npp16s* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Single channel 8-bit unsigned to 16-bit signed vertical Scharr filter.

For common parameter descriptions, see *Common parameters for nppiFilterScharr functions:*.

NppStatus **nppiFilterScharrVert_8s16s_C1R_Ctx**(const *Npp8s* *pSrc, *Npp32s* nSrcStep, *Npp16s* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Single channel 8-bit signed to 16-bit signed vertical Scharr filter.

For common parameter descriptions, see *Common parameters for nppiFilterScharr functions:*.

NppStatus **nppiFilterScharrVert_32f_C1R_Ctx**(const *Npp32f* *pSrc, *Npp32s* nSrcStep, *Npp32f* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Single channel 32-bit floating-point vertical Scharr filter.

For common parameter descriptions, see *Common parameters for nppiFilterScharr functions:*.

1.10.5.5 Image Filter Scharr Border

1.10.5.5.1 FilterScharrBorder

Filters the image using a Scharr filter kernel with border control.

1.10.5.5.1.1 Common parameters for nppiFilterScharrBorder functions:

param pSrc
Source-Image Pointer.

param nSrcStep
Source-Image Line Step.

param oSrcSize
Source image width and height in pixels relative to pSrc.

param oSrcOffset
The pixel offset that pSrc points to relative to the origin of the source image.

param pDst
Destination-Image Pointer.

param nDstStep
Destination-Image Line Step.

param oSizeROI
Region-Of-Interest (ROI).

param eBorderType
The border type operation to be applied at source image border boundaries.

param nppStreamCtx
Application Managed Stream Context.

return
Image Data Related Error Codes, *ROI Related Error Codes*

FilterScharrHorizBorder

Filters the image using a horizontal Scharr filter kernel with border control:

$$\begin{pmatrix} 3 & 10 & 3 \\ 0 & 0 & 0 \\ -3 & -10 & -3 \end{pmatrix}$$

NppStatus **nppiFilterScharrHorizBorder_8u16s_C1R_Ctx**(const *Npp8u* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp16s* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Single channel 8-bit unsigned to 16-bit signed horizontal Scharr filter kernel with border control.

For common parameter descriptions, see *Common parameters for nppiFilterScharrBorder functions:*.

NppStatus **nppiFilterScharrHorizBorder_8s16s_C1R_Ctx**(const *Npp8s* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp16s* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Single channel 8-bit signed to 16-bit signed horizontal Scharr filter kernel with border control.

For common parameter descriptions, see *Common parameters for nppiFilterScharrBorder functions:*.

NppStatus **nppiFilterScharrHorizBorder_32f_C1R_Ctx**(const *Npp32f* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp32f* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Single channel 32-bit floating-point horizontal Scharr filter kernel with border control.

For common parameter descriptions, see *Common parameters for nppiFilterScharrBorder functions:*.

FilterScharrVertBorder

Filters the image using a vertical Scharr filter kernel kernel with border control:

$$\begin{pmatrix} -3 & 0 & 3 \\ -10 & 0 & 10 \\ -3 & 0 & 3 \end{pmatrix}$$

NppStatus **nppiFilterScharrVertBorder_8u16s_C1R_Ctx**(const *Npp8u* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp16s* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Single channel 8-bit unsigned to 16-bit signed vertical Scharr filter kernel with border control.

For common parameter descriptions, see *Common parameters for nppiFilterScharrBorder functions:*.

NppStatus **nppiFilterScharrVertBorder_8s16s_C1R_Ctx**(const *Npp8s* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp16s* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Single channel 8-bit signed to 16-bit signed vertical Scharr filter kernel with border control.

For common parameter descriptions, see *Common parameters for nppiFilterScharrBorder functions:*.

NppStatus **nppiFilterScharrVertBorder_32f_C1R_Ctx**(const *Npp32f* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp32f* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Single channel 32-bit floating-point vertical Scharr filter kernel with border control.

For common parameter descriptions, see *Common parameters for nppiFilterScharrBorder functions:*.

1.10.5.6 Image Filter Sobel

1.10.5.6.1 FilterSobel

Filters the image using a Sobel filter kernel.

1.10.5.6.1.1 Common parameters for nppiFilterSobel functions:

param pSrc
Source-Image Pointer.

param nSrcStep
Source-Image Line Step.

param pDst
Destination-Image Pointer.

param nDstStep
Destination-Image Line Step.

param oSizeROI
Region-Of-Interest (ROI).

param eMaskSize
Enumeration value specifying the mask size.

param nppStreamCtx
Application Managed Stream Context.

return
Image Data Related Error Codes, *ROI Related Error Codes*

FilterSobelHoriz

Filters the image using a horizontal Sobel filter kernel:

$$\begin{pmatrix} 1 & 2 & 1 \\ 0 & 0 & 0 \\ -1 & -2 & -1 \end{pmatrix} \begin{pmatrix} 1 & 4 & 6 & 4 & 1 \\ 2 & 8 & 12 & 8 & 2 \\ 0 & 0 & 0 & 0 & 0 \\ -2 & -8 & -12 & -8 & -2 \\ -1 & -4 & -6 & -4 & -1 \end{pmatrix}$$

NppStatus **nppiFilterSobelHoriz_8u_C1R_Ctx**(const *Npp8u* *pSrc, *Npp32s* nSrcStep, *Npp8u* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Single channel 8-bit unsigned horizontal Sobel filter.

For common parameter descriptions, see *Common parameters for nppiFilterSobel functions:*.

NppStatus **nppiFilterSobelHoriz_8u_C3R_Ctx**(const *Npp8u* *pSrc, *Npp32s* nSrcStep, *Npp8u* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Three channel 8-bit unsigned horizontal Sobel filter.

For common parameter descriptions, see *Common parameters for nppiFilterSobel functions:*.

NppStatus **nppiFilterSobelHoriz_8u_C4R_Ctx**(const *Npp8u* *pSrc, *Npp32s* nSrcStep, *Npp8u* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four channel 8-bit unsigned horizontal Sobel filter.

For common parameter descriptions, see *Common parameters for nppiFilterSobel functions:*.

NppStatus **nppiFilterSobelHoriz_8u_AC4R_Ctx**(const *Npp8u* *pSrc, *Npp32s* nSrcStep, *Npp8u* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four channel 16-bit signed horizontal Sobel filter, ignoring alpha channel.

For common parameter descriptions, see *Common parameters for nppiFilterSobel functions:*.

NppStatus **nppiFilterSobelHoriz_16s_C1R_Ctx**(const *Npp16s* *pSrc, *Npp32s* nSrcStep, *Npp16s* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Single channel 16-bit signed horizontal Sobel filter.

For common parameter descriptions, see *Common parameters for nppiFilterSobel functions:*.

NppStatus **nppiFilterSobelHoriz_16s_C3R_Ctx**(const *Npp16s* *pSrc, *Npp32s* nSrcStep, *Npp16s* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Three channel 16-bit signed horizontal Sobel filter.

For common parameter descriptions, see *Common parameters for nppiFilterSobel functions:*.

NppStatus **nppiFilterSobelHoriz_16s_C4R_Ctx**(const *Npp16s* *pSrc, *Npp32s* nSrcStep, *Npp16s* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four channel 16-bit signed horizontal Sobel filter.

For common parameter descriptions, see *Common parameters for nppiFilterSobel functions:*.

NppStatus **nppiFilterSobelHoriz_16s_AC4R_Ctx**(const *Npp16s* *pSrc, *Npp32s* nSrcStep, *Npp16s* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four channel 8-bit unsigned horizontal Sobel filter, ignoring alpha channel.

For common parameter descriptions, see *Common parameters for nppiFilterSobel functions:*.

NppStatus **nppiFilterSobelHoriz_32f_C1R_Ctx**(const *Npp32f* *pSrc, *Npp32s* nSrcStep, *Npp32f* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Single channel 32-bit floating-point horizontal Sobel filter.

For common parameter descriptions, see *Common parameters for nppiFilterSobel functions:*.

NppStatus **nppiFilterSobelHoriz_32f_C3R_Ctx**(const *Npp32f* *pSrc, *Npp32s* nSrcStep, *Npp32f* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Three channel 32-bit floating-point horizontal Sobel filter.

For common parameter descriptions, see *Common parameters for nppiFilterSobel functions:*.

NppStatus **nppiFilterSobelHoriz_32f_C4R_Ctx**(const *Npp32f* *pSrc, *Npp32s* nSrcStep, *Npp32f* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four channel 32-bit floating-point horizontal Sobel filter.

For common parameter descriptions, see *Common parameters for nppiFilterSobel functions:*.

NppStatus **nppiFilterSobelHoriz_32f_AC4R_Ctx**(const *Npp32f* *pSrc, *Npp32s* nSrcStep, *Npp32f* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four channel 32-bit floating-point horizontal Sobel filter, ignoring alpha channel.

For common parameter descriptions, see *Common parameters for nppiFilterSobel functions:*.

NppStatus **nppiFilterSobelHoriz_8u16s_C1R_Ctx**(const *Npp8u* *pSrc, *Npp32s* nSrcStep, *Npp16s* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiMaskSize* eMaskSize, *NppStreamContext* nppStreamCtx)

Single channel 8-bit unsigned to 16-bit signed horizontal Sobel filter.

For common parameter descriptions, see *Common parameters for nppiFilterSobel functions:*.

NppStatus **nppiFilterSobelHoriz_8s16s_C1R_Ctx**(const *Npp8s* *pSrc, *Npp32s* nSrcStep, *Npp16s* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiMaskSize* eMaskSize, *NppStreamContext* nppStreamCtx)

Single channel 8-bit signed to 16-bit signed horizontal Sobel filter.

For common parameter descriptions, see *Common parameters for nppiFilterSobel functions:*.

NppStatus **nppiFilterSobelHorizMask_32f_C1R_Ctx**(const *Npp32f* *pSrc, *Npp32s* nSrcStep, *Npp32f* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiMaskSize* eMaskSize, *NppStreamContext* nppStreamCtx)

Single channel 32-bit floating-point horizontal Sobel filter.

For common parameter descriptions, see *Common parameters for nppiFilterSobel functions:*.

FilterSobelVert

Filters the image using a vertical Sobel filter kernel:

$$\begin{pmatrix} -1 & 0 & 1 \\ -2 & 0 & 2 \\ -1 & 0 & 1 \end{pmatrix} \begin{pmatrix} -1 & -2 & 0 & 2 & 1 \\ -4 & -8 & 0 & 8 & 4 \\ -6 & -12 & 0 & 12 & 6 \\ -4 & -8 & 0 & 8 & 4 \\ -1 & -2 & 0 & 2 & 1 \end{pmatrix}$$

NppStatus **nppiFilterSobelVert_8u_C1R_Ctx**(const *Npp8u* *pSrc, *Npp32s* nSrcStep, *Npp8u* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Single channel 8-bit unsigned vertical Sobel filter.

For common parameter descriptions, see *Common parameters for nppiFilterSobel functions:*.

NppStatus **nppiFilterSobelVert_8u_C3R_Ctx**(const *Npp8u* *pSrc, *Npp32s* nSrcStep, *Npp8u* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Three channel 8-bit unsigned vertical Sobel filter.

For common parameter descriptions, see *Common parameters for nppiFilterSobel functions:*.

NppStatus **nppiFilterSobelVert_8u_C4R_Ctx**(const *Npp8u* *pSrc, *Npp32s* nSrcStep, *Npp8u* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four channel 8-bit unsigned vertical Sobel filter.

For common parameter descriptions, see *Common parameters for nppiFilterSobel functions:*.

NppStatus **nppiFilterSobelVert_8u_AC4R_Ctx**(const *Npp8u* *pSrc, *Npp32s* nSrcStep, *Npp8u* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four channel 16-bit signed vertical Sobel filter, ignoring alpha channel.

For common parameter descriptions, see *Common parameters for nppiFilterSobel functions:*.

NppStatus **nppiFilterSobelVert_16s_C1R_Ctx**(const *Npp16s* *pSrc, *Npp32s* nSrcStep, *Npp16s* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Single channel 16-bit signed vertical Sobel filter.

For common parameter descriptions, see *Common parameters for nppiFilterSobel functions:*.

NppStatus **nppiFilterSobelVert_16s_C3R_Ctx**(const *Npp16s* *pSrc, *Npp32s* nSrcStep, *Npp16s* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Three channel 16-bit signed vertical Sobel filter.

For common parameter descriptions, see *Common parameters for nppiFilterSobel functions:*.

NppStatus **nppiFilterSobelVert_16s_C4R_Ctx**(const *Npp16s* *pSrc, *Npp32s* nSrcStep, *Npp16s* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four channel 16-bit signed vertical Sobel filter.

For common parameter descriptions, see *Common parameters for nppiFilterSobel functions:*.

NppStatus **nppiFilterSobelVert_16s_AC4R_Ctx**(const *Npp16s* *pSrc, *Npp32s* nSrcStep, *Npp16s* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four channel 8-bit unsigned vertical Sobel filter, ignoring alpha channel.

For common parameter descriptions, see *Common parameters for nppiFilterSobel functions:*.

NppStatus **nppiFilterSobelVert_32f_C1R_Ctx**(const *Npp32f* *pSrc, *Npp32s* nSrcStep, *Npp32f* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Single channel 32-bit floating-point vertical Sobel filter.

For common parameter descriptions, see *Common parameters for nppiFilterSobel functions:*.

NppStatus **nppiFilterSobelVert_32f_C3R_Ctx**(const *Npp32f* *pSrc, *Npp32s* nSrcStep, *Npp32f* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Three channel 32-bit floating-point vertical Sobel filter.

For common parameter descriptions, see *Common parameters for nppiFilterSobel functions:*.

NppStatus **nppiFilterSobelVert_32f_C4R_Ctx**(const *Npp32f* *pSrc, *Npp32s* nSrcStep, *Npp32f* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four channel 32-bit floating-point vertical Sobel filter.

For common parameter descriptions, see *Common parameters for nppiFilterSobel functions:*.

NppStatus **nppiFilterSobelVert_32f_AC4R_Ctx**(const *Npp32f* *pSrc, *Npp32s* nSrcStep, *Npp32f* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four channel 32-bit floating-point vertical Sobel filter, ignoring alpha channel.

For common parameter descriptions, see *Common parameters for nppiFilterSobel functions:*.

NppStatus **nppiFilterSobelVert_8u16s_C1R_Ctx**(const *Npp8u* *pSrc, *Npp32s* nSrcStep, *Npp16s* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiMaskSize* eMaskSize, *NppStreamContext* nppStreamCtx)

Single channel 8-bit unsigned to 16-bit signed vertical Sobel filter.

For common parameter descriptions, see *Common parameters for nppiFilterSobel functions:*.

NppStatus **nppiFilterSobelVert_8s16s_C1R_Ctx**(const *Npp8s* *pSrc, *Npp32s* nSrcStep, *Npp16s* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiMaskSize* eMaskSize, *NppStreamContext* nppStreamCtx)

Single channel 8-bit signed to 16-bit signed vertical Sobel filter.

For common parameter descriptions, see *Common parameters for nppiFilterSobel functions:*.

NppStatus **nppiFilterSobelVertMask_32f_C1R_Ctx**(const *Npp32f* *pSrc, *Npp32s* nSrcStep, *Npp32f* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiMaskSize* eMaskSize, *NppStreamContext* nppStreamCtx)

Single channel 32-bit floating-point vertical Sobel filter.

For common parameter descriptions, see *Common parameters for nppiFilterSobel functions:*.

FilterSobelHorizSecond

Filters the image using a second derivative, horizontal Sobel filter kernel:

$$\begin{pmatrix} 1 & 2 & 1 \\ -2 & -4 & -2 \\ 1 & 2 & 1 \end{pmatrix} \begin{pmatrix} 1 & 4 & 6 & 4 & 1 \\ 0 & 0 & 0 & 0 & 0 \\ -2 & -8 & -12 & -8 & -2 \\ 0 & 0 & 0 & 0 & 0 \\ 1 & 4 & 6 & 4 & 1 \end{pmatrix}$$

NppStatus **nppiFilterSobelHorizSecond_8u16s_C1R_Ctx**(const *Npp8u* *pSrc, *Npp32s* nSrcStep, *Npp16s* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiMaskSize* eMaskSize, *NppStreamContext* nppStreamCtx)

Single channel 8-bit unsigned to 16-bit signed second derivative, horizontal Sobel filter.

For common parameter descriptions, see *Common parameters for nppiFilterSobel functions:*.

NppStatus **nppiFilterSobelHorizSecond_8s16s_C1R_Ctx**(const *Npp8s* *pSrc, *Npp32s* nSrcStep, *Npp16s* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiMaskSize* eMaskSize, *NppStreamContext* nppStreamCtx)

Single channel 8-bit signed to 16-bit signed second derivative, horizontal Sobel filter.

For common parameter descriptions, see *Common parameters for nppiFilterSobel functions:*.

NppStatus **nppiFilterSobelHorizSecond_32f_C1R_Ctx**(const *Npp32f* *pSrc, *Npp32s* nSrcStep, *Npp32f* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiMaskSize* eMaskSize, *NppStreamContext* nppStreamCtx)

Single channel 32-bit floating-point second derivative, horizontal Sobel filter.

For common parameter descriptions, see *Common parameters for nppiFilterSobel functions:*.

FilterSobelVertSecond

Filters the image using a second derivative, vertical Sobel filter kernel:

$$\begin{pmatrix} 1 & -2 & 1 \\ 2 & -4 & 2 \\ 1 & -2 & 1 \end{pmatrix} \begin{pmatrix} 1 & 0 & -2 & 0 & 1 \\ 4 & 0 & -8 & 0 & 4 \\ 6 & 0 & -12 & 0 & 6 \\ 4 & 0 & -8 & 0 & 4 \\ 1 & 0 & -2 & 0 & 1 \end{pmatrix}$$

NppStatus **nppiFilterSobelVertSecond_8u16s_C1R_Ctx**(const *Npp8u* *pSrc, *Npp32s* nSrcStep, *Npp16s* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiMaskSize* eMaskSize, *NppStreamContext* nppStreamCtx)

Single channel 8-bit unsigned to 16-bit signed second derivative, vertical Sobel filter.

For common parameter descriptions, see *Common parameters for nppiFilterSobel functions:*.

NppStatus **nppiFilterSobelVertSecond_8s16s_C1R_Ctx**(const *Npp8s* *pSrc, *Npp32s* nSrcStep, *Npp16s* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiMaskSize* eMaskSize, *NppStreamContext* nppStreamCtx)

Single channel 8-bit signed to 16-bit signed second derivative, vertical Sobel filter.

For common parameter descriptions, see *Common parameters for nppiFilterSobel functions:*.

NppStatus **nppiFilterSobelVertSecond_32f_C1R_Ctx**(const *Npp32f* *pSrc, *Npp32s* nSrcStep, *Npp32f* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiMaskSize* eMaskSize, *NppStreamContext* nppStreamCtx)

Single channel 32-bit floating-point second derivative, vertical Sobel filter.

For common parameter descriptions, see *Common parameters for nppiFilterSobel functions:*.

FilterSobelCross

Filters the image using a second cross derivative Sobel filter kernel:

$$\begin{pmatrix} -1 & 0 & 1 \\ 0 & 0 & 0 \\ 1 & 0 & -1 \end{pmatrix} \begin{pmatrix} -1 & -2 & 0 & 2 & 1 \\ -2 & -4 & 0 & 4 & 2 \\ 0 & 0 & 0 & 0 & 0 \\ 2 & 4 & 0 & -4 & -2 \\ 1 & 2 & 0 & -2 & -1 \end{pmatrix}$$

NppStatus **nppiFilterSobelCross_8u16s_C1R_Ctx**(const *Npp8u* *pSrc, *Npp32s* nSrcStep, *Npp16s* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiMaskSize* eMaskSize, *NppStreamContext* nppStreamCtx)

Single channel 8-bit unsigned to 16-bit signed second cross derivative Sobel filter.

For common parameter descriptions, see *Common parameters for nppiFilterSobel functions:*.

NppStatus **nppiFilterSobelCross_8s16s_C1R_Ctx**(const *Npp8s* *pSrc, *Npp32s* nSrcStep, *Npp16s* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiMaskSize* eMaskSize, *NppStreamContext* nppStreamCtx)

Single channel 8-bit signed to 16-bit signed second cross derivative Sobel filter.

For common parameter descriptions, see *Common parameters for nppiFilterSobel functions:*.

NppStatus **nppiFilterSobelCross_32f_C1R_Ctx**(const *Npp32f* *pSrc, *Npp32s* nSrcStep, *Npp32f* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiMaskSize* eMaskSize, *NppStreamContext* nppStreamCtx)

Single channel 32-bit floating-point second cross derivative Sobel filter.

For common parameter descriptions, see *Common parameters for nppiFilterSobel functions:*.

1.10.5.7 Image Filter Sobel Border

1.10.5.7.1 FilterSobelBorder

Filters the image using a Sobel filter kernel with border control.

1.10.5.7.1.1 Common parameters for nppiFilterSobelBorder functions:

param pSrc
Source-Image Pointer.

param nSrcStep
Source-Image Line Step.

param oSrcSize
Source image width and height in pixels relative to pSrc.

param oSrcOffset
The pixel offset that pSrc points to relative to the origin of the source image.

param pDst
Destination-Image Pointer.

param nDstStep
Destination-Image Line Step.

param oSizeROI
Region-Of-Interest (ROI).

param eMaskSize
Enumeration value specifying the mask size.

param eBorderType
The border type operation to be applied at source image border boundaries.

param nppStreamCtx
Application Managed Stream Context.

return
Image Data Related Error Codes, *ROI Related Error Codes*

FilterSobelHorizBorder

Filters the image using a horizontal Sobel filter kernel with border control:

$$\begin{pmatrix} 1 & 2 & 1 \\ 0 & 0 & 0 \\ -1 & -2 & -1 \end{pmatrix} \begin{pmatrix} 1 & 4 & 6 & 4 & 1 \\ 2 & 8 & 12 & 8 & 2 \\ 0 & 0 & 0 & 0 & 0 \\ -2 & -8 & -12 & -8 & -2 \\ -1 & -4 & -6 & -4 & -1 \end{pmatrix}$$

NppStatus **nppiFilterSobelHorizBorder_8u_C1R_Ctx**(const *Npp8u* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp8u* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Single channel 8-bit unsigned horizontal Sobel filter with border control.

For common parameter descriptions, see *Common parameters for nppiFilterSobelBorder functions:*.

NppStatus **nppiFilterSobelHorizBorder_8u_C3R_Ctx**(const *Npp8u* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp8u* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Three channel 8-bit unsigned horizontal Sobel filter with border control.

For common parameter descriptions, see *Common parameters for nppiFilterSobelBorder functions:*.

NppStatus **nppiFilterSobelHorizBorder_8u_C4R_Ctx**(const *Npp8u* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp8u* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Four channel 8-bit unsigned horizontal Sobel filter with border control.

For common parameter descriptions, see *Common parameters for nppiFilterSobelBorder functions:*.

NppStatus **nppiFilterSobelHorizBorder_8u_AC4R_Ctx**(const *Npp8u* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp8u* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Four channel 16-bit signed horizontal Sobel filter with border control, ignoring alpha channel.

For common parameter descriptions, see *Common parameters for nppiFilterSobelBorder functions:*.

NppStatus **nppiFilterSobelHorizBorder_16s_C1R_Ctx**(const *Npp16s* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp16s* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Single channel 16-bit signed horizontal Sobel filter with border control.

For common parameter descriptions, see *Common parameters for nppiFilterSobelBorder functions:*.

NppStatus **nppiFilterSobelHorizBorder_16s_C3R_Ctx**(const *Npp16s* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp16s* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Three channel 16-bit signed horizontal Sobel filter with border control.

For common parameter descriptions, see *Common parameters for nppiFilterSobelBorder functions:*.

NppStatus **nppiFilterSobelHorizBorder_16s_C4R_Ctx**(const *Npp16s* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp16s* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Four channel 16-bit signed horizontal Sobel filter with border control.

For common parameter descriptions, see *Common parameters for nppiFilterSobelBorder functions:*.

NppStatus **nppiFilterSobelHorizBorder_16s_AC4R_Ctx**(const *Npp16s* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp16s* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Four channel 8-bit unsigned horizontal Sobel filter with border control, ignoring alpha channel.

For common parameter descriptions, see *Common parameters for nppiFilterSobelBorder functions:*.

NppStatus **nppiFilterSobelHorizBorder_32f_C1R_Ctx**(const *Npp32f* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp32f* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Single channel 32-bit floating-point horizontal Sobel filter with border control.

For common parameter descriptions, see *Common parameters for nppiFilterSobelBorder functions:*.

NppStatus **nppiFilterSobelHorizBorder_32f_C3R_Ctx**(const *Npp32f* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp32f* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Three channel 32-bit floating-point horizontal Sobel filter with border control.

For common parameter descriptions, see *Common parameters for nppiFilterSobelBorder functions:*.

NppStatus **nppiFilterSobelHorizBorder_32f_C4R_Ctx**(const *Npp32f* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp32f* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Four channel 32-bit floating-point horizontal Sobel filter with border control.

For common parameter descriptions, see *Common parameters for nppiFilterSobelBorder functions:*.

NppStatus **nppiFilterSobelHorizBorder_32f_AC4R_Ctx**(const *Npp32f* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp32f* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Four channel 32-bit floating-point horizontal Sobel filter with border control, ignoring alpha channel.

For common parameter descriptions, see *Common parameters for nppiFilterSobelBorder functions:*.

NppStatus **nppiFilterSobelHorizBorder_8u16s_C1R_Ctx**(const *Npp8u* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp16s* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiMaskSize* eMaskSize, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Single channel 8-bit unsigned to 16-bit signed horizontal Sobel filter with border control.

For common parameter descriptions, see *Common parameters for nppiFilterSobelBorder functions:*.

NppStatus **nppiFilterSobelHorizBorder_8s16s_C1R_Ctx**(const *Npp8s* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp16s* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiMaskSize* eMaskSize, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Single channel 8-bit signed to 16-bit signed horizontal Sobel filter with border control.

For common parameter descriptions, see *Common parameters for nppiFilterSobelBorder functions:*.

NppStatus **nppiFilterSobelHorizMaskBorder_32f_C1R_Ctx**(const *Npp32f* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp32f* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiMaskSize* eMaskSize, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Single channel 32-bit floating-point horizontal Sobel filter with border control.

For common parameter descriptions, see *Common parameters for nppiFilterSobelBorder functions:*.

FilterSobelVertBorder

Filters the image using a vertical Sobel filter kernel with border control:

$$\begin{pmatrix} -1 & 0 & 1 \\ -2 & 0 & 2 \\ -1 & 0 & 1 \end{pmatrix} \begin{pmatrix} -1 & -2 & 0 & 2 & 1 \\ -4 & -8 & 0 & 8 & 4 \\ -6 & -12 & 0 & 12 & 6 \\ -4 & -8 & 0 & 8 & 4 \\ -1 & -2 & 0 & 2 & 1 \end{pmatrix}$$

NppStatus **nppiFilterSobelVertBorder_8u_C1R_Ctx**(const *Npp8u* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp8u* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Single channel 8-bit unsigned vertical Sobel filter with border control.

For common parameter descriptions, see *Common parameters for nppiFilterSobelBorder functions:*.

NppStatus **nppiFilterSobelVertBorder_8u_C3R_Ctx**(const *Npp8u* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp8u* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Three channel 8-bit unsigned vertical Sobel filter with border control.

For common parameter descriptions, see *Common parameters for nppiFilterSobelBorder functions:*.

NppStatus **nppiFilterSobelVertBorder_8u_C4R_Ctx**(const *Npp8u* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp8u* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Four channel 8-bit unsigned vertical Sobel filter with border control.

For common parameter descriptions, see *Common parameters for nppiFilterSobelBorder functions:*.

NppStatus **nppiFilterSobelVertBorder_8u_AC4R_Ctx**(const *Npp8u* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp8u* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Four channel 16-bit signed vertical Sobel filter with border control, ignoring alpha channel.

For common parameter descriptions, see *Common parameters for nppiFilterSobelBorder functions:*.

NppStatus **nppiFilterSobelVertBorder_16s_C1R_Ctx**(const *Npp16s* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp16s* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Single channel 16-bit signed vertical Sobel filter with border control.

For common parameter descriptions, see *Common parameters for nppiFilterSobelBorder functions:*.

NppStatus **nppiFilterSobelVertBorder_16s_C3R_Ctx**(const *Npp16s* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp16s* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Three channel 16-bit signed vertical Sobel filter with border control.

For common parameter descriptions, see *Common parameters for nppiFilterSobelBorder functions:*.

NppStatus **nppiFilterSobelVertBorder_16s_C4R_Ctx**(const *Npp16s* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp16s* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Four channel 16-bit signed vertical Sobel filter with border control.

For common parameter descriptions, see *Common parameters for nppiFilterSobelBorder functions:*.

NppStatus **nppiFilterSobelVertBorder_16s_AC4R_Ctx**(const *Npp16s* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp16s* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Four channel 8-bit unsigned vertical Sobel filter with border control, ignoring alpha channel.

For common parameter descriptions, see *Common parameters for nppiFilterSobelBorder functions:*.

NppStatus **nppiFilterSobelVertBorder_32f_C1R_Ctx**(const *Npp32f* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp32f* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Single channel 32-bit floating-point vertical Sobel filter with border control.

For common parameter descriptions, see *Common parameters for nppiFilterSobelBorder functions:*.

NppStatus **nppiFilterSobelVertBorder_32f_C3R_Ctx**(const *Npp32f* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp32f* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Three channel 32-bit floating-point vertical Sobel filter with border control.

For common parameter descriptions, see *Common parameters for nppiFilterSobelBorder functions:*.

NppStatus **nppiFilterSobelVertBorder_32f_C4R_Ctx**(const *Npp32f* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp32f* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Four channel 32-bit floating-point vertical Sobel filter with border control.

For common parameter descriptions, see *Common parameters for nppiFilterSobelBorder functions:*.

NppStatus **nppiFilterSobelVertBorder_32f_AC4R_Ctx**(const *Npp32f* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp32f* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Four channel 32-bit floating-point vertical Sobel filter with border control, ignoring alpha channel.

For common parameter descriptions, see *Common parameters for nppiFilterSobelBorder functions:*.

NppStatus **nppiFilterSobelVertBorder_8u16s_C1R_Ctx**(const *Npp8u* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp16s* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiMaskSize* eMaskSize, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Single channel 8-bit unsigned to 16-bit signed vertical Sobel filter with border control.

For common parameter descriptions, see *Common parameters for nppiFilterSobelBorder functions:*.

NppStatus **nppiFilterSobelVertBorder_8s16s_C1R_Ctx**(const *Npp8s* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp16s* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiMaskSize* eMaskSize, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Single channel 8-bit signed to 16-bit signed vertical Sobel filter with border control.

For common parameter descriptions, see *Common parameters for nppiFilterSobelBorder functions:*.

NppStatus **nppiFilterSobelVertMaskBorder_32f_C1R_Ctx**(const *Npp32f* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp32f* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiMaskSize* eMaskSize, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Single channel 32-bit floating-point vertical Sobel filter with border control.

For common parameter descriptions, see *Common parameters for nppiFilterSobelBorder functions:*.

FilterSobelHorizSecondBorder

Filters the image using a second derivative, horizontal Sobel filter kernel with border control:

$$\begin{pmatrix} 1 & 2 & 1 \\ -2 & -4 & -2 \\ 1 & 2 & 1 \end{pmatrix} \begin{pmatrix} 1 & 4 & 6 & 4 & 1 \\ 0 & 0 & 0 & 0 & 0 \\ -2 & -8 & -12 & -8 & -2 \\ 0 & 0 & 0 & 0 & 0 \\ 1 & 4 & 6 & 4 & 1 \end{pmatrix}$$

NppStatus **nppiFilterSobelHorizSecondBorder_8u16s_C1R_Ctx**(const *Npp8u* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp16s* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiMaskSize* eMaskSize, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Single channel 8-bit unsigned to 16-bit signed second derivative, horizontal Sobel filter with border control.

For common parameter descriptions, see *Common parameters for nppiFilterSobelBorder functions:*.

NppStatus **nppiFilterSobelHorizSecondBorder_8s16s_C1R_Ctx**(const *Npp8s* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp16s* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiMaskSize* eMaskSize, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Single channel 8-bit signed to 16-bit signed second derivative, horizontal Sobel filter with border control.

For common parameter descriptions, see *Common parameters for nppiFilterSobelBorder functions:*.

NppStatus **nppiFilterSobelHorizSecondBorder_32f_C1R_Ctx**(const *Npp32f* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp32f* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiMaskSize* eMaskSize, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Single channel 32-bit floating-point second derivative, horizontal Sobel filter with border control.

For common parameter descriptions, see *Common parameters for nppiFilterSobelBorder functions:*.

FilterSobelVertSecondBorder

Filters the image using a second derivative, vertical Sobel filter kernel with border control:

$$\begin{pmatrix} 1 & -2 & 1 \\ 2 & -4 & 2 \\ 1 & -2 & 1 \end{pmatrix} \begin{pmatrix} 1 & 0 & -2 & 0 & 1 \\ 4 & 0 & -8 & 0 & 4 \\ 6 & 0 & -12 & 0 & 6 \\ 4 & 0 & -8 & 0 & 4 \\ 1 & 0 & -2 & 0 & 1 \end{pmatrix}$$

NppStatus **nppiFilterSobelVertSecondBorder_8u16s_C1R_Ctx**(const *Npp8u* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp16s* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiMaskSize* eMaskSize, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Single channel 8-bit unsigned to 16-bit signed second derivative, vertical Sobel filter with border control.

For common parameter descriptions, see *Common parameters for nppiFilterSobelBorder functions:*.

NppStatus **nppiFilterSobelVertSecondBorder_8s16s_C1R_Ctx**(const *Npp8s* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp16s* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiMaskSize* eMaskSize, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Single channel 8-bit signed to 16-bit signed second derivative, vertical Sobel filter with border control.

For common parameter descriptions, see *Common parameters for nppiFilterSobelBorder functions:*.

NppStatus **nppiFilterSobelVertSecondBorder_32f_C1R_Ctx**(const *Npp32f* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp32f* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiMaskSize* eMaskSize, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Single channel 32-bit floating-point second derivative, vertical Sobel filter with border control.

For common parameter descriptions, see *Common parameters for nppiFilterSobelBorder functions:*.

FilterSobelCrossBorder

Filters the image using a second cross derivative Sobel filter kernel with border control:

$$\begin{pmatrix} -1 & 0 & 1 \\ 0 & 0 & 0 \\ 1 & 0 & -1 \end{pmatrix} \begin{pmatrix} -1 & -2 & 0 & 2 & 1 \\ -2 & -4 & 0 & 4 & 2 \\ 0 & 0 & 0 & 0 & 0 \\ 2 & 4 & 0 & -4 & -2 \\ 1 & 2 & 0 & -2 & -1 \end{pmatrix}$$

NppStatus **nppiFilterSobelCrossBorder_8u16s_C1R_Ctx**(const *Npp8u* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp16s* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiMaskSize* eMaskSize, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Single channel 8-bit unsigned to 16-bit signed second cross derivative Sobel filter with border control.

For common parameter descriptions, see *Common parameters for nppiFilterSobelBorder functions:*.

NppStatus **nppiFilterSobelCrossBorder_8s16s_C1R_Ctx**(const *Npp8s* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp16s* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiMaskSize* eMaskSize, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Single channel 8-bit signed to 16-bit signed second cross derivative Sobel filter with border control.

For common parameter descriptions, see *Common parameters for nppiFilterSobelBorder functions:*.

NppStatus **nppiFilterSobelCrossBorder_32f_C1R_Ctx**(const *Npp32f* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp32f* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiMaskSize* eMaskSize, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Single channel 32-bit floating-point second cross derivative Sobel filter with border control.

For common parameter descriptions, see *Common parameters for nppiFilterSobelBorder functions:*.

1.10.5.8 Image Filter Roberts

1.10.5.8.1 FilterRoberts

Filters the image using a Roberts filter kernel.

1.10.5.8.1.1 Common parameters for nppiFilterRoberts functions:

param pSrc
Source-Image Pointer.

param nSrcStep
Source-Image Line Step.

param pDst
Destination-Image Pointer.

param nDstStep
Destination-Image Line Step.

param oSizeROI
Region-Of-Interest (ROI).

param nppStreamCtx
Application Managed Stream Context.

return
Image Data Related Error Codes, *ROI Related Error Codes*

FilterRobertsDown

Filters the image using a horizontal Roberts filter kernel:

$$\begin{pmatrix} 0 & 0 & 0 \\ 0 & 1 & 0 \\ 0 & 0 & -1 \end{pmatrix}$$

NppStatus **nppiFilterRobertsDown_8u_C1R_Ctx**(const *Npp8u* *pSrc, *Npp32s* nSrcStep, *Npp8u* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Single channel 8-bit unsigned horizontal Roberts filter.

For common parameter descriptions, see *Common parameters for nppiFilterRoberts functions:*.

NppStatus **nppiFilterRobertsDown_8u_C3R_Ctx**(const *Npp8u* *pSrc, *Npp32s* nSrcStep, *Npp8u* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Three channel 8-bit unsigned horizontal Roberts filter.

For common parameter descriptions, see *Common parameters for nppiFilterRoberts functions:*.

NppStatus **nppiFilterRobertsDown_8u_C4R_Ctx**(const *Npp8u* *pSrc, *Npp32s* nSrcStep, *Npp8u* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four channel 8-bit unsigned horizontal Roberts filter.

For common parameter descriptions, see *Common parameters for nppiFilterRoberts functions:*.

NppStatus **nppiFilterRobertsDown_8u_AC4R_Ctx**(const *Npp8u* *pSrc, *Npp32s* nSrcStep, *Npp8u* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four channel 8-bit unsigned horizontal Roberts filter, ignoring alpha-channel.

For common parameter descriptions, see *Common parameters for nppiFilterRoberts functions:*.

NppStatus **nppiFilterRobertsDown_16s_C1R_Ctx**(const *Npp16s* *pSrc, *Npp32s* nSrcStep, *Npp16s* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Single channel 16-bit signed horizontal Roberts filter.

For common parameter descriptions, see *Common parameters for nppiFilterRoberts functions:*.

NppStatus **nppiFilterRobertsDown_16s_C3R_Ctx**(const *Npp16s* *pSrc, *Npp32s* nSrcStep, *Npp16s* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Three channel 16-bit signed horizontal Roberts filter.

For common parameter descriptions, see *Common parameters for nppiFilterRoberts functions:*.

NppStatus **nppiFilterRobertsDown_16s_C4R_Ctx**(const *Npp16s* *pSrc, *Npp32s* nSrcStep, *Npp16s* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four channel 16-bit signed horizontal Roberts filter.

For common parameter descriptions, see *Common parameters for nppiFilterRoberts functions:*.

NppStatus **nppiFilterRobertsDown_16s_AC4R_Ctx**(const *Npp16s* *pSrc, *Npp32s* nSrcStep, *Npp16s* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four channel 16-bit signed horizontal Roberts filter, ignoring alpha-channel.

For common parameter descriptions, see *Common parameters for nppiFilterRoberts functions:*.

NppStatus **nppiFilterRobertsDown_32f_C1R_Ctx**(const *Npp32f* *pSrc, *Npp32s* nSrcStep, *Npp32f* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Single channel 32-bit floating-point horizontal Roberts filter.

For common parameter descriptions, see *Common parameters for nppiFilterRoberts functions:*.

NppStatus **nppiFilterRobertsDown_32f_C3R_Ctx**(const *Npp32f* *pSrc, *Npp32s* nSrcStep, *Npp32f* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Three channel 32-bit floating-point horizontal Roberts filter.

For common parameter descriptions, see *Common parameters for nppiFilterRoberts functions:*.

NppStatus **nppiFilterRobertsDown_32f_C4R_Ctx**(const *Npp32f* *pSrc, *Npp32s* nSrcStep, *Npp32f* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four channel 32-bit floating-point horizontal Roberts filter.

For common parameter descriptions, see *Common parameters for nppiFilterRoberts functions:*.

NppStatus **nppiFilterRobertsDown_32f_AC4R_Ctx**(const *Npp32f* *pSrc, *Npp32s* nSrcStep, *Npp32f* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four channel 32-bit floating-point horizontal Roberts filter, ignoring alpha-channel.

For common parameter descriptions, see *Common parameters for nppiFilterRoberts functions:*.

FilterRobertsUp

Filters the image using a vertical Roberts filter kernel:

$$\begin{pmatrix} 0 & 0 & 0 \\ 0 & 1 & 0 \\ -1 & 0 & 0 \end{pmatrix}$$

NppStatus **nppiFilterRobertsUp_8u_C1R_Ctx**(const *Npp8u* *pSrc, *Npp32s* nSrcStep, *Npp8u* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Single channel 8-bit unsigned vertical Roberts filter.

For common parameter descriptions, see *Common parameters for nppiFilterRoberts functions:*.

NppStatus **nppiFilterRobertsUp_8u_C3R_Ctx**(const *Npp8u* *pSrc, *Npp32s* nSrcStep, *Npp8u* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Three channel 8-bit unsigned vertical Roberts filter.

For common parameter descriptions, see *Common parameters for nppiFilterRoberts functions:*.

NppStatus **nppiFilterRobertsUp_8u_C4R_Ctx**(const *Npp8u* *pSrc, *Npp32s* nSrcStep, *Npp8u* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four channel 8-bit unsigned vertical Roberts filter.

For common parameter descriptions, see *Common parameters for nppiFilterRoberts functions:*.

NppStatus **nppiFilterRobertsUp_8u_AC4R_Ctx**(const *Npp8u* *pSrc, *Npp32s* nSrcStep, *Npp8u* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four channel 8-bit unsigned vertical Roberts filter, ignoring alpha-channel.

For common parameter descriptions, see *Common parameters for nppiFilterRoberts functions:*.

NppStatus **nppiFilterRobertsUp_16s_C1R_Ctx**(const *Npp16s* *pSrc, *Npp32s* nSrcStep, *Npp16s* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Single channel 16-bit signed vertical Roberts filter.

For common parameter descriptions, see *Common parameters for nppiFilterRoberts functions:*.

NppStatus **nppiFilterRobertsUp_16s_C3R_Ctx**(const *Npp16s* *pSrc, *Npp32s* nSrcStep, *Npp16s* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Three channel 16-bit signed vertical Roberts filter.

For common parameter descriptions, see *Common parameters for nppiFilterRoberts functions:*.

NppStatus **nppiFilterRobertsUp_16s_C4R_Ctx**(const *Npp16s* *pSrc, *Npp32s* nSrcStep, *Npp16s* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four channel 16-bit signed vertical Roberts filter.

For common parameter descriptions, see *Common parameters for nppiFilterRoberts functions:*.

NppStatus **nppiFilterRobertsUp_16s_AC4R_Ctx**(const *Npp16s* *pSrc, *Npp32s* nSrcStep, *Npp16s* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four channel 16-bit signed vertical Roberts filter, ignoring alpha-channel.

For common parameter descriptions, see *Common parameters for nppiFilterRoberts functions:*.

NppStatus **nppiFilterRobertsUp_32f_C1R_Ctx**(const *Npp32f* *pSrc, *Npp32s* nSrcStep, *Npp32f* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Single channel 32-bit floating-point vertical Roberts filter.

For common parameter descriptions, see *Common parameters for nppiFilterRoberts functions:*.

NppStatus **nppiFilterRobertsUp_32f_C3R_Ctx**(const *Npp32f* *pSrc, *Npp32s* nSrcStep, *Npp32f* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Three channel 32-bit floating-point vertical Roberts filter.

For common parameter descriptions, see *Common parameters for nppiFilterRoberts functions:*.

NppStatus **nppiFilterRobertsUp_32f_C4R_Ctx**(const *Npp32f* *pSrc, *Npp32s* nSrcStep, *Npp32f* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four channel 32-bit floating-point vertical Roberts filter.

For common parameter descriptions, see *Common parameters for nppiFilterRoberts functions:*.

NppStatus **nppiFilterRobertsUp_32f_AC4R_Ctx**(const *Npp32f* *pSrc, *Npp32s* nSrcStep, *Npp32f* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four channel 32-bit floating-point vertical Roberts filter, ignoring alpha-channel.

For common parameter descriptions, see *Common parameters for nppiFilterRoberts functions:*.

1.10.5.9 Image Filter Roberts Border

1.10.5.9.1 FilterRobertsBorder

Filters the image using a Roberts filter kernel with border control.

1.10.5.9.1.1 Common parameters for nppiFilterRobertsBorder functions:

param pSrc
Source-Image Pointer.

param nSrcStep
Source-Image Line Step.

param oSrcSize
Source image width and height in pixels relative to pSrc.

param oSrcOffset
The pixel offset that pSrc points to relative to the origin of the source image.

param pDst
Destination-Image Pointer.

param nDstStep
Destination-Image Line Step.

param oSizeROI
Region-Of-Interest (ROI).

param eBorderType
The border type operation to be applied at source image border boundaries.

param nppStreamCtx
Application Managed Stream Context.

return
Image Data Related Error Codes, *ROI Related Error Codes*

FilterRobertsDownBorder

Filters the image using a horizontal Roberts filter kernel with border control.

If any portion of the mask overlaps the source image boundary the requested border type operation is applied to all mask pixels which fall outside of the source image.

Currently only the NPP_BORDER_REPLICATE border type operation is supported.

$$\begin{pmatrix} 0 & 0 & 0 \\ 0 & 1 & 0 \\ 0 & 0 & -1 \end{pmatrix}$$

NppStatus **nppiFilterRobertsDownBorder_8u_C1R_Ctx**(const *Npp8u* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp8u* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Single channel 8-bit unsigned horizontal Roberts filter with border control.

For common parameter descriptions, see *Common parameters for nppiFilterRobertsBorder functions:*.

NppStatus **nppiFilterRobertsDownBorder_8u_C3R_Ctx**(const *Npp8u* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp8u* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Three channel 8-bit unsigned horizontal Roberts filter with border control.

For common parameter descriptions, see *Common parameters for nppiFilterRobertsBorder functions:*.

NppStatus **nppiFilterRobertsDownBorder_8u_C4R_Ctx**(const *Npp8u* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp8u* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Four channel 8-bit unsigned horizontal Roberts filter with border control.

For common parameter descriptions, see *Common parameters for nppiFilterRobertsBorder functions:*.

NppStatus **nppiFilterRobertsDownBorder_8u_AC4R_Ctx**(const *Npp8u* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp8u* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Four channel 8-bit unsigned horizontal Roberts filter with border control, ignoring alpha-channel.

For common parameter descriptions, see *Common parameters for nppiFilterRobertsBorder functions:*.

NppStatus **nppiFilterRobertsDownBorder_16s_C1R_Ctx**(const *Npp16s* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp16s* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Single channel 16-bit signed horizontal Roberts filter with border control.

For common parameter descriptions, see *Common parameters for nppiFilterRobertsBorder functions:*.

NppStatus **nppiFilterRobertsDownBorder_16s_C3R_Ctx**(const *Npp16s* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp16s* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Three channel 16-bit signed horizontal Roberts filter with border control.

For common parameter descriptions, see *Common parameters for nppiFilterRobertsBorder functions:*.

NppStatus **nppiFilterRobertsDownBorder_16s_C4R_Ctx**(const *Npp16s* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp16s* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Four channel 16-bit signed horizontal Roberts filter with border control.

For common parameter descriptions, see *Common parameters for nppiFilterRobertsBorder functions:*.

NppStatus **nppiFilterRobertsDownBorder_16s_AC4R_Ctx**(const *Npp16s* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp16s* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Four channel 16-bit signed horizontal Roberts filter with border control, ignoring alpha-channel.

For common parameter descriptions, see *Common parameters for nppiFilterRobertsBorder functions:*.

NppStatus **nppiFilterRobertsDownBorder_32f_C1R_Ctx**(const *Npp32f* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp32f* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Single channel 32-bit floating-point horizontal Roberts filter with border control.

For common parameter descriptions, see *Common parameters for nppiFilterRobertsBorder functions:*.

NppStatus **nppiFilterRobertsDownBorder_32f_C3R_Ctx**(const *Npp32f* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp32f* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Three channel 32-bit floating-point horizontal Roberts filter with border control.

For common parameter descriptions, see *Common parameters for nppiFilterRobertsBorder functions:*.

NppStatus **nppiFilterRobertsDownBorder_32f_C4R_Ctx**(const *Npp32f* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp32f* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Four channel 32-bit floating-point horizontal Roberts filter with border control.

For common parameter descriptions, see *Common parameters for nppiFilterRobertsBorder functions:*.

NppStatus **nppiFilterRobertsDownBorder_32f_AC4R_Ctx**(const *Npp32f* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp32f* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Four channel 32-bit floating-point horizontal Roberts filter with border control, ignoring alpha-channel.

For common parameter descriptions, see *Common parameters for nppiFilterRobertsBorder functions:*.

FilterRobertsUpBorder

Filters the image using a vertical Roberts filter kernel with border control.

If any portion of the mask overlaps the source image boundary the requested border type operation is applied to all mask pixels which fall outside of the source image.

Currently only the NPP_BORDER_REPLICATE border type operation is supported.

$$\begin{pmatrix} 0 & 0 & 0 \\ 0 & 1 & 0 \\ -1 & 0 & 0 \end{pmatrix}$$

NppStatus **nppiFilterRobertsUpBorder_8u_C1R_Ctx**(const *Npp8u* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp8u* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Single channel 8-bit unsigned vertical Roberts filter with border control.

For common parameter descriptions, see *Common parameters for nppiFilterRobertsBorder functions:*.

NppStatus **nppiFilterRobertsUpBorder_8u_C3R_Ctx**(const *Npp8u* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp8u* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Three channel 8-bit unsigned vertical Roberts filter with border control.

For common parameter descriptions, see *Common parameters for nppiFilterRobertsBorder functions:*.

NppStatus **nppiFilterRobertsUpBorder_8u_C4R_Ctx**(const *Npp8u* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp8u* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Four channel 8-bit unsigned vertical Roberts filter with border control.

For common parameter descriptions, see *Common parameters for nppiFilterRobertsBorder functions:*.

NppStatus **nppiFilterRobertsUpBorder_8u_AC4R_Ctx**(const *Npp8u* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp8u* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Four channel 8-bit unsigned vertical Roberts filter with border control, ignoring alpha-channel.

For common parameter descriptions, see *Common parameters for nppiFilterRobertsBorder functions:*.

NppStatus **nppiFilterRobertsUpBorder_16s_C1R_Ctx**(const *Npp16s* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp16s* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Single channel 16-bit signed vertical Roberts filter with border control.

For common parameter descriptions, see *Common parameters for nppiFilterRobertsBorder functions:*.

NppStatus **nppiFilterRobertsUpBorder_16s_C3R_Ctx**(const *Npp16s* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp16s* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Three channel 16-bit signed vertical Roberts filter with border control.

For common parameter descriptions, see *Common parameters for nppiFilterRobertsBorder functions:*.

NppStatus **nppiFilterRobertsUpBorder_16s_C4R_Ctx**(const *Npp16s* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp16s* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Four channel 16-bit signed vertical Roberts filter with border control.

For common parameter descriptions, see *Common parameters for nppiFilterRobertsBorder functions:*.

NppStatus **nppiFilterRobertsUpBorder_16s_AC4R_Ctx**(const *Npp16s* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp16s* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Four channel 16-bit signed vertical Roberts filter with border control, ignoring alpha-channel.

For common parameter descriptions, see *Common parameters for nppiFilterRobertsBorder functions:*.

NppStatus **nppiFilterRobertsUpBorder_32f_C1R_Ctx**(const *Npp32f* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp32f* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Single channel 32-bit floating-point vertical Roberts filter with border control.

For common parameter descriptions, see *Common parameters for nppiFilterRobertsBorder functions:*.

NppStatus **nppiFilterRobertsUpBorder_32f_C3R_Ctx**(const *Npp32f* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp32f* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Three channel 32-bit floating-point vertical Roberts filter with border control.

For common parameter descriptions, see *Common parameters for nppiFilterRobertsBorder functions:*.

NppStatus **nppiFilterRobertsUpBorder_32f_C4R_Ctx**(const *Npp32f* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp32f* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Four channel 32-bit floating-point vertical Roberts filter with border control.

For common parameter descriptions, see *Common parameters for nppiFilterRobertsBorder functions:*.

NppStatus **nppiFilterRobertsUpBorder_32f_AC4R_Ctx**(const *Npp32f* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp32f* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Four channel 32-bit floating-point vertical Roberts filter with border control, ignoring alpha-channel.

For common parameter descriptions, see *Common parameters for nppiFilterRobertsBorder functions:*.

1.10.5.10 Image Filter Laplace

1.10.5.10.1 FilterLaplace

Filters the image using a Laplacian filter kernel.

1.10.5.10.1.1 Common parameters for nppiFilterLaplace functions:

$$\begin{pmatrix} -1 & -1 & -1 \\ -1 & 8 & -1 \\ -1 & -1 & -1 \end{pmatrix} \begin{pmatrix} -1 & -3 & -4 & -3 & -1 \\ -3 & 0 & 6 & 0 & -3 \\ -4 & 6 & 20 & 6 & -4 \\ -3 & 0 & 6 & 0 & -3 \\ -1 & -3 & -4 & -3 & -1 \end{pmatrix}$$

param pSrc
Source-Image Pointer.

param nSrcStep
Source-Image Line Step.

param pDst
Destination-Image Pointer.

param nDstStep
Destination-Image Line Step.

param oSizeROI
Region-Of-Interest (ROI).

param eMaskSize
Enumeration value specifying the mask size.

param nppStreamCtx
Application Managed Stream Context.

return
Image Data Related Error Codes, *ROI Related Error Codes*

Functions

NppStatus **nppiFilterLaplace_8u_C1R_Ctx**(const *Npp8u* *pSrc, *Npp32s* nSrcStep, *Npp8u* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiMaskSize* eMaskSize, *NppStreamContext* nppStreamCtx)

Single channel 8-bit unsigned Laplace filter.

For common parameter descriptions, see *Common parameters for nppiFilterLaplace functions:*.

NppStatus **nppiFilterLaplace_8u_C3R_Ctx**(const *Npp8u* *pSrc, *Npp32s* nSrcStep, *Npp8u* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiMaskSize* eMaskSize, *NppStreamContext* nppStreamCtx)

Three channel 8-bit unsigned Laplace filter.

For common parameter descriptions, see *Common parameters for nppiFilterLaplace functions:*.

NppStatus **nppiFilterLaplace_8u_C4R_Ctx**(const *Npp8u* *pSrc, *Npp32s* nSrcStep, *Npp8u* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiMaskSize* eMaskSize, *NppStreamContext* nppStreamCtx)

Four channel 8-bit unsigned Laplace filter.

For common parameter descriptions, see *Common parameters for nppiFilterLaplace functions:*.

NppStatus **nppiFilterLaplace_8u_AC4R_Ctx**(const *Npp8u* *pSrc, *Npp32s* nSrcStep, *Npp8u* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiMaskSize* eMaskSize, *NppStreamContext* nppStreamCtx)

Four channel 8-bit unsigned Laplace filter, ignoring alpha channel.

For common parameter descriptions, see *Common parameters for nppiFilterLaplace functions:*.

NppStatus **nppiFilterLaplace_16s_C1R_Ctx**(const *Npp16s* *pSrc, *Npp32s* nSrcStep, *Npp16s* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiMaskSize* eMaskSize, *NppStreamContext* nppStreamCtx)

Single channel 16-bit signed Laplace filter.

For common parameter descriptions, see *Common parameters for nppiFilterLaplace functions:*.

NppStatus **nppiFilterLaplace_16s_C3R_Ctx**(const *Npp16s* *pSrc, *Npp32s* nSrcStep, *Npp16s* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiMaskSize* eMaskSize, *NppStreamContext* nppStreamCtx)

Three channel 16-bit signed Laplace filter.

For common parameter descriptions, see *Common parameters for nppiFilterLaplace functions:*.

NppStatus **nppiFilterLaplace_16s_C4R_Ctx**(const *Npp16s* *pSrc, *Npp32s* nSrcStep, *Npp16s* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiMaskSize* eMaskSize, *NppStreamContext* nppStreamCtx)

Four channel 16-bit signed Laplace filter.

For common parameter descriptions, see *Common parameters for nppiFilterLaplace functions:*.

NppStatus **nppiFilterLaplace_16s_AC4R_Ctx**(const *Npp16s* *pSrc, *Npp32s* nSrcStep, *Npp16s* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiMaskSize* eMaskSize, *NppStreamContext* nppStreamCtx)

Four channel 16-bit signed Laplace filter, ignoring alpha channel.

For common parameter descriptions, see *Common parameters for nppiFilterLaplace functions:*.

NppStatus **nppiFilterLaplace_32f_C1R_Ctx**(const *Npp32f* *pSrc, *Npp32s* nSrcStep, *Npp32f* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiMaskSize* eMaskSize, *NppStreamContext* nppStreamCtx)

Single channel 32-bit floating-point Laplace filter.

For common parameter descriptions, see *Common parameters for nppiFilterLaplace functions:*.

NppStatus **nppiFilterLaplace_32f_C3R_Ctx**(const *Npp32f* *pSrc, *Npp32s* nSrcStep, *Npp32f* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiMaskSize* eMaskSize, *NppStreamContext* nppStreamCtx)

Three channel 32-bit floating-point Laplace filter.

For common parameter descriptions, see *Common parameters for nppiFilterLaplace functions:*.

NppStatus **nppiFilterLaplace_32f_C4R_Ctx**(const *Npp32f* *pSrc, *Npp32s* nSrcStep, *Npp32f* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiMaskSize* eMaskSize, *NppStreamContext* nppStreamCtx)

Four channel 32-bit floating-point Laplace filter.

For common parameter descriptions, see *Common parameters for nppiFilterLaplace functions:*.

NppStatus **nppiFilterLaplace_32f_AC4R_Ctx**(const *Npp32f* *pSrc, *Npp32s* nSrcStep, *Npp32f* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiMaskSize* eMaskSize, *NppStreamContext* nppStreamCtx)

Four channel 32-bit floating-point Laplace filter, ignoring alpha channel.

For common parameter descriptions, see *Common parameters for nppiFilterLaplace functions:*.

NppStatus **nppiFilterLaplace_8u16s_C1R_Ctx**(const *Npp8u* *pSrc, *Npp32s* nSrcStep, *Npp16s* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiMaskSize* eMaskSize, *NppStreamContext* nppStreamCtx)

Single channel 8-bit unsigned to 16-bit signed Laplace filter.

For common parameter descriptions, see *Common parameters for nppiFilterLaplace functions:*.

NppStatus **nppiFilterLaplace_8s16s_C1R_Ctx**(const *Npp8s* *pSrc, *Npp32s* nSrcStep, *Npp16s* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiMaskSize* eMaskSize, *NppStreamContext* nppStreamCtx)

Single channel 8-bit signed to 16-bit signed Laplace filter.

For common parameter descriptions, see *Common parameters for nppiFilterLaplace functions:*.

1.10.5.11 Image Filter Laplace Border

1.10.5.11.1 FilterLaplaceBorder

Filters the image using a Laplacian filter kernel with border control.

If any portion of the mask overlaps the source image boundary the requested border type operation is applied to all mask pixels which fall outside of the source image.

Currently only the NPP_BORDER_REPLICATE border type operation is supported.

1.10.5.11.1.1 Common parameters for nppiFilterLaplaceBorder functions:

$$\begin{pmatrix} -1 & -1 & -1 \\ -1 & 8 & -1 \\ -1 & -1 & -1 \end{pmatrix} \begin{pmatrix} -1 & -3 & -4 & -3 & -1 \\ -3 & 0 & 6 & 0 & -3 \\ -4 & 6 & 20 & 6 & -4 \\ -3 & 0 & 6 & 0 & -3 \\ -1 & -3 & -4 & -3 & -1 \end{pmatrix}$$

param pSrc
Source-Image Pointer.

param nSrcStep
Source-Image Line Step.

param oSrcSize
Source image width and height in pixels relative to pSrc.

param oSrcOffset
The pixel offset that pSrc points to relative to the origin of the source image.

param pDst
Destination-Image Pointer.

param nDstStep
Destination-Image Line Step.

param oSizeROI
Region-Of-Interest (ROI).

param eMaskSize
Enumeration value specifying the mask size.

param eBorderType
The border type operation to be applied at source image border boundaries.

param nppStreamCtx
Application Managed Stream Context.

return
Image Data Related Error Codes, *ROI Related Error Codes*

Functions

NppStatus **nppiFilterLaplaceBorder_8u_C1R_Ctx**(const *Npp8u* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp8u* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiMaskSize* eMaskSize, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Single channel 8-bit unsigned Laplace filter with border control.

For common parameter descriptions, see *Common parameters for nppiFilterLaplaceBorder functions:*.

NppStatus **nppiFilterLaplaceBorder_8u_C3R_Ctx**(const *Npp8u* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp8u* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiMaskSize* eMaskSize, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Three channel 8-bit unsigned Laplace filter with border control.

For common parameter descriptions, see *Common parameters for nppiFilterLaplaceBorder functions:*.

NppStatus **nppiFilterLaplaceBorder_8u_C4R_Ctx**(const *Npp8u* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp8u* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiMaskSize* eMaskSize, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Four channel 8-bit unsigned Laplace filter with border control.

For common parameter descriptions, see *Common parameters for nppiFilterLaplaceBorder functions:*.

NppStatus **nppiFilterLaplaceBorder_8u_AC4R_Ctx**(const *Npp8u* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp8u* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiMaskSize* eMaskSize, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Four channel 8-bit unsigned Laplace filter with border control, ignoring alpha channel.

For common parameter descriptions, see *Common parameters for nppiFilterLaplaceBorder functions:*.

NppStatus **nppiFilterLaplaceBorder_16s_C1R_Ctx**(const *Npp16s* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp16s* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiMaskSize* eMaskSize, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Single channel 16-bit signed Laplace filter with border control.

For common parameter descriptions, see *Common parameters for nppiFilterLaplaceBorder functions:*.

NppStatus **nppiFilterLaplaceBorder_16s_C3R_Ctx**(const *Npp16s* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp16s* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiMaskSize* eMaskSize, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Three channel 16-bit signed Laplace filter with border control.

For common parameter descriptions, see *Common parameters for nppiFilterLaplaceBorder functions:*.

NppStatus **nppiFilterLaplaceBorder_16s_C4R_Ctx**(const *Npp16s* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp16s* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiMaskSize* eMaskSize, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Four channel 16-bit signed Laplace filter with border control.

For common parameter descriptions, see *Common parameters for nppiFilterLaplaceBorder functions:*.

NppStatus **nppiFilterLaplaceBorder_16s_AC4R_Ctx**(const *Npp16s* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp16s* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiMaskSize* eMaskSize, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Four channel 16-bit signed Laplace filter with border control, ignoring alpha channel.

For common parameter descriptions, see *Common parameters for nppiFilterLaplaceBorder functions:*.

NppStatus **nppiFilterLaplaceBorder_32f_C1R_Ctx**(const *Npp32f* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp32f* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiMaskSize* eMaskSize, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Single channel 32-bit floating-point Laplace filter with border control.

For common parameter descriptions, see *Common parameters for nppiFilterLaplaceBorder functions:*.

NppStatus **nppiFilterLaplaceBorder_32f_C3R_Ctx**(const *Npp32f* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp32f* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiMaskSize* eMaskSize, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Three channel 32-bit floating-point Laplace filter with border control.

For common parameter descriptions, see *Common parameters for nppiFilterLaplaceBorder functions:*.

NppStatus **nppiFilterLaplaceBorder_32f_C4R_Ctx**(const *Npp32f* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp32f* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiMaskSize* eMaskSize, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Four channel 32-bit floating-point Laplace filter with border control.

For common parameter descriptions, see *Common parameters for nppiFilterLaplaceBorder functions:*.

NppStatus **nppiFilterLaplaceBorder_32f_AC4R_Ctx**(const *Npp32f* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp32f* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiMaskSize* eMaskSize, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Four channel 32-bit floating-point Laplace filter with border control, ignoring alpha channel.

For common parameter descriptions, see *Common parameters for nppiFilterLaplaceBorder functions:*.

NppStatus **nppiFilterLaplaceBorder_8u16s_C1R_Ctx**(const *Npp8u* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp16s* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiMaskSize* eMaskSize, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Single channel 8-bit unsigned to 16-bit signed Laplace filter with border control.

For common parameter descriptions, see *Common parameters for nppiFilterLaplaceBorder functions:*.

NppStatus **nppiFilterLaplaceBorder_8s16s_C1R_Ctx**(const *Npp8s* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp16s* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiMaskSize* eMaskSize, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Single channel 8-bit signed to 16-bit signed Laplace filter with border control.

For common parameter descriptions, see *Common parameters for nppiFilterLaplaceBorder functions:*.

1.10.5.12 Image Filter Gauss

1.10.5.12.1 FilterGauss

Filters the image using a Gaussian filter kernel. Use FilterGaussAdvanced if you want to supply your own filter coefficients.

Note that all FilterGauss functions currently support mask sizes up to 15x15. Filter kernels for these functions are calculated using a sigma value of 0.4F + (mask width / 2) * 0.6F.

1.10.5.12.1.1 Common parameters for nppiFilterGauss functions:

param pSrc
Source-Image Pointer.

param nSrcStep
Source-Image Line Step.

param pDst
Destination-Image Pointer.

param nDstStep
Destination-Image Line Step.

param oSizeROI
Region-Of-Interest (ROI).

param eMaskSize
Enumeration value specifying the mask size.

param nppStreamCtx
Application Managed Stream Context.

return
Image Data Related Error Codes, *ROI Related Error Codes*

Functions

NppStatus **nppiFilterGauss_8u_C1R_Ctx**(const *Npp8u* *pSrc, *Npp32s* nSrcStep, *Npp8u* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiMaskSize* eMaskSize, *NppStreamContext* nppStreamCtx)

Single channel 8-bit unsigned Gauss filter.

For common parameter descriptions, see *Common parameters for nppiFilterGauss functions:*.

NppStatus **nppiFilterGauss_8u_C3R_Ctx**(const *Npp8u* *pSrc, *Npp32s* nSrcStep, *Npp8u* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiMaskSize* eMaskSize, *NppStreamContext* nppStreamCtx)

Three channel 8-bit unsigned Gauss filter.

For common parameter descriptions, see *Common parameters for nppiFilterGauss functions:*.

NppStatus **nppiFilterGauss_8u_C4R_Ctx**(const *Npp8u* *pSrc, *Npp32s* nSrcStep, *Npp8u* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiMaskSize* eMaskSize, *NppStreamContext* nppStreamCtx)

Four channel 8-bit unsigned Gauss filter.

For common parameter descriptions, see *Common parameters for nppiFilterGauss functions:*.

NppStatus **nppiFilterGauss_8u_AC4R_Ctx**(const *Npp8u* *pSrc, *Npp32s* nSrcStep, *Npp8u* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiMaskSize* eMaskSize, *NppStreamContext* nppStreamCtx)

Four channel 8-bit unsigned Gauss filter, ignoring alpha channel.

For common parameter descriptions, see *Common parameters for nppiFilterGauss functions:*.

NppStatus **nppiFilterGauss_16u_C1R_Ctx**(const *Npp16u* *pSrc, *Npp32s* nSrcStep, *Npp16u* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiMaskSize* eMaskSize, *NppStreamContext* nppStreamCtx)

Single channel 16-bit unsigned Gauss filter.

For common parameter descriptions, see *Common parameters for nppiFilterGauss functions:*.

NppStatus **nppiFilterGauss_16u_C3R_Ctx**(const *Npp16u* *pSrc, *Npp32s* nSrcStep, *Npp16u* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiMaskSize* eMaskSize, *NppStreamContext* nppStreamCtx)

Three channel 16-bit unsigned Gauss filter.

For common parameter descriptions, see *Common parameters for nppiFilterGauss functions:*.

NppStatus **nppiFilterGauss_16u_C4R_Ctx**(const *Npp16u* *pSrc, *Npp32s* nSrcStep, *Npp16u* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiMaskSize* eMaskSize, *NppStreamContext* nppStreamCtx)

Four channel 16-bit unsigned Gauss filter.

For common parameter descriptions, see *Common parameters for nppiFilterGauss functions:*.

NppStatus **nppiFilterGauss_16u_AC4R_Ctx**(const *Npp16u* *pSrc, *Npp32s* nSrcStep, *Npp16u* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiMaskSize* eMaskSize, *NppStreamContext* nppStreamCtx)

Four channel 16-bit unsigned Gauss filter, ignoring alpha channel.

For common parameter descriptions, see *Common parameters for nppiFilterGauss functions:*.

NppStatus **nppiFilterGauss_16s_C1R_Ctx**(const *Npp16s* *pSrc, *Npp32s* nSrcStep, *Npp16s* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiMaskSize* eMaskSize, *NppStreamContext* nppStreamCtx)

Single channel 16-bit signed Gauss filter.

For common parameter descriptions, see *Common parameters for nppiFilterGauss functions:*.

NppStatus **nppiFilterGauss_16s_C3R_Ctx**(const *Npp16s* *pSrc, *Npp32s* nSrcStep, *Npp16s* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiMaskSize* eMaskSize, *NppStreamContext* nppStreamCtx)

Three channel 16-bit signed Gauss filter.

For common parameter descriptions, see *Common parameters for nppiFilterGauss functions:*.

NppStatus **nppiFilterGauss_16s_C4R_Ctx**(const *Npp16s* *pSrc, *Npp32s* nSrcStep, *Npp16s* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiMaskSize* eMaskSize, *NppStreamContext* nppStreamCtx)

Four channel 16-bit signed Gauss filter.

For common parameter descriptions, see *Common parameters for nppiFilterGauss functions:*.

NppStatus **nppiFilterGauss_16s_AC4R_Ctx**(const *Npp16s* *pSrc, *Npp32s* nSrcStep, *Npp16s* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiMaskSize* eMaskSize, *NppStreamContext* nppStreamCtx)

Four channel 16-bit signed Gauss filter, ignoring alpha channel.

For common parameter descriptions, see *Common parameters for nppiFilterGauss functions:*.

NppStatus **nppiFilterGauss_32f_C1R_Ctx**(const *Npp32f* *pSrc, *Npp32s* nSrcStep, *Npp32f* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiMaskSize* eMaskSize, *NppStreamContext* nppStreamCtx)

Single channel 32-bit floating-point Gauss filter.

For common parameter descriptions, see *Common parameters for nppiFilterGauss functions:*.

NppStatus **nppiFilterGauss_32f_C3R_Ctx**(const *Npp32f* *pSrc, *Npp32s* nSrcStep, *Npp32f* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiMaskSize* eMaskSize, *NppStreamContext* nppStreamCtx)

Three channel 32-bit floating-point Gauss filter.

For common parameter descriptions, see *Common parameters for nppiFilterGauss functions:*.

NppStatus **nppiFilterGauss_32f_C4R_Ctx**(const *Npp32f* *pSrc, *Npp32s* nSrcStep, *Npp32f* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiMaskSize* eMaskSize, *NppStreamContext* nppStreamCtx)

Four channel 32-bit floating-point Gauss filter.

For common parameter descriptions, see *Common parameters for nppiFilterGauss functions:*.

NppStatus **nppiFilterGauss_32f_AC4R_Ctx**(const *Npp32f* *pSrc, *Npp32s* nSrcStep, *Npp32f* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiMaskSize* eMaskSize, *NppStreamContext* nppStreamCtx)

Four channel 32-bit floating-point Gauss filter, ignoring alpha channel.

For common parameter descriptions, see *Common parameters for nppiFilterGauss functions:*.

1.10.5.13 Image Filter Gauss Advanced

1.10.5.13.1 FilterGaussAdvanced

Filters the image using a separable Gaussian filter kernel with user supplied floating point coefficients:

1.10.5.13.1.1 Common parameters for nppiFilterGaussAdvanced functions:

param pSrc
Source-Image Pointer.

param nSrcStep
Source-Image Line Step.

param pDst
Destination-Image Pointer.

param nDstStep
Destination-Image Line Step.

param oSizeROI
Region-Of-Interest (ROI).

param nFilterTaps
The number of filter taps where nFilterTaps = 2 * ((int)((float)ceil(radius) + 0.5F)) + 1.

param pKernel
Pointer to an array of nFilterTaps kernel coefficients which sum to 1.0F.

param nppStreamCtx
Application Managed Stream Context.

return
Image Data Related Error Codes, *ROI Related Error Codes*

Functions

NppStatus **nppiFilterGaussAdvanced_8u_C1R_Ctx**(const *Npp8u* *pSrc, *Npp32s* nSrcStep, *Npp8u* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, const int nFilterTaps, const *Npp32f* *pKernel, *NppStreamContext* nppStreamCtx)

Single channel 8-bit unsigned Gauss filter.

For common parameter descriptions, see *Common parameters for nppiFilterGaussAdvanced functions:*.

NppStatus **nppiFilterGaussAdvanced_8u_C3R_Ctx**(const *Npp8u* *pSrc, *Npp32s* nSrcStep, *Npp8u* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, const int nFilterTaps, const *Npp32f* *pKernel, *NppStreamContext* nppStreamCtx)

Three channel 8-bit unsigned Gauss filter.

For common parameter descriptions, see *Common parameters for nppiFilterGaussAdvanced functions:*.

NppStatus **nppiFilterGaussAdvanced_8u_C4R_Ctx**(const *Npp8u* *pSrc, *Npp32s* nSrcStep, *Npp8u* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, const int nFilterTaps, const *Npp32f* *pKernel, *NppStreamContext* nppStreamCtx)

Four channel 8-bit unsigned Gauss filter.

For common parameter descriptions, see *Common parameters for nppiFilterGaussAdvanced functions:*.

NppStatus **nppiFilterGaussAdvanced_8u_AC4R_Ctx**(const *Npp8u* *pSrc, *Npp32s* nSrcStep, *Npp8u* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, const int nFilterTaps, const *Npp32f* *pKernel, *NppStreamContext* nppStreamCtx)

Four channel 8-bit unsigned Gauss filter, ignoring alpha channel.

For common parameter descriptions, see *Common parameters for nppiFilterGaussAdvanced functions:*.

NppStatus **nppiFilterGaussAdvanced_16u_C1R_Ctx**(const *Npp16u* *pSrc, *Npp32s* nSrcStep, *Npp16u* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, const int nFilterTaps, const *Npp32f* *pKernel, *NppStreamContext* nppStreamCtx)

Single channel 16-bit unsigned Gauss filter.

For common parameter descriptions, see *Common parameters for nppiFilterGaussAdvanced functions:*.

NppStatus **nppiFilterGaussAdvanced_16u_C3R_Ctx**(const *Npp16u* *pSrc, *Npp32s* nSrcStep, *Npp16u* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, const int nFilterTaps, const *Npp32f* *pKernel, *NppStreamContext* nppStreamCtx)

Three channel 16-bit unsigned Gauss filter.

For common parameter descriptions, see *Common parameters for nppiFilterGaussAdvanced functions:*.

NppStatus **nppiFilterGaussAdvanced_16u_C4R_Ctx**(const *Npp16u* *pSrc, *Npp32s* nSrcStep, *Npp16u* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, const int nFilterTaps, const *Npp32f* *pKernel, *NppStreamContext* nppStreamCtx)

Four channel 16-bit unsigned Gauss filter.

For common parameter descriptions, see *Common parameters for nppiFilterGaussAdvanced functions:*.

NppStatus **nppiFilterGaussAdvanced_16u_AC4R_Ctx**(const *Npp16u* *pSrc, *Npp32s* nSrcStep, *Npp16u* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, const int nFilterTaps, const *Npp32f* *pKernel, *NppStreamContext* nppStreamCtx)

Four channel 16-bit unsigned Gauss filter, ignoring alpha channel.

For common parameter descriptions, see *Common parameters for nppiFilterGaussAdvanced functions:*.

NppStatus **nppiFilterGaussAdvanced_16s_C1R_Ctx**(const *Npp16s* *pSrc, *Npp32s* nSrcStep, *Npp16s* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, const int nFilterTaps, const *Npp32f* *pKernel, *NppStreamContext* nppStreamCtx)

Single channel 16-bit signed Gauss filter.

For common parameter descriptions, see *Common parameters for nppiFilterGaussAdvanced functions:*.

NppStatus **nppiFilterGaussAdvanced_16s_C3R_Ctx**(const *Npp16s* *pSrc, *Npp32s* nSrcStep, *Npp16s* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, const int nFilterTaps, const *Npp32f* *pKernel, *NppStreamContext* nppStreamCtx)

Three channel 16-bit signed Gauss filter.

For common parameter descriptions, see *Common parameters for nppiFilterGaussAdvanced functions:*.

NppStatus **nppiFilterGaussAdvanced_16s_C4R_Ctx**(const *Npp16s* *pSrc, *Npp32s* nSrcStep, *Npp16s* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, const int nFilterTaps, const *Npp32f* *pKernel, *NppStreamContext* nppStreamCtx)

Four channel 16-bit signed Gauss filter.

For common parameter descriptions, see *Common parameters for nppiFilterGaussAdvanced functions:*.

NppStatus **nppiFilterGaussAdvanced_16s_AC4R_Ctx**(const *Npp16s* *pSrc, *Npp32s* nSrcStep, *Npp16s* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, const int nFilterTaps, const *Npp32f* *pKernel, *NppStreamContext* nppStreamCtx)

Four channel 16-bit signed Gauss filter, ignoring alpha channel.

For common parameter descriptions, see *Common parameters for nppiFilterGaussAdvanced functions:*.

NppStatus **nppiFilterGaussAdvanced_32f_C1R_Ctx**(const *Npp32f* *pSrc, *Npp32s* nSrcStep, *Npp32f* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, const int nFilterTaps, const *Npp32f* *pKernel, *NppStreamContext* nppStreamCtx)

Single channel 32-bit floating-point Gauss filter.

For common parameter descriptions, see *Common parameters for nppiFilterGaussAdvanced functions:*.

NppStatus **nppiFilterGaussAdvanced_32f_C3R_Ctx**(const *Npp32f* *pSrc, *Npp32s* nSrcStep, *Npp32f* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, const int nFilterTaps, const *Npp32f* *pKernel, *NppStreamContext* nppStreamCtx)

Three channel 32-bit floating-point Gauss filter.

For common parameter descriptions, see *Common parameters for nppiFilterGaussAdvanced functions:*.

NppStatus **nppiFilterGaussAdvanced_32f_C4R_Ctx**(const *Npp32f* *pSrc, *Npp32s* nSrcStep, *Npp32f* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, const int nFilterTaps, const *Npp32f* *pKernel, *NppStreamContext* nppStreamCtx)

Four channel 32-bit floating-point Gauss filter.

For common parameter descriptions, see *Common parameters for nppiFilterGaussAdvanced functions:*.

NppStatus **nppiFilterGaussAdvanced_32f_AC4R_Ctx**(const *Npp32f* *pSrc, *Npp32s* nSrcStep, *Npp32f* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, const int nFilterTaps, const *Npp32f* *pKernel, *NppStreamContext* nppStreamCtx)

Four channel 32-bit floating-point Gauss filter, ignoring alpha channel.

For common parameter descriptions, see *Common parameters for nppiFilterGaussAdvanced functions:*.

1.10.5.14 Image Filter Gauss Border

1.10.5.14.1 FilterGaussBorder

Filters the image using a Gaussian filter kernel with border control. Use FilterGaussAdvancedBorder if you want to supply your own filter coefficients.

If any portion of the mask overlaps the source image boundary the requested border type operation is applied to all mask pixels which fall outside of the source image.

Currently only the NPP_BORDER_REPLICATE border type operation is supported.

Note that all FilterGaussBorder functions currently support mask sizes up to 15x15. Filter kernels for these functions are calculated using a sigma value of 0.4F + (mask width / 2) * 0.6F.

1.10.5.14.1.1 Common parameters for nppiFilterGaussBorder functions:

param pSrc
Source-Image Pointer.

param nSrcStep
Source-Image Line Step.

param oSrcSize
Full source image width and height in pixels.

param oSrcOffset
The pixel offset that pSrc points to relative to the origin of the source image.

param pDst
Destination-Image Pointer.

param nDstStep
Destination-Image Line Step.

param oSizeROI
Region-Of-Interest (ROI).

param eMaskSize
Enumeration value specifying the mask size.

param eBorderType
The border type operation to be applied at source image border boundaries.

param nppStreamCtx
Application Managed Stream Context.

return
Image Data Related Error Codes, *ROI Related Error Codes*

Functions

NppStatus **nppiFilterGaussBorder_8u_C1R_Ctx**(const *Npp8u* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp8u* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiMaskSize* eMaskSize, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Single channel 8-bit unsigned Gauss filter with border control.

For common parameter descriptions, see *Common parameters for nppiFilterGaussBorder functions:*.

NppStatus **nppiFilterGaussBorder_8u_C3R_Ctx**(const *Npp8u* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp8u* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiMaskSize* eMaskSize, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Three channel 8-bit unsigned Gauss filter with border control.

For common parameter descriptions, see *Common parameters for nppiFilterGaussBorder functions:*.

NppStatus **nppiFilterGaussBorder_8u_C4R_Ctx**(const *Npp8u* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp8u* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiMaskSize* eMaskSize, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Four channel 8-bit unsigned Gauss filter with border control.

For common parameter descriptions, see *Common parameters for nppiFilterGaussBorder functions:*.

NppStatus **nppiFilterGaussBorder_8u_AC4R_Ctx**(const *Npp8u* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp8u* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiMaskSize* eMaskSize, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Four channel 8-bit unsigned Gauss filter with border control, ignoring alpha channel.

For common parameter descriptions, see *Common parameters for nppiFilterGaussBorder functions:*.

NppStatus **nppiFilterGaussBorder_16u_C1R_Ctx**(const *Npp16u* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp16u* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiMaskSize* eMaskSize, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Single channel 16-bit unsigned Gauss filter with border control.

For common parameter descriptions, see *Common parameters for nppiFilterGaussBorder functions:*.

NppStatus **nppiFilterGaussBorder_16u_C3R_Ctx**(const *Npp16u* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp16u* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiMaskSize* eMaskSize, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Three channel 16-bit unsigned Gauss filter with border control.

For common parameter descriptions, see *Common parameters for nppiFilterGaussBorder functions:*.

NppStatus **nppiFilterGaussBorder_16u_C4R_Ctx**(const *Npp16u* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp16u* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiMaskSize* eMaskSize, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Four channel 16-bit unsigned Gauss filter with border control.

For common parameter descriptions, see *Common parameters for nppiFilterGaussBorder functions:*.

NppStatus **nppiFilterGaussBorder_16u_AC4R_Ctx**(const *Npp16u* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp16u* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiMaskSize* eMaskSize, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Four channel 16-bit unsigned Gauss filter with border control, ignoring alpha channel.

For common parameter descriptions, see *Common parameters for nppiFilterGaussBorder functions:*.

NppStatus **nppiFilterGaussBorder_16s_C1R_Ctx**(const *Npp16s* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp16s* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiMaskSize* eMaskSize, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Single channel 16-bit signed Gauss filter with border control.

For common parameter descriptions, see *Common parameters for nppiFilterGaussBorder functions:*.

NppStatus **nppiFilterGaussBorder_16s_C3R_Ctx**(const *Npp16s* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp16s* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiMaskSize* eMaskSize, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Three channel 16-bit signed Gauss filter with border control.

For common parameter descriptions, see *Common parameters for nppiFilterGaussBorder functions:*.

NppStatus **nppiFilterGaussBorder_16s_C4R_Ctx**(const *Npp16s* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp16s* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiMaskSize* eMaskSize, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Four channel 16-bit signed Gauss filter with border control.

For common parameter descriptions, see *Common parameters for nppiFilterGaussBorder functions:*.

NppStatus **nppiFilterGaussBorder_16s_AC4R_Ctx**(const *Npp16s* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp16s* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiMaskSize* eMaskSize, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Four channel 16-bit signed Gauss filter with border control, ignoring alpha channel.

For common parameter descriptions, see *Common parameters for nppiFilterGaussBorder functions:*.

NppStatus **nppiFilterGaussBorder_32f_C1R_Ctx**(const *Npp32f* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp32f* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiMaskSize* eMaskSize, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Single channel 32-bit floating-point Gauss filter with border control.

For common parameter descriptions, see *Common parameters for nppiFilterGaussBorder functions:*.

NppStatus **nppiFilterGaussBorder_32f_C3R_Ctx**(const *Npp32f* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp32f* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiMaskSize* eMaskSize, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Three channel 32-bit floating-point Gauss filter with border control.

For common parameter descriptions, see *Common parameters for nppiFilterGaussBorder functions:*.

NppStatus **nppiFilterGaussBorder_32f_C4R_Ctx**(const *Npp32f* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp32f* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiMaskSize* eMaskSize, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Four channel 32-bit floating-point Gauss filter with border control.

For common parameter descriptions, see *Common parameters for nppiFilterGaussBorder functions:*.

NppStatus **nppiFilterGaussBorder_32f_AC4R_Ctx**(const *Npp32f* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp32f* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiMaskSize* eMaskSize, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Four channel 32-bit floating-point Gauss filter with border control, ignoring alpha channel.

For common parameter descriptions, see *Common parameters for nppiFilterGaussBorder functions:*.

1.10.5.15 Image Filter Advanced Gauss Border

1.10.5.15.1 FilterGaussAdvancedBorder

Filters the image using a separable Gaussian filter kernel with user supplied floating point coefficients with border control.

If any portion of the mask overlaps the source image boundary the requested border type operation is applied to all mask pixels which fall outside of the source image.

Note that the performance of these functions can drop significantly for filter kernels with a very large number of taps.

Currently only the NPP_BORDER_REPLICATE and NPP_BORDER_MIRROR border type operations are supported.

1.10.5.15.1.1 Common parameters for nppiFilterGaussAdvancedBorder functions:

param pSrc
Source-Image Pointer.

param nSrcStep
Source-Image Line Step.

param oSrcSize
Full source image width and height in pixels.

param oSrcOffset
The pixel offset that pSrc points to relative to the origin of the source image.

param pDst
Destination-Image Pointer.

param nDstStep
Destination-Image Line Step.

param oSizeROI
Region-Of-Interest (ROI).

param nFilterTaps
The number of filter taps where nFilterTaps = 2 * ((int)((float)ceil(radius) + 0.5F)) + 1.

param pKernel
Pointer to an array of nFilterTaps kernel coefficients which sum to 1.0F.

param eBorderType
The border type operation to be applied at source image border boundaries.

param nppStreamCtx
Application Managed Stream Context.

return
Image Data Related Error Codes, *ROI Related Error Codes*

Functions

NppStatus **nppiFilterGaussAdvancedBorder_8u_C1R_Ctx**(const *Npp8u* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp8u* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, const int nFilterTaps, const *Npp32f* *pKernel, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Single channel 8-bit unsigned Gauss filter with border control.

For common parameter descriptions, see *Common parameters for nppiFilterGaussAdvancedBorder functions:*.

NppStatus **nppiFilterGaussAdvancedBorder_8u_C3R_Ctx**(const *Npp8u* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp8u* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, const int nFilterTaps, const *Npp32f* *pKernel, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Three channel 8-bit unsigned Gauss filter with border control.

For common parameter descriptions, see *Common parameters for nppiFilterGaussAdvancedBorder functions:*.

NppStatus **nppiFilterGaussAdvancedBorder_8u_C4R_Ctx**(const *Npp8u* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp8u* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, const int nFilterTaps, const *Npp32f* *pKernel, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Four channel 8-bit unsigned Gauss filter with border control.

For common parameter descriptions, see *Common parameters for nppiFilterGaussAdvancedBorder functions:*.

NppStatus **nppiFilterGaussAdvancedBorder_8u_AC4R_Ctx**(const *Npp8u* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp8u* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, const int nFilterTaps, const *Npp32f* *pKernel, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Four channel 8-bit unsigned Gauss filter with border control, ignoring alpha channel.

For common parameter descriptions, see *Common parameters for nppiFilterGaussAdvancedBorder functions:*.

NppStatus **nppiFilterGaussAdvancedBorder_16u_C1R_Ctx**(const *Npp16u* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp16u* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, const int nFilterTaps, const *Npp32f* *pKernel, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Single channel 16-bit unsigned Gauss filter with border control.

For common parameter descriptions, see *Common parameters for nppiFilterGaussAdvancedBorder functions:*.

NppStatus **nppiFilterGaussAdvancedBorder_16u_C3R_Ctx**(const *Npp16u* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp16u* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, const int nFilterTaps, const *Npp32f* *pKernel, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Three channel 16-bit unsigned Gauss filter with border control.

For common parameter descriptions, see *Common parameters for nppiFilterGaussAdvancedBorder functions:*.

NppStatus **nppiFilterGaussAdvancedBorder_16u_C4R_Ctx**(const *Npp16u* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp16u* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, const int nFilterTaps, const *Npp32f* *pKernel, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Four channel 16-bit unsigned Gauss filter with border control.

For common parameter descriptions, see *Common parameters for nppiFilterGaussAdvancedBorder functions:*.

NppStatus **nppiFilterGaussAdvancedBorder_16u_AC4R_Ctx**(const *Npp16u* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp16u* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, const int nFilterTaps, const *Npp32f* *pKernel, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Four channel 16-bit unsigned Gauss filter with border control, ignoring alpha channel.

For common parameter descriptions, see *Common parameters for nppiFilterGaussAdvancedBorder functions:*.

NppStatus **nppiFilterGaussAdvancedBorder_16s_C1R_Ctx**(const *Npp16s* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp16s* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, const int nFilterTaps, const *Npp32f* *pKernel, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Single channel 16-bit signed Gauss filter with border control.

For common parameter descriptions, see *Common parameters for nppiFilterGaussAdvancedBorder functions:*.

NppStatus **nppiFilterGaussAdvancedBorder_16s_C3R_Ctx**(const *Npp16s* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp16s* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, const int nFilterTaps, const *Npp32f* *pKernel, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Three channel 16-bit signed Gauss filter with border control.

For common parameter descriptions, see *Common parameters for nppiFilterGaussAdvancedBorder functions:*.

NppStatus **nppiFilterGaussAdvancedBorder_16s_C4R_Ctx**(const *Npp16s* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp16s* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, const int nFilterTaps, const *Npp32f* *pKernel, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Four channel 16-bit signed Gauss filter with border control.

For common parameter descriptions, see *Common parameters for nppiFilterGaussAdvancedBorder functions:*.

NppStatus **nppiFilterGaussAdvancedBorder_16s_AC4R_Ctx**(const *Npp16s* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp16s* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, const int nFilterTaps, const *Npp32f* *pKernel, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Four channel 16-bit signed Gauss filter with border control, ignoring alpha channel.

For common parameter descriptions, see *Common parameters for nppiFilterGaussAdvancedBorder functions:*.

NppStatus **nppiFilterGaussAdvancedBorder_32f_C1R_Ctx**(const *Npp32f* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp32f* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, const int nFilterTaps, const *Npp32f* *pKernel, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Single channel 32-bit floating-point Gauss filter with border control.

For common parameter descriptions, see *Common parameters for nppiFilterGaussAdvancedBorder functions:*.

NppStatus **nppiFilterGaussAdvancedBorder_32f_C3R_Ctx**(const *Npp32f* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp32f* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, const int nFilterTaps, const *Npp32f* *pKernel, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Three channel 32-bit floating-point Gauss filter with border control.

For common parameter descriptions, see *Common parameters for nppiFilterGaussAdvancedBorder functions:*.

NppStatus **nppiFilterGaussAdvancedBorder_32f_C4R_Ctx**(const *Npp32f* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp32f* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, const int nFilterTaps, const *Npp32f* *pKernel, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Four channel 32-bit floating-point Gauss filter with border control.

For common parameter descriptions, see *Common parameters for nppiFilterGaussAdvancedBorder functions:*.

NppStatus **nppiFilterGaussAdvancedBorder_32f_AC4R_Ctx**(const *Npp32f* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp32f* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, const int nFilterTaps, const *Npp32f* *pKernel, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Four channel 32-bit floating-point Gauss filter with border control, ignoring alpha channel.

For common parameter descriptions, see *Common parameters for nppiFilterGaussAdvancedBorder functions:*.

1.10.5.16 Image Filter Gauss Pyramid Layer Down Border

1.10.5.16.1 FilterGaussPyramidLayerDownBorder

Filters the image using a separable Gaussian filter kernel with user supplied floating point coefficients with downsampling and border control.

If the downsampling rate is equivalent to an integer value then unnecessary source pixels are just skipped. If any portion of the mask overlaps the source image boundary the requested border type operation is applied to all mask pixels which fall outside of the source image.

Currently only the NPP_BORDER_MIRROR and NPP_BORDER_REPLICATE border type operations are supported.

1.10.5.16.1.1 Common parameters for nppiFilterGaussPyramidLayerDownBorder functions:

param pSrc
Source-Image Pointer.

param nSrcStep
Source-Image Line Step.

param oSrcSize
Source image width and height in pixels relative to pSrc.

param oSrcOffset
The pixel offset that pSrc points to relative to the origin of the source image.

param pDst
Destination-Image Pointer.

param nDstStep
Destination-Image Line Step.

param oSizeROI
Region-Of-Interest (ROI).

param nRate
The downsampling rate to be used. For integer equivalent rates unnecessary source pixels are just skipped. For non-integer rates the source image is bilinear interpolated. nRate must be > 1.0F and <= 10.0F.

param nFilterTaps
The number of filter taps where nFilterTaps = 2 * ((int)((float)ceil(radius) + 0.5F)) + 1.

param pKernel
Pointer to an array of nFilterTaps kernel coefficients which sum to 1.0F.

param eBorderType
The border type operation to be applied at source image border boundaries.

param nppStreamCtx
Application Managed Stream Context.

return
Image Data Related Error Codes, *ROI Related Error Codes*

Functions

NppStatus **nppiGetFilterGaussPyramidLayerDownBorderDstROI**(int nSrcROIWidth, int nSrcROIHeight, *NppiSize* *pDstSizeROI, *Npp32f* nRate)

Calculate destination image SizeROI width and height from source image ROI width and height and downsampling rate.

It is highly recommended that this function be use to determine the destination image ROI for consistent results.

Parameters

- **nSrcROIWidth** – The desired source image ROI width, must be <= oSrcSize.width.
- **nSrcROIHeight** – The desired source image ROI height, must be <= oSrcSize.height.
- **pDstSizeROI** – Host memory pointer to the destination image roi_specification.
- **nRate** – The downsampling or upsampling rate to be used. For integer equivalent rates unnecessary source pixels are just skipped. For non-integer rates the source image is bilinear interpolated. nRate must be > 1.0F and <= 10.0F.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiFilterGaussPyramidLayerDownBorder_8u_C1R_Ctx**(const *Npp8u* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp8u* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *Npp32f* nRate, const int nFilterTaps, const *Npp32f* *pKernel, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Single channel 8-bit unsigned Gauss filter with downsampling and border control.

For common parameter descriptions, see *Common parameters for nppiFilterGaussPyramidLayerDownBorder functions:*.

NppStatus **nppiFilterGaussPyramidLayerDownBorder_8u_C3R_Ctx**(const *Npp8u* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp8u* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *Npp32f* nRate, const int nFilterTaps, const *Npp32f* *pKernel, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Three channel 8-bit unsigned Gauss filter with downsampling and border control.

For common parameter descriptions, see *Common parameters for nppiFilterGaussPyramidLayerDownBorder functions:*.

NppStatus **nppiFilterGaussPyramidLayerDownBorder_16u_C1R_Ctx**(const *Npp16u* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp16u* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *Npp32f* nRate, const int nFilterTaps, const *Npp32f* *pKernel, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Single channel 16-bit unsigned Gauss filter with downsampling and border control.

For common parameter descriptions, see *Common parameters for nppiFilterGaussPyramidLayerDownBorder functions:*.

NppStatus **nppiFilterGaussPyramidLayerDownBorder_16u_C3R_Ctx**(const *Npp16u* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp16u* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *Npp32f* nRate, const int nFilterTaps, const *Npp32f* *pKernel, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Three channel 16-bit unsigned Gauss filter with downsampling and border control.

For common parameter descriptions, see *Common parameters for nppiFilterGaussPyramidLayerDownBorder functions:*.

NppStatus **nppiFilterGaussPyramidLayerDownBorder_32f_C1R_Ctx**(const *Npp32f* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp32f* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *Npp32f* nRate, const int nFilterTaps, const *Npp32f* *pKernel, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Single channel 32-bit floating-point Gauss filter downsampling and with border control.

For common parameter descriptions, see *Common parameters for nppiFilterGaussPyramidLayerDownBorder functions:*.

NppStatus **nppiFilterGaussPyramidLayerDownBorder_32f_C3R_Ctx**(const *Npp32f* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp32f* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *Npp32f* nRate, const int nFilterTaps, const *Npp32f* *pKernel, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Three channel 32-bit floating-point Gauss filter with downsampling and border control.

For common parameter descriptions, see *Common parameters for nppiFilterGaussPyramidLayerDownBorder functions:*.

1.10.5.17 Image Filter Gauss Pyramid Layer Up Border

1.10.5.17.1 FilterGaussPyramidLayerUpBorder

Filters the image using a separable Gaussian filter kernel with user supplied floating point coefficients with upsampling and border control.

If the upsampling rate is equivalent to an integer value then unnecessary source pixels are just skipped. If any portion of the mask overlaps the source image boundary the requested border type operation is applied to all mask pixels which fall outside of the source image.

Currently only the NPP_BORDER_MIRROR and NPP_BORDER_REPLICATE border type operations are supported.

1.10.5.17.1.1 Common parameters for nppiFilterGaussPyramidLayerUpBorder functions:

param pSrc
Source-Image Pointer.

param nSrcStep
Source-Image Line Step.

param oSrcSize
Source image width and height in pixels relative to pSrc.

param oSrcOffset
The pixel offset that pSrc points to relative to the origin of the source image.

param pDst
Destination-Image Pointer.

param nDstStep
Destination-Image Line Step.

param oSizeROI
Region-Of-Interest (ROI).

param nRate
The upsampling rate to be used. For integer equivalent rates unnecessary source pixels are just skipped. For non-integer rates the source image is bilinear interpolated. nRate must be > 1.0F and <= 10.0F.

param nFilterTaps
The number of filter taps where nFilterTaps = 2 * ((int)((float)ceil(radius) + 0.5F)) + 1.

param pKernel
Pointer to an array of nFilterTaps kernel coefficients which sum to 1.0F.

param eBorderType
The border type operation to be applied at source image border boundaries.

param nppStreamCtx
Application Managed Stream Context.

return
Image Data Related Error Codes, *ROI Related Error Codes*

Functions

NppStatus **nppiGetFilterGaussPyramidLayerUpBorderDstROI**(int nSrcROIWidth, int nSrcROIHeight, *NppiSize* *pDstSizeROIMin, *NppiSize* *pDstSizeROIMax, *Npp32f* nRate)

Calculate destination image minimum and maximum SizeROI width and height from source image ROI width and height and upsampling rate.

It is highly recommended that this function be use to determine the best destination image ROI for consistent results.

Parameters

- **nSrcROIWidth** – The desired source image ROI width, must be <= oSrcSize.width.
- **nSrcROIHeight** – The desired source image ROI height, must be <= oSrcSize.height.
- **pDstSizeROIMin** – Host memory pointer to the minimum recommended destination image roi_specification.
- **pDstSizeROIMax** – Host memory pointer to the maximum recommended destination image roi_specification.
- **nRate** – The upsampling rate to be used. For integer equivalent rates unnecessary source pixels are just skipped. For non-integer rates the source image is bilinear interpolated. nRate must be > 1.0F and <= 10.0F.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiFilterGaussPyramidLayerUpBorder_8u_C1R_Ctx**(const *Npp8u* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp8u* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *Npp32f* nRate, const int nFilterTaps, const *Npp32f* *pKernel, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Single channel 8-bit unsigned Gauss filter with upsampling and border control.

For common parameter descriptions, see *Common parameters for nppiFilterGaussPyramidLayerUpBorder functions:*.

NppStatus **nppiFilterGaussPyramidLayerUpBorder_8u_C3R_Ctx**(const *Npp8u* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp8u* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *Npp32f* nRate, const int nFilterTaps, const *Npp32f* *pKernel, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Three channel 8-bit unsigned Gauss filter with upsampling and border control.

For common parameter descriptions, see *Common parameters for nppiFilterGaussPyramidLayerUpBorder functions:*.

NppStatus **nppiFilterGaussPyramidLayerUpBorder_16u_C1R_Ctx**(const *Npp16u* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp16u* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *Npp32f* nRate, const int nFilterTaps, const *Npp32f* *pKernel, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Single channel 16-bit unsigned Gauss filter with upsampling and border control.

For common parameter descriptions, see *Common parameters for nppiFilterGaussPyramidLayerUpBorder functions:*.

NppStatus **nppiFilterGaussPyramidLayerUpBorder_16u_C3R_Ctx**(const *Npp16u* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp16u* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *Npp32f* nRate, const int nFilterTaps, const *Npp32f* *pKernel, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Three channel 16-bit unsigned Gauss filter with upsampling and border control.

For common parameter descriptions, see *Common parameters for nppiFilterGaussPyramidLayerUpBorder functions:*.

NppStatus **nppiFilterGaussPyramidLayerUpBorder_32f_C1R_Ctx**(const *Npp32f* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp32f* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *Npp32f* nRate, const int nFilterTaps, const *Npp32f* *pKernel, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Single channel 32-bit floating-point Gauss filter upsampling and with border control.

For common parameter descriptions, see *Common parameters for nppiFilterGaussPyramidLayerUpBorder functions:*.

NppStatus **nppiFilterGaussPyramidLayerUpBorder_32f_C3R_Ctx**(const *Npp32f* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp32f* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *Npp32f* nRate, const int nFilterTaps, const *Npp32f* *pKernel, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Three channel 32-bit floating-point Gauss filter with upsampling and border control.

For common parameter descriptions, see *Common parameters for nppiFilterGaussPyramidLayerUpBorder functions:*.

1.10.5.18 Image Filter Bilateral Gauss Border

1.10.5.18.1 FilterBilateralGaussBorder

Filters the image using a bilateral Gaussian filter kernel with border control.

If any portion of the mask overlaps the source image boundary the requested border type operation is applied to all mask pixels which fall outside of the source image.

For this filter the anchor point is always the central element of the kernel. Coefficients of the bilateral filter kernel depend on their position in the kernel and on the value of some source image pixels overlayed by the filter kernel. Only source image pixels with both coordinates divisible by nDistanceBetweenSrcPixels are used in calculations.

The value of an output pixel d is

$$d = \frac{\sum_{h=-nRadius}^{nRadius} \sum_{w=-nRadius}^{nRadius} W1(h,w) \cdot W2(h,w) \cdot S(h,w)}{\sum_{h=-nRadius}^{nRadius} \sum_{w=-nRadius}^{nRadius} W1(h,w) \cdot W2(h,w)}$$

where h and w are the corresponding kernel width and height indexes, S(h,w) is the value of the source image pixel overlayed by filter kernel position (h,w), W1(h,w) is func(nValSquareSigma, (S(h,w) - S(0,0))) where S(0,0) is the value of the source image pixel at the center of the kernel, W2(h,w) is func(nPosSquareSigma, sqrt(h*h+w*w)), and func is the following formula

$$func(S, I) = exp(-\frac{I^2}{2.0F \cdot S^2})$$

Supported border types:

- NPP_BORDER_REPLICATE — edge pixel is repeated (clamp)
- NPP_BORDER_MIRROR (4) — IPP mirrored / OpenCV BORDER_REFLECT_101: gfedcb|abcdefgh|gfedcba (edge NOT repeated)
- NPP_BORDER_MIRROR_REFL (5) — IPP mirrored with replication / OpenCV BORDER_REFLECT: fedcba|abcdefgh|hgfedcba (edge IS repeated)

1.10.5.18.1.1 Common parameters for nppiFilterBilateralGaussBorder functions:

param pSrc
Source-Image Pointer.

param nSrcStep
Source-Image Line Step.

param oSrcSize
Source image width and height in pixels relative to pSrc.

param oSrcOffset
The pixel offset that pSrc points to relative to the origin of the source image.

param pDst
Destination-Image Pointer.

param nDstStep
Destination-Image Line Step.

param oSizeROI
Region-Of-Interest (ROI).

param nRadius
The radius of the round filter kernel to be used. A radius of 1 indicates a filter kernel size of 3 by 3, 2 indicates 5 by 5, etc. Radius values from 1 to 32 are supported.

param nStepBetweenSrcPixels
The step size between adjacent source image pixels processed by the filter kernel, most commonly 1.

param nValSquareSigma
The square of the sigma for the relative intensity distance between a source image pixel in the filter kernel and the source image pixel at the center of the filter kernel.

param nPosSquareSigma
The square of the sigma for the relative geometric distance between a source image pixel in the filter kernel and the source image pixel at the center of the filter kernel.

param eBorderType
The border type operation to be applied at source image border boundaries.

param nppStreamCtx
Application Managed Stream Context.

return
Image Data Related Error Codes, *ROI Related Error Codes*

Functions

NppStatus **nppiFilterBilateralGaussBorder_8u_C1R_Ctx**(const *Npp8u* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp8u* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, const int nRadius, const int nStepBetweenSrcPixels, const *Npp32f* nValSquareSigma, const *Npp32f* nPosSquareSigma, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Single channel 8-bit unsigned bilateral Gauss filter with border control.

For common parameter descriptions, see *Common parameters for nppiFilterBilateralGaussBorder functions:*.

NppStatus **nppiFilterBilateralGaussBorder_8u_C3R_Ctx**(const *Npp8u* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp8u* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, const int nRadius, const int nStepBetweenSrcPixels, const *Npp32f* nValSquareSigma, const *Npp32f* nPosSquareSigma, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Three channel 8-bit unsigned bilateral Gauss filter with border control.

For common parameter descriptions, see *Common parameters for nppiFilterBilateralGaussBorder functions:*.

NppStatus **nppiFilterBilateralGaussBorder_16u_C1R_Ctx**(const *Npp16u* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp16u* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, const int nRadius, const int nStepBetweenSrcPixels, const *Npp32f* nValSquareSigma, const *Npp32f* nPosSquareSigma, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Single channel 16-bit unsigned bilateral Gauss filter with border control.

For common parameter descriptions, see *Common parameters for nppiFilterBilateralGaussBorder functions:*.

NppStatus **nppiFilterBilateralGaussBorder_16u_C3R_Ctx**(const *Npp16u* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp16u* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, const int nRadius, const int nStepBetweenSrcPixels, const *Npp32f* nValSquareSigma, const *Npp32f* nPosSquareSigma, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Three channel 16-bit unsigned bilateral Gauss filter with border control.

For common parameter descriptions, see *Common parameters for nppiFilterBilateralGaussBorder functions:*.

NppStatus **nppiFilterBilateralGaussBorder_32f_C1R_Ctx**(const *Npp32f* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp32f* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, const int nRadius, const int nStepBetweenSrcPixels, const *Npp32f* nValSquareSigma, const *Npp32f* nPosSquareSigma, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

One channel 32-bit floating-point bilateral Gauss filter with border control.

For common parameter descriptions, see *Common parameters for nppiFilterBilateralGaussBorder functions:*.

NppStatus **nppiFilterBilateralGaussBorder_32f_C3R_Ctx**(const *Npp32f* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp32f* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, const int nRadius, const int nStepBetweenSrcPixels, const *Npp32f* nValSquareSigma, const *Npp32f* nPosSquareSigma, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Three channel 32-bit floating-point bilateral Gauss filter with border control.

For common parameter descriptions, see *Common parameters for nppiFilterBilateralGaussBorder functions:*.

1.10.5.19 Image Filter High Pass

1.10.5.19.1 FilterHighPass

Filters the image using a high-pass filter kernel.

1.10.5.19.1.1 Common parameters for nppiFilterHighPass functions:

$$\begin{pmatrix} -1 & -1 & -1 \\ -1 & 8 & -1 \\ -1 & -1 & -1 \end{pmatrix} \begin{pmatrix} -1 & -1 & -1 & -1 & -1 \\ -1 & -1 & -1 & -1 & -1 \\ -1 & -1 & 24 & -1 & -1 \\ -1 & -1 & -1 & -1 & -1 \\ -1 & -1 & -1 & -1 & -1 \end{pmatrix}$$

param pSrc
Source-Image Pointer.

param nSrcStep
Source-Image Line Step.

param pDst
Destination-Image Pointer.

param nDstStep
Destination-Image Line Step.

param oSizeROI
Region-Of-Interest (ROI).

param eMaskSize
Enumeration value specifying the mask size.

param nppStreamCtx
Application Managed Stream Context.

return
Image Data Related Error Codes, *ROI Related Error Codes*

Functions

NppStatus **nppiFilterHighPass_8u_C1R_Ctx**(const *Npp8u* *pSrc, *Npp32s* nSrcStep, *Npp8u* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiMaskSize* eMaskSize, *NppStreamContext* nppStreamCtx)

Single channel 8-bit unsigned high-pass filter.

For common parameter descriptions, see *Common parameters for nppiFilterHighPass functions:*.

NppStatus **nppiFilterHighPass_8u_C3R_Ctx**(const *Npp8u* *pSrc, *Npp32s* nSrcStep, *Npp8u* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiMaskSize* eMaskSize, *NppStreamContext* nppStreamCtx)

Three channel 8-bit unsigned high-pass filter.

For common parameter descriptions, see *Common parameters for nppiFilterHighPass functions:*.

NppStatus **nppiFilterHighPass_8u_C4R_Ctx**(const *Npp8u* *pSrc, *Npp32s* nSrcStep, *Npp8u* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiMaskSize* eMaskSize, *NppStreamContext* nppStreamCtx)

Four channel 8-bit unsigned high-pass filter.

For common parameter descriptions, see *Common parameters for nppiFilterHighPass functions:*.

NppStatus **nppiFilterHighPass_8u_AC4R_Ctx**(const *Npp8u* *pSrc, *Npp32s* nSrcStep, *Npp8u* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiMaskSize* eMaskSize, *NppStreamContext* nppStreamCtx)

Four channel 8-bit unsigned high-pass filter, ignoring alpha channel.

For common parameter descriptions, see *Common parameters for nppiFilterHighPass functions:*.

NppStatus **nppiFilterHighPass_16u_C1R_Ctx**(const *Npp16u* *pSrc, *Npp32s* nSrcStep, *Npp16u* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiMaskSize* eMaskSize, *NppStreamContext* nppStreamCtx)

Single channel 16-bit unsigned high-pass filter.

For common parameter descriptions, see *Common parameters for nppiFilterHighPass functions:*.

NppStatus **nppiFilterHighPass_16u_C3R_Ctx**(const *Npp16u* *pSrc, *Npp32s* nSrcStep, *Npp16u* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiMaskSize* eMaskSize, *NppStreamContext* nppStreamCtx)

Three channel 16-bit unsigned high-pass filter.

For common parameter descriptions, see *Common parameters for nppiFilterHighPass functions:*.

NppStatus **nppiFilterHighPass_16u_C4R_Ctx**(const *Npp16u* *pSrc, *Npp32s* nSrcStep, *Npp16u* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiMaskSize* eMaskSize, *NppStreamContext* nppStreamCtx)

Four channel 16-bit unsigned high-pass filter.

For common parameter descriptions, see *Common parameters for nppiFilterHighPass functions:*.

NppStatus **nppiFilterHighPass_16u_AC4R_Ctx**(const *Npp16u* *pSrc, *Npp32s* nSrcStep, *Npp16u* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiMaskSize* eMaskSize, *NppStreamContext* nppStreamCtx)

Four channel 16-bit unsigned high-pass filter, ignoring alpha channel.

For common parameter descriptions, see *Common parameters for nppiFilterHighPass functions:*.

NppStatus **nppiFilterHighPass_16s_C1R_Ctx**(const *Npp16s* *pSrc, *Npp32s* nSrcStep, *Npp16s* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiMaskSize* eMaskSize, *NppStreamContext* nppStreamCtx)

Single channel 16-bit signed high-pass filter.

For common parameter descriptions, see *Common parameters for nppiFilterHighPass functions:*.

NppStatus **nppiFilterHighPass_16s_C3R_Ctx**(const *Npp16s* *pSrc, *Npp32s* nSrcStep, *Npp16s* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiMaskSize* eMaskSize, *NppStreamContext* nppStreamCtx)

Three channel 16-bit signed high-pass filter.

For common parameter descriptions, see *Common parameters for nppiFilterHighPass functions:*.

NppStatus **nppiFilterHighPass_16s_C4R_Ctx**(const *Npp16s* *pSrc, *Npp32s* nSrcStep, *Npp16s* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiMaskSize* eMaskSize, *NppStreamContext* nppStreamCtx)

Four channel 16-bit signed high-pass filter.

For common parameter descriptions, see *Common parameters for nppiFilterHighPass functions:*.

NppStatus **nppiFilterHighPass_16s_AC4R_Ctx**(const *Npp16s* *pSrc, *Npp32s* nSrcStep, *Npp16s* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiMaskSize* eMaskSize, *NppStreamContext* nppStreamCtx)

Four channel 16-bit signed high-pass filter, ignoring alpha channel.

For common parameter descriptions, see *Common parameters for nppiFilterHighPass functions:*.

NppStatus **nppiFilterHighPass_32f_C1R_Ctx**(const *Npp32f* *pSrc, *Npp32s* nSrcStep, *Npp32f* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiMaskSize* eMaskSize, *NppStreamContext* nppStreamCtx)

Single channel 32-bit floating-point high-pass filter.

For common parameter descriptions, see *Common parameters for nppiFilterHighPass functions:*.

NppStatus **nppiFilterHighPass_32f_C3R_Ctx**(const *Npp32f* *pSrc, *Npp32s* nSrcStep, *Npp32f* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiMaskSize* eMaskSize, *NppStreamContext* nppStreamCtx)

Three channel 32-bit floating-point high-pass filter.

For common parameter descriptions, see *Common parameters for nppiFilterHighPass functions:*.

NppStatus **nppiFilterHighPass_32f_C4R_Ctx**(const *Npp32f* *pSrc, *Npp32s* nSrcStep, *Npp32f* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiMaskSize* eMaskSize, *NppStreamContext* nppStreamCtx)

Four channel 32-bit floating-point high-pass filter.

For common parameter descriptions, see *Common parameters for nppiFilterHighPass functions:*.

NppStatus **nppiFilterHighPass_32f_AC4R_Ctx**(const *Npp32f* *pSrc, *Npp32s* nSrcStep, *Npp32f* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiMaskSize* eMaskSize, *NppStreamContext* nppStreamCtx)

Four channel 32-bit floating-point high-pass filter, ignoring alpha channel.

For common parameter descriptions, see *Common parameters for nppiFilterHighPass functions:*.

1.10.5.20 Image Filter High Pass Border

1.10.5.20.1 FilterHighPassBorder

Filters the image using a high-pass filter kernel with border control.

If any portion of the mask overlaps the source image boundary the requested border type operation is applied to all mask pixels which fall outside of the source image.

Currently only the NPP_BORDER_REPLICATE border type operation is supported.

1.10.5.20.1.1 Common parameters for nppiFilterHighPassBorder functions:

$$\begin{pmatrix} -1 & -1 & -1 \\ -1 & 8 & -1 \\ -1 & -1 & -1 \end{pmatrix} \begin{pmatrix} -1 & -1 & -1 & -1 & -1 \\ -1 & -1 & -1 & -1 & -1 \\ -1 & -1 & 24 & -1 & -1 \\ -1 & -1 & -1 & -1 & -1 \\ -1 & -1 & -1 & -1 & -1 \end{pmatrix}$$

param pSrc
Source-Image Pointer.

param nSrcStep
Source-Image Line Step.

param oSrcSize
Source image width and height in pixels relative to pSrc.

param oSrcOffset
The pixel offset that pSrc points to relative to the origin of the source image.

param pDst
Destination-Image Pointer.

param nDstStep
Destination-Image Line Step.

param oSizeROI
Region-Of-Interest (ROI).

param eMaskSize
Enumeration value specifying the mask size.

param eBorderType
The border type operation to be applied at source image border boundaries.

param nppStreamCtx
Application Managed Stream Context.

return
Image Data Related Error Codes, *ROI Related Error Codes*

Functions

NppStatus **nppiFilterHighPassBorder_8u_C1R_Ctx**(const *Npp8u* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp8u* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiMaskSize* eMaskSize, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Single channel 8-bit unsigned high-pass filter.

For common parameter descriptions, see *Common parameters for nppiFilterHighPassBorder functions:*.

NppStatus **nppiFilterHighPassBorder_8u_C3R_Ctx**(const *Npp8u* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp8u* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiMaskSize* eMaskSize, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Three channel 8-bit unsigned high-pass filter.

For common parameter descriptions, see *Common parameters for nppiFilterHighPassBorder functions:*.

NppStatus **nppiFilterHighPassBorder_8u_C4R_Ctx**(const *Npp8u* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp8u* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiMaskSize* eMaskSize, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Four channel 8-bit unsigned high-pass filter.

For common parameter descriptions, see *Common parameters for nppiFilterHighPassBorder functions:*.

NppStatus **nppiFilterHighPassBorder_8u_AC4R_Ctx**(const *Npp8u* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp8u* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiMaskSize* eMaskSize, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Four channel 8-bit unsigned high-pass filter, ignoring alpha channel.

For common parameter descriptions, see *Common parameters for nppiFilterHighPassBorder functions:*.

NppStatus **nppiFilterHighPassBorder_16u_C1R_Ctx**(const *Npp16u* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp16u* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiMaskSize* eMaskSize, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Single channel 16-bit unsigned high-pass filter.

For common parameter descriptions, see *Common parameters for nppiFilterHighPassBorder functions:*.

NppStatus **nppiFilterHighPassBorder_16u_C3R_Ctx**(const *Npp16u* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp16u* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiMaskSize* eMaskSize, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Three channel 16-bit unsigned high-pass filter.

For common parameter descriptions, see *Common parameters for nppiFilterHighPassBorder functions:*.

NppStatus **nppiFilterHighPassBorder_16u_C4R_Ctx**(const *Npp16u* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp16u* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiMaskSize* eMaskSize, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Four channel 16-bit unsigned high-pass filter.

For common parameter descriptions, see *Common parameters for nppiFilterHighPassBorder functions:*.

NppStatus **nppiFilterHighPassBorder_16u_AC4R_Ctx**(const *Npp16u* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp16u* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiMaskSize* eMaskSize, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Four channel 16-bit unsigned high-pass filter, ignoring alpha channel.

For common parameter descriptions, see *Common parameters for nppiFilterHighPassBorder functions:*.

NppStatus **nppiFilterHighPassBorder_16s_C1R_Ctx**(const *Npp16s* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp16s* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiMaskSize* eMaskSize, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Single channel 16-bit signed high-pass filter.

For common parameter descriptions, see *Common parameters for nppiFilterHighPassBorder functions:*.

NppStatus **nppiFilterHighPassBorder_16s_C3R_Ctx**(const *Npp16s* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp16s* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiMaskSize* eMaskSize, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Three channel 16-bit signed high-pass filter.

For common parameter descriptions, see *Common parameters for nppiFilterHighPassBorder functions:*.

NppStatus **nppiFilterHighPassBorder_16s_C4R_Ctx**(const *Npp16s* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp16s* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiMaskSize* eMaskSize, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Four channel 16-bit signed high-pass filter.

For common parameter descriptions, see *Common parameters for nppiFilterHighPassBorder functions:*.

NppStatus **nppiFilterHighPassBorder_16s_AC4R_Ctx**(const *Npp16s* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp16s* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiMaskSize* eMaskSize, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Four channel 16-bit signed high-pass filter, ignoring alpha channel.

For common parameter descriptions, see *Common parameters for nppiFilterHighPassBorder functions:*.

NppStatus **nppiFilterHighPassBorder_32f_C1R_Ctx**(const *Npp32f* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp32f* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiMaskSize* eMaskSize, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Single channel 32-bit floating-point high-pass filter.

For common parameter descriptions, see *Common parameters for nppiFilterHighPassBorder functions:*.

NppStatus **nppiFilterHighPassBorder_32f_C3R_Ctx**(const *Npp32f* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp32f* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiMaskSize* eMaskSize, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Three channel 32-bit floating-point high-pass filter.

For common parameter descriptions, see *Common parameters for nppiFilterHighPassBorder functions:*.

NppStatus **nppiFilterHighPassBorder_32f_C4R_Ctx**(const *Npp32f* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp32f* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiMaskSize* eMaskSize, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Four channel 32-bit floating-point high-pass filter.

For common parameter descriptions, see *Common parameters for nppiFilterHighPassBorder functions:*.

NppStatus **nppiFilterHighPassBorder_32f_AC4R_Ctx**(const *Npp32f* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp32f* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiMaskSize* eMaskSize, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Four channel 32-bit floating-point high-pass filter, ignoring alpha channel.

For common parameter descriptions, see *Common parameters for nppiFilterHighPassBorder functions:*.

1.10.5.21 Image Filter Low Pass

1.10.5.21.1 FilterLowPass

Filters the image using a low-pass filter kernel.

1.10.5.21.1.1 Common parameters for nppiFilterLowPass functions:

$$\begin{pmatrix} 1/9 & 1/9 & 1/9 \\ 1/9 & 1/9 & 1/9 \\ 1/9 & 1/9 & 1/9 \end{pmatrix} \begin{pmatrix} 1/25 & 1/25 & 1/25 & 1/25 & 1/25 \\ 1/25 & 1/25 & 1/25 & 1/25 & 1/25 \\ 1/25 & 1/25 & 1/25 & 1/25 & 1/25 \\ 1/25 & 1/25 & 1/25 & 1/25 & 1/25 \\ 1/25 & 1/25 & 1/25 & 1/25 & 1/25 \end{pmatrix}$$

param pSrc
Source-Image Pointer.

param nSrcStep
Source-Image Line Step.

param pDst
Destination-Image Pointer.

param nDstStep
Destination-Image Line Step.

param oSizeROI
Region-Of-Interest (ROI).

param eMaskSize
Enumeration value specifying the mask size.

param nppStreamCtx
Application Managed Stream Context.

return
Image Data Related Error Codes, *ROI Related Error Codes*

Functions

NppStatus **nppiFilterLowPass_8u_C1R_Ctx**(const *Npp8u* *pSrc, *Npp32s* nSrcStep, *Npp8u* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiMaskSize* eMaskSize, *NppStreamContext* nppStreamCtx)

Single channel 8-bit unsigned low-pass filter.

For common parameter descriptions, see *Common parameters for nppiFilterLowPass functions:*.

NppStatus **nppiFilterLowPass_8u_C3R_Ctx**(const *Npp8u* *pSrc, *Npp32s* nSrcStep, *Npp8u* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiMaskSize* eMaskSize, *NppStreamContext* nppStreamCtx)

Three channel 8-bit unsigned low-pass filter.

For common parameter descriptions, see *Common parameters for nppiFilterLowPass functions:*.

NppStatus **nppiFilterLowPass_8u_C4R_Ctx**(const *Npp8u* *pSrc, *Npp32s* nSrcStep, *Npp8u* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiMaskSize* eMaskSize, *NppStreamContext* nppStreamCtx)

Four channel 8-bit unsigned low-pass filter.

For common parameter descriptions, see *Common parameters for nppiFilterLowPass functions:*.

NppStatus **nppiFilterLowPass_8u_AC4R_Ctx**(const *Npp8u* *pSrc, *Npp32s* nSrcStep, *Npp8u* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiMaskSize* eMaskSize, *NppStreamContext* nppStreamCtx)

Four channel 8-bit unsigned low-pass filter, ignoring alpha channel.

For common parameter descriptions, see *Common parameters for nppiFilterLowPass functions:*.

NppStatus **nppiFilterLowPass_16u_C1R_Ctx**(const *Npp16u* *pSrc, *Npp32s* nSrcStep, *Npp16u* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiMaskSize* eMaskSize, *NppStreamContext* nppStreamCtx)

Single channel 16-bit unsigned low-pass filter.

For common parameter descriptions, see *Common parameters for nppiFilterLowPass functions:*.

NppStatus **nppiFilterLowPass_16u_C3R_Ctx**(const *Npp16u* *pSrc, *Npp32s* nSrcStep, *Npp16u* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiMaskSize* eMaskSize, *NppStreamContext* nppStreamCtx)

Three channel 16-bit unsigned low-pass filter.

For common parameter descriptions, see *Common parameters for nppiFilterLowPass functions:*.

NppStatus **nppiFilterLowPass_16u_C4R_Ctx**(const *Npp16u* *pSrc, *Npp32s* nSrcStep, *Npp16u* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiMaskSize* eMaskSize, *NppStreamContext* nppStreamCtx)

Four channel 16-bit unsigned low-pass filter.

For common parameter descriptions, see *Common parameters for nppiFilterLowPass functions:*.

NppStatus **nppiFilterLowPass_16u_AC4R_Ctx**(const *Npp16u* *pSrc, *Npp32s* nSrcStep, *Npp16u* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiMaskSize* eMaskSize, *NppStreamContext* nppStreamCtx)

Four channel 16-bit unsigned low-pass filter, ignoring alpha channel.

For common parameter descriptions, see *Common parameters for nppiFilterLowPass functions:*.

NppStatus **nppiFilterLowPass_16s_C1R_Ctx**(const *Npp16s* *pSrc, *Npp32s* nSrcStep, *Npp16s* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiMaskSize* eMaskSize, *NppStreamContext* nppStreamCtx)

Single channel 16-bit signed low-pass filter.

For common parameter descriptions, see *Common parameters for nppiFilterLowPass functions:*.

NppStatus **nppiFilterLowPass_16s_C3R_Ctx**(const *Npp16s* *pSrc, *Npp32s* nSrcStep, *Npp16s* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiMaskSize* eMaskSize, *NppStreamContext* nppStreamCtx)

Three channel 16-bit signed low-pass filter.

For common parameter descriptions, see *Common parameters for nppiFilterLowPass functions:*.

NppStatus **nppiFilterLowPass_16s_C4R_Ctx**(const *Npp16s* *pSrc, *Npp32s* nSrcStep, *Npp16s* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiMaskSize* eMaskSize, *NppStreamContext* nppStreamCtx)

Four channel 16-bit signed low-pass filter.

For common parameter descriptions, see *Common parameters for nppiFilterLowPass functions:*.

NppStatus **nppiFilterLowPass_16s_AC4R_Ctx**(const *Npp16s* *pSrc, *Npp32s* nSrcStep, *Npp16s* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiMaskSize* eMaskSize, *NppStreamContext* nppStreamCtx)

Four channel 16-bit signed low-pass filter, ignoring alpha channel.

For common parameter descriptions, see *Common parameters for nppiFilterLowPass functions:*.

NppStatus **nppiFilterLowPass_32f_C1R_Ctx**(const *Npp32f* *pSrc, *Npp32s* nSrcStep, *Npp32f* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiMaskSize* eMaskSize, *NppStreamContext* nppStreamCtx)

Single channel 32-bit floating-point low-pass filter.

For common parameter descriptions, see *Common parameters for nppiFilterLowPass functions:*.

NppStatus **nppiFilterLowPass_32f_C3R_Ctx**(const *Npp32f* *pSrc, *Npp32s* nSrcStep, *Npp32f* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiMaskSize* eMaskSize, *NppStreamContext* nppStreamCtx)

Three channel 32-bit floating-point low-pass filter.

For common parameter descriptions, see *Common parameters for nppiFilterLowPass functions:*.

NppStatus **nppiFilterLowPass_32f_C4R_Ctx**(const *Npp32f* *pSrc, *Npp32s* nSrcStep, *Npp32f* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiMaskSize* eMaskSize, *NppStreamContext* nppStreamCtx)

Four channel 32-bit floating-point low-pass filter.

For common parameter descriptions, see *Common parameters for nppiFilterLowPass functions:*.

NppStatus **nppiFilterLowPass_32f_AC4R_Ctx**(const *Npp32f* *pSrc, *Npp32s* nSrcStep, *Npp32f* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiMaskSize* eMaskSize, *NppStreamContext* nppStreamCtx)

Four channel 32-bit floating-point high-pass filter, ignoring alpha channel.

For common parameter descriptions, see *Common parameters for nppiFilterLowPass functions:*.

1.10.5.22 Image Filter Low Pass Border

1.10.5.22.1 FilterLowPassBorder

Filters the image using a low-pass filter kernel with border control.

If any portion of the mask overlaps the source image boundary the requested border type operation is applied to all mask pixels which fall outside of the source image.

Currently only the NPP_BORDER_REPLICATE border type operation is supported.

1.10.5.22.1.1 Common parameters for nppiFilterLowPassBorder functions:

$$\begin{pmatrix} 1/9 & 1/9 & 1/9 \\ 1/9 & 1/9 & 1/9 \\ 1/9 & 1/9 & 1/9 \end{pmatrix} \begin{pmatrix} 1/25 & 1/25 & 1/25 & 1/25 & 1/25 \\ 1/25 & 1/25 & 1/25 & 1/25 & 1/25 \\ 1/25 & 1/25 & 1/25 & 1/25 & 1/25 \\ 1/25 & 1/25 & 1/25 & 1/25 & 1/25 \\ 1/25 & 1/25 & 1/25 & 1/25 & 1/25 \end{pmatrix}$$

param pSrc
Source-Image Pointer.

param nSrcStep
Source-Image Line Step.

param oSrcSize
Source image width and height in pixels relative to pSrc.

param oSrcOffset
The pixel offset that pSrc points to relative to the origin of the source image.

param pDst
Destination-Image Pointer.

param nDstStep
Destination-Image Line Step.

param oSizeROI
Region-Of-Interest (ROI).

param eMaskSize
Enumeration value specifying the mask size.

param eBorderType
The border type operation to be applied at source image border boundaries.

param nppStreamCtx
Application Managed Stream Context.

return
Image Data Related Error Codes, *ROI Related Error Codes*

Functions

NppStatus **nppiFilterLowPassBorder_8u_C1R_Ctx**(const *Npp8u* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp8u* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiMaskSize* eMaskSize, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Single channel 8-bit unsigned high-pass filter.

For common parameter descriptions, see *Common parameters for nppiFilterLowPassBorder functions:*.

NppStatus **nppiFilterLowPassBorder_8u_C3R_Ctx**(const *Npp8u* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp8u* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiMaskSize* eMaskSize, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Three channel 8-bit unsigned high-pass filter.

For common parameter descriptions, see *Common parameters for nppiFilterLowPassBorder functions:*.

NppStatus **nppiFilterLowPassBorder_8u_C4R_Ctx**(const *Npp8u* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp8u* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiMaskSize* eMaskSize, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Four channel 8-bit unsigned high-pass filter.

For common parameter descriptions, see *Common parameters for nppiFilterLowPassBorder functions:*.

NppStatus **nppiFilterLowPassBorder_8u_AC4R_Ctx**(const *Npp8u* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp8u* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiMaskSize* eMaskSize, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Four channel 8-bit unsigned high-pass filter, ignoring alpha channel.

For common parameter descriptions, see *Common parameters for nppiFilterLowPassBorder functions:*.

NppStatus **nppiFilterLowPassBorder_16u_C1R_Ctx**(const *Npp16u* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp16u* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiMaskSize* eMaskSize, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Single channel 16-bit unsigned high-pass filter.

For common parameter descriptions, see *Common parameters for nppiFilterLowPassBorder functions:*.

NppStatus **nppiFilterLowPassBorder_16u_C3R_Ctx**(const *Npp16u* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp16u* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiMaskSize* eMaskSize, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Three channel 16-bit unsigned high-pass filter.

For common parameter descriptions, see *Common parameters for nppiFilterLowPassBorder functions:*.

NppStatus **nppiFilterLowPassBorder_16u_C4R_Ctx**(const *Npp16u* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp16u* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiMaskSize* eMaskSize, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Four channel 16-bit unsigned high-pass filter.

For common parameter descriptions, see *Common parameters for nppiFilterLowPassBorder functions:*.

NppStatus **nppiFilterLowPassBorder_16u_AC4R_Ctx**(const *Npp16u* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp16u* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiMaskSize* eMaskSize, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Four channel 16-bit unsigned high-pass filter, ignoring alpha channel.

For common parameter descriptions, see *Common parameters for nppiFilterLowPassBorder functions:*.

NppStatus **nppiFilterLowPassBorder_16s_C1R_Ctx**(const *Npp16s* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp16s* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiMaskSize* eMaskSize, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Single channel 16-bit signed high-pass filter.

For common parameter descriptions, see *Common parameters for nppiFilterLowPassBorder functions:*.

NppStatus **nppiFilterLowPassBorder_16s_C3R_Ctx**(const *Npp16s* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp16s* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiMaskSize* eMaskSize, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Three channel 16-bit signed high-pass filter.

For common parameter descriptions, see *Common parameters for nppiFilterLowPassBorder functions:*.

NppStatus **nppiFilterLowPassBorder_16s_C4R_Ctx**(const *Npp16s* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp16s* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiMaskSize* eMaskSize, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Four channel 16-bit signed high-pass filter.

For common parameter descriptions, see *Common parameters for nppiFilterLowPassBorder functions:*.

NppStatus **nppiFilterLowPassBorder_16s_AC4R_Ctx**(const *Npp16s* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp16s* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiMaskSize* eMaskSize, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Four channel 16-bit signed high-pass filter, ignoring alpha channel.

For common parameter descriptions, see *Common parameters for nppiFilterLowPassBorder functions:*.

NppStatus **nppiFilterLowPassBorder_32f_C1R_Ctx**(const *Npp32f* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp32f* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiMaskSize* eMaskSize, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Single channel 32-bit floating-point high-pass filter.

For common parameter descriptions, see *Common parameters for nppiFilterLowPassBorder functions:*.

NppStatus **nppiFilterLowPassBorder_32f_C3R_Ctx**(const *Npp32f* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp32f* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiMaskSize* eMaskSize, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Three channel 32-bit floating-point high-pass filter.

For common parameter descriptions, see *Common parameters for nppiFilterLowPassBorder functions:*.

NppStatus **nppiFilterLowPassBorder_32f_C4R_Ctx**(const *Npp32f* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp32f* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiMaskSize* eMaskSize, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Four channel 32-bit floating-point high-pass filter.

For common parameter descriptions, see *Common parameters for nppiFilterLowPassBorder functions:*.

NppStatus **nppiFilterLowPassBorder_32f_AC4R_Ctx**(const *Npp32f* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp32f* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiMaskSize* eMaskSize, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Four channel 32-bit floating-point high-pass filter, ignoring alpha channel.

For common parameter descriptions, see *Common parameters for nppiFilterLowPassBorder functions:*.

1.10.5.23 Image Filter Sharpen

1.10.5.23.1 FilterSharpen

Filters the image using a sharpening filter kernel:

1.10.5.23.1.1 Common parameters for nppiFilterSharpen functions:

$$\begin{pmatrix} -1/8 & -1/8 & -1/8 \\ -1/8 & 16/8 & -1/8 \\ -1/8 & -1/8 & -1/8 \end{pmatrix}$$

param pSrc
Source-Image Pointer.

param nSrcStep
Source-Image Line Step.

param pDst
Destination-Image Pointer.

param nDstStep
Destination-Image Line Step.

param oSizeROI
Region-Of-Interest (ROI).

param nppStreamCtx
Application Managed Stream Context.

return
Image Data Related Error Codes, *ROI Related Error Codes*

Functions

NppStatus **nppiFilterSharpen_8u_C1R_Ctx**(const *Npp8u* *pSrc, *Npp32s* nSrcStep, *Npp8u* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Single channel 8-bit unsigned sharpening filter.

For common parameter descriptions, see *Common parameters for nppiFilterSharpen functions:*.

NppStatus **nppiFilterSharpen_8u_C3R_Ctx**(const *Npp8u* *pSrc, *Npp32s* nSrcStep, *Npp8u* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Three channel 8-bit unsigned sharpening filter.

For common parameter descriptions, see *Common parameters for nppiFilterSharpen functions:*.

NppStatus **nppiFilterSharpen_8u_C4R_Ctx**(const *Npp8u* *pSrc, *Npp32s* nSrcStep, *Npp8u* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four channel 8-bit unsigned sharpening filter.

For common parameter descriptions, see *Common parameters for nppiFilterSharpen functions:*.

NppStatus **nppiFilterSharpen_8u_AC4R_Ctx**(const *Npp8u* *pSrc, *Npp32s* nSrcStep, *Npp8u* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four channel 8-bit unsigned sharpening filter, ignoring alpha channel.

For common parameter descriptions, see *Common parameters for nppiFilterSharpen functions:*.

NppStatus **nppiFilterSharpen_16u_C1R_Ctx**(const *Npp16u* *pSrc, *Npp32s* nSrcStep, *Npp16u* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Single channel 16-bit unsigned sharpening filter.

For common parameter descriptions, see *Common parameters for nppiFilterSharpen functions:*.

NppStatus **nppiFilterSharpen_16u_C3R_Ctx**(const *Npp16u* *pSrc, *Npp32s* nSrcStep, *Npp16u* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Three channel 16-bit unsigned sharpening filter.

For common parameter descriptions, see *Common parameters for nppiFilterSharpen functions:*.

NppStatus **nppiFilterSharpen_16u_C4R_Ctx**(const *Npp16u* *pSrc, *Npp32s* nSrcStep, *Npp16u* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four channel 16-bit unsigned sharpening filter.

For common parameter descriptions, see *Common parameters for nppiFilterSharpen functions:*.

NppStatus **nppiFilterSharpen_16u_AC4R_Ctx**(const *Npp16u* *pSrc, *Npp32s* nSrcStep, *Npp16u* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four channel 16-bit unsigned sharpening filter, ignoring alpha channel.

For common parameter descriptions, see *Common parameters for nppiFilterSharpen functions:*.

NppStatus **nppiFilterSharpen_16s_C1R_Ctx**(const *Npp16s* *pSrc, *Npp32s* nSrcStep, *Npp16s* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Single channel 16-bit signed sharpening filter.

For common parameter descriptions, see *Common parameters for nppiFilterSharpen functions:*.

NppStatus **nppiFilterSharpen_16s_C3R_Ctx**(const *Npp16s* *pSrc, *Npp32s* nSrcStep, *Npp16s* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Three channel 16-bit signed sharpening filter.

For common parameter descriptions, see *Common parameters for nppiFilterSharpen functions:*.

NppStatus **nppiFilterSharpen_16s_C4R_Ctx**(const *Npp16s* *pSrc, *Npp32s* nSrcStep, *Npp16s* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four channel 16-bit signed sharpening filter.

For common parameter descriptions, see *Common parameters for nppiFilterSharpen functions:*.

NppStatus **nppiFilterSharpen_16s_AC4R_Ctx**(const *Npp16s* *pSrc, *Npp32s* nSrcStep, *Npp16s* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four channel 16-bit signed sharpening filter, ignoring alpha channel.

For common parameter descriptions, see *Common parameters for nppiFilterSharpen functions:*.

NppStatus **nppiFilterSharpen_32f_C1R_Ctx**(const *Npp32f* *pSrc, *Npp32s* nSrcStep, *Npp32f* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Single channel 32-bit floating-point sharpening filter.

For common parameter descriptions, see *Common parameters for nppiFilterSharpen functions:*.

NppStatus **nppiFilterSharpen_32f_C3R_Ctx**(const *Npp32f* *pSrc, *Npp32s* nSrcStep, *Npp32f* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Three channel 32-bit floating-point sharpening filter.

For common parameter descriptions, see *Common parameters for nppiFilterSharpen functions:*.

NppStatus **nppiFilterSharpen_32f_C4R_Ctx**(const *Npp32f* *pSrc, *Npp32s* nSrcStep, *Npp32f* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four channel 32-bit floating-point sharpening filter.

For common parameter descriptions, see *Common parameters for nppiFilterSharpen functions:*.

NppStatus **nppiFilterSharpen_32f_AC4R_Ctx**(const *Npp32f* *pSrc, *Npp32s* nSrcStep, *Npp32f* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four channel 32-bit floating-point sharpening filter, ignoring alpha channel.

For common parameter descriptions, see *Common parameters for nppiFilterSharpen functions:*.

1.10.5.24 Image Filter Sharpen Border

1.10.5.24.1 FilterSharpenBorder

Filters the image using a sharpening filter kernel with border control.

If any portion of the 3x3 mask overlaps the source image boundary the requested border type operation is applied to all mask pixels which fall outside of the source image.

Currently only the NPP_BORDER_REPLICATE border type operation is supported.

1.10.5.24.1.1 Common parameters for nppiFilterSharpenBorder functions:

$$\begin{pmatrix} -1/8 & -1/8 & -1/8 \\ -1/8 & 16/8 & -1/8 \\ -1/8 & -1/8 & -1/8 \end{pmatrix}$$

param pSrc
Source-Image Pointer.

param nSrcStep
Source-Image Line Step.

param oSrcSize
Source image width and height in pixels relative to pSrc.

param oSrcOffset
The pixel offset that pSrc points to relative to the origin of the source image.

param pDst
Destination-Image Pointer.

param nDstStep
Destination-Image Line Step.

param oSizeROI
Region-Of-Interest (ROI).

param eBorderType
The border type operation to be applied at source image border boundaries.

param nppStreamCtx
Application Managed Stream Context.

return
Image Data Related Error Codes, *ROI Related Error Codes*

Functions

NppStatus **nppiFilterSharpenBorder_8u_C1R_Ctx**(const *Npp8u* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp8u* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Single channel 8-bit unsigned sharpening filter with border control.

For common parameter descriptions, see *Common parameters for nppiFilterSharpenBorder functions:*.

NppStatus **nppiFilterSharpenBorder_8u_C3R_Ctx**(const *Npp8u* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp8u* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Three channel 8-bit unsigned sharpening filter with border control.

For common parameter descriptions, see *Common parameters for nppiFilterSharpenBorder functions:*.

NppStatus **nppiFilterSharpenBorder_8u_C4R_Ctx**(const *Npp8u* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp8u* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Four channel 8-bit unsigned sharpening filter with border control.

For common parameter descriptions, see *Common parameters for nppiFilterSharpenBorder functions:*.

NppStatus **nppiFilterSharpenBorder_8u_AC4R_Ctx**(const *Npp8u* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp8u* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Four channel 8-bit unsigned sharpening filter with border control, ignoring alpha channel.

For common parameter descriptions, see *Common parameters for nppiFilterSharpenBorder functions:*.

NppStatus **nppiFilterSharpenBorder_16u_C1R_Ctx**(const *Npp16u* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp16u* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Single channel 16-bit unsigned sharpening filter with border control.

For common parameter descriptions, see *Common parameters for nppiFilterSharpenBorder functions:*.

NppStatus **nppiFilterSharpenBorder_16u_C3R_Ctx**(const *Npp16u* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp16u* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Three channel 16-bit unsigned sharpening filter with border control.

For common parameter descriptions, see *Common parameters for nppiFilterSharpenBorder functions:*.

NppStatus **nppiFilterSharpenBorder_16u_C4R_Ctx**(const *Npp16u* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp16u* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Four channel 16-bit unsigned sharpening filter with border control.

For common parameter descriptions, see *Common parameters for nppiFilterSharpenBorder functions:*.

NppStatus **nppiFilterSharpenBorder_16u_AC4R_Ctx**(const *Npp16u* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp16u* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Four channel 16-bit unsigned sharpening filter with border control, ignoring alpha channel.

For common parameter descriptions, see *Common parameters for nppiFilterSharpenBorder functions:*.

NppStatus **nppiFilterSharpenBorder_16s_C1R_Ctx**(const *Npp16s* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp16s* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Single channel 16-bit signed sharpening filter with border control.

For common parameter descriptions, see *Common parameters for nppiFilterSharpenBorder functions:*.

NppStatus **nppiFilterSharpenBorder_16s_C3R_Ctx**(const *Npp16s* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp16s* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Three channel 16-bit signed sharpening filter with border control.

For common parameter descriptions, see *Common parameters for nppiFilterSharpenBorder functions:*.

NppStatus **nppiFilterSharpenBorder_16s_C4R_Ctx**(const *Npp16s* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp16s* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Four channel 16-bit signed sharpening filter with border control.

For common parameter descriptions, see *Common parameters for nppiFilterSharpenBorder functions:*.

NppStatus **nppiFilterSharpenBorder_16s_AC4R_Ctx**(const *Npp16s* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp16s* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Four channel 16-bit signed sharpening filter with border control, ignoring alpha channel.

For common parameter descriptions, see *Common parameters for nppiFilterSharpenBorder functions:*.

NppStatus **nppiFilterSharpenBorder_32f_C1R_Ctx**(const *Npp32f* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp32f* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Single channel 32-bit floating-point sharpening filter with border control.

For common parameter descriptions, see *Common parameters for nppiFilterSharpenBorder functions:*.

NppStatus **nppiFilterSharpenBorder_32f_C3R_Ctx**(const *Npp32f* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp32f* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Three channel 32-bit floating-point sharpening filter with border control.

For common parameter descriptions, see *Common parameters for nppiFilterSharpenBorder functions:*.

NppStatus **nppiFilterSharpenBorder_32f_C4R_Ctx**(const *Npp32f* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp32f* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Four channel 32-bit floating-point sharpening filter with border control.

For common parameter descriptions, see *Common parameters for nppiFilterSharpenBorder functions:*.

NppStatus **nppiFilterSharpenBorder_32f_AC4R_Ctx**(const *Npp32f* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp32f* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Four channel 32-bit floating-point sharpening filter with border control, ignoring alpha channel.

For common parameter descriptions, see *Common parameters for nppiFilterSharpenBorder functions:*.

1.10.5.25 Image Filter Unsharp Border

1.10.5.25.1 FilterUnsharpBorder

Filters the image using a unsharp-mask sharpening filter kernel with border control.

The algorithm involves the following steps: Smooth the original image with a Gaussian filter, with the width controlled by the nRadius. Subtract the smoothed image from the original to create a high-pass filtered image. Apply any clipping needed on the high-pass image, as controlled by the nThreshold. Add a certain percentage of the high-pass filtered image to the original image, with the percentage controlled by the nWeight. In pseudocode this algorithm can be written as: HighPass = Image - Gaussian(Image) Result = Image + nWeight * HighPass * (|HighPass| >= nThreshold) where nWeight is the amount, nThreshold is the threshold, and >= indicates a Boolean operation, 1 if true, or 0 otherwise.

If any portion of the mask overlaps the source image boundary, the requested border type operation is applied to all mask pixels which fall outside of the source image.

Currently only the NPP_BORDER_REPLICATE border type operation is supported.

1.10.5.25.1.1 . Common parameters for nppiFilterUnsharpBorder functions:

1.10.5.25.1.2 . Common parameters for nppiFilterUnsharpGetBufferSize functions:

param pSrc
Source-Image Pointer.

param nSrcStep
Source-Image Line Step.

param oSrcOffset
The pixel offset that pSrc points to relative to the origin of the source image.

param pDst
Destination-Image Pointer.

param nDstStep
Destination-Image Line Step.

param oSizeROI
Region-Of-Interest (ROI).

param nRadius
The radius of the Gaussian filter, in pixles, not counting the center pixel.

param nSigma
The standard deviation of the Gaussian filter, in pixel.

param nWeight
The percentage of the difference between the original and the high pass image that is added back into the original.

param nThreshold
The threshold neede to apply the difference amount.

param eBorderType
The border type operation to be applied at source image border boundaries.

param pDeviceBuffer
Pointer to the user-allocated device scratch buffer required for the unsharp operation.

param nppStreamCtx
Application Managed Stream Context.

return
Image Data Related Error Codes, *ROI Related Error Codes*

param nRadius
The radius of the Gaussian filter, in pixles, not counting the center pixel.

param nSigma
The standard deviation of the Gaussian filter, in pixel.

param hpBufferSize
Pointer to the size of the scratch buffer required for the unsharp operation.

return
Image Data Related Error Codes

Functions

NppStatus **nppiFilterUnsharpBorder_8u_C1R_Ctx**(const *Npp8u* *pSrc, *Npp32s* nSrcStep, *NppiPoint* oSrcOffset, *Npp8u* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *Npp32f* nRadius, *Npp32f* nSigma, *Npp32f* nWeight, *Npp32f* nThreshold, *NppiBorderType* eBorderType, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Single channel 8-bit unsigned unsharp filter.

For common parameter descriptions, see . *Common parameters for nppiFilterUnsharpBorder functions:*.

NppStatus **nppiFilterUnsharpBorder_8u_C3R_Ctx**(const *Npp8u* *pSrc, *Npp32s* nSrcStep, *NppiPoint* oSrcOffset, *Npp8u* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *Npp32f* nRadius, *Npp32f* nSigma, *Npp32f* nWeight, *Npp32f* nThreshold, *NppiBorderType* eBorderType, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Three channel 8-bit unsigned unsharp filter.

For common parameter descriptions, see . *Common parameters for nppiFilterUnsharpBorder functions:*.

NppStatus **nppiFilterUnsharpBorder_8u_C4R_Ctx**(const *Npp8u* *pSrc, *Npp32s* nSrcStep, *NppiPoint* oSrcOffset, *Npp8u* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *Npp32f* nRadius, *Npp32f* nSigma, *Npp32f* nWeight, *Npp32f* nThreshold, *NppiBorderType* eBorderType, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Four channel 8-bit unsigned unsharp filter.

For common parameter descriptions, see . *Common parameters for nppiFilterUnsharpBorder functions:*.

NppStatus **nppiFilterUnsharpBorder_8u_AC4R_Ctx**(const *Npp8u* *pSrc, *Npp32s* nSrcStep, *NppiPoint* oSrcOffset, *Npp8u* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *Npp32f* nRadius, *Npp32f* nSigma, *Npp32f* nWeight, *Npp32f* nThreshold, *NppiBorderType* eBorderType, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Four channel 8-bit unsigned unsharp filter (alpha channel is not processed).

For common parameter descriptions, see . *Common parameters for nppiFilterUnsharpBorder functions:*.

NppStatus **nppiFilterUnsharpBorder_16u_C1R_Ctx**(const *Npp16u* *pSrc, *Npp32s* nSrcStep, *NppiPoint* oSrcOffset, *Npp16u* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *Npp32f* nRadius, *Npp32f* nSigma, *Npp32f* nWeight, *Npp32f* nThreshold, *NppiBorderType* eBorderType, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Single channel 16-bit unsigned unsharp filter.

For common parameter descriptions, see . *Common parameters for nppiFilterUnsharpBorder functions:*.

NppStatus **nppiFilterUnsharpBorder_16u_C3R_Ctx**(const *Npp16u* *pSrc, *Npp32s* nSrcStep, *NppiPoint* oSrcOffset, *Npp16u* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *Npp32f* nRadius, *Npp32f* nSigma, *Npp32f* nWeight, *Npp32f* nThreshold, *NppiBorderType* eBorderType, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Three channel 16-bit unsigned unsharp filter.

For common parameter descriptions, see . *Common parameters for nppiFilterUnsharpBorder functions:*.

NppStatus **nppiFilterUnsharpBorder_16u_C4R_Ctx**(const *Npp16u* *pSrc, *Npp32s* nSrcStep, *NppiPoint* oSrcOffset, *Npp16u* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *Npp32f* nRadius, *Npp32f* nSigma, *Npp32f* nWeight, *Npp32f* nThreshold, *NppiBorderType* eBorderType, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Four channel 16-bit unsigned unsharp filter.

For common parameter descriptions, see . *Common parameters for nppiFilterUnsharpBorder functions:*.

NppStatus **nppiFilterUnsharpBorder_16u_AC4R_Ctx**(const *Npp16u* *pSrc, *Npp32s* nSrcStep, *NppiPoint* oSrcOffset, *Npp16u* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *Npp32f* nRadius, *Npp32f* nSigma, *Npp32f* nWeight, *Npp32f* nThreshold, *NppiBorderType* eBorderType, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Four channel 16-bit unsigned unsharp filter (alpha channel is not processed).

For common parameter descriptions, see . *Common parameters for nppiFilterUnsharpBorder functions:*.

NppStatus **nppiFilterUnsharpBorder_16s_C1R_Ctx**(const *Npp16s* *pSrc, *Npp32s* nSrcStep, *NppiPoint* oSrcOffset, *Npp16s* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *Npp32f* nRadius, *Npp32f* nSigma, *Npp32f* nWeight, *Npp32f* nThreshold, *NppiBorderType* eBorderType, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Single channel 16-bit signed unsharp filter.

For common parameter descriptions, see . *Common parameters for nppiFilterUnsharpBorder functions:*.

NppStatus **nppiFilterUnsharpBorder_16s_C3R_Ctx**(const *Npp16s* *pSrc, *Npp32s* nSrcStep, *NppiPoint* oSrcOffset, *Npp16s* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *Npp32f* nRadius, *Npp32f* nSigma, *Npp32f* nWeight, *Npp32f* nThreshold, *NppiBorderType* eBorderType, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Single channel 16-bit signed unsharp filter.

For common parameter descriptions, see . *Common parameters for nppiFilterUnsharpBorder functions:*.

NppStatus **nppiFilterUnsharpBorder_16s_C4R_Ctx**(const *Npp16s* *pSrc, *Npp32s* nSrcStep, *NppiPoint* oSrcOffset, *Npp16s* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *Npp32f* nRadius, *Npp32f* nSigma, *Npp32f* nWeight, *Npp32f* nThreshold, *NppiBorderType* eBorderType, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Four channel 16-bit signed unsharp filter.

For common parameter descriptions, see . *Common parameters for nppiFilterUnsharpBorder functions:*.

NppStatus **nppiFilterUnsharpBorder_16s_AC4R_Ctx**(const *Npp16s* *pSrc, *Npp32s* nSrcStep, *NppiPoint* oSrcOffset, *Npp16s* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *Npp32f* nRadius, *Npp32f* nSigma, *Npp32f* nWeight, *Npp32f* nThreshold, *NppiBorderType* eBorderType, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Four channel 16-bit signed unsharp filter (alpha channel is not processed).

For common parameter descriptions, see . *Common parameters for nppiFilterUnsharpBorder functions:*.

NppStatus **nppiFilterUnsharpBorder_32f_C1R_Ctx**(const *Npp32f* *pSrc, *Npp32s* nSrcStep, *NppiPoint* oSrcOffset, *Npp32f* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *Npp32f* nRadius, *Npp32f* nSigma, *Npp32f* nWeight, *Npp32f* nThreshold, *NppiBorderType* eBorderType, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Single channel 32-bit floating point unsharp filter.

For common parameter descriptions, see . *Common parameters for nppiFilterUnsharpBorder functions:*.

NppStatus **nppiFilterUnsharpBorder_32f_C3R_Ctx**(const *Npp32f* *pSrc, *Npp32s* nSrcStep, *NppiPoint* oSrcOffset, *Npp32f* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *Npp32f* nRadius, *Npp32f* nSigma, *Npp32f* nWeight, *Npp32f* nThreshold, *NppiBorderType* eBorderType, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Three channel 32-bit floating point unsharp filter.

For common parameter descriptions, see . *Common parameters for nppiFilterUnsharpBorder functions:*.

NppStatus **nppiFilterUnsharpBorder_32f_C4R_Ctx**(const *Npp32f* *pSrc, *Npp32s* nSrcStep, *NppiPoint* oSrcOffset, *Npp32f* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *Npp32f* nRadius, *Npp32f* nSigma, *Npp32f* nWeight, *Npp32f* nThreshold, *NppiBorderType* eBorderType, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Four channel 32-bit floating point unsharp filter.

For common parameter descriptions, see . *Common parameters for nppiFilterUnsharpBorder functions:*.

NppStatus **nppiFilterUnsharpBorder_32f_AC4R_Ctx**(const *Npp32f* *pSrc, *Npp32s* nSrcStep, *NppiPoint* oSrcOffset, *Npp32f* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *Npp32f* nRadius, *Npp32f* nSigma, *Npp32f* nWeight, *Npp32f* nThreshold, *NppiBorderType* eBorderType, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Four channel 32-bit floating point unsharp filter (alpha channel is not processed).

For common parameter descriptions, see *. Common parameters for nppiFilterUnsharpBorder functions:*.

NppStatus **nppiFilterUnsharpGetBufferSize_8u_C1R**(const *Npp32f* nRadius, const *Npp32f* nSigma, int *hpBufferSize)

Single channel 8-bit unsigned unsharp filter scratch memory size.

For common parameter descriptions, see *. Common parameters for nppiFilterUnsharpGetBufferSize functions:*.

NppStatus **nppiFilterUnsharpGetBufferSize_8u_C3R**(const *Npp32f* nRadius, const *Npp32f* nSigma, int *hpBufferSize)

Three channel 8-bit unsigned unsharp filter scratch memory size.

For common parameter descriptions, see *. Common parameters for nppiFilterUnsharpGetBufferSize functions:*.

NppStatus **nppiFilterUnsharpGetBufferSize_8u_C4R**(const *Npp32f* nRadius, const *Npp32f* nSigma, int *hpBufferSize)

Four channel 8-bit unsigned unsharp filter scratch memory size.

For common parameter descriptions, see *. Common parameters for nppiFilterUnsharpGetBufferSize functions:*.

NppStatus **nppiFilterUnsharpGetBufferSize_8u_AC4R**(const *Npp32f* nRadius, const *Npp32f* nSigma, int *hpBufferSize)

Four channel 8-bit unsigned unsharp filter scratch memory size (alpha channel is not processed).

For common parameter descriptions, see *. Common parameters for nppiFilterUnsharpGetBufferSize functions:*.

NppStatus **nppiFilterUnsharpGetBufferSize_16u_C1R**(const *Npp32f* nRadius, const *Npp32f* nSigma, int *hpBufferSize)

Single channel 16-bit unsigned unsharp filter scratch memory size.

For common parameter descriptions, see *. Common parameters for nppiFilterUnsharpGetBufferSize functions:*.

NppStatus **nppiFilterUnsharpGetBufferSize_16u_C3R**(const *Npp32f* nRadius, const *Npp32f* nSigma, int *hpBufferSize)

Three channel 16-bit unsigned unsharp filter scratch memory size.

For common parameter descriptions, see *. Common parameters for nppiFilterUnsharpGetBufferSize functions:*.

NppStatus **nppiFilterUnsharpGetBufferSize_16u_C4R**(const *Npp32f* nRadius, const *Npp32f* nSigma, int *hpBufferSize)

Four channel 16-bit unsigned unsharp filter scratch memory size.

For common parameter descriptions, see *. Common parameters for nppiFilterUnsharpGetBufferSize functions:*.

NppStatus **nppiFilterUnsharpGetBufferSize_16u_AC4R**(const *Npp32f* nRadius, const *Npp32f* nSigma, int *hpBufferSize)

Four channel 16-bit unsigned unsharp filter scratch memory size (alpha channel is not processed).

For common parameter descriptions, see *. Common parameters for nppiFilterUnsharpGetBufferSize functions:*.

NppStatus **nppiFilterUnsharpGetBufferSize_16s_C1R**(const *Npp32f* nRadius, const *Npp32f* nSigma, int *hpBufferSize)

Single channel 16-bit signed unsharp filter scratch memory size.

For common parameter descriptions, see *. Common parameters for nppiFilterUnsharpGetBufferSize functions:*.

NppStatus **nppiFilterUnsharpGetBufferSize_16s_C3R**(const *Npp32f* nRadius, const *Npp32f* nSigma, int *hpBufferSize)

Three channel 16-bit signed unsharp filter scratch memory size.

For common parameter descriptions, see *. Common parameters for nppiFilterUnsharpGetBufferSize functions:*.

NppStatus **nppiFilterUnsharpGetBufferSize_16s_C4R**(const *Npp32f* nRadius, const *Npp32f* nSigma, int *hpBufferSize)

Four channel 16-bit signed unsharp filter scratch memory size.

For common parameter descriptions, see *. Common parameters for nppiFilterUnsharpGetBufferSize functions:*.

NppStatus **nppiFilterUnsharpGetBufferSize_16s_AC4R**(const *Npp32f* nRadius, const *Npp32f* nSigma, int *hpBufferSize)

Four channel 16-bit signed unsharp filter scratch memory size (alpha channel is not processed).

For common parameter descriptions, see *. Common parameters for nppiFilterUnsharpGetBufferSize functions:*.

NppStatus **nppiFilterUnsharpGetBufferSize_32f_C1R**(const *Npp32f* nRadius, const *Npp32f* nSigma, int *hpBufferSize)

Single channel 32-bit floating point unsharp filter scratch memory size.

For common parameter descriptions, see *. Common parameters for nppiFilterUnsharpGetBufferSize functions:*.

NppStatus **nppiFilterUnsharpGetBufferSize_32f_C3R**(const *Npp32f* nRadius, const *Npp32f* nSigma, int *hpBufferSize)

Three channel 32-bit floating point unsharp filter scratch memory size.

For common parameter descriptions, see *. Common parameters for nppiFilterUnsharpGetBufferSize functions:*.

NppStatus **nppiFilterUnsharpGetBufferSize_32f_C4R**(const *Npp32f* nRadius, const *Npp32f* nSigma, int *hpBufferSize)

Four channel 32-bit floating point unsharp filter scratch memory size.

For common parameter descriptions, see *. Common parameters for nppiFilterUnsharpGetBufferSize functions:*.

NppStatus **nppiFilterUnsharpGetBufferSize_32f_AC4R**(const *Npp32f* nRadius, const *Npp32f* nSigma, int *hpBufferSize)

Four channel 32-bit floating point unsharp filter scratch memory size (alpha channel is not processed).

For common parameter descriptions, see . *Common parameters for nppiFilterUnsharpGetBufferSize functions:*.

1.10.5.26 Image Filter Wiener Border

1.10.5.26.1 FilterWienerBorder

Noise removal filtering of an image using an adaptive Wiener filter with border control.

Pixels under the source mask are used to generate statistics about the local neighborhood which are then used to control the amount of adaptive noise filtering locally applied.

Note that if the noise value for a particular channel is set to 0.0f then the output for that channel will contain the square of the variance of local pixels within aMaskSize surrounding each pixel in oSizeROI. Note that is unlikely to be useful unless the pixel data type is floating point due to result clamping. Output from these cases can then be passed through an nppiMean function call using the same oSizeROI. The square root for that channel from the nppiMean call result can then be used as a noise value for a future call to this function if there is no known preexisting noise value.

Currently only the NPP_BORDER_REPLICATE border type operation is supported.

1.10.5.26.1.1 Common parameters for nppiFilterWienerBorder functions:

For each pixel in the source image the function estimates the local mean and variance in the neighborhood defined by oMaskSize relative to the primary source pixel located at oAnchor.x and oAnchor.y. Given an oMaskSize with width W and height H, the mean, variance, and destination pixel value will be computed per channel as

$$Mean = \frac{1}{W \cdot H} \sum_{j=0}^{H-1} \sum_{i=0}^{W-1} pSrc(j,i)$$

$$Variance^2 = \frac{1}{W \cdot H} \sum_{j=0}^{H-1} \sum_{i=0}^{W-1} (pSrc(j,i)^2 - Mean^2)$$

$$pDst(j,i) = Mean + \frac{(Variance^2 - NoiseVariance^2)}{Variance^2} \cdot (pSrc(j,i) - Mean)$$

param pSrc
Source-Image Pointer.

param nSrcStep
Source-Image Line Step.

param oSrcSize
Source image width and height in pixels relative to pSrc.

param oSrcOffset
The pixel offset that pSrc points to relative to the origin of the source image.

param pDst
Destination-Image Pointer.

param nDstStep
Destination-Image Line Step.

param oSizeROI
Region-Of-Interest (ROI).

param oMaskSize
Pixel Width and Height of the rectangular region of interest surrounding the source pixel.

param oAnchor
Positive X and Y relative offsets of primary pixel in region of interest surrounding the source pixel relative to bottom right of oMaskSize.

param aNoise
Fixed size array of per-channel noise variance level value in range of 0.0F to 1.0F.

param eBorderType
The border type operation to be applied at source image border boundaries.

param nppStreamCtx
Application Managed Stream Context.

return
Image Data Related Error Codes, *ROI Related Error Codes*

Functions

NppStatus **nppiFilterWienerBorder_8u_C1R_Ctx**(const *Npp8u* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp8u* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiSize* oMaskSize, *NppiPoint* oAnchor, *Npp32f* aNoise[1], *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Single channel 8-bit unsigned Wiener filter with border control.

For common parameter descriptions, see *Common parameters for nppiFilterWienerBorder functions:*.

NppStatus **nppiFilterWienerBorder_8u_C3R_Ctx**(const *Npp8u* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp8u* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiSize* oMaskSize, *NppiPoint* oAnchor, *Npp32f* aNoise[3], *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Three channel 8-bit unsigned Wiener filter with border control.

For common parameter descriptions, see *Common parameters for nppiFilterWienerBorder functions:*.

NppStatus **nppiFilterWienerBorder_8u_C4R_Ctx**(const *Npp8u* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp8u* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiSize* oMaskSize, *NppiPoint* oAnchor, *Npp32f* aNoise[4], *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Four channel 8-bit unsigned Wiener filter with border control.

For common parameter descriptions, see *Common parameters for nppiFilterWienerBorder functions:*.

NppStatus **nppiFilterWienerBorder_8u_AC4R_Ctx**(const *Npp8u* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp8u* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiSize* oMaskSize, *NppiPoint* oAnchor, *Npp32f* aNoise[3], *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Four channel 8-bit unsigned Wiener filter with border control, ignoring alpha channel.

For common parameter descriptions, see *Common parameters for nppiFilterWienerBorder functions:*.

NppStatus **nppiFilterWienerBorder_16s_C1R_Ctx**(const *Npp16s* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp16s* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiSize* oMaskSize, *NppiPoint* oAnchor, *Npp32f* aNoise[1], *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Single channel 16-bit signed Wiener filter with border control.

For common parameter descriptions, see *Common parameters for nppiFilterWienerBorder functions:*.

NppStatus **nppiFilterWienerBorder_16s_C3R_Ctx**(const *Npp16s* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp16s* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiSize* oMaskSize, *NppiPoint* oAnchor, *Npp32f* aNoise[3], *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Three channel 16-bit signed Wiener filter with border control.

For common parameter descriptions, see *Common parameters for nppiFilterWienerBorder functions:*.

NppStatus **nppiFilterWienerBorder_16s_C4R_Ctx**(const *Npp16s* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp16s* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiSize* oMaskSize, *NppiPoint* oAnchor, *Npp32f* aNoise[4], *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Four channel 16-bit signed Wiener filter with border control.

For common parameter descriptions, see *Common parameters for nppiFilterWienerBorder functions:*.

NppStatus **nppiFilterWienerBorder_16s_AC4R_Ctx**(const *Npp16s* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp16s* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiSize* oMaskSize, *NppiPoint* oAnchor, *Npp32f* aNoise[3], *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Four channel 16-bit signed Wiener filter with border control, ignoring alpha channel.

For common parameter descriptions, see *Common parameters for nppiFilterWienerBorder functions:*.

NppStatus **nppiFilterWienerBorder_32f_C1R_Ctx**(const *Npp32f* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp32f* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiSize* oMaskSize, *NppiPoint* oAnchor, *Npp32f* aNoise[1], *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Single channel 32-bit float Wiener filter with border control.

For common parameter descriptions, see *Common parameters for nppiFilterWienerBorder functions:*.

NppStatus **nppiFilterWienerBorder_32f_C3R_Ctx**(const *Npp32f* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp32f* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiSize* oMaskSize, *NppiPoint* oAnchor, *Npp32f* aNoise[3], *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Three channel 32-bit float Wiener filter with border control.

For common parameter descriptions, see *Common parameters for nppiFilterWienerBorder functions:*.

NppStatus **nppiFilterWienerBorder_32f_C4R_Ctx**(const *Npp32f* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp32f* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiSize* oMaskSize, *NppiPoint* oAnchor, *Npp32f* aNoise[4], *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Four channel 32-bit float Wiener filter with border control.

For common parameter descriptions, see *Common parameters for nppiFilterWienerBorder functions:*.

NppStatus **nppiFilterWienerBorder_32f_AC4R_Ctx**(const *Npp32f* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp32f* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiSize* oMaskSize, *NppiPoint* oAnchor, *Npp32f* aNoise[3], *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Four channel 32-bit float Wiener filter with border control, ignoring alpha channel.

For common parameter descriptions, see *Common parameters for nppiFilterWienerBorder functions:*.

1.10.5.27 Image Filter Gradient Vector Prewitt Border

1.10.5.27.1 GradientVectorPrewittBorder

RGB Color to Prewitt Gradient Vector conversion using user selected fixed mask size and gradient distance method. Functions support up to 4 optional single channel output gradient vectors, X (vertical), Y (horizontal), magnitude, and angle with user selectable distance methods. Output for a particular vector is disabled by supplying a NULL pointer for that vector. X and Y gradient vectors are in cartesian form in the destination data type.

Magnitude vectors are polar gradient form in the destination data type, angle is always in floating point polar gradient format. Only fixed mask sizes of 3x3 are supported. Only nppiNormL1 (sum) and nppiNormL2 (sqrt of sum of squares) distance methods are currently supported.

Currently only the NPP_BORDER_REPLICATE border type operation is supported. Borderless output can be accomplished by using a larger source image than the destination and adjusting oSrcSize and oSrcOffset parameters accordingly.

1.10.5.27.1.1 Common parameters for nppiFilterGradientVectorPrewittBorder functions:

The following fixed kernel mask is used for producing the pDstX (vertical) output image.

$$\begin{pmatrix} -1 & 0 & 1 \\ -1 & 0 & 1 \\ -1 & 0 & 1 \end{pmatrix}$$

The following fixed kernel mask is used for producing the pDstY (horizontal) output image.

$$\begin{pmatrix} 1 & 1 & 1 \\ 0 & 0 & 0 \\ -1 & -1 & -1 \end{pmatrix}$$

For the C1R versions of the function the pDstMag output image value for L1 normalization consists of the absolute value of the pDstX value plus the absolute value of the pDstY value at that particular image pixel location. For the C1R versions of the function the pDstMag output image value for L2 normalization consists of the square root of the pDstX value squared plus the pDstY value squared at that particular image pixel location. For the C1R versions of the function the pDstAngle output image value consists of the arctangent (atan2) of the pDstY value and the pDstX value at that particular image pixel location.

For the C3C1R versions of the function, regardless of the selected normalization method, the L2 normalization value is first determined for each or the pDstX and pDstY values for each source channel then the largest L2 normalization value (largest gradient) is used to select which of the 3 pDstX channel values are output to the pDstX image or pDstY channel values are output to the pDstY image. For the C3C1R versions of the function the pDstMag output image value for L1 normalizaton consists of the same technique used for the C1R version for each source image channel. Then the largest L2 normalization value is again used to select which of the 3 pDstMag channel values to output to the pDstMag image. For the C3C1R versions of the function the pDstMag output image value for L2 normalizaton consists of just outputting the largest per source channel L2 normalization value to the pDstMag image. For the C3C1R versions of the function the pDstAngle output image value consists of the same technique used for the C1R version calculated for each source image channel. Then the largest L2 normalization value is again used to select which of the 3 angle values to output to the pDstAngle image.

param pSrc
Source-Image Pointer.

param nSrcStep
Source-Image Line Step.

param oSrcSize
Source image width and height in pixels relative to pSrc.

param oSrcOffset
The pixel offset that pSrc points to relative to the origin of the source image.

param pDstX
X vector destination_image_pointer.

param nDstXStep
X vector destination_image_line_step.

param pDstY
Y vector destination_image_pointer.

param nDstYStep
Y vector destination_image_line_step.

param pDstMag
magnitude destination_image_pointer.

param nDstMagStep
magnitude destination_image_line_step.

param pDstAngle
angle destination_image_pointer.

param nDstAngleStep
angle destination_image_line_step.

param oSizeROI
Region-Of-Interest (ROI).

param eMaskSize
fixed filter mask size to use.

param eNorm
gradient distance method to use.

param eBorderType
source image border type to use use.

param nppStreamCtx
Application Managed Stream Context.

return
Image Data Related Error Codes, *ROI Related Error Codes*

Functions

NppStatus **nppiGradientVectorPrewittBorder_8u16s_C1R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp16s* *pDstX, int nDstXStep, *Npp16s* *pDstY, int nDstYStep, *Npp16s* *pDstMag, int nDstMagStep, *Npp32f* *pDstAngle, int nDstAngleStep, *NppiSize* oSizeROI, *NppiMaskSize* eMaskSize, *NppiNorm* eNorm, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

1 channel 8-bit unsigned packed RGB to optional 1 channel 16-bit signed X (vertical), Y (horizontal), magnitude, and/or 32-bit floating point angle gradient vectors with user selectable fixed mask size and distance method with border control.

For common parameter descriptions, see *Common parameters for nppiFilterGradientVectorPrewittBorder functions:*.

NppStatus **nppiGradientVectorPrewittBorder_8u16s_C3C1R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp16s* *pDstX, int nDstXStep, *Npp16s* *pDstY, int nDstYStep, *Npp16s* *pDstMag, int nDstMagStep, *Npp32f* *pDstAngle, int nDstAngleStep, *NppiSize* oSizeROI, *NppiMaskSize* eMaskSize, *NppiNorm* eNorm, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

3 channel 8-bit unsigned packed RGB to optional 1 channel 16-bit signed X (vertical), Y (horizontal), magnitude, and/or 32-bit floating point angle gradient vectors with user selectable fixed mask size and distance method with border control.

For common parameter descriptions, see *Common parameters for nppiFilterGradientVectorPrewittBorder functions:*.

NppStatus **nppiGradientVectorPrewittBorder_16s32f_C1R_Ctx**(const *Npp16s* *pSrc, int nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp32f* *pDstX, int nDstXStep, *Npp32f* *pDstY, int nDstYStep, *Npp32f* *pDstMag, int nDstMagStep, *Npp32f* *pDstAngle, int nDstAngleStep, *NppiSize* oSizeROI, *NppiMaskSize* eMaskSize, *NppiNorm* eNorm, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

1 channel 16-bit signed packed RGB to optional 1 channel 32-bit floating point X (vertical), Y (horizontal), magnitude, and/or 32-bit floating point angle gradient vectors with user selectable fixed mask size and distance method with border control.

For common parameter descriptions, see *Common parameters for nppiFilterGradientVectorPrewittBorder functions:*.

NppStatus **nppiGradientVectorPrewittBorder_16s32f_C3C1R_Ctx**(const *Npp16s* *pSrc, int nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp32f* *pDstX, int nDstXStep, *Npp32f* *pDstY, int nDstYStep, *Npp32f* *pDstMag, int nDstMagStep, *Npp32f* *pDstAngle, int nDstAngleStep, *NppiSize* oSizeROI, *NppiMaskSize* eMaskSize, *NppiNorm* eNorm, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

3 channel 16-bit signed packed RGB to optional 1 channel 32-bit floating point X (vertical), Y (horizontal), magnitude, and/or 32-bit floating point angle gradient vectors with user selectable fixed mask size and distance method with border control.

For common parameter descriptions, see *Common parameters for nppiFilterGradientVectorPrewittBorder functions:*.

NppStatus **nppiGradientVectorPrewittBorder_16u32f_C1R_Ctx**(const *Npp16u* *pSrc, int nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp32f* *pDstX, int nDstXStep, *Npp32f* *pDstY, int nDstYStep, *Npp32f* *pDstMag, int nDstMagStep, *Npp32f* *pDstAngle, int nDstAngleStep, *NppiSize* oSizeROI, *NppiMaskSize* eMaskSize, *NppiNorm* eNorm, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

1 channel 16-bit unsigned packed RGB to optional 1 channel 32-bit floating point X (vertical), Y (horizontal), magnitude, and/or 32-bit floating point angle gradient vectors with user selectable fixed mask size and distance method with border control.

For common parameter descriptions, see *Common parameters for nppiFilterGradientVectorPrewittBorder functions:*.

NppStatus **nppiGradientVectorPrewittBorder_16u32f_C3C1R_Ctx**(const *Npp16u* *pSrc, int nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp32f* *pDstX, int nDstXStep, *Npp32f* *pDstY, int nDstYStep, *Npp32f* *pDstMag, int nDstMagStep, *Npp32f* *pDstAngle, int nDstAngleStep, *NppiSize* oSizeROI, *NppiMaskSize* eMaskSize, *NppiNorm* eNorm, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

3 channel 16-bit unsigned packed RGB to optional 1 channel 32-bit floating point X (vertical), Y (horizontal), magnitude, and/or 32-bit floating point angle gradient vectors with user selectable fixed mask size and distance method with border control.

For common parameter descriptions, see *Common parameters for nppiFilterGradientVectorPrewittBorder functions:*.

NppStatus **nppiGradientVectorPrewittBorder_32f_C1R_Ctx**(const *Npp32f* *pSrc, int nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp32f* *pDstX, int nDstXStep, *Npp32f* *pDstY, int nDstYStep, *Npp32f* *pDstMag, int nDstMagStep, *Npp32f* *pDstAngle, int nDstAngleStep, *NppiSize* oSizeROI, *NppiMaskSize* eMaskSize, *NppiNorm* eNorm, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

1 channel 32-bit floating point packed RGB to optional 1 channel 32-bit floating point X (vertical), Y (horizontal), magnitude, and/or 32-bit floating point angle gradient vectors with user selectable fixed mask size and distance method with border control.

For common parameter descriptions, see *Common parameters for nppiFilterGradientVectorPrewittBorder functions:*.

NppStatus **nppiGradientVectorPrewittBorder_32f_C3C1R_Ctx**(const *Npp32f* *pSrc, int nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp32f* *pDstX, int nDstXStep, *Npp32f* *pDstY, int nDstYStep, *Npp32f* *pDstMag, int nDstMagStep, *Npp32f* *pDstAngle, int nDstAngleStep, *NppiSize* oSizeROI, *NppiMaskSize* eMaskSize, *NppiNorm* eNorm, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

3 channel 32-bit floating point packed RGB to optional 1 channel 32-bit floating point X (vertical), Y (horizontal), magnitude, and/or 32-bit floating point angle gradient vectors with user selectable fixed mask size and distance method with border control.

For common parameter descriptions, see *Common parameters for nppiFilterGradientVectorPrewittBorder functions:*.

1.10.5.28 Image Filter Gradient Vector Scharr Border

1.10.5.28.1 GradientVectorScharrBorder

RGB Color to Scharr Gradient Vector conversion using user selected fixed mask size and gradient distance method. Functions support up to 4 optional single channel output gradient vectors, X (vertical), Y (horizontal), magnitude, and angle with user selectable distance methods. Output for a particular vector is disabled by supplying a NULL pointer for that vector. X and Y gradient vectors are in cartesian form in the destination data type.

Magnitude vectors are polar gradient form in the destination data type, angle is always in floating

point polar gradient format. Only fixed mask sizes of 3x3 are supported. Only nppiNormL1 (sum) and nppiNormL2 (sqrt of sum of squares) distance methods are currently supported.

Currently only the NPP_BORDER_REPLICATE border type operation is supported. Borderless output can be accomplished by using a larger source image than the destination and adjusting oSrcSize and oSrcOffset parameters accordingly.

1.10.5.28.1.1 Common parameters for nppiFilterGradientVectorScharrBorder functions:

The following fixed kernel mask is used for producing the pDstX (vertical) output image.

$$\begin{pmatrix} 3 & 0 & -3 \\ 10 & 0 & -10 \\ 3 & 0 & -3 \end{pmatrix}$$

The following fixed kernel mask is used for producing the pDstY (horizontal) output image.

$$\begin{pmatrix} 3 & 10 & 3 \\ 0 & 0 & 0 \\ -3 & -10 & -3 \end{pmatrix}$$

For the C1R versions of the function the pDstMag output image value for L1 normalization consists of the absolute value of the pDstX value plus the absolute value of the pDstY value at that particular image pixel location. For the C1R versions of the function the pDstMag output image value for L2 normalization consists of the square root of the pDstX value squared plus the pDstY value squared at that particular image pixel location. For the C1R versions of the function the pDstAngle output image value consists of the arctangent (atan2) of the pDstY value and the pDstX value at that particular image pixel location.

For the C3C1R versions of the function, regardless of the selected normalization method, the L2 normalization value is first determined for each or the pDstX and pDstY values for each source channel then the largest L2 normalization value (largest gradient) is used to select which of the 3 pDstX channel values are output to the pDstX image or pDstY channel values are output to the pDstY image. For the C3C1R versions of the function the pDstMag output image value for L1 normalizaton consists of the same technique used for the C1R version for each source image channel. Then the largest L2 normalization value is again used to select which of the 3 pDstMag channel values to output to the pDstMag image. For the C3C1R versions of the function the pDstMag output image value for L2 normalizaton consists of just outputting the largest per source channel L2 normalization value to the pDstMag image. For the C3C1R versions of the function the pDstAngle output image value consists of the same technique used for the C1R version calculated for each source image channel. Then the largest L2 normalization value is again used to select which of the 3 angle values to output to the pDstAngle image.

param pSrc
Source-Image Pointer.

param nSrcStep
Source-Image Line Step.

param oSrcSize
Source image width and height in pixels relative to pSrc.

param oSrcOffset
The pixel offset that pSrc points to relative to the origin of the source image.

param pDstX
X vector destination_image_pointer.

param nDstXStep
X vector destination_image_line_step.

param pDstY
Y vector destination_image_pointer.

param nDstYStep
Y vector destination_image_line_step.

param pDstMag
magnitude destination_image_pointer.

param nDstMagStep
magnitude destination_image_line_step.

param pDstAngle
angle destination_image_pointer.

param nDstAngleStep
angle destination_image_line_step.

param oSizeROI
Region-Of-Interest (ROI).

param eMaskSize
fixed filter mask size to use.

param eNorm
gradient distance method to use.

param eBorderType
source image border type to use use.

param nppStreamCtx
Application Managed Stream Context.

return
Image Data Related Error Codes, *ROI Related Error Codes*

Functions

NppStatus **nppiGradientVectorScharrBorder_8u16s_C1R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp16s* *pDstX, int nDstXStep, *Npp16s* *pDstY, int nDstYStep, *Npp16s* *pDstMag, int nDstMagStep, *Npp32f* *pDstAngle, int nDstAngleStep, *NppiSize* oSizeROI, *NppiMaskSize* eMaskSize, *NppiNorm* eNorm, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

1 channel 8-bit unsigned packed RGB to optional 1 channel 16-bit signed X (vertical), Y (horizontal), magnitude, and/or 32-bit floating point angle gradient vectors with user selectable fixed mask size and distance method with border control.

For common parameter descriptions, see *Common parameters for nppiFilterGradientVectorScharrBorder functions:*.

NppStatus **nppiGradientVectorScharrBorder_8u16s_C3C1R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp16s* *pDstX, int nDstXStep, *Npp16s* *pDstY, int nDstYStep, *Npp16s* *pDstMag, int nDstMagStep, *Npp32f* *pDstAngle, int nDstAngleStep, *NppiSize* oSizeROI, *NppiMaskSize* eMaskSize, *NppiNorm* eNorm, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

3 channel 8-bit unsigned packed RGB to optional 1 channel 16-bit signed X (vertical), Y (horizontal), magnitude, and/or 32-bit floating point angle gradient vectors with user selectable fixed mask size and distance method with border control.

For common parameter descriptions, see *Common parameters for nppiFilterGradientVectorScharrBorder functions:*.

NppStatus **nppiGradientVectorScharrBorder_16s32f_C1R_Ctx**(const *Npp16s* *pSrc, int nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp32f* *pDstX, int nDstXStep, *Npp32f* *pDstY, int nDstYStep, *Npp32f* *pDstMag, int nDstMagStep, *Npp32f* *pDstAngle, int nDstAngleStep, *NppiSize* oSizeROI, *NppiMaskSize* eMaskSize, *NppiNorm* eNorm, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

1 channel 16-bit signed packed RGB to optional 1 channel 32-bit floating point X (vertical), Y (horizontal), magnitude, and/or 32-bit floating point angle gradient vectors with user selectable fixed mask size and distance method with border control.

For common parameter descriptions, see *Common parameters for nppiFilterGradientVectorScharrBorder functions:*.

NppStatus **nppiGradientVectorScharrBorder_16s32f_C3C1R_Ctx**(const *Npp16s* *pSrc, int nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp32f* *pDstX, int nDstXStep, *Npp32f* *pDstY, int nDstYStep, *Npp32f* *pDstMag, int nDstMagStep, *Npp32f* *pDstAngle, int nDstAngleStep, *NppiSize* oSizeROI, *NppiMaskSize* eMaskSize, *NppiNorm* eNorm, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

3 channel 16-bit signed packed RGB to optional 1 channel 32-bit floating point X (vertical), Y (horizontal), magnitude, and/or 32-bit floating point angle gradient vectors with user selectable fixed mask size and distance method with border control.

For common parameter descriptions, see *Common parameters for nppiFilterGradientVectorScharrBorder functions:*.

NppStatus **nppiGradientVectorScharrBorder_16u32f_C1R_Ctx**(const *Npp16u* *pSrc, int nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp32f* *pDstX, int nDstXStep, *Npp32f* *pDstY, int nDstYStep, *Npp32f* *pDstMag, int nDstMagStep, *Npp32f* *pDstAngle, int nDstAngleStep, *NppiSize* oSizeROI, *NppiMaskSize* eMaskSize, *NppiNorm* eNorm, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

1 channel 16-bit unsigned packed RGB to optional 1 channel 32-bit floating point X (vertical), Y (horizontal), magnitude, and/or 32-bit floating point angle gradient vectors with user selectable fixed mask size and distance method with border control.

For common parameter descriptions, see *Common parameters for nppiFilterGradientVectorScharrBorder functions:*.

NppStatus **nppiGradientVectorScharrBorder_16u32f_C3C1R_Ctx**(const *Npp16u* *pSrc, int nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp32f* *pDstX, int nDstXStep, *Npp32f* *pDstY, int nDstYStep, *Npp32f* *pDstMag, int nDstMagStep, *Npp32f* *pDstAngle, int nDstAngleStep, *NppiSize* oSizeROI, *NppiMaskSize* eMaskSize, *NppiNorm* eNorm, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

3 channel 16-bit unsigned packed RGB to optional 1 channel 32-bit floating point X (vertical), Y (horizontal), magnitude, and/or 32-bit floating point angle gradient vectors with user selectable fixed mask size and distance method with border control.

For common parameter descriptions, see *Common parameters for nppiFilterGradientVectorScharrBorder functions:*.

NppStatus **nppiGradientVectorScharrBorder_32f_C1R_Ctx**(const *Npp32f* *pSrc, int nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp32f* *pDstX, int nDstXStep, *Npp32f* *pDstY, int nDstYStep, *Npp32f* *pDstMag, int nDstMagStep, *Npp32f* *pDstAngle, int nDstAngleStep, *NppiSize* oSizeROI, *NppiMaskSize* eMaskSize, *NppiNorm* eNorm, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

1 channel 32-bit floating point packed RGB to optional 1 channel 32-bit floating point X (vertical), Y (horizontal), magnitude, and/or 32-bit floating point angle gradient vectors with user selectable fixed mask size and distance method with border control.

For common parameter descriptions, see *Common parameters for nppiFilterGradientVectorScharrBorder functions:*.

NppStatus **nppiGradientVectorScharrBorder_32f_C3C1R_Ctx**(const *Npp32f* *pSrc, int nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp32f* *pDstX, int nDstXStep, *Npp32f* *pDstY, int nDstYStep, *Npp32f* *pDstMag, int nDstMagStep, *Npp32f* *pDstAngle, int nDstAngleStep, *NppiSize* oSizeROI, *NppiMaskSize* eMaskSize, *NppiNorm* eNorm, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

3 channel 32-bit floating point packed RGB to optional 1 channel 32-bit floating point X (vertical), Y (horizontal), magnitude, and/or 32-bit floating point angle gradient vectors with user selectable fixed mask size and distance method with border control.

For common parameter descriptions, see *Common parameters for nppiFilterGradientVectorSchar-rBorder functions:*.

1.10.5.29 Image Filter Gradient Vector Sobel Border

1.10.5.29.1 GradientVectorSobelBorder

RGB Color to Sobel Gradient Vector conversion using user selected fixed mask size and gradient distance method. Functions support up to 4 optional single channel output gradient vectors, X (vertical), Y (horizontal), magnitude, and angle with user selectable distance methods. Output for a particular vector is disabled by supplying a NULL pointer for that vector. X and Y gradient vectors are in cartesian form in the destination data type.

Magnitude vectors are polar gradient form in the destination data type, angle is always in floating point polar gradient format. Only fixed mask sizes of 3x3 and 5x5 are supported. Only nppiNormL1 (sum) and nppiNormL2 (sqrt of sum of squares) distance methods are currently supported.

Currently only the NPP_BORDER_REPLICATE border type operation is supported. Borderless output can be accomplished by using a larger source image than the destination and adjusting oSrcSize and oSrcOffset parameters accordingly.

1.10.5.29.1.1 Common parameters for nppiFilterGradientVectorSobelBorder functions:

One of the following fixed kernel masks are used for producing the 3x3 or 5x5 pDstX (vertical) output image depending on selected mask size.

$$\begin{pmatrix} -1 & 0 & 1 \\ -2 & 0 & 2 \\ -1 & 0 & 1 \end{pmatrix}$$

$$\begin{pmatrix} -1 & -2 & 0 & 2 & 1 \\ -4 & -8 & 0 & 8 & 4 \\ -6 & -12 & 0 & 12 & 6 \\ -4 & -8 & 0 & 8 & 4 \\ -1 & -2 & 0 & 2 & 1 \end{pmatrix}$$

One of the following fixed kernel masks are used for producing the 3x3 or 5x5 pDstY (horizontal) output image depending on selected mask size.

$$\begin{pmatrix} 1 & 2 & 1 \\ 0 & 0 & 0 \\ -1 & -2 & -1 \end{pmatrix}$$

$$\begin{pmatrix} 1 & 4 & 6 & 4 & 1 \\ 2 & 8 & 12 & 8 & 2 \\ 0 & 0 & 0 & 0 & 0 \\ -2 & -8 & -12 & -8 & -2 \\ -1 & -4 & -6 & -4 & -1 \end{pmatrix}$$

For the C1R versions of the function the pDstMag output image value for L1 normalization consists of the absolute value of the pDstX value plus the absolute value of the pDstY value at that particular image pixel location. For the C1R versions of the function the pDstMag output image value for L2 normalization consists of the square root of the pDstX value squared plus the pDstY value squared at that particular image pixel location. For the C1R versions of the function the pDstAngle output image value consists of the arctangent (atan2) of the pDstY value and the pDstX value at that particular image pixel location.

For the C3C1R versions of the function, regardless of the selected normalization method, the L2 normalization value is first determined for each or the pDstX and pDstY values for each source channel then the largest L2 normalization value (largest gradient) is used to select which of the 3 pDstX channel values are output to the pDstX image or pDstY channel values are output to the pDstY image. For the C3C1R versions of the function the pDstMag output image value for L1 normalizaton consists of the same technique used for the C1R version for each source image channel. Then the largest L2 normalization value is again used to select which of the 3 pDstMag channel values to output to the pDstMag image. For the C3C1R versions of the function the pDstMag output image value for L2 normalizaton consists of just outputting the largest per source channel L2 normalization value to the pDstMag image. For the C3C1R versions of the function the pDstAngle output image value consists of the same technique used for the C1R version calculated for each source image channel. Then the largest L2 normalization value is again used to select which of the 3 angle values to output to the pDstAngle image.

param pSrc
Source-Image Pointer.

param nSrcStep
Source-Image Line Step.

param oSrcSize
Source image width and height in pixels relative to pSrc.

param oSrcOffset
The pixel offset that pSrc points to relative to the origin of the source image.

param pDstX
X vector destination_image_pointer.

param nDstXStep
X vector destination_image_line_step.

param pDstY
Y vector destination_image_pointer.

param nDstYStep
Y vector destination_image_line_step.

param pDstMag
magnitude destination_image_pointer.

param nDstMagStep
magnitude destination_image_line_step.

param pDstAngle
angle destination_image_pointer.

param nDstAngleStep
angle destination_image_line_step.

param oSizeROI
Region-Of-Interest (ROI).

param eMaskSize
fixed filter mask size to use.

param eNorm
gradient distance method to use.

param eBorderType
source image border type to use use.

param nppStreamCtx
Application Managed Stream Context.

return
Image Data Related Error Codes, *ROI Related Error Codes*

Functions

NppStatus **nppiGradientVectorSobelBorder_8u16s_C1R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp16s* *pDstX, int nDstXStep, *Npp16s* *pDstY, int nDstYStep, *Npp16s* *pDstMag, int nDstMagStep, *Npp32f* *pDstAngle, int nDstAngleStep, *NppiSize* oSizeROI, *NppiMaskSize* eMaskSize, *NppiNorm* eNorm, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

1 channel 8-bit unsigned packed RGB to optional 1 channel 16-bit signed X (vertical), Y (horizontal), magnitude, and/or 32-bit floating point angle gradient vectors with user selectable fixed mask size and distance method with border control.

For common parameter descriptions, see *Common parameters for nppiFilterGradientVectorSobelBorder functions:*.

NppStatus **nppiGradientVectorSobelBorder_8u16s_C3C1R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp16s* *pDstX, int nDstXStep, *Npp16s* *pDstY, int nDstYStep, *Npp16s* *pDstMag, int nDstMagStep, *Npp32f* *pDstAngle, int nDstAngleStep, *NppiSize* oSizeROI, *NppiMaskSize* eMaskSize, *NppiNorm* eNorm, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

3 channel 8-bit unsigned packed RGB to optional 1 channel 16-bit signed X (vertical), Y (horizontal), magnitude, and/or 32-bit floating point angle gradient vectors with user selectable fixed mask size and distance method with border control.

For common parameter descriptions, see *Common parameters for nppiFilterGradientVectorSobelBorder functions:*.

NppStatus **nppiGradientVectorSobelBorder_16s32f_C1R_Ctx**(const *Npp16s* *pSrc, int nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp32f* *pDstX, int nDstXStep, *Npp32f* *pDstY, int nDstYStep, *Npp32f* *pDstMag, int nDstMagStep, *Npp32f* *pDstAngle, int nDstAngleStep, *NppiSize* oSizeROI, *NppiMaskSize* eMaskSize, *NppiNorm* eNorm, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

1 channel 16-bit signed packed RGB to optional 1 channel 32-bit floating point X (vertical), Y (horizontal), magnitude, and/or 32-bit floating point angle gradient vectors with user selectable fixed mask size and distance method with border control.

For common parameter descriptions, see *Common parameters for nppiFilterGradientVectorSobelBorder functions:*.

NppStatus **nppiGradientVectorSobelBorder_16s32f_C3C1R_Ctx**(const *Npp16s* *pSrc, int nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp32f* *pDstX, int nDstXStep, *Npp32f* *pDstY, int nDstYStep, *Npp32f* *pDstMag, int nDstMagStep, *Npp32f* *pDstAngle, int nDstAngleStep, *NppiSize* oSizeROI, *NppiMaskSize* eMaskSize, *NppiNorm* eNorm, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

3 channel 16-bit signed packed RGB to optional 1 channel 32-bit floating point X (vertical), Y (horizontal), magnitude, and/or 32-bit floating point angle gradient vectors with user selectable fixed mask size and distance method with border control.

NppStatus **nppiGradientVectorSobelBorder_16u32f_C1R_Ctx**(const *Npp16u* *pSrc, int nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp32f* *pDstX, int nDstXStep, *Npp32f* *pDstY, int nDstYStep, *Npp32f* *pDstMag, int nDstMagStep, *Npp32f* *pDstAngle, int nDstAngleStep, *NppiSize* oSizeROI, *NppiMaskSize* eMaskSize, *NppiNorm* eNorm, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

1 channel 16-bit unsigned packed RGB to optional 1 channel 32-bit floating point X (vertical), Y (horizontal), magnitude, and/or 32-bit floating point angle gradient vectors with user selectable fixed mask size and distance method with border control.

For common parameter descriptions, see *Common parameters for nppiFilterGradientVectorSobelBorder functions:*.

NppStatus **nppiGradientVectorSobelBorder_16u32f_C3C1R_Ctx**(const *Npp16u* *pSrc, int nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp32f* *pDstX, int nDstXStep, *Npp32f* *pDstY, int nDstYStep, *Npp32f* *pDstMag, int nDstMagStep, *Npp32f* *pDstAngle, int nDstAngleStep, *NppiSize* oSizeROI, *NppiMaskSize* eMaskSize, *NppiNorm* eNorm, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

3 channel 16-bit unsigned packed RGB to optional 1 channel 32-bit floating point X (vertical), Y (horizontal), magnitude, and/or 32-bit floating point angle gradient vectors with user selectable fixed mask size and distance method with border control.

For common parameter descriptions, see *Common parameters for nppiFilterGradientVectorSobelBorder functions:*.

NppStatus **nppiGradientVectorSobelBorder_32f_C1R_Ctx**(const *Npp32f* *pSrc, int nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp32f* *pDstX, int nDstXStep, *Npp32f* *pDstY, int nDstYStep, *Npp32f* *pDstMag, int nDstMagStep, *Npp32f* *pDstAngle, int nDstAngleStep, *NppiSize* oSizeROI, *NppiMaskSize* eMaskSize, *NppiNorm* eNorm, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

1 channel 32-bit floating point packed RGB to optional 1 channel 32-bit floating point X (vertical), Y (horizontal), magnitude, and/or 32-bit floating point angle gradient vectors with user selectable fixed mask size and distance method with border control.

For common parameter descriptions, see *Common parameters for nppiFilterGradientVectorSobelBorder functions:*.

NppStatus **nppiGradientVectorSobelBorder_32f_C3C1R_Ctx**(const *Npp32f* *pSrc, int nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp32f* *pDstX, int nDstXStep, *Npp32f* *pDstY, int nDstYStep, *Npp32f* *pDstMag, int nDstMagStep, *Npp32f* *pDstAngle, int nDstAngleStep, *NppiSize* oSizeROI, *NppiMaskSize* eMaskSize, *NppiNorm* eNorm, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

3 channel 32-bit floating point packed RGB to optional 1 channel 32-bit floating point X (vertical), Y (horizontal), magnitude, and/or 32-bit floating point angle gradient vectors with user selectable fixed mask size and distance method with border control.

For common parameter descriptions, see *Common parameters for nppiFilterGradientVectorSobelBorder functions:*.

1.10.6. Computer Vision Filtering Functions

1.10.6.1 Computer Vision

The set of computer vision functions available in the library.

1.10.6.2 Image Filter Distance Transform

1.10.6.2.1 FilterDistanceTransform

Performs Exact Euclidean Distance Transform function using the Parallel Banding Algorithm (PBA+) defined by Tiow-Seng Tan, et al paper named "Parallel Banding Algorithm to Compute Exact Distance Transform with the GPU" published dated August 8, 2019.

Output for these functions is an optional 16-bit signed integer voronoi diagram (pairs of signed 16 bit integer x, y distance values) and/or an optional true euclidean distance transform image generated from the internal voronoi diagram in either unsigned 16-bit truncated integer format or 32-bit floating point format. Additional optional output can include an signed 16-bit integer Voronoi diagram containing site indices and/or a signed 16-bit integer Voronoi diagram containing relative Manhattan distances to the closest sites. Minimum and maximum image ROI widths and heights are 64 and 32767.

Note that an input image that does not contain at least one site pixel is considered to be an invalid image. If you suspect that your input image may be invalid you can call an NPP function like nppiCountInRange() first to confirm that the image is valid before calling the distance transform function.

The nMinSiteValue and nMaxSiteValue parameters can be used to control which source image pixels are considered sites(traditionally 0) and non-sites (everything else).

Antialiased true distance transform, when available, is only available as double precision floating point (Npp64f) output data only and is enabled by setting the pAntialiasingDeviceBuffer pointer parameter to a non-NULL value.

The algorithm used for antialising is derived from the edtaa4 version from "Anti-aliased Euclidean distance transform" by Stefan Gustavson et. al. published in 2009 and is used under the permissions specified below.

Derived from edtaa4.c - compute the Euclidean distance transform of an image, with more accurate handling of 1 pixel wide anti-aliased edges.

This is a MEX-file for MATLAB. MATLAB is a product of The MathWorks, Inc.

Code in "edtaa4func.c" originally by Stefan Gustavson 1994, implemented from a verbal description in the PhD dissertation of Ingemar Ragnemalm, dept of EE, Linkoping University.

Modification to handle antialiased edges and this Matlab MEX wrapper by Stefan Gustavson, (stefan.gustavson@gmail.com) 2009-05-17

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Functions

NppStatus **nppiDistanceTransformPBAGetBufferSize**(*NppiSize* oSizeROI, size_t *hpBufferSize)

Calculate scratch buffer size needed for the DistanceTransformPBA function based on destination image SizeROI width and height.

Parameters

- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **hpBufferSize** – Required buffer size. Important: hpBufferSize is a *host pointer. Scratch Buffer and Host Pointer*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiDistanceTransformPBAGetAntialiasingBufferSize**(*NppiSize* oSizeROI, size_t *hpAntialiasingBufferSize)

Calculate scratch buffer size needed for the DistanceTransformPBA function antialiasing based on destination image SizeROI width and height.

Parameters

- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **hpAntialiasingBufferSize** – Optional buffer size. Important: hpAntialiasingBufferSize is a *host pointer. Scratch Buffer and Host Pointer*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiSignedDistanceTransformPBAGetBufferSize**(*NppiSize* oSizeROI, size_t *hpBufferSize)

Calculate scratch buffer size needed for the DistanceTransformPBA Antialiasing function based on destination image SizeROI width and height.

Parameters

- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **hpBufferSize** – Required buffer size. Important: hpBufferSize is a *host pointer. Scratch Buffer and Host Pointer*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiSignedDistanceTransformPBAGet64fBufferSize**(*NppiSize* oSizeROI, size_t *hpBufferSize)

Calculate scratch buffer size needed for the SignedDistanceTransformPBA function when transform output data type is Npp64f based on destination image SizeROI width and height.

Parameters

- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **hpBufferSize** – Required buffer size. Important: hpBufferSize is a *host pointer. Scratch Buffer and Host Pointer*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiSignedDistanceTransformPBAGetAntialiasingBufferSize**(*NppiSize* oSizeROI, size_t *hpAntialiasingBufferSize)

Calculate scratch buffer size needed for the SignedDistanceTransformPBA function antialiasing based on destination image SizeROI width and height.

Parameters

- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **hpAntialiasingBufferSize** – Optional buffer size. Important: hpAntialiasingBufferSize is a *host pointer.* *Scratch Buffer and Host Pointer*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiDistanceTransformPBA_8u16u_C1R_Ctx**(*Npp8u* *pSrc, int nSrcStep, *Npp8u* nMinSiteValue, *Npp8u* nMaxSiteValue, *Npp16s* *pDstVoronoi, int nDstVoronoiStep, *Npp16s* *pDstVoronoiIndices, int nDstVoronoiIndicesStep, *Npp16s* *pDstVoronoiRelativeManhattanDistances, int nDstVoronoiRelativeManhattanDistancesStep, *Npp16u* *pDstTransform, int nDstTransformStep, *NppiSize* oSizeROI, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

1 channel 8-bit unsigned grayscale to optional 1 channel 16-bit signed integer euclidean distance voronoi diagram output and/or optional unsigned 16-bit truncated integer transform with optional relative Manhattan distances.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **nMinSiteValue** – source image pixel values >= nMinSiteValue and <= nMaxSiteValue are considered sites (traditionally 0s).
- **nMaxSiteValue** – source image pixel values >= nMinSiteValue and <= nMaxSiteValue are considered sites (traditionally 0s).
- **pDstVoronoi** – device memory voronoi diagram destination_image_pointer or NULL for no voronoi output.
- **nDstVoronoiStep** – voronoi destination_image_line_step (must be at least oSizeROI.width * 2 * sizeof(Npp16s)).
- **pDstVoronoiIndices** – device memory voronoi diagram destination_image_pointer or NULL for no voronoi indices output.

- **nDstVoronoiIndicesStep** – voronoi indices destination_image_line_step (must be at least oSizeROI.width * 2 * sizeof(Npp16s)).
- **pDstVoronoiRelativeManhattanDistances** – device memory voronoi relative Manhattan distances destination_image_pointer or NULL for no voronoi Manhattan output.
- **nDstVoronoiRelativeManhattanDistancesStep** – voronoi Manhattan destination_image_line_step (must be at least oSizeROI.width * 2 * sizeof(Npp16s)).
- **pDstTransform** – device memory true euclidean distance transform destination_image_pointer or NULL for no transform output.
- **nDstTransformStep** – true euclidean distance transform destination_image_line_step (must be at least oSizeROI.width * sizeof(Npp16u)).
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **pDeviceBuffer** – pointer to scratch DEVICE memory buffer of size hpBufferSize (see *nppiDistanceTransformPBAGetBufferSize()* above)
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiDistanceTransformAbsPBA_8u16u_C1R_Ctx**(*Npp8u* *pSrc, int nSrcStep, *Npp8u* nMinSiteValue, *Npp8u* nMaxSiteValue, *Npp16s* *pDstVoronoi, int nDstVoronoiStep, *Npp16s* *pDstVoronoiIndices, int nDstVoronoiIndicesStep, *Npp16u* *pDstVoronoiAbsoluteManhattanDistances, int nDstVoronoiAbsoluteManhattanDistancesStep, *Npp16u* *pDstTransform, int nDstTransformStep, *NppiSize* oSizeROI, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

1 channel 8-bit unsigned grayscale to optional 1 channel 16-bit signed integer euclidean distance voronoi diagram output and/or optional unsigned 16-bit truncated integer transform with optional absolute Manhattan distances.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **nMinSiteValue** – source image pixel values >= nMinSiteValue and <= nMaxSiteValue are considered sites (traditionally 0s).
- **nMaxSiteValue** – source image pixel values >= nMinSiteValue and <= nMaxSiteValue are considered sites (traditionally 0s).
- **pDstVoronoi** – device memory voronoi diagram destination_image_pointer or NULL for no voronoi output.
- **nDstVoronoiStep** – voronoi destination_image_line_step (must be at least oSizeROI.width * 2 * sizeof(Npp16s)).

- **pDstVoronoiIndices** – device memory voronoi diagram destination_image_pointer or NULL for no voronoi indices output.
- **nDstVoronoiIndicesStep** – voronoi indices destination_image_line_step (must be at least oSizeROI.width * 2 * sizeof(Npp16s)).
- **pDstVoronoiAbsoluteManhattanDistances** – device memory voronoi absolute Manhattan distances destination_image_pointer or NULL for no voronoi Manhattan output.
- **nDstVoronoiAbsoluteManhattanDistancesStep** – voronoi Manhattan destination_image_line_step (must be at least oSizeROI.width * 2 * sizeof(Npp16s)).
- **pDstTransform** – device memory true euclidean distance transform destination_image_pointer or NULL for no transform output.
- **nDstTransformStep** – true euclidean distance transform destination_image_line_step (must be at least oSizeROI.width * sizeof(Npp16u)).
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **pDeviceBuffer** – pointer to scratch DEVICE memory buffer of size hpBufferSize (see *nppiDistanceTransformPBAGetBufferSize()* above)
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiDistanceTransformPBA_8s16u_C1R_Ctx**(*Npp8s* *pSrc, int nSrcStep, *Npp8s* nMinSiteValue, *Npp8s* nMaxSiteValue, *Npp16s* *pDstVoronoi, int nDstVoronoiStep, *Npp16s* *pDstVoronoiIndices, int nDstVoronoiIndicesStep, *Npp16s* *pDstVoronoiRelativeManhattanDistances, int nDstVoronoiRelativeManhattanDistancesStep, *Npp16u* *pDstTransform, int nDstTransformStep, *NppiSize* oSizeROI, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

1 channel 8-bit signed grayscale to optional 1 channel 16-bit signed integer euclidean distance voronoi diagram output and/or optional unsigned 16-bit truncated integer transform with optional relative Manhattan distances.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **nMinSiteValue** – signed source image pixel values >= nMinSiteValue and <= nMaxSiteValue are considered sites (traditionally 0s).
- **nMaxSiteValue** – signed source image pixel values >= nMinSiteValue and <= nMaxSiteValue are considered sites (traditionally 0s).
- **pDstVoronoi** – device memory voronoi diagram destination_image_pointer or NULL for no voronoi output.

- **nDstVoronoiStep** – voronoi destination_image_line_step (must be at least oSizeROI.width * 2 * sizeof(Npp16s)).
- **pDstVoronoiIndices** – device memory voronoi diagram destination_image_pointer or NULL for no voronoi indices output.
- **nDstVoronoiIndicesStep** – voronoi indices destination_image_line_step (must be at least oSizeROI.width * 2 * sizeof(Npp16s)).
- **pDstVoronoiRelativeManhattanDistances** – device memory voronoi relative Manhattan distances destination_image_pointer or NULL for no voronoi Manhattan output.
- **nDstVoronoiRelativeManhattanDistancesStep** – voronoi Manhattan destination_image_line_step (must be at least oSizeROI.width * 2 * sizeof(Npp16s)).
- **pDstTransform** – device memory true euclidean distance transform destination_image_pointer or NULL for no transform output.
- **nDstTransformStep** – true euclidean distance transform destination_image_line_step (must be at least oSizeROI.width * sizeof(Npp16u)).
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **pDeviceBuffer** – pointer to scratch DEVICE memory buffer of size hpBufferSize (see *nppiDistanceTransformPBAGetBufferSize()* above)
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiDistanceTransformAbsPBA_8s16u_C1R_Ctx**(*Npp8s* *pSrc, int nSrcStep, *Npp8s* nMinSiteValue, *Npp8s* nMaxSiteValue, *Npp16s* *pDstVoronoi, int nDstVoronoiStep, *Npp16s* *pDstVoronoiIndices, int nDstVoronoiIndicesStep, *Npp16u* *pDstVoronoiAbsoluteManhattanDistances, int nDstVoronoiAbsoluteManhattanDistancesStep, *Npp16u* *pDstTransform, int nDstTransformStep, *NppiSize* oSizeROI, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

1 channel 8-bit signed grayscale to optional 1 channel 16-bit signed integer euclidean distance voronoi diagram output and/or optional unsigned 16-bit truncated integer transform with optional absolute Manhattan distances.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **nMinSiteValue** – signed source image pixel values >= nMinSiteValue and <= nMaxSiteValue are considered sites (traditionally 0s).
- **nMaxSiteValue** – signed source image pixel values >= nMinSiteValue and <= nMaxSiteValue are considered sites (traditionally 0s).

- **pDstVoronoi** – device memory voronoi diagram destination_image_pointer or NULL for no voronoi output.
- **nDstVoronoiStep** – voronoi destination_image_line_step (must be at least oSizeROI.width * 2 * sizeof(Npp16s)).
- **pDstVoronoiIndices** – device memory voronoi diagram destination_image_pointer or NULL for no voronoi indices output.
- **nDstVoronoiIndicesStep** – voronoi indices destination_image_line_step (must be at least oSizeROI.width * 2 * sizeof(Npp16s)).
- **pDstVoronoiAbsoluteManhattanDistances** – device memory voronoi absolute Manhattan distances destination_image_pointer or NULL for no voronoi Manhattan output.
- **nDstVoronoiAbsoluteManhattanDistancesStep** – voronoi Manhattan destination_image_line_step (must be at least oSizeROI.width * 2 * sizeof(Npp16s)).
- **pDstTransform** – device memory true euclidean distance transform destination_image_pointer or NULL for no transform output.
- **nDstTransformStep** – true euclidean distance transform destination_image_line_step (must be at least oSizeROI.width * sizeof(Npp16u)).
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **pDeviceBuffer** – pointer to scratch DEVICE memory buffer of size hpBufferSize (see *nppiDistanceTransformPBAGetBufferSize()* above)
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiDistanceTransformPBA_16u16u_C1R_Ctx**(*Npp16u* *pSrc, int nSrcStep, *Npp16u* nMinSiteValue, *Npp16u* nMaxSiteValue, *Npp16s* *pDstVoronoi, int nDstVoronoiStep, *Npp16s* *pDstVoronoiIndices, int nDstVoronoiIndicesStep, *Npp16s* *pDstVoronoiRelativeManhattanDistances, int nDstVoronoiRelativeManhattanDistancesStep, *Npp16u* *pDstTransform, int nDstTransformStep, *NppiSize* oSizeROI, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

1 channel 16-bit unsigned grayscale to optional 1 channel 16-bit signed integer euclidean distance voronoi diagram output and/or optional unsigned 16-bit truncated integer transform with optional relative Manhattan distances.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **nMinSiteValue** – source image pixel values >= nMinSiteValue and <= nMaxSiteValue are considered sites (traditionally 0s).

- **nMaxSiteValue** – source image pixel values >= nMinSiteValue and <= nMaxSiteValue are considered sites (traditionally 0s).
- **pDstVoronoi** – device memory voronoi diagram destination_image_pointer or NULL for no voronoi output.
- **nDstVoronoiStep** – voronoi destination_image_line_step (must be at least oSizeROI.width * 2 * sizeof(Npp16s)).
- **pDstVoronoiIndices** – device memory voronoi diagram destination_image_pointer or NULL for no voronoi indices output.
- **nDstVoronoiIndicesStep** – voronoi indices destination_image_line_step (must be at least oSizeROI.width * 2 * sizeof(Npp16s)).
- **pDstVoronoiRelativeManhattanDistances** – device memory voronoi relative Manhattan distances destination_image_pointer or NULL for no voronoi Manhattan output.
- **nDstVoronoiRelativeManhattanDistancesStep** – voronoi Manhattan destination_image_line_step (must be at least oSizeROI.width * 2 * sizeof(Npp16s)).
- **pDstTransform** – device memory true euclidean distance transform destination_image_pointer or NULL for no transform output.
- **nDstTransformStep** – true euclidean distance transform destination_image_line_step (must be at least oSizeROI.width * sizeof(Npp16u)).
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **pDeviceBuffer** – pointer to scratch DEVICE memory buffer of size hpBufferSize (see *nppiDistanceTransformPBAGetBufferSize()* above)
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiDistanceTransformAbsPBA_16u16u_C1R_Ctx**(*Npp16u* *pSrc, int nSrcStep, *Npp16u* nMinSiteValue, *Npp16u* nMaxSiteValue, *Npp16s* *pDstVoronoi, int nDstVoronoiStep, *Npp16s* *pDstVoronoiIndices, int nDstVoronoiIndicesStep, *Npp16u* *pDstVoronoiAbsoluteManhattanDistances, int nDstVoronoiAbsoluteManhattanDistancesStep, *Npp16u* *pDstTransform, int nDstTransformStep, *NppiSize* oSizeROI, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

1 channel 16-bit unsigned grayscale to optional 1 channel 16-bit signed integer euclidean distance voronoi diagram output and/or optional unsigned 16-bit truncated integer transform with optional absolute Manhattan distances.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **nMinSiteValue** – source image pixel values >= nMinSiteValue and <= nMaxSiteValue are considered sites (traditionally 0s).
- **nMaxSiteValue** – source image pixel values >= nMinSiteValue and <= nMaxSiteValue are considered sites (traditionally 0s).
- **pDstVoronoi** – device memory voronoi diagram destination_image_pointer or NULL for no voronoi output.
- **nDstVoronoiStep** – voronoi destination_image_line_step (must be at least oSizeROI.width * 2 * sizeof(Npp16s)).
- **pDstVoronoiIndices** – device memory voronoi diagram destination_image_pointer or NULL for no voronoi indices output.
- **nDstVoronoiIndicesStep** – voronoi indices destination_image_line_step (must be at least oSizeROI.width * 2 * sizeof(Npp16s)).
- **pDstVoronoiAbsoluteManhattanDistances** – device memory voronoi absolute Manhattan distances destination_image_pointer or NULL for no voronoi Manhattan output.
- **nDstVoronoiAbsoluteManhattanDistancesStep** – voronoi Manhattan destination_image_line_step (must be at least oSizeROI.width * 2 * sizeof(Npp16s)).
- **pDstTransform** – device memory true euclidean distance transform destination_image_pointer or NULL for no transform output.
- **nDstTransformStep** – true euclidean distance transform destination_image_line_step (must be at least oSizeROI.width * sizeof(Npp16u)).
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **pDeviceBuffer** – pointer to scratch DEVICE memory buffer of size hpBufferSize (see *nppiDistanceTransformPBAGetBufferSize()* above)
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiDistanceTransformPBA_16s16u_C1R_Ctx**(*Npp16s* *pSrc, int nSrcStep, *Npp16s* nMinSiteValue, *Npp16s* nMaxSiteValue, *Npp16s* *pDstVoronoi, int nDstVoronoiStep, *Npp16s* *pDstVoronoiIndices, int nDstVoronoiIndicesStep, *Npp16s* *pDstVoronoiRelativeManhattanDistances, int nDstVoronoiRelativeManhattanDistancesStep, *Npp16u* *pDstTransform, int nDstTransformStep, *NppiSize* oSizeROI, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

1 channel 16-bit signed grayscale to optional 1 channel 16-bit signed integer euclidean distance voronoi diagram output and/or optional unsigned 16-bit truncated integer transform with optional relative Manhattan distances.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **nMinSiteValue** – signed source image pixel values >= nMinSiteValue and <= nMaxSiteValue are considered sites (traditionally 0s).
- **nMaxSiteValue** – signed source image pixel values >= nMinSiteValue and <= nMaxSiteValue are considered sites (traditionally 0s).
- **pDstVoronoi** – device memory voronoi diagram destination_image_pointer or NULL for no voronoi output.
- **nDstVoronoiStep** – voronoi destination_image_line_step (must be at least oSizeROI.width * 2 * sizeof(Npp16s)).
- **pDstVoronoiIndices** – device memory voronoi diagram destination_image_pointer or NULL for no voronoi indices output.
- **nDstVoronoiIndicesStep** – voronoi indices destination_image_line_step (must be at least oSizeROI.width * 2 * sizeof(Npp16s)).
- **pDstVoronoiRelativeManhattanDistances** – device memory voronoi relative Manhattan distances destination_image_pointer or NULL for no voronoi Manhattan output.
- **nDstVoronoiRelativeManhattanDistancesStep** – voronoi Manhattan destination_image_line_step (must be at least oSizeROI.width * 2 * sizeof(Npp16s)).
- **pDstTransform** – device memory true euclidean distance transform destination_image_pointer or NULL for no transform output.
- **nDstTransformStep** – true euclidean distance transform destination_image_line_step (must be at least oSizeROI.width * sizeof(Npp16u)).
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **pDeviceBuffer** – pointer to scratch DEVICE memory buffer of size hpBufferSize (see *nppiDistanceTransformPBAGetBufferSize()* above)
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiDistanceTransformAbsPBA_16s16u_C1R_Ctx**(*Npp16s* *pSrc, int nSrcStep, *Npp16s* nMinSiteValue, *Npp16s* nMaxSiteValue, *Npp16s* *pDstVoronoi, int nDstVoronoiStep, *Npp16s* *pDstVoronoiIndices, int nDstVoronoiIndicesStep, *Npp16u* *pDstVoronoiAbsoluteManhattanDistances, int nDstVoronoiAbsoluteManhattanDistancesStep, *Npp16u* *pDstTransform, int nDstTransformStep, *NppiSize* oSizeROI, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

1 channel 16-bit signed grayscale to optional 1 channel 16-bit signed integer euclidean distance voronoi diagram output and/or optional unsigned 16-bit truncated integer transform with absolute Manhattan distances.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **nMinSiteValue** – signed source image pixel values >= nMinSiteValue and <= nMaxSiteValue are considered sites (traditionally 0s).
- **nMaxSiteValue** – signed source image pixel values >= nMinSiteValue and <= nMaxSiteValue are considered sites (traditionally 0s).
- **pDstVoronoi** – device memory voronoi diagram destination_image_pointer or NULL for no voronoi output.
- **nDstVoronoiStep** – voronoi destination_image_line_step (must be at least oSizeROI.width * 2 * sizeof(Npp16s)).
- **pDstVoronoiIndices** – device memory voronoi diagram destination_image_pointer or NULL for no voronoi indices output.
- **nDstVoronoiIndicesStep** – voronoi indices destination_image_line_step (must be at least oSizeROI.width * 2 * sizeof(Npp16s)).
- **pDstVoronoiAbsoluteManhattanDistances** – device memory voronoi absolute Manhattan distances destination_image_pointer or NULL for no voronoi Manhattan output.
- **nDstVoronoiAbsoluteManhattanDistancesStep** – voronoi Manhattan destination_image_line_step (must be at least oSizeROI.width * 2 * sizeof(Npp16s)).
- **pDstTransform** – device memory true euclidean distance transform destination_image_pointer or NULL for no transform output.
- **nDstTransformStep** – true euclidean distance transform destination_image_line_step (must be at least oSizeROI.width * sizeof(Npp16u)).
- **oSizeROI** – *Region-Of-Interest (ROI)*.

- **pDeviceBuffer** – pointer to scratch DEVICE memory buffer of size hpBufferSize (see *nppiDistanceTransformPBAGetBufferSize()* above)
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiDistanceTransformPBA_8u32f_C1R_Ctx**(*Npp8u* *pSrc, int nSrcStep, *Npp8u* nMinSiteValue, *Npp8u* nMaxSiteValue, *Npp16s* *pDstVoronoi, int nDstVoronoiStep, *Npp16s* *pDstVoronoiIndices, int nDstVoronoiIndicesStep, *Npp16s* *pDstVoronoiRelativeManhattanDistances, int nDstVoronoiRelativeManhattanDistancesStep, *Npp32f* *pDstTransform, int nDstTransformStep, *NppiSize* oSizeROI, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

1 channel 8-bit unsigned grayscale to optional 1 channel 16-bit signed integer euclidean distance voronoi diagram output and/or optional 32-bit floating point transform with optional relative Manhattan distances.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **nMinSiteValue** – source image pixel values >= nMinSiteValue and <= nMaxSiteValue are considered sites (traditionally 0s).
- **nMaxSiteValue** – source image pixel values >= nMinSiteValue and <= nMaxSiteValue are considered sites (traditionally 0s).
- **pDstVoronoi** – device memory voronoi diagram destination_image_pointer or NULL for no voronoi output.
- **nDstVoronoiStep** – voronoi destination_image_line_step (must be at least oSizeROI.width * 2 * sizeof(Npp16s)).
- **pDstVoronoiIndices** – device memory voronoi diagram destination_image_pointer or NULL for no voronoi indices output.
- **nDstVoronoiIndicesStep** – voronoi indices destination_image_line_step (must be at least oSizeROI.width * 2 * sizeof(Npp16s)).
- **pDstVoronoiRelativeManhattanDistances** – device memory voronoi relative Manhattan distances destination_image_pointer or NULL for no voronoi Manhattan output.
- **nDstVoronoiRelativeManhattanDistancesStep** – voronoi Manhattan destination_image_line_step (must be at least oSizeROI.width * 2 * sizeof(Npp16s)).
- **pDstTransform** – device memory true euclidean distance transform destination_image_pointer or NULL for no transform output.
- **nDstTransformStep** – true euclidean distance transform destination_image_line_step (must be at least oSizeROI.width * sizeof(Npp32f)).

- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **pDeviceBuffer** – pointer to scratch DEVICE memory buffer of size hpBufferSize (see *nppiDistanceTransformPBAGetBufferSize()* above)
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiDistanceTransformAbsPBA_8u32f_C1R_Ctx**(*Npp8u* *pSrc, int nSrcStep, *Npp8u* nMinSiteValue, *Npp8u* nMaxSiteValue, *Npp16s* *pDstVoronoi, int nDstVoronoiStep, *Npp16s* *pDstVoronoiIndices, int nDstVoronoiIndicesStep, *Npp16u* *pDstVoronoiAbsoluteManhattanDistances, int nDstVoronoiAbsoluteManhattanDistancesStep, *Npp32f* *pDstTransform, int nDstTransformStep, *NppiSize* oSizeROI, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

1 channel 8-bit unsigned grayscale to optional 1 channel 16-bit signed integer euclidean distance voronoi diagram output and/or optional 32-bit floating point transform with optional absolute Manhattan distances.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **nMinSiteValue** – source image pixel values >= nMinSiteValue and <= nMaxSiteValue are considered sites (traditionally 0s).
- **nMaxSiteValue** – source image pixel values >= nMinSiteValue and <= nMaxSiteValue are considered sites (traditionally 0s).
- **pDstVoronoi** – device memory voronoi diagram destination_image_pointer or NULL for no voronoi output.
- **nDstVoronoiStep** – voronoi destination_image_line_step (must be at least oSizeROI.width * 2 * sizeof(Npp16s)).
- **pDstVoronoiIndices** – device memory voronoi diagram destination_image_pointer or NULL for no voronoi indices output.
- **nDstVoronoiIndicesStep** – voronoi indices destination_image_line_step (must be at least oSizeROI.width * 2 * sizeof(Npp16s)).
- **pDstVoronoiAbsoluteManhattanDistances** – device memory voronoi absolute Manhattan distances destination_image_pointer or NULL for no voronoi Manhattan output.
- **nDstVoronoiAbsoluteManhattanDistancesStep** – voronoi Manhattan destination_image_line_step (must be at least oSizeROI.width * 2 * sizeof(Npp16s)).
- **pDstTransform** – device memory true euclidean distance transform destination_image_pointer or NULL for no transform output.

- **nDstTransformStep** – true euclidean distance transform destination_image_line_step (must be at least oSizeROI.width * sizeof(Npp32f)).
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **pDeviceBuffer** – pointer to scratch DEVICE memory buffer of size hpBufferSize (see *nppiDistanceTransformPBAGetBufferSize()* above)
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiDistanceTransformPBA_8s32f_C1R_Ctx**(*Npp8s* *pSrc, int nSrcStep, *Npp8s* nMinSiteValue, *Npp8s* nMaxSiteValue, *Npp16s* *pDstVoronoi, int nDstVoronoiStep, *Npp16s* *pDstVoronoiIndices, int nDstVoronoiIndicesStep, *Npp16s* *pDstVoronoiRelativeManhattanDistances, int nDstVoronoiRelativeManhattanDistancesStep, *Npp32f* *pDstTransform, int nDstTransformStep, *NppiSize* oSizeROI, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

1 channel 8-bit signed grayscale to optional 1 channel 16-bit signed integer euclidean distance voronoi diagram output and/or optional 32-bit floating point transform with optional relative Manhattan distances.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **nMinSiteValue** – signed source image pixel values >= nMinSiteValue and <= nMaxSiteValue are considered sites (traditionally 0s).
- **nMaxSiteValue** – signed source image pixel values >= nMinSiteValue and <= nMaxSiteValue are considered sites (traditionally 0s).
- **pDstVoronoi** – device memory voronoi diagram destination_image_pointer or NULL for no voronoi output.
- **nDstVoronoiStep** – voronoi destination_image_line_step (must be at least oSizeROI.width * 2 * sizeof(Npp16s)).
- **pDstVoronoiIndices** – device memory voronoi diagram destination_image_pointer or NULL for no voronoi indices output.
- **nDstVoronoiIndicesStep** – voronoi indices destination_image_line_step (must be at least oSizeROI.width * 2 * sizeof(Npp16s)).
- **pDstVoronoiRelativeManhattanDistances** – device memory voronoi relative Manhattan distances destination_image_pointer or NULL for no voronoi Manhattan output.
- **nDstVoronoiRelativeManhattanDistancesStep** – voronoi Manhattan destination_image_line_step (must be at least oSizeROI.width * 2 * sizeof(Npp16s)).

- **pDstTransform** – device memory true euclidean distance transform destination_image_pointer or NULL for no transform output.
- **nDstTransformStep** – true euclidean distance transform destination_image_line_step (must be at least oSizeROI.width * sizeof(Npp32f)).
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **pDeviceBuffer** – pointer to scratch DEVICE memory buffer of size hpBufferSize (see *nppiDistanceTransformPBAGetBufferSize()* above)
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiDistanceTransformAbsPBA_8s32f_C1R_Ctx**(*Npp8s* *pSrc, int nSrcStep, *Npp8s* nMinSiteValue, *Npp8s* nMaxSiteValue, *Npp16s* *pDstVoronoi, int nDstVoronoiStep, *Npp16s* *pDstVoronoiIndices, int nDstVoronoiIndicesStep, *Npp16u* *pDstVoronoiAbsoluteManhattanDistances, int nDstVoronoiAbsoluteManhattanDistancesStep, *Npp32f* *pDstTransform, int nDstTransformStep, *NppiSize* oSizeROI, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

1 channel 8-bit signed grayscale to optional 1 channel 16-bit signed integer euclidean distance voronoi diagram output and/or optional 32-bit floating point transform with optional absolute Manhattan distances.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **nMinSiteValue** – signed source image pixel values >= nMinSiteValue and <= nMaxSiteValue are considered sites (traditionally 0s).
- **nMaxSiteValue** – signed source image pixel values >= nMinSiteValue and <= nMaxSiteValue are considered sites (traditionally 0s).
- **pDstVoronoi** – device memory voronoi diagram destination_image_pointer or NULL for no voronoi output.
- **nDstVoronoiStep** – voronoi destination_image_line_step (must be at least oSizeROI.width * 2 * sizeof(Npp16s)).
- **pDstVoronoiIndices** – device memory voronoi diagram destination_image_pointer or NULL for no voronoi indices output.
- **nDstVoronoiIndicesStep** – voronoi indices destination_image_line_step (must be at least oSizeROI.width * 2 * sizeof(Npp16s)).
- **pDstVoronoiAbsoluteManhattanDistances** – device memory voronoi absolute Manhattan distances destination_image_pointer or NULL for no voronoi Manhattan output.

- **nDstVoronoiAbsoluteManhattanDistancesStep** – voronoi Manhattan destination_image_line_step (must be at least oSizeROI.width * 2 * sizeof(Npp16s)).
- **pDstTransform** – device memory true euclidean distance transform destination_image_pointer or NULL for no transform output.
- **nDstTransformStep** – true euclidean distance transform destination_image_line_step (must be at least oSizeROI.width * sizeof(Npp32f)).
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **pDeviceBuffer** – pointer to scratch DEVICE memory buffer of size hpBufferSize (see *nppiDistanceTransformPBAGetBufferSize()* above)
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiDistanceTransformPBA_16u32f_C1R_Ctx**(*Npp16u* *pSrc, int nSrcStep, *Npp16u* nMinSiteValue, *Npp16u* nMaxSiteValue, *Npp16s* *pDstVoronoi, int nDstVoronoiStep, *Npp16s* *pDstVoronoiIndices, int nDstVoronoiIndicesStep, *Npp16s* *pDstVoronoiRelativeManhattanDistances, int nDstVoronoiRelativeManhattanDistancesStep, *Npp32f* *pDstTransform, int nDstTransformStep, *NppiSize* oSizeROI, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

1 channel 16-bit unsigned grayscale to optional 1 channel 16-bit signed integer euclidean distance voronoi diagram output and/or optional 32-bit floating point transform with optional relative Manhattan distances.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **nMinSiteValue** – source image pixel values >= nMinSiteValue and <= nMaxSiteValue are considered sites (traditionally 0s).
- **nMaxSiteValue** – source image pixel values >= nMinSiteValue and <= nMaxSiteValue are considered sites (traditionally 0s).
- **pDstVoronoi** – device memory voronoi diagram destination_image_pointer or NULL for no voronoi output.
- **nDstVoronoiStep** – voronoi destination_image_line_step (must be at least oSizeROI.width * 2 * sizeof(Npp16s)).
- **pDstVoronoiIndices** – device memory voronoi diagram destination_image_pointer or NULL for no voronoi indices output.
- **nDstVoronoiIndicesStep** – voronoi indices destination_image_line_step (must be at least oSizeROI.width * 2 * sizeof(Npp16s)).

- **pDstVoronoiRelativeManhattanDistances** – device memory voronoi relative Manhattan distances destination_image_pointer or NULL for no voronoi Manhattan output.
- **nDstVoronoiRelativeManhattanDistancesStep** – voronoi Manhattan destination_image_line_step (must be at least oSizeROI.width * 2 * sizeof(Npp16s)).
- **pDstTransform** – device memory true euclidean distance transform destination_image_pointer or NULL for no transform output.
- **nDstTransformStep** – true euclidean distance transform destination_image_line_step (must be at least oSizeROI.width * sizeof(Npp32f)).
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **pDeviceBuffer** – pointer to scratch DEVICE memory buffer of size hpBufferSize (see *nppiDistanceTransformPBAGetBufferSize()* above)
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiDistanceTransformAbsPBA_16u32f_C1R_Ctx**(*Npp16u* *pSrc, int nSrcStep, *Npp16u* nMinSiteValue, *Npp16u* nMaxSiteValue, *Npp16s* *pDstVoronoi, int nDstVoronoiStep, *Npp16s* *pDstVoronoiIndices, int nDstVoronoiIndicesStep, *Npp16u* *pDstVoronoiAbsoluteManhattanDistances, int nDstVoronoiAbsoluteManhattanDistancesStep, *Npp32f* *pDstTransform, int nDstTransformStep, *NppiSize* oSizeROI, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

1 channel 16-bit unsigned grayscale to optional 1 channel 16-bit signed integer euclidean distance voronoi diagram output and/or optional 32-bit floating point transform with optional absolute Manhattan distances.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **nMinSiteValue** – source image pixel values >= nMinSiteValue and <= nMaxSiteValue are considered sites (traditionally 0s).
- **nMaxSiteValue** – source image pixel values >= nMinSiteValue and <= nMaxSiteValue are considered sites (traditionally 0s).
- **pDstVoronoi** – device memory voronoi diagram destination_image_pointer or NULL for no voronoi output.
- **nDstVoronoiStep** – voronoi destination_image_line_step (must be at least oSizeROI.width * 2 * sizeof(Npp16s)).

- **pDstVoronoiIndices** – device memory voronoi diagram destination_image_pointer or NULL for no voronoi indices output.
- **nDstVoronoiIndicesStep** – voronoi indices destination_image_line_step (must be at least oSizeROI.width * 2 * sizeof(Npp16s)).
- **pDstVoronoiAbsoluteManhattanDistances** – device memory voronoi absolute Manhattan distances destination_image_pointer or NULL for no voronoi Manhattan output.
- **nDstVoronoiAbsoluteManhattanDistancesStep** – voronoi Manhattan destination_image_line_step (must be at least oSizeROI.width * 2 * sizeof(Npp16s)).
- **pDstTransform** – device memory true euclidean distance transform destination_image_pointer or NULL for no transform output.
- **nDstTransformStep** – true euclidean distance transform destination_image_line_step (must be at least oSizeROI.width * sizeof(Npp32f)).
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **pDeviceBuffer** – pointer to scratch DEVICE memory buffer of size hpBufferSize (see *nppiDistanceTransformPBAGetBufferSize()* above)
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiDistanceTransformPBA_16s32f_C1R_Ctx**(*Npp16s* *pSrc, int nSrcStep, *Npp16s* nMinSiteValue, *Npp16s* nMaxSiteValue, *Npp16s* *pDstVoronoi, int nDstVoronoiStep, *Npp16s* *pDstVoronoiIndices, int nDstVoronoiIndicesStep, *Npp16s* *pDstVoronoiRelativeManhattanDistances, int nDstVoronoiRelativeManhattanDistancesStep, *Npp32f* *pDstTransform, int nDstTransformStep, *NppiSize* oSizeROI, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

1 channel 16-bit signed grayscale to optional 1 channel 16-bit signed integer euclidean distance voronoi diagram output and/or optional 32-bit floating point transform with optional relative Manhattan distances.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **nMinSiteValue** – signed source image pixel values >= nMinSiteValue and <= nMaxSiteValue are considered sites (traditionally 0s).
- **nMaxSiteValue** – signed source image pixel values >= nMinSiteValue and <= nMaxSiteValue are considered sites (traditionally 0s).
- **pDstVoronoi** – device memory voronoi diagram destination_image_pointer or NULL for no voronoi output.

- **nDstVoronoiStep** – voronoi destination_image_line_step (must be at least oSizeROI.width * 2 * sizeof(Npp16s)).
- **pDstVoronoiIndices** – device memory voronoi diagram destination_image_pointer or NULL for no voronoi indices output.
- **nDstVoronoiIndicesStep** – voronoi indices destination_image_line_step (must be at least oSizeROI.width * 2 * sizeof(Npp16s)).
- **pDstVoronoiRelativeManhattanDistances** – device memory voronoi relative Manhattan distances destination_image_pointer or NULL for no voronoi Manhattan output.
- **nDstVoronoiRelativeManhattanDistancesStep** – voronoi Manhattan destination_image_line_step (must be at least oSizeROI.width * 2 * sizeof(Npp16s)).
- **pDstTransform** – device memory true euclidean distance transform destination_image_pointer or NULL for no transform output.
- **nDstTransformStep** – true euclidean distance transform destination_image_line_step (must be at least oSizeROI.width * sizeof(Npp32f)).
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **pDeviceBuffer** – pointer to scratch DEVICE memory buffer of size hpBufferSize (see *nppiDistanceTransformPBAGetBufferSize()* above)
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiDistanceTransformAbsPBA_16s32f_C1R_Ctx**(*Npp16s* *pSrc, int nSrcStep, *Npp16s* nMinSiteValue, *Npp16s* nMaxSiteValue, *Npp16s* *pDstVoronoi, int nDstVoronoiStep, *Npp16s* *pDstVoronoiIndices, int nDstVoronoiIndicesStep, *Npp16u* *pDstVoronoiAbsoluteManhattanDistances, int nDstVoronoiAbsoluteManhattanDistancesStep, *Npp32f* *pDstTransform, int nDstTransformStep, *NppiSize* oSizeROI, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

1 channel 16-bit signed grayscale to optional 1 channel 16-bit signed integer euclidean distance voronoi diagram output and/or optional 32-bit floating point transform with optional absolute Manhattan distances.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **nMinSiteValue** – signed source image pixel values >= nMinSiteValue and <= nMaxSiteValue are considered sites (traditionally 0s).

- **nMaxSiteValue** – signed source image pixel values >= nMinSiteValue and <= nMaxSiteValue are considered sites (traditionally 0s).
- **pDstVoronoi** – device memory voronoi diagram destination_image_pointer or NULL for no voronoi output.
- **nDstVoronoiStep** – voronoi destination_image_line_step (must be at least oSizeROI.width * 2 * sizeof(Npp16s)).
- **pDstVoronoiIndices** – device memory voronoi diagram destination_image_pointer or NULL for no voronoi indices output.
- **nDstVoronoiIndicesStep** – voronoi indices destination_image_line_step (must be at least oSizeROI.width * 2 * sizeof(Npp16s)).
- **pDstVoronoiAbsoluteManhattanDistances** – device memory voronoi absolute Manhattan distances destination_image_pointer or NULL for no voronoi Manhattan output.
- **nDstVoronoiAbsoluteManhattanDistancesStep** – voronoi Manhattan destination_image_line_step (must be at least oSizeROI.width * 2 * sizeof(Npp16s)).
- **pDstTransform** – device memory true euclidean distance transform destination_image_pointer or NULL for no transform output.
- **nDstTransformStep** – true euclidean distance transform destination_image_line_step (must be at least oSizeROI.width * sizeof(Npp32f)).
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **pDeviceBuffer** – pointer to scratch DEVICE memory buffer of size hpBufferSize (see *nppiDistanceTransformPBAGetBufferSize()* above)
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiDistanceTransformPBA_8u64f_C1R_Ctx**(*Npp8u* *pSrc, int nSrcStep, *Npp8u* nMinSiteValue, *Npp8u* nMaxSiteValue, *Npp16s* *pDstVoronoi, int nDstVoronoiStep, *Npp16s* *pDstVoronoiIndices, int nDstVoronoiIndicesStep, *Npp16s* *pDstVoronoiRelativeManhattanDistances, int nDstVoronoiRelativeManhattanDistancesStep, *Npp64f* *pDstTransform, int nDstTransformStep, *NppiSize* oSizeROI, *Npp8u* *pDeviceBuffer, *Npp8u* *pAntialiasingDeviceBuffer, *NppStreamContext* nppStreamCtx)

1 channel 8-bit unsigned grayscale to optional 1 channel 16-bit signed integer euclidean distance voronoi diagram output and/or optional 64-bit floating point transform with optional relative Manhattan distances.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.

- **nMinSiteValue** – source image pixel values >= nMinSiteValue and <= nMaxSiteValue are considered sites (traditionally 0s).
- **nMaxSiteValue** – source image pixel values >= nMinSiteValue and <= nMaxSiteValue are considered sites (traditionally 0s).
- **pDstVoronoi** – device memory voronoi diagram destination_image_pointer or NULL for no voronoi output.
- **nDstVoronoiStep** – voronoi destination_image_line_step (must be at least oSizeROI.width * 2 * sizeof(Npp16s)).
- **pDstVoronoiIndices** – device memory voronoi diagram destination_image_pointer or NULL for no voronoi indices output.
- **nDstVoronoiIndicesStep** – voronoi indices destination_image_line_step (must be at least oSizeROI.width * 2 * sizeof(Npp16s)).
- **pDstVoronoiRelativeManhattanDistances** – device memory voronoi relative Manhattan distances destination_image_pointer or NULL for no voronoi Manhattan output.
- **nDstVoronoiRelativeManhattanDistancesStep** – voronoi Manhattan destination_image_line_step (must be at least oSizeROI.width * 2 * sizeof(Npp16s)).
- **pDstTransform** – device memory true euclidean distance transform destination_image_pointer or NULL for no transform output.
- **nDstTransformStep** – true euclidean distance transform destination_image_line_step (must be at least oSizeROI.width * sizeof(Npp64f)).
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **pDeviceBuffer** – pointer to scratch DEVICE memory buffer of size hpBufferSize (see *nppiDistanceTransformPBAGetBufferSize()* above)
- **pAntialiasingDeviceBuffer** – pointer to scratch DEVICE memory buffer of size hpAntialiasingBufferSize (see *nppiDistanceTransformPBAGetAntialiasingBufferSize()* above) or NULL if not Antialiasing
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiDistanceTransformAbsPBA_8u64f_C1R_Ctx**(*Npp8u* *pSrc, int nSrcStep, *Npp8u* nMinSiteValue, *Npp8u* nMaxSiteValue, *Npp16s* *pDstVoronoi, int nDstVoronoiStep, *Npp16s* *pDstVoronoiIndices, int nDstVoronoiIndicesStep, *Npp16u* *pDstVoronoiAbsoluteManhattanDistances, int nDstVoronoiAbsoluteManhattanDistancesStep, *Npp64f* *pDstTransform, int nDstTransformStep, *NppiSize* oSizeROI, *Npp8u* *pDeviceBuffer, *Npp8u* *pAntialiasingDeviceBuffer, *NppStreamContext* nppStreamCtx)

1 channel 8-bit unsigned grayscale to optional 1 channel 16-bit signed integer euclidean distance

voronoi diagram output and/or optional 64-bit floating point transform with optional absolute Manhattan distances.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **nMinSiteValue** – source image pixel values >= nMinSiteValue and <= nMaxSiteValue are considered sites (traditionally 0s).
- **nMaxSiteValue** – source image pixel values >= nMinSiteValue and <= nMaxSiteValue are considered sites (traditionally 0s).
- **pDstVoronoi** – device memory voronoi diagram destination_image_pointer or NULL for no voronoi output.
- **nDstVoronoiStep** – voronoi destination_image_line_step (must be at least oSizeROI.width * 2 * sizeof(Npp16s)).
- **pDstVoronoiIndices** – device memory voronoi diagram destination_image_pointer or NULL for no voronoi indices output.
- **nDstVoronoiIndicesStep** – voronoi indices destination_image_line_step (must be at least oSizeROI.width * 2 * sizeof(Npp16s)).
- **pDstVoronoiAbsoluteManhattanDistances** – device memory voronoi absolute Manhattan distances destination_image_pointer or NULL for no voronoi Manhattan output.
- **nDstVoronoiAbsoluteManhattanDistancesStep** – voronoi Manhattan destination_image_line_step (must be at least oSizeROI.width * 2 * sizeof(Npp16s)).
- **pDstTransform** – device memory true euclidean distance transform destination_image_pointer or NULL for no transform output.
- **nDstTransformStep** – true euclidean distance transform destination_image_line_step (must be at least oSizeROI.width * sizeof(Npp64f)).
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **pDeviceBuffer** – pointer to scratch DEVICE memory buffer of size hpBufferSize (see *nppiDistanceTransformPBAGetBufferSize()* above)
- **pAntialiasingDeviceBuffer** – pointer to scratch DEVICE memory buffer of size hpAntialiasingBufferSize (see *nppiDistanceTransformPBAGetAntialiasingBufferSize()* above) or NULL if not Antialiasing
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiDistanceTransformPBA_8s64f_C1R_Ctx**(*Npp8s* *pSrc, int nSrcStep, *Npp8s* nMinSiteValue, *Npp8s* nMaxSiteValue, *Npp16s* *pDstVoronoi, int nDstVoronoiStep, *Npp16s* *pDstVoronoiIndices, int nDstVoronoiIndicesStep, *Npp16s* *pDstVoronoiRelativeManhattanDistances, int nDstVoronoiRelativeManhattanDistancesStep, *Npp64f* *pDstTransform, int nDstTransformStep, *NppiSize* oSizeROI, *Npp8u* *pDeviceBuffer, *Npp8u* *pAntialiasingDeviceBuffer, *NppStreamContext* nppStreamCtx)

1 channel 8-bit signed grayscale to optional 1 channel 16-bit signed integer euclidean distance voronoi diagram output and/or optional 64-bit floating point transform with optional relative Manhattan distances.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **nMinSiteValue** – signed source image pixel values >= nMinSiteValue and <= nMaxSiteValue are considered sites (traditionally 0s).
- **nMaxSiteValue** – signed source image pixel values >= nMinSiteValue and <= nMaxSiteValue are considered sites (traditionally 0s).
- **pDstVoronoi** – device memory voronoi diagram destination_image_pointer or NULL for no voronoi output.
- **nDstVoronoiStep** – voronoi destination_image_line_step (must be at least oSizeROI.width * 2 * sizeof(Npp16s)).
- **pDstVoronoiIndices** – device memory voronoi diagram destination_image_pointer or NULL for no voronoi indices output.
- **nDstVoronoiIndicesStep** – voronoi indices destination_image_line_step (must be at least oSizeROI.width * 2 * sizeof(Npp16s)).
- **pDstVoronoiRelativeManhattanDistances** – device memory voronoi relative Manhattan distances destination_image_pointer or NULL for no voronoi Manhattan output.
- **nDstVoronoiRelativeManhattanDistancesStep** – voronoi Manhattan destination_image_line_step (must be at least oSizeROI.width * 2 * sizeof(Npp16s)).
- **pDstTransform** – device memory true euclidean distance transform destination_image_pointer or NULL for no transform output.
- **nDstTransformStep** – true euclidean distance transform destination_image_line_step (must be at least oSizeROI.width * sizeof(Npp64f)).
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **pDeviceBuffer** – pointer to scratch DEVICE memory buffer of size hpBufferSize (see *nppiDistanceTransformPBAGetBufferSize()* above)

- **pAntialiasingDeviceBuffer** – pointer to scratch DEVICE memory buffer of size hpAntialiasingBufferSize (see *nppiDistanceTransformPBAGetAntialiasingBufferSize()* above) or NULL if not Antialiasing
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiDistanceTransformAbsPBA_8s64f_C1R_Ctx**(*Npp8s* *pSrc, int nSrcStep, *Npp8s* nMinSiteValue, *Npp8s* nMaxSiteValue, *Npp16s* *pDstVoronoi, int nDstVoronoiStep, *Npp16s* *pDstVoronoiIndices, int nDstVoronoiIndicesStep, *Npp16u* *pDstVoronoiAbsoluteManhattanDistances, int nDstVoronoiAbsoluteManhattanDistancesStep, *Npp64f* *pDstTransform, int nDstTransformStep, *NppiSize* oSizeROI, *Npp8u* *pDeviceBuffer, *Npp8u* *pAntialiasingDeviceBuffer, *NppStreamContext* nppStreamCtx)

1 channel 8-bit signed grayscale to optional 1 channel 16-bit signed integer euclidean distance voronoi diagram output and/or optional 64-bit floating point transform with optional absolute Manhattan distances.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **nMinSiteValue** – signed source image pixel values >= nMinSiteValue and <= nMaxSiteValue are considered sites (traditionally 0s).
- **nMaxSiteValue** – signed source image pixel values >= nMinSiteValue and <= nMaxSiteValue are considered sites (traditionally 0s).
- **pDstVoronoi** – device memory voronoi diagram destination_image_pointer or NULL for no voronoi output.
- **nDstVoronoiStep** – voronoi destination_image_line_step (must be at least oSizeROI.width * 2 * sizeof(Npp16s)).
- **pDstVoronoiIndices** – device memory voronoi diagram destination_image_pointer or NULL for no voronoi indices output.
- **nDstVoronoiIndicesStep** – voronoi indices destination_image_line_step (must be at least oSizeROI.width * 2 * sizeof(Npp16s)).
- **pDstVoronoiAbsoluteManhattanDistances** – device memory voronoi absolute Manhattan distances destination_image_pointer or NULL for no voronoi Manhattan output.
- **nDstVoronoiAbsoluteManhattanDistancesStep** – voronoi Manhattan destination_image_line_step (must be at least oSizeROI.width * 2 * sizeof(Npp16s)).

- **pDstTransform** – device memory true euclidean distance transform destination_image_pointer or NULL for no transform output.
- **nDstTransformStep** – true euclidean distance transform destination_image_line_step (must be at least oSizeROI.width * sizeof(Npp64f)).
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **pDeviceBuffer** – pointer to scratch DEVICE memory buffer of size hpBufferSize (see *nppiDistanceTransformPBAGetBufferSize()* above)
- **pAntialiasingDeviceBuffer** – pointer to scratch DEVICE memory buffer of size hpAntialiasingBufferSize (see *nppiDistanceTransformPBAGetAntialiasingBufferSize()* above) or NULL if not Antialiasing
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiDistanceTransformPBA_16u64f_C1R_Ctx**(*Npp16u* *pSrc, int nSrcStep, *Npp16u* nMinSiteValue, *Npp16u* nMaxSiteValue, *Npp16s* *pDstVoronoi, int nDstVoronoiStep, *Npp16s* *pDstVoronoiIndices, int nDstVoronoiIndicesStep, *Npp16s* *pDstVoronoiRelativeManhattanDistances, int nDstVoronoiRelativeManhattanDistancesStep, *Npp64f* *pDstTransform, int nDstTransformStep, *NppiSize* oSizeROI, *Npp8u* *pDeviceBuffer, *Npp8u* *pAntialiasingDeviceBuffer, *NppStreamContext* nppStreamCtx)

1 channel 16-bit unsigned grayscale to optional 1 channel 16-bit signed integer euclidean distance voronoi diagram output and/or optional 64-bit floating point transform with optional relative Manhattan distances.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **nMinSiteValue** – source image pixel values >= nMinSiteValue and <= nMaxSiteValue are considered sites (traditionally 0s).
- **nMaxSiteValue** – source image pixel values >= nMinSiteValue and <= nMaxSiteValue are considered sites (traditionally 0s).
- **pDstVoronoi** – device memory voronoi diagram destination_image_pointer or NULL for no voronoi output.
- **nDstVoronoiStep** – voronoi destination_image_line_step (must be at least oSizeROI.width * 2 * sizeof(Npp16s)).
- **pDstVoronoiIndices** – device memory voronoi diagram destination_image_pointer or NULL for no voronoi indices output.
- **nDstVoronoiIndicesStep** – voronoi indices destination_image_line_step (must be at least oSizeROI.width * 2 * sizeof(Npp16s)).

- **pDstVoronoiRelativeManhattanDistances** – device memory voronoi relative Manhattan distances destination_image_pointer or NULL for no voronoi Manhattan output.
- **nDstVoronoiRelativeManhattanDistancesStep** – voronoi Manhattan destination_image_line_step (must be at least oSizeROI.width * 2 * sizeof(Npp16s)).
- **pDstTransform** – device memory true euclidean distance transform destination_image_pointer or NULL for no transform output.
- **nDstTransformStep** – true euclidean distance transform destination_image_line_step (must be at least oSizeROI.width * sizeof(Npp64f)).
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **pDeviceBuffer** – pointer to scratch DEVICE memory buffer of size hpBufferSize (see *nppiDistanceTransformPBAGetBufferSize()* above)
- **pAntialiasingDeviceBuffer** – pointer to scratch DEVICE memory buffer of size hpAntialiasingBufferSize (see *nppiDistanceTransformPBAGetAntialiasingBufferSize()* above) or NULL if not Antialiasing
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiDistanceTransformAbsPBA_16u64f_C1R_Ctx**(*Npp16u* *pSrc, int nSrcStep, *Npp16u* nMinSiteValue, *Npp16u* nMaxSiteValue, *Npp16s* *pDstVoronoi, int nDstVoronoiStep, *Npp16s* *pDstVoronoiIndices, int nDstVoronoiIndicesStep, *Npp16u* *pDstVoronoiAbsoluteManhattanDistances, int nDstVoronoiAbsoluteManhattanDistancesStep, *Npp64f* *pDstTransform, int nDstTransformStep, *NppiSize* oSizeROI, *Npp8u* *pDeviceBuffer, *Npp8u* *pAntialiasingDeviceBuffer, *NppStreamContext* nppStreamCtx)

1 channel 16-bit unsigned grayscale to optional 1 channel 16-bit signed integer euclidean distance voronoi diagram output and/or optional 64-bit floating point transform with optional absolute Manhattan distances.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **nMinSiteValue** – source image pixel values >= nMinSiteValue and <= nMaxSiteValue are considered sites (traditionally 0s).
- **nMaxSiteValue** – source image pixel values >= nMinSiteValue and <= nMaxSiteValue are considered sites (traditionally 0s).

- **pDstVoronoi** – device memory voronoi diagram destination_image_pointer or NULL for no voronoi output.
- **nDstVoronoiStep** – voronoi destination_image_line_step (must be at least oSizeROI.width * 2 * sizeof(Npp16s)).
- **pDstVoronoiIndices** – device memory voronoi diagram destination_image_pointer or NULL for no voronoi indices output.
- **nDstVoronoiIndicesStep** – voronoi indices destination_image_line_step (must be at least oSizeROI.width * 2 * sizeof(Npp16s)).
- **pDstVoronoiAbsoluteManhattanDistances** – device memory voronoi absolute Manhattan distances destination_image_pointer or NULL for no voronoi Manhattan output.
- **nDstVoronoiAbsoluteManhattanDistancesStep** – voronoi Manhattan destination_image_line_step (must be at least oSizeROI.width * 2 * sizeof(Npp16s)).
- **pDstTransform** – device memory true euclidean distance transform destination_image_pointer or NULL for no transform output.
- **nDstTransformStep** – true euclidean distance transform destination_image_line_step (must be at least oSizeROI.width * sizeof(Npp64f)).
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **pDeviceBuffer** – pointer to scratch DEVICE memory buffer of size hpBufferSize (see *nppiDistanceTransformPBAGetBufferSize()* above)
- **pAntialiasingDeviceBuffer** – pointer to scratch DEVICE memory buffer of size hpAntialiasingBufferSize (see *nppiDistanceTransformPBAGetAntialiasingBufferSize()* above) or NULL if not Antialiasing
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiDistanceTransformPBA_16s64f_C1R_Ctx**(*Npp16s* *pSrc, int nSrcStep, *Npp16s* nMinSiteValue, *Npp16s* nMaxSiteValue, *Npp16s* *pDstVoronoi, int nDstVoronoiStep, *Npp16s* *pDstVoronoiIndices, int nDstVoronoiIndicesStep, *Npp16s* *pDstVoronoiRelativeManhattanDistances, int nDstVoronoiRelativeManhattanDistancesStep, *Npp64f* *pDstTransform, int nDstTransformStep, *NppiSize* oSizeROI, *Npp8u* *pDeviceBuffer, *Npp8u* *pAntialiasingDeviceBuffer, *NppStreamContext* nppStreamCtx)

1 channel 16-bit signed grayscale to optional 1 channel 16-bit signed integer euclidean distance voronoi diagram output and/or optional 64-bit floating point transform with optional relative Manhattan distances.

Parameters

- **pSrc** – *Source-Image Pointer*.

- **nSrcStep** – *Source-Image Line Step*.
- **nMinSiteValue** – signed source image pixel values >= nMinSiteValue and <= nMaxSiteValue are considered sites (traditionally 0s).
- **nMaxSiteValue** – signed source image pixel values >= nMinSiteValue and <= nMaxSiteValue are considered sites (traditionally 0s).
- **pDstVoronoi** – device memory voronoi diagram destination_image_pointer or NULL for no voronoi output.
- **nDstVoronoiStep** – voronoi destination_image_line_step (must be at least oSizeROI.width * 2 * sizeof(Npp16s)).
- **pDstVoronoiIndices** – device memory voronoi diagram destination_image_pointer or NULL for no voronoi indices output.
- **nDstVoronoiIndicesStep** – voronoi indices destination_image_line_step (must be at least oSizeROI.width * 2 * sizeof(Npp16s)).
- **pDstVoronoiRelativeManhattanDistances** – device memory voronoi relative Manhattan distances destination_image_pointer or NULL for no voronoi Manhattan output.
- **nDstVoronoiRelativeManhattanDistancesStep** – voronoi Manhattan destination_image_line_step (must be at least oSizeROI.width * 2 * sizeof(Npp16s)).
- **pDstTransform** – device memory true euclidean distance transform destination_image_pointer or NULL for no transform output.
- **nDstTransformStep** – true euclidean distance transform destination_image_line_step (must be at least oSizeROI.width * sizeof(Npp64f)).
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **pDeviceBuffer** – pointer to scratch DEVICE memory buffer of size hpBufferSize (see *nppiDistanceTransformPBAGetBufferSize()* above)
- **pAntialiasingDeviceBuffer** – pointer to scratch DEVICE memory buffer of size hpAntialiasingBufferSize (see *nppiDistanceTransformPBAGetAntialiasingBufferSize()* above) or NULL if not Antialiasing
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiDistanceTransformAbsPBA_16s64f_C1R_Ctx**(*Npp16s* *pSrc, int nSrcStep, *Npp16s* nMinSiteValue, *Npp16s* nMaxSiteValue, *Npp16s* *pDstVoronoi, int nDstVoronoiStep, *Npp16s* *pDstVoronoiIndices, int nDstVoronoiIndicesStep, *Npp16u* *pDstVoronoiAbsoluteManhattanDistances, int nDstVoronoiAbsoluteManhattanDistancesStep, *Npp64f* *pDstTransform, int nDstTransformStep, *NppiSize* oSizeROI, *Npp8u* *pDeviceBuffer, *Npp8u* *pAntialiasingDeviceBuffer, *NppStreamContext* nppStreamCtx)

1 channel 16-bit signed grayscale to optional 1 channel 16-bit signed integer euclidean distance voronoi diagram output and/or optional 64-bit floating point transform with optional absolute Manhattan distances.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **nMinSiteValue** – signed source image pixel values >= nMinSiteValue and <= nMaxSiteValue are considered sites (traditionally 0s).
- **nMaxSiteValue** – signed source image pixel values >= nMinSiteValue and <= nMaxSiteValue are considered sites (traditionally 0s).
- **pDstVoronoi** – device memory voronoi diagram destination_image_pointer or NULL for no voronoi output.
- **nDstVoronoiStep** – voronoi destination_image_line_step (must be at least oSizeROI.width * 2 * sizeof(Npp16s)).
- **pDstVoronoiIndices** – device memory voronoi diagram destination_image_pointer or NULL for no voronoi indices output.
- **nDstVoronoiIndicesStep** – voronoi indices destination_image_line_step (must be at least oSizeROI.width * 2 * sizeof(Npp16s)).
- **pDstVoronoiAbsoluteManhattanDistances** – device memory voronoi absolute Manhattan distances destination_image_pointer or NULL for no voronoi Manhattan output.
- **nDstVoronoiAbsoluteManhattanDistancesStep** – voronoi Manhattan destination_image_line_step (must be at least oSizeROI.width * 2 * sizeof(Npp16s)).
- **pDstTransform** – device memory true euclidean distance transform destination_image_pointer or NULL for no transform output.
- **nDstTransformStep** – true euclidean distance transform destination_image_line_step (must be at least oSizeROI.width * sizeof(Npp64f)).
- **oSizeROI** – *Region-Of-Interest (ROI)*.

- **pDeviceBuffer** – pointer to scratch DEVICE memory buffer of size hpBufferSize (see *nppiDistanceTransformPBAGetBufferSize()* above)
- **pAntialiasingDeviceBuffer** – pointer to scratch DEVICE memory buffer of size hpAntialiasingBufferSize (see *nppiDistanceTransformPBAGetAntialiasingBufferSize()* above) or NULL if not Antialiasing
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiDistanceTransformPBA_32f64f_C1R_Ctx**(*Npp32f* *pSrc, int nSrcStep, *Npp32f* nMinSiteValue, *Npp32f* nMaxSiteValue, *Npp16s* *pDstVoronoi, int nDstVoronoiStep, *Npp16s* *pDstVoronoiIndices, int nDstVoronoiIndicesStep, *Npp16s* *pDstVoronoiRelativeManhattanDistances, int nDstVoronoiRelativeManhattanDistancesStep, *Npp64f* *pDstTransform, int nDstTransformStep, *NppiSize* oSizeROI, *Npp8u* *pDeviceBuffer, *Npp8u* *pAntialiasingDeviceBuffer, *NppStreamContext* nppStreamCtx)

1 channel 32-bit floating point grayscale to optional 1 channel 16-bit signed integer euclidean distance voronoi diagram output and/or optional 64-bit floating point transform with optional relative Manhattan distances.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **nMinSiteValue** – source image pixel values >= nMinSiteValue and <= nMaxSiteValue are considered sites (traditionally 0s).
- **nMaxSiteValue** – source image pixel values >= nMinSiteValue and <= nMaxSiteValue are considered sites (traditionally 0s).
- **pDstVoronoi** – device memory voronoi diagram destination_image_pointer or NULL for no voronoi output.
- **nDstVoronoiStep** – voronoi destination_image_line_step (must be at least oSizeROI.width * 2 * sizeof(Npp16s)).
- **pDstVoronoiIndices** – device memory voronoi diagram destination_image_pointer or NULL for no voronoi indices output.
- **nDstVoronoiIndicesStep** – voronoi indices destination_image_line_step (must be at least oSizeROI.width * 2 * sizeof(Npp16s)).
- **pDstVoronoiRelativeManhattanDistances** – device memory voronoi relative Manhattan distances destination_image_pointer or NULL for no voronoi Manhattan output.
- **nDstVoronoiRelativeManhattanDistancesStep** – voronoi Manhattan destination_image_line_step (must be at least oSizeROI.width * 2 * sizeof(Npp16s)).

- **pDstTransform** – device memory true euclidean distance transform destination_image_pointer or NULL for no transform output.
- **nDstTransformStep** – true euclidean distance transform destination_image_line_step (must be at least oSizeROI.width * sizeof(Npp64f)).
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **pDeviceBuffer** – pointer to scratch DEVICE memory buffer of size hpBufferSize (see *nppiDistanceTransformPBAGetBufferSize()* above)
- **pAntialiasingDeviceBuffer** – pointer to scratch DEVICE memory buffer of size hpAntialiasingBufferSize (see *nppiDistanceTransformPBAGetAntialiasingBufferSize()* above) or NULL if not Antialiasing
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiDistanceTransformAbsPBA_32f64f_C1R_Ctx**(*Npp32f* *pSrc, int nSrcStep, *Npp32f* nMinSiteValue, *Npp32f* nMaxSiteValue, *Npp16s* *pDstVoronoi, int nDstVoronoiStep, *Npp16s* *pDstVoronoiIndices, int nDstVoronoiIndicesStep, *Npp16u* *pDstVoronoiAbsoluteManhattanDistances, int nDstVoronoiAbsoluteManhattanDistancesStep, *Npp64f* *pDstTransform, int nDstTransformStep, *NppiSize* oSizeROI, *Npp8u* *pDeviceBuffer, *Npp8u* *pAntialiasingDeviceBuffer, *NppStreamContext* nppStreamCtx)

1 channel 32-bit floating point grayscale to optional 1 channel 16-bit signed integer euclidean distance voronoi diagram output and/or optional 64-bit floating point transform with optional absolute Manhattan distances.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **nMinSiteValue** – source image pixel values >= nMinSiteValue and <= nMaxSiteValue are considered sites (traditionally 0s).
- **nMaxSiteValue** – source image pixel values >= nMinSiteValue and <= nMaxSiteValue are considered sites (traditionally 0s).
- **pDstVoronoi** – device memory voronoi diagram destination_image_pointer or NULL for no voronoi output.
- **nDstVoronoiStep** – voronoi destination_image_line_step (must be at least oSizeROI.width * 2 * sizeof(Npp16s)).

- **pDstVoronoiIndices** – device memory voronoi diagram destination_image_pointer or NULL for no voronoi indices output.
- **nDstVoronoiIndicesStep** – voronoi indices destination_image_line_step (must be at least oSizeROI.width * 2 * sizeof(Npp16s)).
- **pDstVoronoiAbsoluteManhattanDistances** – device memory voronoi absolute Manhattan distances destination_image_pointer or NULL for no voronoi Manhattan output.
- **nDstVoronoiAbsoluteManhattanDistancesStep** – voronoi Manhattan destination_image_line_step (must be at least oSizeROI.width * 2 * sizeof(Npp16s)).
- **pDstTransform** – device memory true euclidean distance transform destination_image_pointer or NULL for no transform output.
- **nDstTransformStep** – true euclidean distance transform destination_image_line_step (must be at least oSizeROI.width * sizeof(Npp64f)).
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **pDeviceBuffer** – pointer to scratch DEVICE memory buffer of size hpBufferSize (see *nppiDistanceTransformPBAGetBufferSize()* above)
- **pAntialiasingDeviceBuffer** – pointer to scratch DEVICE memory buffer of size hpAntialiasingBufferSize (see *nppiDistanceTransformPBAGetAntialiasingBufferSize()* above) or NULL if not Antialiasing
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiDistanceTransformPBA_64f_C1R_Ctx**(*Npp64f* *pSrc, int nSrcStep, *Npp64f* nMinSiteValue, *Npp64f* nMaxSiteValue, *Npp16s* *pDstVoronoi, int nDstVoronoiStep, *Npp16s* *pDstVoronoiIndices, int nDstVoronoiIndicesStep, *Npp16s* *pDstVoronoiRelativeManhattanDistances, int nDstVoronoiRelativeManhattanDistancesStep, *Npp64f* *pDstTransform, int nDstTransformStep, *NppiSize* oSizeROI, *Npp8u* *pDeviceBuffer, *Npp8u* *pAntialiasingDeviceBuffer, *NppStreamContext* nppStreamCtx)

1 channel 64-bit floating point grayscale to optional 1 channel 16-bit signed integer euclidean distance voronoi diagram output and/or optional 64-bit floating point transform with optional relative Manhattan distances.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **nMinSiteValue** – source image pixel values >= nMinSiteValue and <= nMaxSiteValue are considered sites (traditionally 0s).

- **nMaxSiteValue** – source image pixel values >= nMinSiteValue and <= nMaxSiteValue are considered sites (traditionally 0s).
- **pDstVoronoi** – device memory voronoi diagram destination_image_pointer or NULL for no voronoi output.
- **nDstVoronoiStep** – voronoi destination_image_line_step (must be at least oSizeROI.width * 2 * sizeof(Npp16s)).
- **pDstVoronoiIndices** – device memory voronoi diagram destination_image_pointer or NULL for no voronoi indices output.
- **nDstVoronoiIndicesStep** – voronoi indices destination_image_line_step (must be at least oSizeROI.width * 2 * sizeof(Npp16s)).
- **pDstVoronoiRelativeManhattanDistances** – device memory voronoi relative Manhattan distances destination_image_pointer or NULL for no voronoi Manhattan output.
- **nDstVoronoiRelativeManhattanDistancesStep** – voronoi Manhattan destination_image_line_step (must be at least oSizeROI.width * 2 * sizeof(Npp16s)).
- **pDstTransform** – device memory true euclidean distance transform destination_image_pointer or NULL for no transform output.
- **nDstTransformStep** – true euclidean distance transform destination_image_line_step (must be at least oSizeROI.width * sizeof(Npp64f)).
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **pDeviceBuffer** – pointer to scratch DEVICE memory buffer of size hpBufferSize (see *nppiDistanceTransformPBAGetBufferSize()* above)
- **pAntialiasingDeviceBuffer** – pointer to scratch DEVICE memory buffer of size hpAntialiasingBufferSize (see *nppiDistanceTransformPBAGetAntialiasingBufferSize()* above) or NULL if not Antialiasing
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiDistanceTransformAbsPBA_64f_C1R_Ctx**(*Npp64f* *pSrc, int nSrcStep, *Npp64f* nMinSiteValue, *Npp64f* nMaxSiteValue, *Npp16s* *pDstVoronoi, int nDstVoronoiStep, *Npp16s* *pDstVoronoiIndices, int nDstVoronoiIndicesStep, *Npp16u* *pDstVoronoiAbsoluteManhattanDistances, int nDstVoronoiAbsoluteManhattanDistancesStep, *Npp64f* *pDstTransform, int nDstTransformStep, *NppiSize* oSizeROI, *Npp8u* *pDeviceBuffer, *Npp8u* *pAntialiasingDeviceBuffer, *NppStreamContext* nppStreamCtx)

1 channel 64-bit floating point grayscale to optional 1 channel 16-bit signed integer euclidean distance voronoi diagram output and/or optional 64-bit floating point transform with optional absolute Manhattan distances.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **nMinSiteValue** – source image pixel values >= nMinSiteValue and <= nMaxSiteValue are considered sites (traditionally 0s).
- **nMaxSiteValue** – source image pixel values >= nMinSiteValue and <= nMaxSiteValue are considered sites (traditionally 0s).
- **pDstVoronoi** – device memory voronoi diagram destination_image_pointer or NULL for no voronoi output.
- **nDstVoronoiStep** – voronoi destination_image_line_step (must be at least oSizeROI.width * 2 * sizeof(Npp16s)).
- **pDstVoronoiIndices** – device memory voronoi diagram destination_image_pointer or NULL for no voronoi indices output.
- **nDstVoronoiIndicesStep** – voronoi indices destination_image_line_step (must be at least oSizeROI.width * 2 * sizeof(Npp16s)).
- **pDstVoronoiAbsoluteManhattanDistances** – device memory voronoi absolute Manhattan distances destination_image_pointer or NULL for no voronoi Manhattan output.
- **nDstVoronoiAbsoluteManhattanDistancesStep** – voronoi Manhattan destination_image_line_step (must be at least oSizeROI.width * 2 * sizeof(Npp16s)).
- **pDstTransform** – device memory true euclidean distance transform destination_image_pointer or NULL for no transform output.
- **nDstTransformStep** – true euclidean distance transform destination_image_line_step (must be at least oSizeROI.width * sizeof(Npp64f)).
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **pDeviceBuffer** – pointer to scratch DEVICE memory buffer of size hpBufferSize (see *nppiDistanceTransformPBAGetBufferSize()* above)
- **pAntialiasingDeviceBuffer** – pointer to scratch DEVICE memory buffer of size hpAntialiasingBufferSize (see *nppiDistanceTransformPBAGetAntialiasingBufferSize()* above) or NULL if not Antialiasing
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiSignedDistanceTransformPBA_32f_C1R_Ctx**(*Npp32f* *pSrc, int nSrcStep, *Npp32f* nCutoffValue, *Npp32f* nSubPixelXShift, *Npp32f* nSubPixelYShift, *Npp16s* *pDstVoronoi, int nDstVoronoiStep, *Npp16s* *pDstVoronoiIndices, int nDstVoronoiIndicesStep, *Npp16s* *pDstVoronoiRelativeManhattanDistances, int nDstVoronoiRelativeManhattanDistancesStep, *Npp32f* *pDstTransform, int nDstTransformStep, *NppiSize* oSizeROI, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

1 channel 32-bit floating point grayscale to optional 1 channel 16-bit signed integer euclidean distance voronoi diagram and 32-bit floating point transform with optional sub-pixel shifts.

For this particular version of the function acceptable input pixel intensities are less than or equal to 0.0f for those fully outside of connected pixel regions, intensities with fractional parts between 0.0f and 1.0f representing the percentage of connected pixel region sub-pixel coverage within a particular pixel (region contour), and intensities greater than or equal to 1.0f for pixels that are fully contained within closed connected pixel regions. This function executes in two passes, the first pass prioritizes pixels outside of closed regions, the second pass prioritizes pixels within closed regions. The two passes are then merged on output. The function assumes that fully covered pixels have centers located at sub-pixel locations of .5,.5 . In general, object exterior distances are output as negative numbers and object interior distances are output as positive numbers.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **nCutoffValue** – source image pixel values < nCutoffValue will be considered fully outside of pixel regions (and set to -1).
- **nSubPixelXShift** – final transform distances will be shifted in the X direction by this sub-pixel fraction.
- **nSubPixelYShift** – final transform distances will be shifted in the Y direction by this sub-pixel fraction.
- **pDstVoronoi** – device memory voronoi diagram destination_image_pointer or NULL for no voronoi output.
- **nDstVoronoiStep** – voronoi destination_image_line_step (must be at least oSizeROI.width * 2 * sizeof(Npp16s)).
- **pDstVoronoiIndices** – device memory voronoi diagram destination_image_pointer or NULL for no voronoi indices output.
- **nDstVoronoiIndicesStep** – voronoi indices destination_image_line_step (must be at least oSizeROI.width * 2 * sizeof(Npp16s)).

- **pDstVoronoiRelativeManhattanDistances** – device memory voronoi relative Manhattan distances destination_image_pointer or NULL for no voronoi Manhattan output.
- **nDstVoronoiRelativeManhattanDistancesStep** – voronoi Manhattan destination_image_line_step (must be at least oSizeROI.width * 2 * sizeof(Npp16s)).
- **pDstTransform** – device memory true euclidean distance transform destination_image_pointer or NULL for no transform output.
- **nDstTransformStep** – true euclidean distance transform destination_image_line_step (must be at least oSizeROI.width * sizeof(Npp32f)).
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **pDeviceBuffer** – pointer to scratch DEVICE memory buffer of size hpBufferSize (see *nppiSignedDistanceTransformPBAGetBufferSize()* above)
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiSignedDistanceTransformAbsPBA_32f_C1R_Ctx**(*Npp32f* *pSrc, int nSrcStep, *Npp32f* nCutoffValue, *Npp32f* nSubPixelXShift, *Npp32f* nSubPixelYShift, *Npp16s* *pDstVoronoi, int nDstVoronoiStep, *Npp16s* *pDstVoronoiIndices, int nDstVoronoiIndicesStep, *Npp16u* *pDstVoronoiAbsoluteManhattanDistances, int nDstVoronoiAbsoluteManhattanDistancesStep, *Npp32f* *pDstTransform, int nDstTransformStep, *NppiSize* oSizeROI, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

1 channel 32-bit floating point grayscale to optional 1 channel 16-bit signed integer euclidean distance voronoi diagram and 32-bit floating point transform with optional sub-pixel shifts.

For this particular version of the function acceptable input pixel intensities are less than or equal to 0.0f for those fully outside of connected pixel regions, intensities with fractional parts between 0.0f and 1.0f representing the percentage of connected pixel region sub-pixel coverage within a particular pixel (region contour), and intensities greater than or equal to 1.0f for pixels that are fully contained within closed connected pixel regions. This function executes in two passes, the first pass prioritizes pixels outside of closed regions, the second pass prioritizes pixels within closed regions. The two passes are then merged on output. The function assumes that fully covered pixels have centers located at sub-pixel locations of .5,.5 . In general, object exterior distances are output as negative numbers progressing to positive and object interior distances are output as positive numbers progressing to negative.

Parameters

- **pSrc** – *Source-Image Pointer*.

- **nSrcStep** – *Source-Image Line Step*.
- **nCutoffValue** – source image pixel values < nCutoffValue will be considered fully outside of pixel regions (and set to -1).
- **nSubPixelXShift** – final transform distances will be shifted in the X direction by this sub-pixel fraction.
- **nSubPixelYShift** – final transform distances will be shifted in the Y direction by this sub-pixel fraction.
- **pDstVoronoi** – device memory voronoi diagram destination_image_pointer or NULL for no voronoi output.
- **nDstVoronoiStep** – voronoi destination_image_line_step (must be at least oSizeROI.width * 2 * sizeof(Npp16s)).
- **pDstVoronoiIndices** – device memory voronoi diagram destination_image_pointer or NULL for no voronoi indices output.
- **nDstVoronoiIndicesStep** – voronoi indices destination_image_line_step (must be at least oSizeROI.width * 2 * sizeof(Npp16s)).
- **pDstVoronoiAbsoluteManhattanDistances** – device memory voronoi absolute Manhattan distances destination_image_pointer or NULL for no voronoi Manhattan output.
- **nDstVoronoiAbsoluteManhattanDistancesStep** – voronoi Manhattan destination_image_line_step (must be at least oSizeROI.width * 2 * sizeof(Npp16s)).
- **pDstTransform** – device memory true euclidean distance transform destination_image_pointer or NULL for no transform output.
- **nDstTransformStep** – true euclidean distance transform destination_image_line_step (must be at least oSizeROI.width * sizeof(Npp32f)).
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **pDeviceBuffer** – pointer to scratch DEVICE memory buffer of size hpBufferSize (see *nppiSignedDistanceTransformPBAGetBufferSize()* above)
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiSignedDistanceTransformPBA_32f64f_C1R_Ctx**(*Npp32f* *pSrc, int nSrcStep, *Npp32f* nCutoffValue, *Npp64f* nSubPixelXShift, *Npp64f* nSubPixelYShift, *Npp16s* *pDstVoronoi, int nDstVoronoiStep, *Npp16s* *pDstVoronoiIndices, int nDstVoronoiIndicesStep, *Npp16s* *pDstVoronoiRelativeManhattanDistances, int nDstVoronoiRelativeManhattanDistancesStep, *Npp64f* *pDstTransform, int nDstTransformStep, *NppiSize* oSizeROI, *Npp8u* *pDeviceBuffer, *Npp8u* *pAntialiasingDeviceBuffer, *NppStreamContext* nppStreamCtx)

1 channel 32-bit floating point grayscale to optional 1 channel 16-bit signed integer euclidean distance voronoi diagram and 64-bit floating point transform with optional sub-pixel shifts.

For this particular version of the function acceptable input pixel intensities are less than or equal to 0.0f for those fully outside of connected pixel regions, intensities with fractional parts between 0.0f and 1.0f representing the percentage of connected pixel region sub-pixel coverage within a particular pixel (region contour), and intensities greater than or equal to 1.0f for pixels that are fully contained within closed connected pixel regions. This function executes in two passes, the first pass prioritizes pixels outside of closed regions, the second pass prioritizes pixels within closed regions. The two passes are then merged on output. The function assumes that fully covered pixels have centers located at sub-pixel locations of .5,.5 . In general, object exterior distances are output as negative numbers progressing to positive and object interior distances are output as positive numbers progressing to negative.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **nCutoffValue** – source image pixel values < nCutoffValue will be considered fully outside of pixel regions (and set to -1).
- **nSubPixelXShift** – final transform distances will be shifted in the X direction by this sub-pixel fraction.
- **nSubPixelYShift** – final transform distances will be shifted in the Y direction by this sub-pixel fraction.
- **pDstVoronoi** – device memory voronoi diagram destination_image_pointer or NULL for no voronoi output.
- **nDstVoronoiStep** – voronoi destination_image_line_step (must be at least oSizeROI.width * 2 * sizeof(Npp16s)).
- **pDstVoronoiIndices** – device memory voronoi diagram destination_image_pointer or NULL for no voronoi indices output.

- **nDstVoronoiIndicesStep** – voronoi indices destination_image_line_step (must be at least oSizeROI.width * 2 * sizeof(Npp16s)).
- **pDstVoronoiRelativeManhattanDistances** – device memory voronoi relative Manhattan distances destination_image_pointer or NULL for no voronoi Manhattan output.
- **nDstVoronoiRelativeManhattanDistancesStep** – voronoi Manhattan destination_image_line_step (must be at least oSizeROI.width * 2 * sizeof(Npp16s)).
- **pDstTransform** – device memory true euclidean distance transform destination_image_pointer or NULL for no transform output.
- **nDstTransformStep** – true euclidean distance transform destination_image_line_step (must be at least oSizeROI.width * sizeof(Npp32f)).
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **pDeviceBuffer** – pointer to scratch DEVICE memory buffer of size hpBufferSize (see *nppiSignedDistanceTransformPBAGet64fBufferSize()* above)
- **pAntialiasingDeviceBuffer** – pointer to scratch DEVICE memory buffer of size hpAntialiasingBufferSize (see *nppiSignedDistanceTransformPBAGetAntialiasingBufferSize()* above) or NULL if not Antialiasing
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiSignedDistanceTransformAbsPBA_32f64f_C1R_Ctx**(*Npp32f* *pSrc, int nSrcStep, *Npp32f* nCutoffValue, *Npp64f* nSubPixelXShift, *Npp64f* nSubPixelYShift, *Npp16s* *pDstVoronoi, int nDstVoronoiStep, *Npp16s* *pDstVoronoiIndices, int nDstVoronoiIndicesStep, *Npp16u* *pDstVoronoiAbsoluteManhattanDistances, int nDstVoronoiAbsoluteManhattanDistancesStep, *Npp64f* *pDstTransform, int nDstTransformStep, *NppiSize* oSizeROI, *Npp8u* *pDeviceBuffer, *Npp8u* *pAntialiasingDeviceBuffer, *NppStreamContext* nppStreamCtx)

1 channel 32-bit floating point grayscale to optional 1 channel 16-bit signed integer euclidean distance voronoi diagram and 64-bit floating point transform with optional sub-pixel shifts.

For this particular version of the function acceptable input pixel intensities are less than or equal to 0.0f for those fully outside of connected pixel regions, intensities with fractional parts between 0.0f and 1.0f representing the percentage of connected pixel region sub-pixel coverage within a particular pixel (region contour), and intensities greater than or equal to 1.0f for pixels that are fully contained within closed connected pixel regions. This function executes in two passes, the

first pass prioritizes pixels outside of closed regions, the second pass prioritizes pixels within closed regions. The two passes are then merged on output. The function assumes that fully covered pixels have centers located at sub-pixel locations of .5,.5 . In general, object exterior distances are output as negative numbers progressing to positive and object interior distances are output as positive numbers progressing to negative.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **nCutoffValue** – source image pixel values < nCutoffValue will be considered fully outside of pixel regions (and set to -1).
- **nSubPixelXShift** – final transform distances will be shifted in the X direction by this sub-pixel fraction.
- **nSubPixelYShift** – final transform distances will be shifted in the Y direction by this sub-pixel fraction.
- **pDstVoronoi** – device memory voronoi diagram destination_image_pointer or NULL for no voronoi output.
- **nDstVoronoiStep** – voronoi destination_image_line_step (must be at least oSizeROI.width * 2 * sizeof(Npp16s)).
- **pDstVoronoiIndices** – device memory voronoi diagram destination_image_pointer or NULL for no voronoi indices output.
- **nDstVoronoiIndicesStep** – voronoi indices destination_image_line_step (must be at least oSizeROI.width * 2 * sizeof(Npp16s)).
- **pDstVoronoiAbsoluteManhattanDistances** – device memory voronoi absolute Manhattan distances destination_image_pointer or NULL for no voronoi Manhattan output.
- **nDstVoronoiAbsoluteManhattanDistancesStep** – voronoi Manhattan destination_image_line_step (must be at least oSizeROI.width * 2 * sizeof(Npp16s)).
- **pDstTransform** – device memory true euclidean distance transform destination_image_pointer or NULL for no transform output.
- **nDstTransformStep** – true euclidean distance transform destination_image_line_step (must be at least oSizeROI.width * sizeof(Npp32f)).
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **pDeviceBuffer** – pointer to scratch DEVICE memory buffer of size hpBufferSize (see *nppiSignedDistanceTransformPBAGet64fBufferSize()* above)
- **pAntialiasingDeviceBuffer** – pointer to scratch DEVICE memory buffer of size hpAntialiasingBufferSize (see *nppiSignedDistanceTransformPBAGetAntialiasingBufferSize()* above) or NULL if not Antialiasing
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiSignedDistanceTransformPBA_64f_C1R_Ctx**(*Npp64f* *pSrc, int nSrcStep, *Npp64f* nCutoffValue, *Npp64f* nSubPixelXShift, *Npp64f* nSubPixelYShift, *Npp16s* *pDstVoronoi, int nDstVoronoiStep, *Npp16s* *pDstVoronoiIndices, int nDstVoronoiIndicesStep, *Npp16s* *pDstVoronoiRelativeManhattan-Distances, int nDstVoronoiRelativeManhattan-DistancesStep, *Npp64f* *pDstTransform, int nDstTransformStep, *NppiSize* oSizeROI, *Npp8u* *pDeviceBuffer, *Npp8u* *pAntialiasingDeviceBuffer, *NppStreamContext* nppStreamCtx)

1 channel 64-bit floating point grayscale to optional 1 channel 16-bit signed integer euclidean distance voronoi diagram and 64-bit floating point transform with optional sub-pixel shifts.

For this particular version of the function acceptable input pixel intensities are less than or equal to 0.0f for those fully outside of connected pixel regions, intensities with fractional parts between 0.0f and 1.0f representing the percentage of connected pixel region sub-pixel coverage within a particular pixel (region contour), and intensities greater than or equal to 1.0f for pixels that are fully contained within closed connected pixel regions. This function executes in two passes, the first pass prioritizes pixels outside of closed regions, the second pass prioritizes pixels within closed regions. The two passes are then merged on output. The function assumes that fully covered pixels have centers located at sub-pixel locations of .5,.5 . In general, object exterior distances are output as negative numbers progressing to positive and object interior distances are output as positive numbers progressing to negative.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **nCutoffValue** – source image pixel values < nCutoffValue will be considered fully outside of pixel regions (and set to -1).
- **nSubPixelXShift** – final transform distances will be shifted in the X direction by this sub-pixel fraction.
- **nSubPixelYShift** – final transform distances will be shifted in the Y direction by this sub-pixel fraction.
- **pDstVoronoi** – device memory voronoi diagram destination_image_pointer or NULL for no voronoi output.
- **nDstVoronoiStep** – voronoi destination_image_line_step (must be at least oSizeROI.width * 2 * sizeof(Npp16s)).
- **pDstVoronoiIndices** – device memory voronoi diagram destination_image_pointer or NULL for no voronoi indices output.
- **nDstVoronoiIndicesStep** – voronoi indices destination_image_line_step (must be at least oSizeROI.width * 2 * sizeof(Npp16s)).

- **pDstVoronoiRelativeManhattanDistances** – device memory voronoi relative Manhattan distances destination_image_pointer or NULL for no voronoi Manhattan output.
- **nDstVoronoiRelativeManhattanDistancesStep** – voronoi Manhattan destination_image_line_step (must be at least oSizeROI.width * 2 * sizeof(Npp16s)).
- **pDstTransform** – device memory true euclidean distance transform destination_image_pointer or NULL for no transform output.
- **nDstTransformStep** – true euclidean distance transform destination_image_line_step (must be at least oSizeROI.width * sizeof(Npp32f)).
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **pDeviceBuffer** – pointer to scratch DEVICE memory buffer of size hpBufferSize (see *nppiSignedDistanceTransformPBAGet64fBufferSize()* above)
- **pAntialiasingDeviceBuffer** – pointer to scratch DEVICE memory buffer of size hpAntialiasingBufferSize (see *nppiDistanceTransformPBAGetAntialiasingBufferSize()* above) or NULL if not Antialiasing
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiSignedDistanceTransformAbsPBA_64f_C1R_Ctx**(*Npp64f* *pSrc, int nSrcStep, *Npp64f* nCutoffValue, *Npp64f* nSubPixelXShift, *Npp64f* nSubPixelYShift, *Npp16s* *pDstVoronoi, int nDstVoronoiStep, *Npp16s* *pDstVoronoiIndices, int nDstVoronoiIndicesStep, *Npp16u* *pDstVoronoiAbsoluteManhattanDistances, int nDstVoronoiAbsoluteManhattanDistancesStep, *Npp64f* *pDstTransform, int nDstTransformStep, *NppiSize* oSizeROI, *Npp8u* *pDeviceBuffer, *Npp8u* *pAntialiasingDeviceBuffer, *NppStreamContext* nppStreamCtx)

1 channel 64-bit floating point grayscale to optional 1 channel 16-bit signed integer euclidean distance voronoi diagram and 64-bit floating point transform with optional sub-pixel shifts.

For this particular version of the function acceptable input pixel intensities are less than or equal to 0.0f for those fully outside of connected pixel regions, intensities with fractional parts between 0.0f and 1.0f representing the percentage of connected pixel region sub-pixel coverage within a particular pixel (region contour), and intensities greater than or equal to 1.0f for pixels that are fully contained within closed connected pixel regions. This function executes in two passes, the first pass prioritizes pixels outside of closed regions, the second pass prioritizes pixels within closed regions. The two passes are then merged on output. The function assumes that fully covered pixels have centers located at sub-pixel locations of .5,.5 . In general, object exterior distances are output as negative numbers progressing to positive and object interior distances are output as positive numbers progressing to negative.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **nCutoffValue** – source image pixel values < nCutoffValue will be considered fully outside of pixel regions (and set to -1).
- **nSubPixelXShift** – final transform distances will be shifted in the X direction by this sub-pixel fraction.
- **nSubPixelYShift** – final transform distances will be shifted in the Y direction by this sub-pixel fraction.
- **pDstVoronoi** – device memory voronoi diagram destination_image_pointer or NULL for no voronoi output.
- **nDstVoronoiStep** – voronoi destination_image_line_step (must be at least oSizeROI.width * 2 * sizeof(Npp16s)).
- **pDstVoronoiIndices** – device memory voronoi diagram destination_image_pointer or NULL for no voronoi indices output.
- **nDstVoronoiIndicesStep** – voronoi indices destination_image_line_step (must be at least oSizeROI.width * 2 * sizeof(Npp16s)).
- **pDstVoronoiAbsoluteManhattanDistances** – device memory voronoi absolute Manhattan distances destination_image_pointer or NULL for no voronoi Manhattan output.
- **nDstVoronoiAbsoluteManhattanDistancesStep** – voronoi Manhattan destination_image_line_step (must be at least oSizeROI.width * 2 * sizeof(Npp16s)).
- **pDstTransform** – device memory true euclidean distance transform destination_image_pointer or NULL for no transform output.
- **nDstTransformStep** – true euclidean distance transform destination_image_line_step (must be at least oSizeROI.width * sizeof(Npp32f)).
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **pDeviceBuffer** – pointer to scratch DEVICE memory buffer of size hpBufferSize (see *nppiSignedDistanceTransformPBAGet64fBufferSize()* above)
- **pAntialiasingDeviceBuffer** – pointer to scratch DEVICE memory buffer of size hpAntialiasingBufferSize (see *nppiDistanceTransformPBAGetAntialiasingBufferSize()* above) or NULL if not Antialiasing
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

1.10.6.3 Image Filter Canny Border

1.10.6.3.1 FilterCannyBorder

Performs Canny edge detection on a single channel 8-bit grayscale image and outputs a single channel 8-bit image consisting of 0x00 and 0xFF values with 0xFF representing edge pixels.

The algorithm consists of three phases. The first phase generates two output images consisting of a single channel 16-bit signed image containing magnitude values and a single channel 32-bit floating point image containing the angular direction of those magnitude values. This phase is accomplished by calling the appropriate GradientVectorBorder filter function based on the filter type, filter mask size, and norm type requested. The next phase uses those magnitude and direction images to suppress non-maximum magnitude values which are lower than the values of either of its two nearest neighbors in the same direction as the test magnitude pixel in the 3x3 surrounding magnitude pixel neighborhood. This phase outputs a new magnitude image with non-maximum pixel values suppressed. Finally, in the third phase, the new magnitude image is passed through a hysteresis threshold filter that filters out any magnitude values that are not connected to another edge magnitude value. In this phase, any magnitude value above the high threshold value is automatically accepted, any magnitude value below the low threshold value is automatically rejected. For magnitude values that lie between the low and high threshold, values are only accepted if one of their two neighbors in the same direction in the 3x3 neighborhood around them lies above the low threshold value. In other words, if they are connected to an active edge. J. Canny recommends that the ratio of high to low threshold limit be in the range two or three to one, based on predicted signal-to-noise ratios. The final output of the third phase consists of a single channel 8-bit unsigned image of 0x00 and 0xFF values based on whether they are accepted or rejected during threshold testing.

Currently only the NPP_BORDER_REPLICATE border type operation is supported. Borderless output can be accomplished by using a larger source image than the destination and adjusting oSrcSize and oSrcOffset parameters accordingly.

Functions

NppStatus **nppiFilterCannyBorderGetBufferSize**(*NppiSize* oSizeROI, int *hpBufferSize)

Calculate scratch buffer size needed for the FilterCannyBorder function based on destination image SizeROI width and height.

Parameters

- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **hpBufferSize** – Required buffer size. Important: hpBufferSize is a *host pointer. Scratch Buffer and Host Pointer*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiFilterCannyBorder_8u_C1R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppiDifferentialKernel* eFilterType, *NppiMaskSize* eMaskSize, *Npp16s* nLowThreshold, *Npp16s* nHighThreshold, *NppiNorm* eNorm, *NppiBorderType* eBorderType, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

1 channel 8-bit unsigned grayscale to 1 channel 8-bit unsigned black (0x00) and white (0xFF) image with border control.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **oSrcSize** – Source image width and height in pixels relative to pSrc.
- **oSrcOffset** – The pixel offset that pSrc points to relative to the origin of the source image.
- **pDst** – output edge destination_image_pointer.
- **nDstStep** – output edge destination_image_line_step.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **eFilterType** – selects between Sobel or Scharr filter type.
- **eMaskSize** – fixed filter mask size to use.
- **nLowThreshold** – low hysteresis threshold value.
- **nHighThreshold** – high hysteresis threshold value.
- **eNorm** – gradient distance method to use.
- **eBorderType** – source image border type to use use.
- **pDeviceBuffer** – pointer to scratch DEVICE memory buffer of size hpBuffer-Size (see *nppiFilterCannyBorderGetBufferSize()* above)
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiFilterCannyBorder_8u_C3C1R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppiDifferentialKernel* eFilterType, *NppiMaskSize* eMaskSize, *Npp16s* nLowThreshold, *Npp16s* nHighThreshold, *NppiNorm* eNorm, *NppiBorderType* eBorderType, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

3 channel 8-bit unsigned color to 1 channel 8-bit unsigned black (0x00) and white (0xFF) image with border control.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **oSrcSize** – Source image width and height in pixels relative to pSrc.
- **oSrcOffset** – The pixel offset that pSrc points to relative to the origin of the source image.

- **pDst** – output edge destination_image_pointer.
- **nDstStep** – output edge destination_image_line_step.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **eFilterType** – selects between Sobel or Scharr filter type.
- **eMaskSize** – fixed filter mask size to use.
- **nLowThreshold** – low hysteresis threshold value.
- **nHighThreshold** – high hysteresis threshold value.
- **eNorm** – gradient distance method to use.
- **eBorderType** – source image border type to use use.
- **pDeviceBuffer** – pointer to scratch DEVICE memory buffer of size hpBufferSize (see *nppiFilterCannyBorderGetBufferSize()* above)
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

1.10.6.4 Image Filter Harris Corners Border

1.10.6.4.1 FilterHarrisCornersBorder

Performs Harris Corner detection on a single channel 8-bit grayscale image and outputs a single channel 32-bit floating point image consisting the corner response at each pixel of the image.

The algorithm consists of two phases. The first phase generates the floating point product of XX, YY, and XY gradients at each pixel in the image. The type of gradient used is controlled by the eFilterType and eMaskSize parameters. The second phase averages those products over a window of either 3x3 or 5x5 pixels around the center pixel then generates the Harris corner response at that pixel which is output in the destination image. The Harris response value is determined as H = ((XX * YY - XY * XY) - (nK * ((XX + YY) * (XX + YY)))) * nScale.

Currently only the NPP_BORDER_REPLICATE border type operation is supported. Borderless output can be accomplished by using a larger source image than the destination and adjusting oSrcSize and oSrcOffset parameters accordingly.

Functions

NppStatus **nppiFilterHarrisCornersBorderGetBufferSize**(*NppiSize* oSizeROI, int *hpBufferSize)

Calculate scratch buffer size needed for the FilterHarrisCornersBorder function based on destination image SizeROI width and height.

Parameters

- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **hpBufferSize** – Required buffer size. Important: hpBufferSize is a *host pointer*. *Scratch Buffer and Host Pointer*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiFilterHarrisCornersBorder_8u32f_C1R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp32f* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppiDifferentialKernel* eFilterType, *NppiMaskSize* eMaskSize, *NppiMaskSize* eAvgWindowSize, *Npp32f* nK, *Npp32f* nScale, *NppiBorderType* eBorderType, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

1 channel 8-bit unsigned grayscale to 1 channel 32-bit floating point Harris corners response image with border control.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **oSrcSize** – Source image width and height in pixels relative to pSrc.
- **oSrcOffset** – The pixel offset that pSrc points to relative to the origin of the source image.
- **pDst** – output edge destination_image_pointer.
- **nDstStep** – output edge destination_image_line_step.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **eFilterType** – selects between Sobel or Scharr filter type.
- **eMaskSize** – fixed filter mask size to use (3x3 or 5x5 for Sobel).
- **eAvgWindowSize** – fixed window mask size to use (3x3 or 5x5).
- **nK** – Harris Corners constant (commonly used value is 0.04F).
- **nScale** – output is scaled by this scale factor.
- **eBorderType** – source image border type to use use.
- **pDeviceBuffer** – pointer to scratch DEVICE memory buffer of size hpBufferSize (see *nppiFilterHarrisCornersBorderGetBufferSize()* above)
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

1.10.6.5 Image Filter Hough Line

1.10.6.5.1 FilterHoughLine

Extracts Hough lines from a single channel 8-bit binarized (0, 255) source feature (canny edges, etc.) image.

Outputs a list of lines in point polar format representing the length (rho) and angle (theta) of each line from the origin of the normal to the line using the formula rho = x cos(theta) + y sin(theta). The level of discretization, nDelta, is specified as an input parameter. The performance and effectiveness of this function highly depends on this parameter with higher performance for larger numbers and more detailed results for lower numbers. Also, lines are not guaranteed to be added to the pDeviceLines list in the same order from one call to the next. However, all of the same lines will still be generated as long as nMaxLineCount is set large enough so that they all can fit in the list. To convert lines in point polar format back to cartesian lines use the following formula:

```
Npp32f nHough = ((sqrt(2.0F) * static_cast<Npp32f>(oSizeROI.height > oSizeROI.width ?
↪oSizeROI.height
                                                                                    :
↪oSizeROI.width)) / 2.0F);
int nAccumulatorsHeight = nDelta.rho > 1.0F ? static_cast<int>(ceil(nHough * 2.0F))
                                            : static_cast<int>(ceil((nHough * 2.0F) /
↪nDelta.rho));
int nCenterX = oSizeROI.width >> 1;
int nCenterY = oSizeROI.height >> 1;
Npp32f nThetaRad = static_cast<Npp32f>(deviceline.theta) * 0.0174532925199433F;
Npp32f nSinTheta = sin(nThetaRad);
Npp32f nCosTheta = cos(nThetaRad);
int nX1, nY1, nX2, nY2;

if (deviceline.theta >= 45 && deviceline.theta <= 135) // degrees
{
    // y = (rho - x cos(theta)) / sin(theta)
    nX1 = minimum cartesian X boundary value;
    nY1 = static_cast<int>((static_cast<Npp32f>(deviceline.rho - (nAccumulatorsHeight
↪>> 1)) -
                            ((nX1 - nCenterX) * nCosTheta)) / nSinTheta + nCenterY);
    nX2 = maximum cartesian X boundary value;
    nY2 = static_cast<int>((static_cast<Npp32f>(deviceline.rho - (nAccumulatorsHeight
↪>> 1)) -
                            ((nX2 - nCenterX) * nCosTheta)) / nSinTheta + nCenterY);
}
else
{
    // x = (rho - y sin(theta)) / cos(theta)
    nY1 = minimum cartesian Y boundary value;
    nX1 = static_cast<int>((static_cast<Npp32f>(deviceline.rho - (nAccumulatorsHeight
↪>> 1)) -
                            ((nY1 - nCenterY) * nSinTheta)) / nCosTheta + nCenterX);
    nY2 = maximum cartesian Y boundary value;
    nX2 = static_cast<int>((static_cast<Npp32f>(deviceline.rho - (nAccumulatorsHeight
↪>> 1)) -
                            ((nY2 - nCenterY) * nSinTheta)) / nCosTheta + nCenterX);
}
```

Functions

NppStatus **nppiFilterHoughLineGetBufferSize**(*NppiSize* oSizeROI, *NppPointPolar* nDelta, int nMaxLineCount, int *hpBufferSize)

Calculate scratch buffer size needed for the FilterHoughLine or FilterHoughLineRegion functions based on destination image SizeROI width and height and nDelta parameters.

Parameters

- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nDelta** – rho radial increment and theta angular increment that will be used in the FilterHoughLine or FilterHoughLineRegion function call.
- **nMaxLineCount** – The maximum number of lines expected from the FilterHoughLine or FilterHoughLineRegion function call.
- **hpBufferSize** – Required buffer size in bytes. Important: hpBufferSize is a *host pointer. Scratch Buffer and Host Pointer*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiFilterHoughLine_8u32f_C1R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *NppiSize* oSizeROI, *NppPointPolar* nDelta, int nThreshold, *NppPointPolar* *pDeviceLines, int nMaxLineCount, int *pDeviceLineCount, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

1 channel 8-bit unsigned binarized (0, 255) source feature (canny edges, etc.) source image to list of lines in point polar format representing the length (rho) and angle (theta) of each line from the origin of the normal to the line using the formula rho = x cos(theta) + y sin(theta).

The level of discretization, nDelta, is specified as an input parameter. The performance and effectiveness of this function highly depends on this parameter with higher performance for larger numbers and more detailed results for lower numbers. nDelta must have the same values as those used in the *nppiFilterHoughLineGetBufferSize()* function call.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nDelta** – Discretization steps, range 0.0F < radial increment nDelta.rho < 3.0F, 1.0F recommended, range 0.25F < angular increment nDelta.theta < 3.0F, 1.0F recommended.
- **nThreshold** – Minimum number of points to accept a line.
- **pDeviceLines** – Device pointer to (nMaxLineCount * sizeof(NppPointPolar) line objects.
- **nMaxLineCount** – The maximum number of lines to output.
- **pDeviceLineCount** – Device memory pointer to an int that receives the number of lines detected up to nMaxLineCount. Must be allocated with cudaMalloc — passing a host pointer causes NPP_CUDA_KERNEL_EXECUTION_ERROR.

- **pDeviceBuffer** – pointer to scratch DEVICE memory buffer of size hpBufferSize (see *nppiFilterHoughLineGetBufferSize()* above)
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiFilterHoughLineRegion_8u32f_C1R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *NppiSize* oSizeROI, *NppPointPolar* nDelta, int nThreshold, *NppPointPolar* *pDeviceLines, *NppPointPolar* oDstROI[2], int nMaxLineCount, int *pDeviceLineCount, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

1 channel 8-bit unsigned binarized (0, 255) source feature (canny edges, etc.) source image to list of lines in point polar format representing the length (rho) and angle (theta) of each line from the origin of the normal to the line using the formula rho = x cos(theta) + y sin(theta).

The level of discretization, nDelta, is specified as an input parameter. The performance and effectiveness of this function highly depends on this parameter with higher performance for larger numbers and more detailed results for lower numbers. nDelta must have the same values as those used in the *nppiFilterHoughLineGetBufferSize()* function call. The oDstROI region limits are used to limit accepted lines to those that fall within those limits.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nDelta** – Discretization steps, range 0.0F < radial increment nDelta.rho < 3.0F, 1.0F recommended, range 0.25F < angular increment nDelta.theta < 3.0F, 1.0F recommended.
- **nThreshold** – Minimum number of points to accept a line.
- **pDeviceLines** – Device pointer to (nMaxLineCount * sizeof(NppPointPolar) line objects.
- **oDstROI** – Region limits with oDstROI[0].rho <= accepted rho <= oDstROI[1].rho and oDstROI[0].theta <= accepted theta <= oDstROI[1].theta.
- **nMaxLineCount** – The maximum number of lines to output.
- **pDeviceLineCount** – Device memory pointer to an int that receives the number of lines detected up to nMaxLineCount. Must be allocated with cudaMalloc — passing a host pointer causes NPP_CUDA_KERNEL_EXECUTION_ERROR.
- **pDeviceBuffer** – pointer to scratch DEVICE memory buffer of size hpBufferSize (see *nppiFilterHoughLineGetBufferSize()* above)
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

1.10.6.6 Image Filter Histogram Of Oriented Gradients Border

1.10.6.6.1 HistogramOfOrientedGradientsBorder

Performs Histogram Of Oriented Gradients operation on source image generating separate windows of Histogram Descriptors for each requested location.

This function implements the simplest form of functionality described by N. Dalal and B. Triggs. Histograms of Oriented Gradients for Human Detection. INRIA, 2005. It supports overlapped contrast normalized block histogram output with L2 normalization only, no threshold clipping, and no pre or post gaussian smoothing of input images or histogram output values. It supports both single channel grayscale source images and three channel color images. For color images, the color channel with the highest magnitude value is used as that pixel's magnitude. Output is row order only. Descriptors are output consecutively with no separation padding if multiple descriptor output is requested (one descriptor per source image location). For example, common HOG parameters are 9 histogram bins per 8 by 8 pixel cell, 2 by 2 cells per block, with a descriptor window size of 64 horizontal by 128 vertical pixels yielding 7 by 15 overlapping blocks (1 cell overlap in both horizontal and vertical directions). This results in 9 bins * 4 cells * 7 horizontal overlapping blocks * 15 vertical overlapping blocks or 3780 32-bit floating point output values (bins) per descriptor window.

The number of horizontal overlapping block histogram bins per descriptor window width is determined by (((oHOGConfig.detectionWindowSize.width / oHOGConfig.histogramBlockSize) * 2) - 1) * oHOGConfig.nHistogramBins. The number of vertical overlapping block histograms per descriptor window height is determined by (((oHOGConfig.detectionWindowSize.height / oHOGConfig.histogramBlockSize) * 2) - 1) The offset of each descriptor window in the descriptors output buffer is therefore horizontal histogram bins per descriptor window width * vertical histograms per descriptor window height 32-bit floating point values relative to the previous descriptor window output.

The algorithm uses a 1D centered derivative mask of [-1, 0, +1] when generating input magnitude and angle gradients. Magnitudes are added to the two nearest histogram bins of oriented gradients between 0 and 180 degrees using a weighted linear interpolation of each magnitude value across the 2 nearest angular bin orientations. 2D overlapping blocks of histogram bins consisting of the bins from 2D arrangements of cells are then contrast normalized using L2 normalization and output to the corresponding histogram descriptor window for that particular window location in the window locations list.

Some restrictions include:

```
#define NPP_HOG_MAX_CELL_SIZE                             (16)
#define NPP_HOG_MAX_BLOCK_SIZE                            (64)
#define NPP_HOG_MAX_BINS_PER_CELL                         (16)
#define NPP_HOG_MAX_CELLS_PER_DESCRIPTOR                 (256)
#define NPP_HOG_MAX_OVERLAPPING_BLOCKS_PER_DESCRIPTOR    (256)
#define NPP_HOG_MAX_DESCRIPTOR_LOCATIONS_PER_CALL        (128)
```

Currently only the NPP_BORDER_REPLICATE border type operation is supported.

1.10.6.6.1.1 Common parameters for nppiFilterHistogramOfGradientsBorder functions:

param pSrc
Source-Image Pointer.

param nSrcStep
Source-Image Line Step.

param oSrcSize
Source image width and height in pixels relative to pSrc.

param oSrcOffset
The pixel offset that pSrc points to relative to the origin of the source image.

param hpLocations
Host pointer to array of *NppiPoint* source pixel starting locations of requested descriptor windows. Important: hpLocations is a *host pointer.*

param nLocations
Number of *NppiPoint* in pLocations array.

param pDstWindowDescriptorBuffer
Output device memory buffer pointer of size hpDescriptorsSize bytes to first of nLoc descriptor windows (see *nppiHistogramOfGradientsBorderGetDescriptorsSize()* above).

param oSizeROI
Region-Of-Interest (ROI) of source image.

param oHOGConfig
Requested HOG configuration parameters structure.

param pScratchBuffer
Device memory buffer pointer of size hpBufferSize bytes to scratch memory buffer (see *nppiHistogramOfGradientsBorderGetBufferSize()* above).

param eBorderType
The border type operation to be applied at source image border boundaries.

param nppStreamCtx
Application Managed Stream Context.

return
Image Data Related Error Codes, *ROI Related Error Codes*

Functions

NppStatus **nppiHistogramOfGradientsBorderGetBufferSize**(const *NppiHOGConfig* oHOGConfig, const *NppiPoint* *hpLocations, int nLocations, *NppiSize* oSizeROI, int *hpBufferSize)

Validates requested HOG configuration and calculates scratch buffer size needed for the HistogramOfGradientsBorder function based on requested HOG configuration, source image ROI, and number and locations of descriptor window locations.

Parameters

- **oHOGConfig** – Requested HOG configuration parameters structure.
- **hpLocations** – Host pointer to array of *NppiPoint* source pixel starting locations of requested descriptor windows. Important: hpLocations is a *host pointer.*
- **nLocations** – Number of *NppiPoint* in pLocations array.
- **oSizeROI** – *Region-Of-Interest (ROI)* of source image.
- **hpBufferSize** – Required buffer size in bytes. Important: hpBufferSize is a *host pointer. Scratch Buffer and Host Pointer*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiHistogramOfGradientsBorderGetDescriptorsSize**(const *NppiHOGConfig* oHOGConfig, int nLocations, int *hpDescriptorsSize)

Validates requested HOG configuration and calculates output window descriptors buffer size needed for the HistogramOfGradientsBorder function based on requested HOG configuration, and number of descriptor window locations, one descriptor window is output for each location.

Descriptor windows are located sequentially and contiguously in the descriptors buffer.

The number of horizontal overlapping block histogram bins per descriptor window width is determined by (((oHOGConfig.detectionWindowSize.width / oHOGConfig.histogramBlockSize) * 2) - 1) * oHOGConfig.nHistogramBins. The number of vertical overlapping block histograms per descriptor window height is determined by (((oHOGConfig.detectionWindowSize.height / oHOGConfig.histogramBlockSize) * 2) - 1) The offset of each descriptor window in the descriptors output buffer is therefore horizontal histogram bins per descriptor window width * vertical histograms per descriptor window height floating point values relative to the previous descriptor window output.

Parameters

- **oHOGConfig** – Requested HOG configuration parameters structure.
- **nLocations** – Number of *NppiPoint* in pLocations array.
- **hpDescriptorsSize** – Required buffer size in bytes of output windows descriptors for nLocations descriptor windows. Important: hpDescriptorsSize is a *host pointer.*

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiHistogramOfGradientsBorder_8u32f_C1R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, const *NppiPoint* *hpLocations, int nLocations, *Npp32f* *pDstWindowDescriptorBuffer, *NppiSize* oSizeROI, const *NppiHOGConfig* oHOGConfig, *Npp8u* *pScratchBuffer, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

1 channel 8-bit unsigned grayscale per source image descriptor window location with source image border control to per descriptor window destination floating point histogram of gradients.

Requires first calling nppiHistogramOfGradientsBorderGetBufferSize function call to get required scratch (host) working buffer size and *nppiHistogramOfGradientsBorderGetDescriptorsSize()* function call to get total size for nLocations of output histogram block descriptor windows.

For common parameter descriptions, see *Common parameters for nppiFilterHistogramOfGradientsBorder functions:*.

NppStatus **nppiHistogramOfGradientsBorder_8u32f_C3R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, const *NppiPoint* *hpLocations, int nLocations, *Npp32f* *pDstWindowDescriptorBuffer, *NppiSize* oSizeROI, const *NppiHOGConfig* oHOGConfig, *Npp8u* *pScratchBuffer, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

3 channel 8-bit unsigned color per source image descriptor window location with source image border control to per descriptor window destination floating point histogram of gradients.

Requires first calling nppiHistogramOfGradientsBorderGetBufferSize function call to get required scratch (host) working buffer size and *nppiHistogramOfGradientsBorderGetDescriptorsSize()* function call to get total size for nLocations of output histogram block descriptor windows.

For common parameter descriptions, see *Common parameters for nppiFilterHistogramOfGradientsBorder functions:*.

NppStatus **nppiHistogramOfGradientsBorder_16u32f_C1R_Ctx**(const *Npp16u* *pSrc, int nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, const *NppiPoint* *hpLocations, int nLocations, *Npp32f* *pDstWindowDescriptorBuffer, *NppiSize* oSizeROI, const *NppiHOGConfig* oHOGConfig, *Npp8u* *pScratchBuffer, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

1 channel 16-bit unsigned grayscale per source image descriptor window location with source image border control to per descriptor window destination floating point histogram of gradients.

Requires first calling nppiHistogramOfGradientsBorderGetBufferSize function call to get required scratch (host) working buffer size and *nppiHistogramOfGradientsBorderGetDescriptorsSize()* function call to get total size for nLocations of output histogram block descriptor windows.

For common parameter descriptions, see *Common parameters for nppiFilterHistogramOfGradientsBorder functions:*.

NppStatus **nppiHistogramOfGradientsBorder_16u32f_C3R_Ctx**(const *Npp16u* *pSrc, int nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, const *NppiPoint* *hpLocations, int nLocations, *Npp32f* *pDstWindowDescriptorBuffer, *NppiSize* oSizeROI, const *NppiHOGConfig* oHOGConfig, *Npp8u* *pScratchBuffer, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

3 channel 16-bit unsigned color per source image descriptor window location with source image border control to per descriptor window destination floating point histogram of gradients.

Requires first calling nppiHistogramOfGradientsBorderGetBufferSize function call to get required scratch (host) working buffer size and *nppiHistogramOfGradientsBorderGetDescriptorsSize()* function call to get total size for nLocations of output histogram block descriptor windows.

For common parameter descriptions, see *Common parameters for nppiFilterHistogramOfGradientsBorder functions:*.

NppStatus **nppiHistogramOfGradientsBorder_16s32f_C1R_Ctx**(const *Npp16s* *pSrc, int nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, const *NppiPoint* *hpLocations, int nLocations, *Npp32f* *pDstWindowDescriptorBuffer, *NppiSize* oSizeROI, const *NppiHOGConfig* oHOGConfig, *Npp8u* *pScratchBuffer, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

1 channel 16-bit signed grayscale per source image descriptor window location with source image border control to per descriptor window destination floating point histogram of gradients.

Requires first calling nppiHistogramOfGradientsBorderGetBufferSize function call to get required scratch (host) working buffer size and *nppiHistogramOfGradientsBorderGetDescriptorsSize()* function call to get total size for nLocations of output histogram block descriptor windows.

For common parameter descriptions, see *Common parameters for nppiFilterHistogramOfGradientsBorder functions:*.

NppStatus **nppiHistogramOfGradientsBorder_16s32f_C3R_Ctx**(const *Npp16s* *pSrc, int nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, const *NppiPoint* *hpLocations, int nLocations, *Npp32f* *pDstWindowDescriptorBuffer, *NppiSize* oSizeROI, const *NppiHOGConfig* oHOGConfig, *Npp8u* *pScratchBuffer, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

3 channel 16-bit signed color per source image descriptor window location with source image border control to per descriptor window destination floating point histogram of gradients.

Requires first calling nppiHistogramOfGradientsBorderGetBufferSize function call to get required scratch (host) working buffer size and *nppiHistogramOfGradientsBorderGetDescriptorsSize()* function call to get total size for nLocations of output histogram block descriptor windows.

For common parameter descriptions, see *Common parameters for nppiFilterHistogramOfGradientsBorder functions:*.

NppStatus **nppiHistogramOfGradientsBorder_32f_C1R_Ctx**(const *Npp32f* *pSrc, int nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, const *NppiPoint* *hpLocations, int nLocations, *Npp32f* *pDstWindowDescriptorBuffer, *NppiSize* oSizeROI, const *NppiHOGConfig* oHOGConfig, *Npp8u* *pScratchBuffer, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

1 channel 32-bit floating point grayscale per source image descriptor window location with source image border control to per descriptor window destination floating point histogram of gradients.

Requires first calling nppiHistogramOfGradientsBorderGetBufferSize function call to get required scratch (host) working buffer size and *nppiHistogramOfGradientsBorderGetDescriptorsSize()* function call to get total size for nLocations of output histogram block descriptor windows.

For common parameter descriptions, see *Common parameters for nppiFilterHistogramOfGradientsBorder functions:*.

NppStatus **nppiHistogramOfGradientsBorder_32f_C3R_Ctx**(const *Npp32f* *pSrc, int nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, const *NppiPoint* *hpLocations, int nLocations, *Npp32f* *pDstWindowDescriptorBuffer, *NppiSize* oSizeROI, const *NppiHOGConfig* oHOGConfig, *Npp8u* *pScratchBuffer, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

3 channel 32-bit floating point color per source image descriptor window location with source image border control to per descriptor window destination floating point histogram of gradients.

Requires first calling nppiHistogramOfGradientsBorderGetBufferSize function call to get required scratch (host) working buffer size and *nppiHistogramOfGradientsBorderGetDescriptorsSize()* function call to get total size for nLocations of output histogram block descriptor windows.

For common parameter descriptions, see *Common parameters for nppiFilterHistogramOfGradientsBorder functions:*.

1.10.7. Image Filter Flood Fill

1.10.7.1 FloodFill

Flood fill a connected region of an image with a specified new value.

FloodFillGetBufferSize

Before calling any of the FloodFill functions the application first needs to call the FloodFillGetBufferSize function to determine the amount of device memory to allocate as a working buffer.

The application allocated device memory is then passed as the pBuffer parameter to the corresponding FloodFill function.

NppStatus **nppiFloodFillGetBufferSize**(*NppiSize* oSizeROI, int *hpBufferSize)

Calculate scratch buffer size needed for the FloodFill function based on destination image oSizeROI width and height.

Parameters

- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **hpBufferSize** – Required buffer size in bytes.

1.10.7.2 Flood Fill

1.10.7.2.1 FloodFill

In place flood fill of a region of pixels connected to the pixel at the seed pixel location in an image with a new pixel value.

Before calling any of the FloodFill functions the application first needs to call the FloodFillGetBufferSize function to determine the amount of device memory to allocate as a working buffer. The allocated device memory is then passed as the pBuffer parameter to the corresponding FloodFill function.

Optionally the function can return connected region information for the filled region in the pConnectedRegion *NppiConnectedRegion* structure in host memory. The oBoundingBox x and y will be set to the left and top coordinates and width and height will be set to the right bottom coordinates of the bounding box relative to pSrcDst. Set pConnectedRegion to NULL if not required. Requesting pConnectedRegion information may slightly degrade performance.

Functions

NppStatus **nppiFloodFill_8u_C1IR_Ctx**(*Npp8u* *pSrcDst, int nSrcDstStep, *NppiPoint* oSeed, const *Npp8u* nNewValue, *NppiNorm* eNorm, *NppiSize* oSizeROI, *NppiConnectedRegion* *pConnectedRegion, *Npp8u* *pBuffer, *NppStreamContext* nppStreamCtx)

1 channel 8-bit unsigned integer grayscale in place flood fill.

Parameters

- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step* in bytes.
- **oSeed** – Image location of seed pixel value to be used for comparison.
- **nNewValue** – Image pixel value to be used to replace matching pixels.
- **eNorm** – Type of pixel connectivity test to use, nppiNormInf will use 8 way connectivity and nppiNormL1 will use 4 way connectivity.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **pConnectedRegion** – Optional host memory pointer to an *NppiConnectedRegion* object which returns information about the filled region. Set to NULL if not needed.
- **pBuffer** – Pointer to device memory scratch buffer at least as large as value returned by the corresponding FloodFillGetBufferSize call.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiFloodFill_8u_C3IR_Ctx**(*Npp8u* *pSrcDst, int nSrcDstStep, *NppiPoint* oSeed, const *Npp8u* aNewValues[3], *NppiNorm* eNorm, *NppiSize* oSizeROI, *NppiConnectedRegion* *pConnectedRegion, *Npp8u* *pBuffer, *NppStreamContext* nppStreamCtx)

3 channel 8-bit unsigned integer color in place flood fill.

Parameters

- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step* in bytes.
- **oSeed** – Image location of seed pixel value to be used for comparison.
- **aNewValues** – Image pixel values to be used to replace matching pixels.
- **eNorm** – Type of pixel connectivity test to use, nppiNormInf will use 8 way connectivity and nppiNormL1 will use 4 way connectivity.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **pConnectedRegion** – Optional host memory pointer to an *NppiConnectedRegion* object which returns information about the filled region. Set to NULL if not needed.
- **pBuffer** – Pointer to device memory scratch buffer at least as large as value returned by the corresponding FloodFillGetBufferSize call.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiFloodFill_16u_C1IR_Ctx**(*Npp16u* *pSrcDst, int nSrcDstStep, *NppiPoint* oSeed, const *Npp16u* nNewValue, *NppiNorm* eNorm, *NppiSize* oSizeROI, *NppiConnectedRegion* *pConnectedRegion, *Npp8u* *pBuffer, *NppStreamContext* nppStreamCtx)

1 channel 16-bit unsigned integer grayscale in place flood fill.

Parameters

- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step* in bytes.
- **oSeed** – Image location of seed pixel value to be used for comparison.
- **nNewValue** – Image pixel value to be used to replace matching pixels.
- **eNorm** – Type of pixel connectivity test to use, nppiNormInf will use 8 way connectivity and nppiNormL1 will use 4 way connectivity.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **pConnectedRegion** – Optional host memory pointer to an *NppiConnectedRegion* object which returns information about the filled region. Set to NULL if not needed.
- **pBuffer** – Pointer to device memory scratch buffer at least as large as value returned by the corresponding FloodFillGetBufferSize call.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiFloodFill_16u_C3IR_Ctx**(*Npp16u* *pSrcDst, int nSrcDstStep, *NppiPoint* oSeed, const *Npp16u* aNewValues[3], *NppiNorm* eNorm, *NppiSize* oSizeROI, *NppiConnectedRegion* *pConnectedRegion, *Npp8u* *pBuffer, *NppStreamContext* nppStreamCtx)

3 channel 16-bit unsigned integer color in place flood fill.

Parameters

- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step* in bytes.
- **oSeed** – Image location of seed pixel value to be used for comparison.
- **aNewValues** – Image pixel values to be used to replace matching pixels.
- **eNorm** – Type of pixel connectivity test to use, nppiNormInf will use 8 way connectivity and nppiNormL1 will use 4 way connectivity.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **pConnectedRegion** – Optional host memory pointer to an *NppiConnectedRegion* object which returns information about the filled region. Set to NULL if not needed.
- **pBuffer** – Pointer to device memory scratch buffer at least as large as value returned by the corresponding FloodFillGetBufferSize call.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiFloodFill_32u_C1IR_Ctx**(*Npp32u* *pSrcDst, int nSrcDstStep, *NppiPoint* oSeed, const *Npp32u* nNewValue, *NppiNorm* eNorm, *NppiSize* oSizeROI, *NppiConnectedRegion* *pConnectedRegion, *Npp8u* *pBuffer, *NppStreamContext* nppStreamCtx)

1 channel 32-bit unsigned integer grayscale in place flood fill.

Parameters

- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step* in bytes.
- **oSeed** – Image location of seed pixel value to be used for comparison.
- **nNewValue** – Image pixel value to be used to replace matching pixels.
- **eNorm** – Type of pixel connectivity test to use, nppiNormInf will use 8 way connectivity and nppiNormL1 will use 4 way connectivity.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **pConnectedRegion** – Optional host memory pointer to an *NppiConnectedRegion* object which returns information about the filled region. Set to NULL if not needed.
- **pBuffer** – Pointer to device memory scratch buffer at least as large as value returned by the corresponding FloodFillGetBufferSize call.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiFloodFill_32u_C3IR_Ctx**(*Npp32u* *pSrcDst, int nSrcDstStep, *NppiPoint* oSeed, const *Npp32u* aNewValues[3], *NppiNorm* eNorm, *NppiSize* oSizeROI, *NppiConnectedRegion* *pConnectedRegion, *Npp8u* *pBuffer, *NppStreamContext* nppStreamCtx)

3 channel 32-bit unsigned integer color in place flood fill.

Parameters

- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step* in bytes.
- **oSeed** – Image location of seed pixel value to be used for comparison.
- **aNewValues** – Image pixel values to be used to replace matching pixels.
- **eNorm** – Type of pixel connectivity test to use, nppiNormInf will use 8 way connectivity and nppiNormL1 will use 4 way connectivity.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **pConnectedRegion** – Optional host memory pointer to an *NppiConnectedRegion* object which returns information about the filled region. Set to NULL if not needed.
- **pBuffer** – Pointer to device memory scratch buffer at least as large as value returned by the corresponding FloodFillGetBufferSize call.

- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

1.10.7.3 Flood Fill Boundary

1.10.7.3.1 FloodFillBoundary

In place flood fill of a region of pixels connected to the pixel at the seed pixel location in an image with a new pixel value. Also fill boundary of filled region with a specified color.

Before calling any of the FloodFill functions the application first needs to call the FloodFillGetBufferSize function to determine the amount of device memory to allocate as a working buffer. The allocated device memory is then passed as the pBuffer parameter to the corresponding FloodFill function.

Optionally the function can return connected region information for the filled region in the pConnectedRegion *NppiConnectedRegion* structure in host memory. The oBoundingBox x and y will be set to the left and top coordinates and width and height will be set to the right bottom coordinates of the bounding box relative to pSrcDst. Set pConnectedRegion to NULL if not required. Requesting pConnectedRegion information may slightly degrade performance.

Functions

NppStatus **nppiFloodFillBoundary_8u_C1IR_Ctx**(*Npp8u* *pSrcDst, int nSrcDstStep, *NppiPoint* oSeed, const *Npp8u* nNewValue, const *Npp8u* nBoundaryValue, *NppiNorm* eNorm, *NppiSize* oSizeROI, *NppiConnectedRegion* *pConnectedRegion, *Npp8u* *pBuffer, *NppStreamContext* nppStreamCtx)

1 channel 8-bit unsigned integer grayscale in place flood fill.

Parameters

- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step* in bytes.
- **oSeed** – Image location of seed pixel value to be used for comparison.
- **nNewValue** – Image pixel value to be used to replace matching pixels.
- **nBoundaryValue** – Image pixel value to be used for region boundary.
- **eNorm** – Type of pixel connectivity test to use, nppiNormInf will use 8 way connectivity and nppiNormL1 will use 4 way connectivity.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **pConnectedRegion** – Optional host memory pointer to an *NppiConnectedRegion* object which returns information about the filled region. Set to NULL if not needed.
- **pBuffer** – Pointer to device memory scratch buffer at least as large as value returned by the corresponding FloodFillGetBufferSize call.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiFloodFillBoundary_8u_C3IR_Ctx**(*Npp8u* *pSrcDst, int nSrcDstStep, *NppiPoint* oSeed, const *Npp8u* aNewValues[3], const *Npp8u* aBoundaryValues[3], *NppiNorm* eNorm, *NppiSize* oSizeROI, *NppiConnectedRegion* *pConnectedRegion, *Npp8u* *pBuffer, *NppStreamContext* nppStreamCtx)

3 channel 8-bit unsigned integer color in place flood fill.

Parameters

- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step* in bytes.
- **oSeed** – Image location of seed pixel value to be used for comparison.
- **aNewValues** – Image pixel values to be used to replace matching pixels.
- **aBoundaryValues** – Image pixel values to be used for region boundary.
- **eNorm** – Type of pixel connectivity test to use, nppiNormInf will use 8 way connectivity and nppiNormL1 will use 4 way connectivity.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **pConnectedRegion** – Optional host memory pointer to an *NppiConnectedRegion* object which returns information about the filled region. Set to NULL if not needed.
- **pBuffer** – Pointer to device memory scratch buffer at least as large as value returned by the corresponding FloodFillGetBufferSize call.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiFloodFillBoundary_16u_C1IR_Ctx**(*Npp16u* *pSrcDst, int nSrcDstStep, *NppiPoint* oSeed, const *Npp16u* nNewValue, const *Npp16u* nBoundaryValue, *NppiNorm* eNorm, *NppiSize* oSizeROI, *NppiConnectedRegion* *pConnectedRegion, *Npp8u* *pBuffer, *NppStreamContext* nppStreamCtx)

1 channel 16-bit unsigned integer grayscale in place flood fill.

Parameters

- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step* in bytes.
- **oSeed** – Image location of seed pixel value to be used for comparison.
- **nNewValue** – Image pixel value to be used to replace matching pixels.
- **nBoundaryValue** – Image pixel value to be used for region boundary.

- **eNorm** – Type of pixel connectivity test to use, nppiNormInf will use 8 way connectivity and nppiNormL1 will use 4 way connectivity.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **pConnectedRegion** – Optional host memory pointer to an *NppiConnectedRegion* object which returns information about the filled region. Set to NULL if not needed.
- **pBuffer** – Pointer to device memory scratch buffer at least as large as value returned by the corresponding FloodFillGetBufferSize call.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiFloodFillBoundary_16u_C3IR_Ctx**(*Npp16u* *pSrcDst, int nSrcDstStep, *NppiPoint* oSeed, const *Npp16u* aNewValues[3], const *Npp16u* aBoundaryValues[3], *NppiNorm* eNorm, *NppiSize* oSizeROI, *NppiConnectedRegion* *pConnectedRegion, *Npp8u* *pBuffer, *NppStreamContext* nppStreamCtx)

3 channel 16-bit unsigned integer color in place flood fill.

Parameters

- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step* in bytes.
- **oSeed** – Image location of seed pixel value to be used for comparison.
- **aNewValues** – Image pixel values to be used to replace matching pixels.
- **aBoundaryValues** – Image pixel values to be used for region boundary.
- **eNorm** – Type of pixel connectivity test to use, nppiNormInf will use 8 way connectivity and nppiNormL1 will use 4 way connectivity.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **pConnectedRegion** – Optional host memory pointer to an *NppiConnectedRegion* object which returns information about the filled region. Set to NULL if not needed.
- **pBuffer** – Pointer to device memory scratch buffer at least as large as value returned by the corresponding FloodFillGetBufferSize call.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiFloodFillBoundary_32u_C1IR_Ctx**(*Npp32u* *pSrcDst, int nSrcDstStep, *NppiPoint* oSeed, const *Npp32u* nNewValue, const *Npp32u* nBoundaryValue, *NppiNorm* eNorm, *NppiSize* oSizeROI, *NppiConnectedRegion* *pConnectedRegion, *Npp8u* *pBuffer, *NppStreamContext* nppStreamCtx)

1 channel 32-bit unsigned integer grayscale in place flood fill.

Parameters

- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step* in bytes.
- **oSeed** – Image location of seed pixel value to be used for comparison.
- **nNewValue** – Image pixel value to be used to replace matching pixels.
- **nBoundaryValue** – Image pixel value to be used for region boundary.
- **eNorm** – Type of pixel connectivity test to use, nppiNormInf will use 8 way connectivity and nppiNormL1 will use 4 way connectivity.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **pConnectedRegion** – Optional host memory pointer to an *NppiConnectedRegion* object which returns information about the filled region. Set to NULL if not needed.
- **pBuffer** – Pointer to device memory scratch buffer at least as large as value returned by the corresponding FloodFillGetBufferSize call.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiFloodFillBoundary_32u_C3IR_Ctx**(*Npp32u* *pSrcDst, int nSrcDstStep, *NppiPoint* oSeed, const *Npp32u* aNewValues[3], const *Npp32u* aBoundaryValues[3], *NppiNorm* eNorm, *NppiSize* oSizeROI, *NppiConnectedRegion* *pConnectedRegion, *Npp8u* *pBuffer, *NppStreamContext* nppStreamCtx)

3 channel 32-bit unsigned integer color in place flood fill.

Parameters

- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step* in bytes.
- **oSeed** – Image location of seed pixel value to be used for comparison.
- **aNewValues** – Image pixel values to be used to replace matching pixels.
- **aBoundaryValues** – Image pixel values to be used for region boundary.
- **eNorm** – Type of pixel connectivity test to use, nppiNormInf will use 8 way connectivity and nppiNormL1 will use 4 way connectivity.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **pConnectedRegion** – Optional host memory pointer to an *NppiConnectedRegion* object which returns information about the filled region. Set to NULL if not needed.

- **pBuffer** – Pointer to device memory scratch buffer at least as large as value returned by the corresponding FloodFillGetBufferSize call.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

1.10.7.4 Flood Fill Range

1.10.7.4.1 FloodFillRange

In place flood fill of a region of pixels connected to the pixel at the seed pixel location and with a Pixel value >= Min and <= Max in an image with a new pixel value.

Before calling any of the FloodFill functions the application first needs to call the FloodFillGetBufferSize function to determine the amount of device memory to allocate as a working buffer. The allocated device memory is then passed as the pBuffer parameter to the corresponding FloodFill function.

Optionally the function can return connected region information for the filled region in the pConnectedRegion *NppiConnectedRegion* structure in host memory. The oBoundingBox x and y will be set to the left and top coordinates and width and height will be set to the right bottom coordinates of the bounding box relative to pSrcDst. Set pConnectedRegion to NULL if not required. Requesting pConnectedRegion information may slightly degrade performance.

Functions

NppStatus **nppiFloodFillRange_8u_C1IR_Ctx**(*Npp8u* *pSrcDst, int nSrcDstStep, *NppiPoint* oSeed, *Npp8u* nMin, *Npp8u* nMax, const *Npp8u* nNewValue, *NppiNorm* eNorm, *NppiSize* oSizeROI, *NppiConnectedRegion* *pConnectedRegion, *Npp8u* *pBuffer, *NppStreamContext* nppStreamCtx)

1 channel 8-bit unsigned integer grayscale in place flood fill.

Parameters

- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step* in bytes.
- **oSeed** – Image location of seed pixel value to be used for comparison.
- **nMin** – Value of tested pixel must be >= this value.
- **nMax** – Value of tested pixel must be <= this value.
- **nNewValue** – Image pixel value to be used to replace matching pixels.
- **eNorm** – Type of pixel connectivity test to use, nppiNormInf will use 8 way connectivity and nppiNormL1 will use 4 way connectivity.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **pConnectedRegion** – Optional host memory pointer to an *NppiConnectedRegion* object which returns information about the filled region. Set to NULL if not needed.

- **pBuffer** – Pointer to device memory scratch buffer at least as large as value returned by the corresponding FloodFillGetBufferSize call.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiFloodFillRange_8u_C3IR_Ctx**(*Npp8u* *pSrcDst, int nSrcDstStep, *NppiPoint* oSeed, *Npp8u* aMin[3], *Npp8u* aMax[3], const *Npp8u* aNewValues[3], *NppiNorm* eNorm, *NppiSize* oSizeROI, *NppiConnectedRegion* *pConnectedRegion, *Npp8u* *pBuffer, *NppStreamContext* nppStreamCtx)

3 channel 8-bit unsigned integer color in place flood fill.

Parameters

- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step* in bytes.
- **oSeed** – Image location of seed pixel value to be used for comparison.
- **aMin** – Value of each element of tested pixel must be >= the corresponding aMin value.
- **aMax** – Value of each element of tested pixel must be <= the corresponding aMax value.
- **aNewValues** – Image pixel values to be used to replace matching pixels.
- **eNorm** – Type of pixel connectivity test to use, nppiNormInf will use 8 way connectivity and nppiNormL1 will use 4 way connectivity.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **pConnectedRegion** – Optional host memory pointer to an *NppiConnectedRegion* object which returns information about the filled region. Set to NULL if not needed.
- **pBuffer** – Pointer to device memory scratch buffer at least as large as value returned by the corresponding FloodFillGetBufferSize call.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiFloodFillRange_16u_C1IR_Ctx**(*Npp16u* *pSrcDst, int nSrcDstStep, *NppiPoint* oSeed, *Npp16u* nMin, *Npp16u* nMax, const *Npp16u* nNewValue, *NppiNorm* eNorm, *NppiSize* oSizeROI, *NppiConnectedRegion* *pConnectedRegion, *Npp8u* *pBuffer, *NppStreamContext* nppStreamCtx)

1 channel 16-bit unsigned integer grayscale in place flood fill.

Parameters

- **pSrcDst** – *In-Place Image Pointer*.

- **nSrcDstStep** – *In-Place-Image Line Step* in bytes.
- **oSeed** – Image location of seed pixel value to be used for comparison.
- **nMin** – Value of tested pixel must be >= this value.
- **nMax** – Value of tested pixel must be <= this value.
- **nNewValue** – Image pixel value to be used to replace matching pixels.
- **eNorm** – Type of pixel connectivity test to use, nppiNormInf will use 8 way connectivity and nppiNormL1 will use 4 way connectivity.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **pConnectedRegion** – Optional host memory pointer to an *NppiConnectedRegion* object which returns information about the filled region. Set to NULL if not needed.
- **pBuffer** – Pointer to device memory scratch buffer at least as large as value returned by the corresponding FloodFillGetBufferSize call.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiFloodFillRange_16u_C3IR_Ctx**(*Npp16u* *pSrcDst, int nSrcDstStep, *NppiPoint* oSeed, *Npp16u* aMin[3], *Npp16u* aMax[3], const *Npp16u* aNewValues[3], *NppiNorm* eNorm, *NppiSize* oSizeROI, *NppiConnectedRegion* *pConnectedRegion, *Npp8u* *pBuffer, *NppStreamContext* nppStreamCtx)

3 channel 16-bit unsigned integer color in place flood fill.

Parameters

- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step* in bytes.
- **oSeed** – Image location of seed pixel value to be used for comparison.
- **aMin** – Value of each element of tested pixel must be >= the corresponding aMin value.
- **aMax** – Value of each element of tested pixel must be <= the corresponding aMax value.
- **aNewValues** – Image pixel values to be used to replace matching pixels.
- **eNorm** – Type of pixel connectivity test to use, nppiNormInf will use 8 way connectivity and nppiNormL1 will use 4 way connectivity.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **pConnectedRegion** – Optional host memory pointer to an *NppiConnectedRegion* object which returns information about the filled region. Set to NULL if not needed.
- **pBuffer** – Pointer to device memory scratch buffer at least as large as value returned by the corresponding FloodFillGetBufferSize call.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiFloodFillRange_32u_C1IR_Ctx**(*Npp32u* *pSrcDst, int nSrcDstStep, *NppiPoint* oSeed, *Npp32u* nMin, *Npp32u* nMax, const *Npp32u* nNewValue, *NppiNorm* eNorm, *NppiSize* oSizeROI, *NppiConnectedRegion* *pConnectedRegion, *Npp8u* *pBuffer, *NppStreamContext* nppStreamCtx)

1 channel 32-bit unsigned integer grayscale in place flood fill.

Parameters

- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step* in bytes.
- **oSeed** – Image location of seed pixel value to be used for comparison.
- **nMin** – Value of tested pixel must be >= this value.
- **nMax** – Value of tested pixel must be <= this value.
- **nNewValue** – Image pixel value to be used to replace matching pixels.
- **eNorm** – Type of pixel connectivity test to use, nppiNormInf will use 8 way connectivity and nppiNormL1 will use 4 way connectivity.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **pConnectedRegion** – Optional host memory pointer to an *NppiConnectedRegion* object which returns information about the filled region. Set to NULL if not needed.
- **pBuffer** – Pointer to device memory scratch buffer at least as large as value returned by the corresponding FloodFillGetBufferSize call.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiFloodFillRange_32u_C3IR_Ctx**(*Npp32u* *pSrcDst, int nSrcDstStep, *NppiPoint* oSeed, *Npp32u* aMin[3], *Npp32u* aMax[3], const *Npp32u* aNewValues[3], *NppiNorm* eNorm, *NppiSize* oSizeROI, *NppiConnectedRegion* *pConnectedRegion, *Npp8u* *pBuffer, *NppStreamContext* nppStreamCtx)

3 channel 32-bit unsigned integer color in place flood fill.

Parameters

- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step* in bytes.
- **oSeed** – Image location of seed pixel value to be used for comparison.
- **aMin** – Value of each element of tested pixel must be >= the corresponding aMin value.

- **aMax** – Value of each element of tested pixel must be <= the corresponding aMax value.
- **aNewValues** – Image pixel values to be used to replace matching pixels.
- **eNorm** – Type of pixel connectivity test to use, nppiNormInf will use 8 way connectivity and nppiNormL1 will use 4 way connectivity.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **pConnectedRegion** – Optional host memory pointer to an *NppiConnectedRegion* object which returns information about the filled region. Set to NULL if not needed.
- **pBuffer** – Pointer to device memory scratch buffer at least as large as value returned by the corresponding FloodFillGetBufferSize call.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

1.10.7.5 Flood Fill Range Boundary

1.10.7.5.1 FloodFillRangeBoundary

In place flood fill of a region of pixels connected to the pixel at the seed pixel location and with a Pixel value >= Min and <= Max in an image with a new pixel value. Also fill boundary of filled region with a specified color.

Before calling any of the FloodFill functions the application first needs to call the FloodFillGetBufferSize function to determine the amount of device memory to allocate as a working buffer. The allocated device memory is then passed as the pBuffer parameter to the corresponding FloodFill function.

Optionally the function can return connected region information for the filled region in the pConnectedRegion *NppiConnectedRegion* structure in host memory. The oBoundingBox x and y will be set to the left and top coordinates and width and height will be set to the right bottom coordinates of the bounding box relative to pSrcDst. Set pConnectedRegion to NULL if not required. Requesting pConnectedRegion information may slightly degrade performance.

Functions

NppStatus **nppiFloodFillRangeBoundary_8u_C1IR_Ctx**(*Npp8u* *pSrcDst, int nSrcDstStep, *NppiPoint* oSeed, *Npp8u* nMin, *Npp8u* nMax, const *Npp8u* nNewValue, const *Npp8u* nBoundaryValue, *NppiNorm* eNorm, *NppiSize* oSizeROI, *NppiConnectedRegion* *pConnectedRegion, *Npp8u* *pBuffer, *NppStreamContext* nppStreamCtx)

1 channel 8-bit unsigned integer grayscale in place flood fill.

Parameters

- **pSrcDst** – *In-Place Image Pointer*.

- **nSrcDstStep** – *In-Place-Image Line Step* in bytes.
- **oSeed** – Image location of seed pixel value to be used for comparison.
- **nMin** – Value of tested pixel must be >= this value.
- **nMax** – Value of tested pixel must be <= this value.
- **nNewValue** – Image pixel value to be used to replace matching pixels.
- **nBoundaryValue** – Image pixel value to be used for region boundary.
- **eNorm** – Type of pixel connectivity test to use, nppiNormInf will use 8 way connectivity and nppiNormL1 will use 4 way connectivity.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **pConnectedRegion** – Optional host memory pointer to an *NppiConnectedRegion* object which returns information about the filled region. Set to NULL if not needed.
- **pBuffer** – Pointer to device memory scratch buffer at least as large as value returned by the corresponding FloodFillGetBufferSize call.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiFloodFillRangeBoundary_8u_C3IR_Ctx**(*Npp8u* *pSrcDst, int nSrcDstStep, *NppiPoint* oSeed, *Npp8u* aMin[3], *Npp8u* aMax[3], const *Npp8u* aNewValues[3], const *Npp8u* aBoundaryValues[3], *NppiNorm* eNorm, *NppiSize* oSizeROI, *NppiConnectedRegion* *pConnectedRegion, *Npp8u* *pBuffer, *NppStreamContext* nppStreamCtx)

3 channel 8-bit unsigned integer color in place flood fill.

Parameters

- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step* in bytes.
- **oSeed** – Image location of seed pixel value to be used for comparison.
- **aMin** – Value of each element of tested pixel must be >= the corresponding aMin value.
- **aMax** – Value of each element of tested pixel must be <= the corresponding aMax value.
- **aNewValues** – Image pixel values to be used to replace matching pixels.
- **aBoundaryValues** – Image pixel values to be used for region boundary.
- **eNorm** – Type of pixel connectivity test to use, nppiNormInf will use 8 way connectivity and nppiNormL1 will use 4 way connectivity.
- **oSizeROI** – *Region-Of-Interest (ROI)*.

- **pConnectedRegion** – Optional host memory pointer to an *NppiConnectedRegion* object which returns information about the filled region. Set to NULL if not needed.
- **pBuffer** – Pointer to device memory scratch buffer at least as large as value returned by the corresponding FloodFillGetBufferSize call.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiFloodFillRangeBoundary_16u_C1IR_Ctx**(*Npp16u* *pSrcDst, int nSrcDstStep, *NppiPoint* oSeed, *Npp16u* nMin, *Npp16u* nMax, const *Npp16u* nNewValue, const *Npp16u* nBoundaryValue, *NppiNorm* eNorm, *NppiSize* oSizeROI, *NppiConnectedRegion* *pConnectedRegion, *Npp8u* *pBuffer, *NppStreamContext* nppStreamCtx)

1 channel 16-bit unsigned integer grayscale in place flood fill.

Parameters

- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step* in bytes.
- **oSeed** – Image location of seed pixel value to be used for comparison.
- **nMin** – Value of tested pixel must be >= this value.
- **nMax** – Value of tested pixel must be <= this value.
- **nNewValue** – Image pixel value to be used to replace matching pixels.
- **nBoundaryValue** – Image pixel value to be used for region boundary.
- **eNorm** – Type of pixel connectivity test to use, nppiNormInf will use 8 way connectivity and nppiNormL1 will use 4 way connectivity.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **pConnectedRegion** – Optional host memory pointer to an *NppiConnectedRegion* object which returns information about the filled region. Set to NULL if not needed.
- **pBuffer** – Pointer to device memory scratch buffer at least as large as value returned by the corresponding FloodFillGetBufferSize call.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiFloodFillRangeBoundary_16u_C3IR_Ctx**(*Npp16u* *pSrcDst, int nSrcDstStep, *NppiPoint* oSeed, *Npp16u* aMin[3], *Npp16u* aMax[3], const *Npp16u* aNewValues[3], const *Npp16u* aBoundaryValues[3], *NppiNorm* eNorm, *NppiSize* oSizeROI, *NppiConnectedRegion* *pConnectedRegion, *Npp8u* *pBuffer, *NppStreamContext* nppStreamCtx)

3 channel 16-bit unsigned integer color in place flood fill.

Parameters

- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step* in bytes.
- **oSeed** – Image location of seed pixel value to be used for comparison.
- **aMin** – Value of each element of tested pixel must be >= the corresponding aMin value.
- **aMax** – Value of each element of tested pixel must be <= the corresponding aMax value.
- **aNewValues** – Image pixel values to be used to replace matching pixels.
- **aBoundaryValues** – Image pixel values to be used for region boundary.
- **eNorm** – Type of pixel connectivity test to use, nppiNormInf will use 8 way connectivity and nppiNormL1 will use 4 way connectivity.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **pConnectedRegion** – Optional host memory pointer to an *NppiConnectedRegion* object which returns information about the filled region. Set to NULL if not needed.
- **pBuffer** – Pointer to device memory scratch buffer at least as large as value returned by the corresponding FloodFillGetBufferSize call.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiFloodFillRangeBoundary_32u_C1IR_Ctx**(*Npp32u* *pSrcDst, int nSrcDstStep, *NppiPoint* oSeed, *Npp32u* nMin, *Npp32u* nMax, const *Npp32u* nNewValue, const *Npp32u* nBoundaryValue, *NppiNorm* eNorm, *NppiSize* oSizeROI, *NppiConnectedRegion* *pConnectedRegion, *Npp8u* *pBuffer, *NppStreamContext* nppStreamCtx)

1 channel 32-bit unsigned integer grayscale in place flood fill.

Parameters

- **pSrcDst** – *In-Place Image Pointer*.

- **nSrcDstStep** – *In-Place-Image Line Step* in bytes.
- **oSeed** – Image location of seed pixel value to be used for comparison.
- **nMin** – Value of tested pixel must be >= this value.
- **nMax** – Value of tested pixel must be <= this value.
- **nNewValue** – Image pixel value to be used to replace matching pixels.
- **nBoundaryValue** – Image pixel value to be used for region boundary.
- **eNorm** – Type of pixel connectivity test to use, nppiNormInf will use 8 way connectivity and nppiNormL1 will use 4 way connectivity.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **pConnectedRegion** – Optional host memory pointer to an *NppiConnectedRegion* object which returns information about the filled region. Set to NULL if not needed.
- **pBuffer** – Pointer to device memory scratch buffer at least as large as value returned by the corresponding FloodFillGetBufferSize call.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiFloodFillRangeBoundary_32u_C3IR_Ctx**(*Npp32u* *pSrcDst, int nSrcDstStep, *NppiPoint* oSeed, *Npp32u* aMin[3], *Npp32u* aMax[3], const *Npp32u* aNewValues[3], const *Npp32u* aBoundaryValues[3], *NppiNorm* eNorm, *NppiSize* oSizeROI, *NppiConnectedRegion* *pConnectedRegion, *Npp8u* *pBuffer, *NppStreamContext* nppStreamCtx)

3 channel 32-bit unsigned integer color in place flood fill.

Parameters

- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step* in bytes.
- **oSeed** – Image location of seed pixel value to be used for comparison.
- **aMin** – Value of each element of tested pixel must be >= the corresponding aMin value.
- **aMax** – Value of each element of tested pixel must be <= the corresponding aMax value.
- **aNewValues** – Image pixel values to be used to replace matching pixels.
- **aBoundaryValues** – Image pixel values to be used for region boundary.
- **eNorm** – Type of pixel connectivity test to use, nppiNormInf will use 8 way connectivity and nppiNormL1 will use 4 way connectivity.
- **oSizeROI** – *Region-Of-Interest (ROI)*.

- **pConnectedRegion** – Optional host memory pointer to an *NppiConnectedRegion* object which returns information about the filled region. Set to NULL if not needed.
- **pBuffer** – Pointer to device memory scratch buffer at least as large as value returned by the corresponding FloodFillGetBufferSize call.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

1.10.7.6 Flood Fill Gradient

1.10.7.6.1 FloodFillGradient

In place flood fill of a region of pixels connected to the pixel at the seed pixel location and with an original pixel value including seed - Min to seed + Max in an image with a new pixel value.

In place flood fill of a region of pixels connected to the pixel at the seed pixel location in an image with a new pixel value.

Before calling any of the FloodFill functions the application first needs to call the FloodFillGetBufferSize function to determine the amount of device memory to allocate as a working buffer. The allocated device memory is then passed as the pBuffer parameter to the corresponding FloodFill function.

Optionally the function can return connected region information for the filled region in the pConnectedRegion *NppiConnectedRegion* structure in host memory. The oBoundingBox x and y will be set to the left and top coordinates and width and height will be set to the right bottom coordinates of the bounding box relative to pSrcDst. Set pConnectedRegion to NULL if not required. Requesting pConnectedRegion information may slightly degrade performance.

Functions

NppStatus **nppiFloodFillGradient_8u_C1IR_Ctx**(*Npp8u* *pSrcDst, int nSrcDstStep, *NppiPoint* oSeed, *Npp8u* nMin, *Npp8u* nMax, const *Npp8u* nNewValue, *NppiNorm* eNorm, *NppiSize* oSizeROI, *NppiConnectedRegion* *pConnectedRegion, *Npp8u* *pBuffer, *NppStreamContext* nppStreamCtx)

1 channel 8-bit unsigned integer grayscale in place flood fill.

Parameters

- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step* in bytes.
- **oSeed** – Image location of seed pixel value to be used for comparison.
- **nMin** – Value of tested pixel must be >= seed value - this value.
- **nMax** – Value of tested pixel must be <= seed value + this value.
- **nNewValue** – Image pixel value to be used to replace matching pixels.

- **eNorm** – Type of pixel connectivity test to use, nppiNormInf will use 8 way connectivity and nppiNormL1 will use 4 way connectivity.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **pConnectedRegion** – Optional host memory pointer to an *NppiConnectedRegion* object which returns information about the filled region. Set to NULL if not needed.
- **pBuffer** – Pointer to device memory scratch buffer at least as large as value returned by the corresponding FloodFillGetBufferSize call.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiFloodFillGradient_8u_C3IR_Ctx**(*Npp8u* *pSrcDst, int nSrcDstStep, *NppiPoint* oSeed, *Npp8u* aMin[3], *Npp8u* aMax[3], const *Npp8u* aNewValues[3], *NppiNorm* eNorm, *NppiSize* oSizeROI, *NppiConnectedRegion* *pConnectedRegion, *Npp8u* *pBuffer, *NppStreamContext* nppStreamCtx)

3 channel 8-bit unsigned integer color in place flood fill.

Parameters

- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step* in bytes.
- **oSeed** – Image location of seed pixel value to be used for comparison.
- **aMin** – Value of each element of tested pixel must be >= the corresponding seed value - aMin value.
- **aMax** – Value of each element of tested pixel must be <= the corresponding seed value + aMax value.
- **aNewValues** – Image pixel values to be used to replace matching pixels.
- **eNorm** – Type of pixel connectivity test to use, nppiNormInf will use 8 way connectivity and nppiNormL1 will use 4 way connectivity.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **pConnectedRegion** – Optional host memory pointer to an *NppiConnectedRegion* object which returns information about the filled region. Set to NULL if not needed.
- **pBuffer** – Pointer to device memory scratch buffer at least as large as value returned by the corresponding FloodFillGetBufferSize call.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiFloodFillGradient_16u_C1IR_Ctx**(*Npp16u* *pSrcDst, int nSrcDstStep, *NppiPoint* oSeed, *Npp16u* nMin, *Npp16u* nMax, const *Npp16u* nNewValue, *NppiNorm* eNorm, *NppiSize* oSizeROI, *NppiConnectedRegion* *pConnectedRegion, *Npp8u* *pBuffer, *NppStreamContext* nppStreamCtx)

1 channel 16-bit unsigned integer grayscale in place flood fill.

Parameters

- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step* in bytes.
- **oSeed** – Image location of seed pixel value to be used for comparison.
- **nMin** – Value of tested pixel must be >= seed value - this value.
- **nMax** – Value of tested pixel must be <= seed value + this value.
- **nNewValue** – Image pixel value to be used to replace matching pixels.
- **eNorm** – Type of pixel connectivity test to use, nppiNormInf will use 8 way connectivity and nppiNormL1 will use 4 way connectivity.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **pConnectedRegion** – Optional host memory pointer to an *NppiConnectedRegion* object which returns information about the filled region. Set to NULL if not needed.
- **pBuffer** – Pointer to device memory scratch buffer at least as large as value returned by the corresponding FloodFillGetBufferSize call.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiFloodFillGradient_16u_C3IR_Ctx**(*Npp16u* *pSrcDst, int nSrcDstStep, *NppiPoint* oSeed, *Npp16u* aMin[3], *Npp16u* aMax[3], const *Npp16u* aNewValues[3], *NppiNorm* eNorm, *NppiSize* oSizeROI, *NppiConnectedRegion* *pConnectedRegion, *Npp8u* *pBuffer, *NppStreamContext* nppStreamCtx)

3 channel 16-bit unsigned integer color in place flood fill.

Parameters

- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step* in bytes.
- **oSeed** – Image location of seed pixel value to be used for comparison.
- **aMin** – Value of each element of tested pixel must be >= the corresponding seed value - aMin value.

- **aMax** – Value of each element of tested pixel must be <= the corresponding seed value + aMax value.
- **aNewValues** – Image pixel values to be used to replace matching pixels.
- **eNorm** – Type of pixel connectivity test to use, nppiNormInf will use 8 way connectivity and nppiNormL1 will use 4 way connectivity.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **pConnectedRegion** – Optional host memory pointer to an *NppiConnectedRegion* object which returns information about the filled region. Set to NULL if not needed.
- **pBuffer** – Pointer to device memory scratch buffer at least as large as value returned by the corresponding FloodFillGetBufferSize call.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiFloodFillGradient_32u_C1IR_Ctx**(*Npp32u* *pSrcDst, int nSrcDstStep, *NppiPoint* oSeed, *Npp32u* nMin, *Npp32u* nMax, const *Npp32u* nNewValue, *NppiNorm* eNorm, *NppiSize* oSizeROI, *NppiConnectedRegion* *pConnectedRegion, *Npp8u* *pBuffer, *NppStreamContext* nppStreamCtx)

1 channel 32-bit unsigned integer grayscale in place flood fill.

Parameters

- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step* in bytes.
- **oSeed** – Image location of seed pixel value to be used for comparison.
- **nMin** – Value of tested pixel must be >= seed value - this value.
- **nMax** – Value of tested pixel must be <= seed value + this value.
- **nNewValue** – Image pixel value to be used to replace matching pixels.
- **eNorm** – Type of pixel connectivity test to use, nppiNormInf will use 8 way connectivity and nppiNormL1 will use 4 way connectivity.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **pConnectedRegion** – Optional host memory pointer to an *NppiConnectedRegion* object which returns information about the filled region. Set to NULL if not needed.
- **pBuffer** – Pointer to device memory scratch buffer at least as large as value returned by the corresponding FloodFillGetBufferSize call.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiFloodFillGradient_32u_C3IR_Ctx**(*Npp32u* *pSrcDst, int nSrcDstStep, *NppiPoint* oSeed, *Npp32u* aMin[3], *Npp32u* aMax[3], const *Npp32u* aNewValues[3], *NppiNorm* eNorm, *NppiSize* oSizeROI, *NppiConnectedRegion* *pConnectedRegion, *Npp8u* *pBuffer, *NppStreamContext* nppStreamCtx)

3 channel 32-bit unsigned integer color in place flood fill.

Parameters

- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step* in bytes.
- **oSeed** – Image location of seed pixel value to be used for comparison.
- **aMin** – Value of each element of tested pixel must be >= the corresponding seed value - aMin value.
- **aMax** – Value of each element of tested pixel must be <= the corresponding seed value + aMax value.
- **aNewValues** – Image pixel values to be used to replace matching pixels.
- **eNorm** – Type of pixel connectivity test to use, nppiNormInf will use 8 way connectivity and nppiNormL1 will use 4 way connectivity.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **pConnectedRegion** – Optional host memory pointer to an *NppiConnectedRegion* object which returns information about the filled region. Set to NULL if not needed.
- **pBuffer** – Pointer to device memory scratch buffer at least as large as value returned by the corresponding FloodFillGetBufferSize call.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

1.10.7.7 Flood Fill Gradient Boundary

1.10.7.7.1 FloodFillGradientBoundary

In place flood fill of a region of pixels connected to the pixel at the seed pixel location and with an original pixel value including seed - Min to seed + Max in an image with a new pixel value. Also fill boundary of filled region with a specified color.

In place flood fill of a region of pixels connected to the pixel at the seed pixel location in an image with a new pixel value.

Before calling any of the FloodFill functions the application first needs to call the FloodFillGetBufferSize function to determine the amount of device memory to allocate as a working buffer. The allocated device memory is then passed as the pBuffer parameter to the corresponding FloodFill function.

Optionally the function can return connected region information for the filled region in the pConnectedRegion *NppiConnectedRegion* structure in host memory. The oBoundingBox x and y will be set to

the left and top coordinates and width and height will be set to the right bottom coordinates of the bounding box relative to pSrcDst. Set pConnectedRegion to NULL if not required. Requesting pConnectedRegion information may slightly degrade performance.

Functions

NppStatus **nppiFloodFillGradientBoundary_8u_C1IR_Ctx**(*Npp8u* *pSrcDst, int nSrcDstStep, *NppiPoint* oSeed, *Npp8u* nMin, *Npp8u* nMax, const *Npp8u* nNewValue, const *Npp8u* nBoundaryValue, *NppiNorm* eNorm, *NppiSize* oSizeROI, *NppiConnectedRegion* *pConnectedRegion, *Npp8u* *pBuffer, *NppStreamContext* nppStreamCtx)

1 channel 8-bit unsigned integer grayscale in place flood fill.

Parameters

- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step* in bytes.
- **oSeed** – Image location of seed pixel value to be used for comparison.
- **nMin** – Value of tested pixel must be >= seed value - this value.
- **nMax** – Value of tested pixel must be <= seed value + this value.
- **nNewValue** – Image pixel value to be used to replace matching pixels.
- **nBoundaryValue** – Image pixel value to be used for region boundary.
- **eNorm** – Type of pixel connectivity test to use, nppiNormInf will use 8 way connectivity and nppiNormL1 will use 4 way connectivity.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **pConnectedRegion** – Optional host memory pointer to an *NppiConnectedRegion* object which returns information about the filled region. Set to NULL if not needed.
- **pBuffer** – Pointer to device memory scratch buffer at least as large as value returned by the corresponding FloodFillGetBufferSize call.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiFloodFillGradientBoundary_8u_C3IR_Ctx**(*Npp8u* *pSrcDst, int nSrcDstStep, *NppiPoint* oSeed, *Npp8u* aMin[3], *Npp8u* aMax[3], const *Npp8u* aNewValues[3], const *Npp8u* aBoundaryValues[3], *NppiNorm* eNorm, *NppiSize* oSizeROI, *NppiConnectedRegion* *pConnectedRegion, *Npp8u* *pBuffer, *NppStreamContext* nppStreamCtx)

3 channel 8-bit unsigned integer color in place flood fill.

Parameters

- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step* in bytes.
- **oSeed** – Image location of seed pixel value to be used for comparison.
- **aMin** – Value of each element of tested pixel must be >= the corresponding seed value - aMin value.
- **aMax** – Value of each element of tested pixel must be <= the corresponding seed value + aMax value.
- **aNewValues** – Image pixel values to be used to replace matching pixels.
- **aBoundaryValues** – Image pixel values to be used for region boundary.
- **eNorm** – Type of pixel connectivity test to use, nppiNormInf will use 8 way connectivity and nppiNormL1 will use 4 way connectivity.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **pConnectedRegion** – Optional host memory pointer to an *NppiConnectedRegion* object which returns information about the filled region. Set to NULL if not needed.
- **pBuffer** – Pointer to device memory scratch buffer at least as large as value returned by the corresponding FloodFillGetBufferSize call.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiFloodFillGradientBoundary_16u_C1IR_Ctx**(*Npp16u* *pSrcDst, int nSrcDstStep, *NppiPoint* oSeed, *Npp16u* nMin, *Npp16u* nMax, const *Npp16u* nNewValue, const *Npp16u* nBoundaryValue, *NppiNorm* eNorm, *NppiSize* oSizeROI, *NppiConnectedRegion* *pConnectedRegion, *Npp8u* *pBuffer, *NppStreamContext* nppStreamCtx)

1 channel 16-bit unsigned integer grayscale in place flood fill.

Parameters

- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step* in bytes.
- **oSeed** – Image location of seed pixel value to be used for comparison.
- **nMin** – Value of tested pixel must be >= seed value - this value.
- **nMax** – Value of tested pixel must be <= seed value + this value.
- **nNewValue** – Image pixel value to be used to replace matching pixels.
- **nBoundaryValue** – Image pixel value to be used for region boundary.
- **eNorm** – Type of pixel connectivity test to use, nppiNormInf will use 8 way connectivity and nppiNormL1 will use 4 way connectivity.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **pConnectedRegion** – Optional host memory pointer to an *NppiConnectedRegion* object which returns information about the filled region. Set to NULL if not needed.
- **pBuffer** – Pointer to device memory scratch buffer at least as large as value returned by the corresponding FloodFillGetBufferSize call.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiFloodFillGradientBoundary_16u_C3IR_Ctx**(*Npp16u* *pSrcDst, int nSrcDstStep, *NppiPoint* oSeed, *Npp16u* aMin[3], *Npp16u* aMax[3], const *Npp16u* aNewValues[3], const *Npp16u* aBoundaryValues[3], *NppiNorm* eNorm, *NppiSize* oSizeROI, *NppiConnectedRegion* *pConnectedRegion, *Npp8u* *pBuffer, *NppStreamContext* nppStreamCtx)

3 channel 16-bit unsigned integer color in place flood fill.

Parameters

- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step* in bytes.
- **oSeed** – Image location of seed pixel value to be used for comparison.
- **aMin** – Value of each element of tested pixel must be >= the corresponding seed value - aMin value.
- **aMax** – Value of each element of tested pixel must be <= the corresponding seed value + aMax value.
- **aNewValues** – Image pixel values to be used to replace matching pixels.
- **aBoundaryValues** – Image pixel values to be used for region boundary.

- **eNorm** – Type of pixel connectivity test to use, nppiNormInf will use 8 way connectivity and nppiNormL1 will use 4 way connectivity.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **pConnectedRegion** – Optional host memory pointer to an *NppiConnectedRegion* object which returns information about the filled region. Set to NULL if not needed.
- **pBuffer** – Pointer to device memory scratch buffer at least as large as value returned by the corresponding FloodFillGetBufferSize call.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiFloodFillGradientBoundary_32u_C1IR_Ctx**(*Npp32u* *pSrcDst, int nSrcDstStep, *NppiPoint* oSeed, *Npp32u* nMin, *Npp32u* nMax, const *Npp32u* nNewValue, const *Npp32u* nBoundaryValue, *NppiNorm* eNorm, *NppiSize* oSizeROI, *NppiConnectedRegion* *pConnectedRegion, *Npp8u* *pBuffer, *NppStreamContext* nppStreamCtx)

1 channel 32-bit unsigned integer grayscale in place flood fill.

Parameters

- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step* in bytes.
- **oSeed** – Image location of seed pixel value to be used for comparison.
- **nMin** – Value of tested pixel must be >= seed value - this value.
- **nMax** – Value of tested pixel must be <= seed value + this value.
- **nNewValue** – Image pixel value to be used to replace matching pixels.
- **nBoundaryValue** – Image pixel value to be used for region boundary.
- **eNorm** – Type of pixel connectivity test to use, nppiNormInf will use 8 way connectivity and nppiNormL1 will use 4 way connectivity.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **pConnectedRegion** – Optional host memory pointer to an *NppiConnectedRegion* object which returns information about the filled region. Set to NULL if not needed.
- **pBuffer** – Pointer to device memory scratch buffer at least as large as value returned by the corresponding FloodFillGetBufferSize call.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiFloodFillGradientBoundary_32u_C3IR_Ctx**(*Npp32u* *pSrcDst, int nSrcDstStep, *NppiPoint* oSeed, *Npp32u* aMin[3], *Npp32u* aMax[3], const *Npp32u* aNewValues[3], const *Npp32u* aBoundaryValues[3], *NppiNorm* eNorm, *NppiSize* oSizeROI, *NppiConnectedRegion* *pConnectedRegion, *Npp8u* *pBuffer, *NppStreamContext* nppStreamCtx)

3 channel 32-bit unsigned integer color in place flood fill.

Parameters

- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *In-Place-Image Line Step* in bytes.
- **oSeed** – Image location of seed pixel value to be used for comparison.
- **aMin** – Value of each element of tested pixel must be >= the corresponding seed value - aMin value.
- **aMax** – Value of each element of tested pixel must be <= the corresponding seed value + aMax value.
- **aNewValues** – Image pixel values to be used to replace matching pixels.
- **aBoundaryValues** – Image pixel values to be used for region boundary.
- **eNorm** – Type of pixel connectivity test to use, nppiNormInf will use 8 way connectivity and nppiNormL1 will use 4 way connectivity.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **pConnectedRegion** – Optional host memory pointer to an *NppiConnectedRegion* object which returns information about the filled region. Set to NULL if not needed.
- **pBuffer** – Pointer to device memory scratch buffer at least as large as value returned by the corresponding FloodFillGetBufferSize call.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

1.10.8. Label Markers

1.10.8.1 LabelMarkers

Generate image connected region label markers to be used for later image segmentation.

These functions have been deprecated. Use LabelMarkersUF functions instead.

LabelMarkersUFGetBufferSize

Before calling any of the LabelMarkersUF functions the application first needs to call the LabelMarkersGetBufferSize function to determine the amount of device memory to allocate as a working buffer.

The application allocated device memory is then passed as the pBuffer parameter to the corresponding LabelMarkersUF function.

NppStatus **nppiLabelMarkersUFGetBufferSize_32u_C1R**(*NppiSize* oSizeROI, int *hpBufferSize)

Calculate scratch buffer size needed 1 channel 32-bit unsigned integer LabelMarkersUF function based on destination image oSizeROI width and height.

Parameters

- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **hpBufferSize** – Required buffer size in bytes.

1.10.8.2 Label MarkersUF

1.10.8.2.1 LabelMarkersUF

Generate image connected region label markers to be used for later image segmentation.

A connected region is any pixel region where all pixels in the region have the same pixel value. Note that marker label IDs generally increase in value from image left to right and top to bottom they are not generated in any particular order and there may be numeric gaps between sequential marker IDs. To limit the number of marker IDs generated the application should pass the image through a threshold filter before calling this funcion. Doing so however does not necessarily limit the maximum marker ID value generated by this function. Note that these functions currently only support image ROI sizes up to 4 gigapixels. Also note that while these functions support destination image pitches that are not exactly equal to oSizeROI.width * sizeof(Npp32u) it can avoid a cudaMemCpyAsync() call to copy the final result from the working buffer to the destination image if the pitch exactly equals oSizeROI.width * sizeof(Npp32u).

Before calling any of the LabelMarkersUF functions the application first needs to call the LabelMarkersUFGetBufferSize to determine the amount of device memory to allocate as a working buffer. The allocated device memory is then passed as the pBuffer parameter to the corresponding LabelMarkersUF function.

The algorithm used in this implementation is based on the one described in “An Optimized Union-Find Algorithm for Connected Components Labeling Using GPUs” by Jun Chen and others.

Note that the destination image in these functions must be allocated with cudaMalloc() and NOT cudaMallocPitch(). Also the pitch of the output image MUST be set to oSizeROI.width * sizeof(Npp32u).

Functions

NppStatus **nppiLabelMarkersUF_8u32u_C1R_Ctx**(*Npp8u* *pSrc, int nSrcStep, *Npp32u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppiNorm* eNorm, *Npp8u* *pBuffer, *NppStreamContext* nppStreamCtx)

1 channel 8-bit to 32-bit unsigned integer label markers image generation.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **eNorm** – Type of pixel connectivity test to use, nppiNormInf will use 8 way connectivity and nppiNormL1 will use 4 way connectivity.
- **pBuffer** – Pointer to device memory scratch buffer at least as large as value returned by the corresponding LabelMarkersUFGetBufferSize call.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiLabelMarkersUF_16u32u_C1R_Ctx**(*Npp16u* *pSrc, int nSrcStep, *Npp32u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppiNorm* eNorm, *Npp8u* *pBuffer, *NppStreamContext* nppStreamCtx)

1 channel 16-bit to 32-bit unsigned integer label markers image generation.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **eNorm** – Type of pixel connectivity test to use, nppiNormInf will use 8 way connectivity and nppiNormL1 will use 4 way connectivity.
- **pBuffer** – Pointer to device memory scratch buffer at least as large as value returned by the corresponding LabelMarkersUFGetBufferSize call.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiLabelMarkersUF_32u_C1R_Ctx**(*Npp32u* *pSrc, int nSrcStep, *Npp32u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppiNorm* eNorm, *Npp8u* *pBuffer, *NppStreamContext* nppStreamCtx)

1 channel 32-bit to 32-bit unsigned integer label markers image generation.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **eNorm** – Type of pixel connectivity test to use, nppiNormInf will use 8 way connectivity and nppiNormL1 will use 4 way connectivity.
- **pBuffer** – Pointer to device memory scratch buffer at least as large as value returned by the corresponding LabelMarkersUFGetBufferSize call.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

1.10.8.3 Label MarkersUF Batch

1.10.8.3.1 LabelMarkersUFBatch

Generate image connected region label markers to be used for later image segmentation for a batched list of images.

A connected region is any pixel region where all pixels in the region have the same pixel value. Note that marker label IDs generally increase in value from image left to right and top to bottom they are not generated in any particular order and there may be numeric gaps between sequential marker IDs. To limit the number of marker IDs generated the application should pass the image through a threshold filter before calling this funcion. Doing so however does not necessarily limit the maximum marker ID value generated by this function. Note that these functions currently only support image ROI sizes up to 4 gigapixels. Also note that these functions work directly in the destination image so destination pitch MUST be equal to destination ROI.width * sizeof(Npp32u) and even if destination pitch is greater than that the output will be in that format. If this doesn't work for you use the single image version of these functions or cudaMemCopy2D can be called for each output image to restore the original pitch. Note that all source and destination images in the batch list must contain enough device memory to support the full ROI size. ROIs in descriptor lists are ignored in these functions.

The algorithm used in this implementation is based on the one described in "An Optimized Union-Find Algorithm for Connected Components Labeling Using GPUs" by Jun Chen and others.

Note that the destination images in these functions must be allocated with cudaMalloc() and NOT cudaMallocPitch(). Also the pitch of the output image MUST be set to oSizeROI.width * sizeof(Npp32u).

Functions

NppStatus **nppiLabelMarkersUFBatch_8u32u_C1R_Ctx**(const *NppiImageDescriptor* *pSrcBatchList, *NppiImageDescriptor* *pDstBatchList, int nBatchSize, *NppiSize* oSizeROI, *NppiNorm* eNorm, *NppStreamContext* nppStreamCtx)

1 channel 8-bit to 32-bit unsigned integer label markers image generation with fixed destination ROI applied to all images in the batch.

Parameters

- **pSrcBatchList** – *Source-Batch-Images Pointer* device memory pointer to the list of device memory source image descriptors, oSize element is ignored.
- **pDstBatchList** – *Destination-Batch-Images Pointer* device memory pointer to the list of device memory destination image descriptors, oSize element is ignored.
- **nBatchSize** – Number of *NppiImageDescriptor* structures processed in this call (must be > 1).
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **eNorm** – Type of pixel connectivity test to use, nppiNormInf will use 8 way connectivity and nppiNormL1 will use 4 way connectivity for all images in batch.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiLabelMarkersUFBatch_16u32u_C1R_Ctx**(const *NppiImageDescriptor* *pSrcBatchList, *NppiImageDescriptor* *pDstBatchList, int nBatchSize, *NppiSize* oSizeROI, *NppiNorm* eNorm, *NppStreamContext* nppStreamCtx)

1 channel 16-bit to 32-bit unsigned integer label markers image generation with fixed destination ROI applied to all images in the batch.

Parameters

- **pSrcBatchList** – *Source-Batch-Images Pointer* device memory pointer to the list of device memory source image descriptors, oSize element is ignored.
- **pDstBatchList** – *Destination-Batch-Images Pointer* device memory pointer to the list of device memory destination image descriptors, oSize element is ignored.
- **nBatchSize** – Number of *NppiImageDescriptor* structures processed in this call (must be > 1).
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **eNorm** – Type of pixel connectivity test to use, nppiNormInf will use 8 way connectivity and nppiNormL1 will use 4 way connectivity for all images in batch.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiLabelMarkersUFBatch_32u_C1R_Ctx**(const *NppiImageDescriptor* *pSrcBatchList, *NppiImageDescriptor* *pDstBatchList, int nBatchSize, *NppiSize* oSizeROI, *NppiNorm* eNorm, *NppStreamContext* nppStreamCtx)

1 channel 32-bit to 32-bit unsigned integer label markers image generation with fixed destination ROI applied to all images in the batch.

Parameters

- **pSrcBatchList** – *Source-Batch-Images Pointer* device memory pointer to the list of device memory source image descriptors, oSize element is ignored.
- **pDstBatchList** – *Destination-Batch-Images Pointer* device memory pointer to the list of device memory destination image descriptors, oSize element is ignored.
- **nBatchSize** – Number of *NppiImageDescriptor* structures processed in this call (must be > 1).
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **eNorm** – Type of pixel connectivity test to use, nppiNormInf will use 8 way connectivity and nppiNormL1 will use 4 way connectivity for all images in batch.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

1.10.8.4 Label MarkersUF Batch Advanced

1.10.8.4.1 LabelMarkersUFBatchAdvanced

Generate image connected region label markers to be used for later image segmentation for a batched list of images.

A connected region is any pixel region where all pixels in the region have the same pixel value. Note that marker label IDs generally increase in value from image left to right and top to bottom they are not generated in any particular order and there may be numeric gaps between sequential marker IDs. To limit the number of marker IDs generated the application should pass the image through a threshold filter before calling this funcion. Doing so however does not necessarily limit the maximum marker ID value generated by this function. Note that these functions currently only support image ROI sizes up to 4 gigapixels. Also note that these functions work directly in the destination image so destination pitch MUST be equal to destination ROI.width * sizeof(Npp32u) for each destination image in the list and even if the destination image pitch is greater than that of the output will be in that format. If this doesn't work for you use the single image version of these functions or cudaMemCopy2D can be called for each output image to restore the original pitch. Note that all source and destination images in the batch list must contain enough device memory to contain their specified ROI size.

The algorithm used in this implementation is based on the one described in "An Optimized Union-Find Algorithm for Connected Components Labeling Using GPUs" by Jun Chen and others.

Note that the destination images in these functions must be allocated with cudaMalloc() and NOT cudaMallocPitch(). Also the pitch of the output image MUST be set to oSizeROI.width * sizeof(Npp32u).

Functions

NppStatus **nppiLabelMarkersUFBatch_8u32u_C1R_Advanced_Ctx**(const *NppiImageDescriptor* *pSrcBatchList, *NppiImageDescriptor* *pDstBatchList, int nBatchSize, *NppiSize* oMaxSizeROI, *NppiNorm* eNorm, *NppStreamContext* nppStreamCtx)

1 channel 8-bit to 32-bit unsigned integer label markers image generation with per image destination ROI.

Parameters

- **pSrcBatchList** – *Source-Batch-Images Pointer* device memory pointer to the list of device memory source image descriptors, oSize element is ignored.
- **pDstBatchList** – *Destination-Batch-Images Pointer* device memory pointer to the list of device memory destination image descriptors.
- **nBatchSize** – Number of *NppiImageDescriptor* structures processed in this call (must be > 1).
- **oMaxSizeROI** – *Region-Of-Interest (ROI)* maximum ROI width and height of ALL images in the batch.
- **eNorm** – Type of pixel connectivity test to use, nppiNormInf will use 8 way connectivity and nppiNormL1 will use 4 way connectivity for all images in batch.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiLabelMarkersUFBatch_16u32u_C1R_Advanced_Ctx**(const *NppiImageDescriptor* *pSrcBatchList, *NppiImageDescriptor* *pDstBatchList, int nBatchSize, *NppiSize* oMaxSizeROI, *NppiNorm* eNorm, *NppStreamContext* nppStreamCtx)

1 channel 16-bit to 32-bit unsigned integer label markers image generation with per image destination ROI.

Parameters

- **pSrcBatchList** – *Source-Batch-Images Pointer* device memory pointer to the list of device memory source image descriptors, oSize element is ignored.
- **pDstBatchList** – *Destination-Batch-Images Pointer* device memory pointer to the list of device memory destination image descriptors.
- **nBatchSize** – Number of *NppiImageDescriptor* structures processed in this call (must be > 1).

- **oMaxSizeROI** – *Region-Of-Interest (ROI)* maximum ROI width and height of ALL images in the batch.
- **eNorm** – Type of pixel connectivity test to use, nppiNormInf will use 8 way connectivity and nppiNormL1 will use 4 way connectivity for all images in batch.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiLabelMarkersUFBatch_32u_C1R_Advanced_Ctx**(const *NppiImageDescriptor* *pSrcBatchList, *NppiImageDescriptor* *pDstBatchList, int nBatchSize, *NppiSize* oMaxSizeROI, *NppiNorm* eNorm, *NppStreamContext* nppStreamCtx)

1 channel 32-bit to 32-bit unsigned integer label markers image generation with per image destination ROI.

Parameters

- **pSrcBatchList** – *Source-Batch-Images Pointer* device memory pointer to the list of device memory source image descriptors, oSize element is ignored.
- **pDstBatchList** – *Destination-Batch-Images Pointer* device memory pointer to the list of device memory destination image descriptors.
- **nBatchSize** – Number of *NppiImageDescriptor* structures processed in this call (must be > 1).
- **oMaxSizeROI** – *Region-Of-Interest (ROI)* maximum ROI width and height of ALL images in the batch.
- **eNorm** – Type of pixel connectivity test to use, nppiNormInf will use 8 way connectivity and nppiNormL1 will use 4 way connectivity for all images in batch.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

1.10.8.5 Image Filter Compress Marker Labels

Removes sparseness between marker label IDs output from LabelMarkers call.

CompressMarkerLabelsGetBufferSize

Before calling any of the CompressMarkerLabels functions the application first needs to call the corresponding CompressMarkerLabelsGetBufferSize function to determine the amount of device memory to allocate as a working buffer.

The application allocated device memory is then passed as the pBuffer parameter to the corresponding CompressMarkerLabels function.

NppStatus **nppiCompressMarkerLabelsGetBufferSize_32u_C1R**(int nStartingNumber, int *hpBufferSize)

Calculate scratch buffer size needed for 1 channel 32-bit unsigned integer CompressMarkerLabels function based on the number returned in pNumber from a previous nppiLabelMarkers call.

Note that this is the only function that supports the nppiCompressMarkerLabelsUF_32u function and that nStartingNumber MUST be ROI width * ROI height when used with that function.

Parameters

- **nStartingNumber** – The value returned from a previous call to the nppiLabelMarkers_32u function or ROI width * ROI height for images generated by the nppiLabelMarkersUF function and those values MUST match the values used those used in that call.
- **hpBufferSize** – Required buffer size in bytes.

CompressMarkerLabels

NOTE: The previous versions of these functions have been deprecated.

Only nppiCompressMarkerLabelsUF_32u works with output from nppiLabelMarkersUF functions.

NppStatus **nppiCompressMarkerLabelsUF_32u_C1IR_Ctx**(*Npp32u* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, int nStartingNumber, int *pNewNumber, *Npp8u* *pBuffer, *NppStreamContext* nppStreamCtx)

1 channel 32-bit unsigned integer in place connected region marker label renumbering for output from nppiLabelMarkersUF functions only with numbering sparseness elimination.

Note that the image in this function must be allocated with cudaMalloc() and NOT cudaMallocPitch(). Also the pitch MUST be set to oSizeROI.width * sizeof(Npp32u). And the image pointer and oSizeROI values MUST match those used when nppiLabelMarkersUF was called.

Parameters

- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *Source-Image Line Step*. NOTE THAT THIS VALUE MUST BE EQUAL TO oSizeROI.width * sizeof(Npp32u).
- **oSizeROI** – *Region-Of-Interest (ROI)*.

- **nStartingNumber** – MUST be ROI width * ROI height and MUST match ROI values used in the label markers generation function call.
- **pNewNumber** – Pointer to host memory integer value where the maximum renumbered marker label ID will be returned.
- **pBuffer** – Pointer to device memory scratch buffer at least as large as value returned by the corresponding CompressMarkerLabelsGetBufferSize call.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

1.10.8.6 Image Filter Compressed Marker Labels Info

Various methods for extracting information from compressed marker labels.

1.10.8.7 Image Filter Contour Pixel Interpolation

1.10.8.7.1 ContourPixelInterpolation

Various functions for interpolating pixels in image contours.

1.10.8.8 Contours Image Marching Squares Interpolation

1.10.8.8.1 ContoursImageMarchingSquaresInterpolation

Apply Marching Squares bilinear interpolation to all contour pixels in a contours image where contour pixels have values of 0 and non-contour pixels have values of 255.

Functions

NppStatus **nppiContoursImageMarchingSquaresInterpolation_32f_C1R_Ctx**(*Npp8u* *pContoursImageDev, *Npp32s* nContoursImageStep, *NppiPoint32f* *pContoursInterpolatedImageDev, *Npp32s* nContoursInterpolatedImageStep, *NppiContourPixelDirectionInfo* *pContoursDirectionImageDev, *Npp32s* nContoursDirectionImageStep, *NppiContourPixelGeometryInfo* *pContoursPixelGeometryListsDev, *NppiContourPixelGeometryInfo* *pContoursPixelGeometryListsHost, *NppiPoint32f* *pContoursInterpolatedGeometryListsDev, *Npp32u* *pContoursPixelsFoundListHost, *Npp32u* *pContoursPixelsStartingOffsetDev, *Npp32u* *pContoursPixelsStartingOffsetHost, *Npp32u* nTotalImagePixelContourCount, *Npp32u* nMaxMarkerLabelID, *Npp32u* nFirstContourGeom-

1 channel integer coordinate based contours image to marching squares bilinear interpolated coordinates contours image.

Note that ALL input and output data for the function MUST be in device memory except where noted otherwise. Also nFirstContourID and nLastContourID allow only a portion of the contour geometry lists in the image to be output.

Note that the geometry list for each contour will begin at pContoursGeometryListsHost[pContoursPixelStartingOffsetHost[nContourID] * sizeof(NppiContourPixelGeometryInfo).

Note that to significantly improve performance by default a contour that contains more than 256K pixels will be bypassed when generating the output geometry list. The contour ID and number of contour pixels will be output in the contour list however. You can still get this function to output the geometry of this size contour howver by calling the function with a starting contour ID of that contour ID and and ending contour ID of that contour ID + 1. Note that doing so for contours approaching a million pixels can take many minutes. Also, due to the structure of some images contour ID 0 can contain ALL contours in the image so setting the starting contour ID to 1 can significantly increase output preprocessing performance.

Also note that the ordered contour geometry list is contained in the oContourOrderedGeometryLocation object within the *NppiContourPixelGeometryInfo* object for each contour pixel and that this location information is the only valid information in the object relevent to that ordered pixel.

Note that for a particular contour geometry pixel list the bounding box for that contour will be contained in the following elements of first pixel (pixel 0) of the corresponding contour pixel list.

```
pixel[0].oContourPrevPixelLocation.x will contain pCurMarkerLabelsInfo->
↪oMarkerLabelBoundingBox.x      upper left x
pixel[0].oContourPrevPixelLocation.y will contain pCurMarkerLabelsInfo->
↪oMarkerLabelBoundingBox.y      upper left y
pixel[0].oContourNextPixelLocation.x will contain pCurMarkerLabelsInfo->
↪oMarkerLabelBoundingBox.width  lower right x
pixel[0].oContourNextPixelLocation.y will contain pCurMarkerLabelsInfo->
↪oMarkerLabelBoundingBox.height lower right y
```

Note that while the bounding box is relatively accurate occasionally a few contour pixels may extend beyond the bounding box limits. Additionally, bounding box coordinates may vary slightly between runs on the same input due to the parallel reduction used internally; pixel counts (nMarkerLabelPixelCount) remain deterministic. If exact reproducible bounding boxes are required, derive them from the contour pixel geometry lists instead.

Parameters

- **pContoursImageDev** – pointer to device memory image of at least oSizeROI.width * sizeof(Npp8u) * oSizeROI.height bytes.
- **nContoursImageStep** – image line step.
- **pContoursInterpolatedImageDev** – pointer to device memory image of at least oSizeROI.width * sizeof(NppiPoint32f) * OSizeROI.height bytes.
- **nContoursInterpolatedImageStep** – image line step
- **pContoursDirectionImageDev** – *Source-Image Pointer* to output image in device memory containing per contour pixel direction info around each uniquely labeled connected pixel region returned by corresponding nppiCompressedMarkerLabelsUFInfo call.

- **nContoursDirectionImageStep** – image_line_step for contours image.
- **pContoursPixelGeometryListsDev** – pointer to device memory buffer allocated to be at least as big as size returned by corresponding nppiCompressedMarkerLabelsUFGetGeometryListsSize call.
- **pContoursPixelGeometryListsHost** – pointer to host memory buffer allocated to be at least as big as size returned by corresponding nppiCompressedMarkerLabelsUFGetGeometryListsSize call.
- **pContoursInterpolatedGeometryListsDev** – pointer to device memory buffer allocated to be at least nTotalImagePixelContourCount * sizeof(NppPoint32f) bytes.
- **pContoursPixelsFoundListHost** – host memory pointer to array of nMaxMarkerLabelID unsigned integers returned by previous call to nppiCompressedMarkerLabelsUFContoursPixelGeometryLists_C1R_Ctx.
- **pContoursPixelsStartingOffsetDev** – device memory pointer to array of unsigned integers returned by this call representing the starting offset index of each contour found during geometry list generation.
- **pContoursPixelsStartingOffsetHost** – host memory pointer to array of unsigned integers returned by this call representing the starting offset index of each contour found during geometry list generation.
- **nTotalImagePixelContourCount** – the total number of contour pixels in the image returned by nppiCompressedMarkerLabelsUFInfo_32u_C1R_Ctx() call.
- **nMaxMarkerLabelID** – the value of the maximum marker label ID returned by corresponding compress marker labels UF call.
- **nFirstContourGeometryListID** – the ID of the first contour geometry list to output.
- **nLastContourGeometryListID** – the ID of the last contour geometry list to output, last ID MUST be greater than first ID.
- **pContoursBlockSegmentListDev** – device memory pointer to array of *NppiContourBlockSegment* objects, contents will be initialized by NPP.
- **pContoursBlockSegmentListHost** – host memory pointer to array of *NppiContourBlockSegment* objects, contents will be intialized by NPP.
- **oSizeROI** – *Region-Of-Interest (ROI)* for the images, must be the same as used in previous calls.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiContoursImageMarchingSquaresInterpolation_64f_C1R_Ctx**(*Npp8u* *pContoursImageDev, *Npp32s* nContoursImageStep, *NppiPoint64f* *pContoursInterpolatedImageDev, *Npp32s* nContoursInterpolatedImageStep, *NppiContourPixelDirectionInfo* *pContoursDirectionImageDev, *Npp32s* nContoursDirectionImageStep, *NppiContourPixelGeometryInfo* *pContourSPixelGeometryListsDev, *NppiContourPixelGeometryInfo* *pContourSPixelGeometryListsHost, *NppiPoint64f* *pContoursInterpolatedGeometryListsDev, *Npp32u* *pContourSPixelsFoundListHost, *Npp32u* *pContourSPixelsStartingOffsetDev, *Npp32u* *pContourSPixelsStartingOffsetHost, *Npp32u* nTotalImagePixelContourCount, *Npp32u* nMaxMarkerLabelID, *Npp32u* nFirstContourGeom-

Note that while the bounding box is relatively accurate occasionally a few contour pixels may extend beyond the bounding box limits.

Additionally, bounding box coordinates may vary slightly between runs on the same input due to the parallel reduction used internally; pixel counts (nMarkerLabelPixelCount) remain deterministic. If exact reproducible bounding boxes are required, derive them from the contour pixel geometry lists instead.

Parameters

- **pContoursImageDev** – pointer to device memory image of at least oSizeROI.width * sizeof(Npp8u) * oSizeROI.height bytes.
- **nContoursImageStep** – image line step.
- **pContoursInterpolatedImageDev** – pointer to device memory image of at least oSizeROI.width * sizeof(NppiPoint64f) * OSizeROI.height bytes.
- **nContoursInterpolatedImageStep** – image line step
- **pContoursDirectionImageDev** – *Source-Image Pointer* to output image in device memory containing per contour pixel direction info around each uniquely labeled connected pixel region returned by corresponding nppiCompressedMarkerLabelsUFInfo call.
- **nContoursDirectionImageStep** – image_line_step for contours image.
- **pContoursPixelGeometryListsDev** – pointer to device memory buffer allocated to be at least as big as size returned by corresponding nppiCompressedMarkerLabelsUFGetGeometryListsSize call.
- **pContoursPixelGeometryListsHost** – pointer to host memory buffer allocated to be at least as big as size returned by corresponding nppiCompressedMarkerLabelsUFGetGeometryListsSize call.
- **pContoursInterpolatedGeometryListsDev** – pointer to device memory buffer allocated to be at least nTotalImagePixelContourCount * sizeof(NppPoint64f) bytes.
- **pContoursPixelsFoundListHost** – host memory pointer to array of nMaxMarkerLabelID unsigned integers returned by previous call to nppiCompressedMarkerLabelsUFContoursPixelGeometryLists_C1R_Ctx.
- **pContoursPixelsStartingOffsetDev** – device memory pointer to array of unsigned integers returned by this call representing the starting offset index of each contour found during geometry list generation.
- **pContoursPixelsStartingOffsetHost** – host memory pointer to array of unsigned integers returned by this call representing the starting offset index of each contour found during geometry list generation.
- **nTotalImagePixelContourCount** – the total number of contour pixels in the image returned by nppiCompressedMarkerLabelsUFInfo_32u_C1R_Ctx() call.
- **nMaxMarkerLabelID** – the value of the maximum marker label ID returned by corresponding compress marker labels UF call.
- **nFirstContourGeometryListID** – the ID of the first contour geometry list to output.

- **nLastContourGeometryListID** – the ID of the last contour geometry list to output, last ID MUST be greater than first ID.
- **pContoursBlockSegmentListDev** – device memory pointer to array of *NppiContourBlockSegment* objects, contents will be initialized by NPP.
- **pContoursBlockSegmentListHost** – host memory pointer to array of *NppiContourBlockSegment* objects, contents will be intialized by NPP.
- **oSizeROI** – *Region-Of-Interest (ROI)* for the images, must be the same as used in previous calls.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

1.10.9. Bound Segments

Note that these functions have been deprecated.

Use the nppiLabelMarkerUF, nppiCompressMarkerLabelsUF, and nppiCompressedMarkerLabelsUFInfo functions to generate connected pixel region boundaries (contours).

1.10.10. Watershed Segmentation

1.10.10.1 WatershedSegmentation

Segments a grayscale image using the watershed segmentation technique described in “Efficient 2D and 3D Watershed on Graphics Processing Unit: Block-Asynchronous Approaches Based on Cellular Automata” by Pablo Quesada-Barriuso and others.

SegmentWatershedGetBufferSize

Before calling any of the SegmentWatershed functions the application first needs to call the corresponding SegmentWatershedGetBufferSize function to determine the amount of device memory to allocate as a working buffer.

The application allocated device memory is then passed as the pBuffer parameter to the corresponding SegmentWatershed function.

NppStatus **nppiSegmentWatershedGetBufferSize_8u_C1R**(*NppiSize* oSizeROI, size_t *hpDeviceMemoryBufferSize)

Calculate scratch buffer sizes needed for 1 channel 8-bit unsigned integer watershed segmentation function based on destination image oSizeROI width and height.

Parameters

- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **hpDeviceMemoryBufferSize** – Required device memory buffer size in bytes.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiSegmentWatershedGetBufferSize_16u_C1R**(*NppiSize* oSizeROI, size_t *hpDeviceMemoryBufferSize)

Calculate scratch buffer sizes needed for 1 channel 16-bit unsigned integer watershed segmentation function based on destination image oSizeROI width and height.

Parameters

- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **hpDeviceMemoryBufferSize** – Required device memory buffer size in bytes.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*

SegmentWatershed

Generate an output image containing regions of constant value grayscale defined by watershed segmentation plateau boundaries from a grayscale input image.

Optionally output the corresponding marker labels image.

Before calling any of the SegmentWatershed functions the application first needs to call the corresponding SegmentWatershedGetBufferSize to determine the amount of device memory to allocate as working buffers. The allocated memory is then passed as the pDeviceMemoryBuffer parameter to the corresponding SegmentWatershed function.

NppStatus **nppiSegmentWatershed_8u_C1IR_Ctx**(*Npp8u* *pSrcDst, *Npp32s* nSrcDstStep, *Npp32u* *pMarkerLabels, *Npp32s* nMarkerLabelsStep, *NppiNorm* eNorm, *NppiWatershedSegmentBoundaryType* eSegmentBoundaryType, *NppiSize* oSizeROI, *Npp8u* *pDeviceMemoryBuffer, *NppStreamContext* nppStreamCtx)

1 channel 8-bit unsigned integer in place image watershed segmentation generation.

Parameters

- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *Source-Image Line Step*.
- **pMarkerLabels** – Device memory pointer to optionally output the corresponding marker labels image, set to NULL if no marker labels image output is desired.
- **nMarkerLabelsStep** – Marker labels image line step,ignored if pMarkerLabels is NULL.
- **eNorm** – Type of pixel connectivity test to use, nppiNormInf will use 8 way connectivity and nppiNormL1 will use 4 way connectivity.
- **eSegmentBoundaryType** – Type of segment boundaries, if any, to be added to output image.
- **oSizeROI** – *Region-Of-Interest (ROI)* for both segmented image and corresponding marker labels image.

- **pDeviceMemoryBuffer** – Pointer to device memory scratch buffer at least as large as value returned by the corresponging SegmentWatershedGetBufferSize call.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiSegmentWatershed_16u_C1IR_Ctx**(*Npp16u* *pSrcDst, *Npp32s* nSrcDstStep, *Npp32u* *pMarkerLabels, *Npp32s* nMarkerLabelsStep, *NppiNorm* eNorm, *NppiWatershedSegmentBoundaryType* eSegmentBoundaryType, *NppiSize* oSizeROI, *Npp8u* *pDeviceMemoryBuffer, *NppStreamContext* nppStreamCtx)

1 channel 16-bit unsigned integer in place image watershed segmentation generation.

Parameters

- **pSrcDst** – *In-Place Image Pointer*.
- **nSrcDstStep** – *Source-Image Line Step*.
- **pMarkerLabels** – Device memory pointer to optionally output the corresponding marker labels image, set to NULL if no marker labels image output is desired.
- **nMarkerLabelsStep** – Marker labels image line step, ignored if pMarkerLabels is NULL.
- **eNorm** – Type of pixel connectivity test to use, nppiNormInf will use 8 way connectivity and nppiNormL1 will use 4 way connectivity.
- **eSegmentBoundaryType** – Type of segment boundaries, if any, to be added to output image.
- **oSizeROI** – *Region-Of-Interest (ROI)* for both segmented image and corresponding marker labels image.
- **pDeviceMemoryBuffer** – Pointer to device memory scratch buffer at least as large as value returned by the corresponging SegmentWatershedGetBufferSize call.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

1.11. Image Geometry Transforms Functions

Routines manipulating an image geometry.

These functions can be found in the nppig library. Linking to only the sub-libraries that you use can significantly save link time, application load time, and CUDA runtime startup time when using dynamic libraries.

1.11.1. Geometric Transform API Specifics

This section covers some of the unique API features common to the geometric transform primitives.

1.11.2. Geometric Transforms and ROIs

Geometric transforms operate on source and destination ROIs. The way these ROIs affect the processing of pixels differs from other (non geometric) image-processing primitives: Only pixels in the intersection of the destination ROI and the transformed source ROI are being processed.

The typical processing proceeds as follows:

1. Transform the rectangular source ROI (given in source image coordinates) into the destination image space. This yields a quadrilateral.
2. Write only pixels in the intersection of the transformed source ROI and the destination ROI.

1.11.3. Pixel Interpolation

The majority of image geometry transform operation need to perform a resampling of the source image as source and destination pixels are not coincident.

NPP supports the following pixel inerpolation modes (in order from fastest to slowest and lowest to highest quality):

- nearest neighbor
- linear interpolation
- cubic convolution
- supersampling
- interpolation using Lanczos window function

1.11.4. Resize Error Codes

The resize primitives return the following error codes:

```
    - NPP_WRONG_INTERSECTION_ROI_ERROR indicates an error condition if
      srcROIRect has no intersection with the source image.
    - NPP_RESIZE_NO_OPERATION_ERROR if either destination ROI width or
      height is less than 1 pixel.
    - NPP_RESIZE_FACTOR_ERROR Indicates an error condition if either nXFactor or
      nYFactor is less than or equal to zero or in the case of NPPI_INTER_SUPER are
↪not both downscaling.
    - NPP_INTERPOLATION_ERROR if eInterpolation has an illegal value.
    - NPP_SIZE_ERROR if source size width or height is less than 2 pixels.
    - NPP_RECTANGLE_ERROR if either destination ROI width or
      height is less than 1 pixel.
```

1.11.5. ResizeSqrPixel

ResizeSqrPixel functions attempt to choose source pixels that would approximately represent the center of the destination pixels. It does so by using the following scaling formula to select source pixels for interpolation:

```
nAdjustedXFactor = 1.0 / nXFactor;
nAdjustedYFactor = 1.0 / nYFactor;
nAdjustedXShift = nXShift * nAdjustedXFactor + ((1.0 - nAdjustedXFactor) * 0.5);
nAdjustedYShift = nYShift * nAdjustedYFactor + ((1.0 - nAdjustedYFactor) * 0.5);
nSrcX = nAdjustedXFactor * nDstX - nAdjustedXShift;
nSrcY = nAdjustedYFactor * nDstY - nAdjustedYShift;
```

ResizeSqrPixel functions support the following interpolation modes:

```
NPPI_INTER_NN
NPPI_INTER_LINEAR
NPPI_INTER_CUBIC
NPPI_INTER_CUBIC2P_BSPLINE
NPPI_INTER_CUBIC2P_CATMULLROM
NPPI_INTER_CUBIC2P_B05C03
NPPI_INTER_SUPER
NPPI_INTER_LANCZOS
```

In the ResizeSqrPixel functions below source image clip checking is handled as follows:

If the source pixel fractional x and y coordinates are greater than or equal to oSizeROI.x and less than oSizeROI.x + oSizeROI.width and greater than or equal to oSizeROI.y and less than oSizeROI.y + oSizeROI.height then the source pixel is considered to be within the source image clip rectangle and the source image is sampled. Otherwise the source image is not sampled and a destination pixel is not written to the destination image.

GetResizeRect

Returns *NppiRect* which represents the offset and size of the destination rectangle that would be generated by resizing the source *NppiRect* by the requested scale factors and shifts.

NppStatus **nppiGetResizeRect**(*NppiRect* oSrcROI, *NppiRect* *pDstRect, double nXFactor, double nYFactor, double nXShift, double nYShift, int eInterpolation)

Parameters

- **oSrcROI** – Region of interest in the source image.
- **pDstRect** – User supplied host memory pointer to an *NppiRect* structure that will be filled in by this function with the region of interest in the destination image.
- **nXFactor** – Factor by which x dimension is changed.
- **nYFactor** – Factor by which y dimension is changed.
- **nXShift** – Source pixel shift in x-direction.
- **nYShift** – Source pixel shift in y-direction.
- **eInterpolation** – The type of eInterpolation to perform resampling.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*, *Resize Error Codes*

ResizeSqrPixel

Resizes images.

1.11.6. Common parameters for nppiResizeSqrPackedPixel functions:

param pSrc
Source-Image Pointer.

param nSrcStep
Source-Image Line Step.

param oSrcSize
Size in pixels of the source image.

param oSrcROI
Region of interest in the source image.

param pDst
Destination-Image Pointer.

param nDstStep
Destination-Image Line Step.

param oDstROI
Region of interest in the destination image.

param nXFactor
Factor by which x dimension is changed.

param nYFactor
Factor by which y dimension is changed.

param nXShift
Source pixel shift in x-direction.

param nYShift
Source pixel shift in y-direction.

param eInterpolation
The type of eInterpolation to perform resampling.

param nppStreamCtx
Application Managed Stream Context.

return
Image Data Related Error Codes, *ROI Related Error Codes*, *Resize Error Codes*

1.11.7. Common parameters for nppiResizeSqrPlanarPixel functions:

param pSrc
Source-Planar-Image Pointer Array (host memory array containing device memory image plane pointers).

param nSrcStep
Source-Image Line Step.

param oSrcSize
Size in pixels of the source image.

param oSrcROI
Region of interest in the source image.

param pDst
Destination-Planar-Image Pointer Array (host memory array containing device memory image plane pointers).

param nDstStep
Destination-Image Line Step.

param oDstROI
Region of interest in the destination image.

param nXFactor
Factor by which x dimension is changed.

param nYFactor
Factor by which y dimension is changed.

param nXShift
Source pixel shift in x-direction.

param nYShift
Source pixel shift in y-direction.

param eInterpolation
The type of eInterpolation to perform resampling.

param nppStreamCtx
Application Managed Stream Context.

return
Image Data Related Error Codes, *ROI Related Error Codes*, *Resize Error Codes*

NppStatus **nppiResizeSqrPixel_8u_C1R_Ctx**(const *Npp8u* *pSrc, *NppiSize* oSrcSize, int nSrcStep, *NppiRect* oSrcROI, *Npp8u* *pDst, int nDstStep, *NppiRect* oDstROI, double nXFactor, double nYFactor, double nXShift, double nYShift, int eInterpolation, *NppStreamContext* nppStreamCtx)

1 channel 8-bit unsigned image resize.

For common parameter descriptions, see *Common parameters for nppiResizeSqrPackedPixel functions:*.

NppStatus **nppiResizeSqrPixel_8u_C3R_Ctx**(const *Npp8u* *pSrc, *NppiSize* oSrcSize, int nSrcStep, *NppiRect* oSrcROI, *Npp8u* *pDst, int nDstStep, *NppiRect* oDstROI, double nXFactor, double nYFactor, double nXShift, double nYShift, int eInterpolation, *NppStreamContext* nppStreamCtx)

3 channel 8-bit unsigned image resize.

For common parameter descriptions, see *Common parameters for nppiResizeSqrPackedPixel functions:*.

NppStatus **nppiResizeSqrPixel_8u_C4R_Ctx**(const *Npp8u* *pSrc, *NppiSize* oSrcSize, int nSrcStep, *NppiRect* oSrcROI, *Npp8u* *pDst, int nDstStep, *NppiRect* oDstROI, double nXFactor, double nYFactor, double nXShift, double nYShift, int eInterpolation, *NppStreamContext* nppStreamCtx)

4 channel 8-bit unsigned image resize.

For common parameter descriptions, see *Common parameters for nppiResizeSqrPackedPixel functions:*.

NppStatus **nppiResizeSqrPixel_8u_AC4R_Ctx**(const *Npp8u* *pSrc, *NppiSize* oSrcSize, int nSrcStep, *NppiRect* oSrcROI, *Npp8u* *pDst, int nDstStep, *NppiRect* oDstROI, double nXFactor, double nYFactor, double nXShift, double nYShift, int eInterpolation, *NppStreamContext* nppStreamCtx)

4 channel 8-bit unsigned image resize not affecting alpha.

For common parameter descriptions, see *Common parameters for nppiResizeSqrPackedPixel functions:*.

NppStatus **nppiResizeSqrPixel_8u_P3R_Ctx**(const *Npp8u* *const pSrc[3], *NppiSize* oSrcSize, int nSrcStep, *NppiRect* oSrcROI, *Npp8u* *pDst[3], int nDstStep, *NppiRect* oDstROI, double nXFactor, double nYFactor, double nXShift, double nYShift, int eInterpolation, *NppStreamContext* nppStreamCtx)

3 channel 8-bit unsigned planar image resize.

For common parameter descriptions, see *Common parameters for nppiResizeSqrPlanarPixel functions:*.

NppStatus **nppiResizeSqrPixel_8u_P4R_Ctx**(const *Npp8u* *const pSrc[4], *NppiSize* oSrcSize, int nSrcStep, *NppiRect* oSrcROI, *Npp8u* *pDst[4], int nDstStep, *NppiRect* oDstROI, double nXFactor, double nYFactor, double nXShift, double nYShift, int eInterpolation, *NppStreamContext* nppStreamCtx)

4 channel 8-bit unsigned planar image resize.

For common parameter descriptions, see *Common parameters for nppiResizeSqrPlanarPixel functions:*.

NppStatus **nppiResizeSqrPixel_16u_C1R_Ctx**(const *Npp16u* *pSrc, *NppiSize* oSrcSize, int nSrcStep, *NppiRect* oSrcROI, *Npp16u* *pDst, int nDstStep, *NppiRect* oDstROI, double nXFactor, double nYFactor, double nXShift, double nYShift, int eInterpolation, *NppStreamContext* nppStreamCtx)

1 channel 16-bit unsigned image resize.

For common parameter descriptions, see *Common parameters for nppiResizeSqrPackedPixel functions:*.

NppStatus **nppiResizeSqrPixel_16u_C3R_Ctx**(const *Npp16u* *pSrc, *NppiSize* oSrcSize, int nSrcStep, *NppiRect* oSrcROI, *Npp16u* *pDst, int nDstStep, *NppiRect* oDstROI, double nXFactor, double nYFactor, double nXShift, double nYShift, int eInterpolation, *NppStreamContext* nppStreamCtx)

3 channel 16-bit unsigned image resize.

For common parameter descriptions, see *Common parameters for nppiResizeSqrPackedPixel functions:*.

NppStatus **nppiResizeSqrPixel_16u_C4R_Ctx**(const *Npp16u* *pSrc, *NppiSize* oSrcSize, int nSrcStep, *NppiRect* oSrcROI, *Npp16u* *pDst, int nDstStep, *NppiRect* oDstROI, double nXFactor, double nYFactor, double nXShift, double nYShift, int eInterpolation, *NppStreamContext* nppStreamCtx)

4 channel 16-bit unsigned image resize.

For common parameter descriptions, see *Common parameters for nppiResizeSqrPackedPixel functions:*.

NppStatus **nppiResizeSqrPixel_16u_AC4R_Ctx**(const *Npp16u* *pSrc, *NppiSize* oSrcSize, int nSrcStep, *NppiRect* oSrcROI, *Npp16u* *pDst, int nDstStep, *NppiRect* oDstROI, double nXFactor, double nYFactor, double nXShift, double nYShift, int eInterpolation, *NppStreamContext* nppStreamCtx)

4 channel 16-bit unsigned image resize not affecting alpha.

For common parameter descriptions, see *Common parameters for nppiResizeSqrPackedPixel functions:*.

NppStatus **nppiResizeSqrPixel_16u_P3R_Ctx**(const *Npp16u* *const pSrc[3], *NppiSize* oSrcSize, int nSrcStep, *NppiRect* oSrcROI, *Npp16u* *pDst[3], int nDstStep, *NppiRect* oDstROI, double nXFactor, double nYFactor, double nXShift, double nYShift, int eInterpolation, *NppStreamContext* nppStreamCtx)

3 channel 16-bit unsigned planar image resize.

For common parameter descriptions, see *Common parameters for nppiResizeSqrPlanarPixel functions:*.

NppStatus **nppiResizeSqrPixel_16u_P4R_Ctx**(const *Npp16u* *const pSrc[4], *NppiSize* oSrcSize, int nSrcStep, *NppiRect* oSrcROI, *Npp16u* *pDst[4], int nDstStep, *NppiRect* oDstROI, double nXFactor, double nYFactor, double nXShift, double nYShift, int eInterpolation, *NppStreamContext* nppStreamCtx)

4 channel 16-bit unsigned planar image resize.

For common parameter descriptions, see *Common parameters for nppiResizeSqrPlanarPixel functions:*.

NppStatus **nppiResizeSqrPixel_16s_C1R_Ctx**(const *Npp16s* *pSrc, *NppiSize* oSrcSize, int nSrcStep, *NppiRect* oSrcROI, *Npp16s* *pDst, int nDstStep, *NppiRect* oDstROI, double nXFactor, double nYFactor, double nXShift, double nYShift, int eInterpolation, *NppStreamContext* nppStreamCtx)

1 channel 16-bit signed image resize.

For common parameter descriptions, see *Common parameters for nppiResizeSqrPackedPixel functions:*.

NppStatus **nppiResizeSqrPixel_16s_C3R_Ctx**(const *Npp16s* *pSrc, *NppiSize* oSrcSize, int nSrcStep, *NppiRect* oSrcROI, *Npp16s* *pDst, int nDstStep, *NppiRect* oDstROI, double nXFactor, double nYFactor, double nXShift, double nYShift, int eInterpolation, *NppStreamContext* nppStreamCtx)

3 channel 16-bit signed image resize.

For common parameter descriptions, see *Common parameters for nppiResizeSqrPackedPixel functions:*.

NppStatus **nppiResizeSqrPixel_16s_C4R_Ctx**(const *Npp16s* *pSrc, *NppiSize* oSrcSize, int nSrcStep, *NppiRect* oSrcROI, *Npp16s* *pDst, int nDstStep, *NppiRect* oDstROI, double nXFactor, double nYFactor, double nXShift, double nYShift, int eInterpolation, *NppStreamContext* nppStreamCtx)

4 channel 16-bit signed image resize.

For common parameter descriptions, see *Common parameters for nppiResizeSqrPackedPixel functions:*.

NppStatus **nppiResizeSqrPixel_16s_AC4R_Ctx**(const *Npp16s* *pSrc, *NppiSize* oSrcSize, int nSrcStep, *NppiRect* oSrcROI, *Npp16s* *pDst, int nDstStep, *NppiRect* oDstROI, double nXFactor, double nYFactor, double nXShift, double nYShift, int eInterpolation, *NppStreamContext* nppStreamCtx)

4 channel 16-bit signed image resize not affecting alpha.

For common parameter descriptions, see *Common parameters for nppiResizeSqrPackedPixel functions:*.

NppStatus **nppiResizeSqrPixel_16s_P3R_Ctx**(const *Npp16s* *const pSrc[3], *NppiSize* oSrcSize, int nSrcStep, *NppiRect* oSrcROI, *Npp16s* *pDst[3], int nDstStep, *NppiRect* oDstROI, double nXFactor, double nYFactor, double nXShift, double nYShift, int eInterpolation, *NppStreamContext* nppStreamCtx)

3 channel 16-bit signed planar image resize.

For common parameter descriptions, see *Common parameters for nppiResizeSqrPlanarPixel functions:*.

NppStatus **nppiResizeSqrPixel_16s_P4R_Ctx**(const *Npp16s* *const pSrc[4], *NppiSize* oSrcSize, int nSrcStep, *NppiRect* oSrcROI, *Npp16s* *pDst[4], int nDstStep, *NppiRect* oDstROI, double nXFactor, double nYFactor, double nXShift, double nYShift, int eInterpolation, *NppStreamContext* nppStreamCtx)

4 channel 16-bit signed planar image resize.

For common parameter descriptions, see *Common parameters for nppiResizeSqrPlanarPixel functions:*.

NppStatus **nppiResizeSqrPixel_32f_C1R_Ctx**(const *Npp32f* *pSrc, *NppiSize* oSrcSize, int nSrcStep, *NppiRect* oSrcROI, *Npp32f* *pDst, int nDstStep, *NppiRect* oDstROI, double nXFactor, double nYFactor, double nXShift, double nYShift, int eInterpolation, *NppStreamContext* nppStreamCtx)

1 channel 32-bit floating point image resize.

For common parameter descriptions, see *Common parameters for nppiResizeSqrPackedPixel functions:*.

NppStatus **nppiResizeSqrPixel_32f_C3R_Ctx**(const *Npp32f* *pSrc, *NppiSize* oSrcSize, int nSrcStep, *NppiRect* oSrcROI, *Npp32f* *pDst, int nDstStep, *NppiRect* oDstROI, double nXFactor, double nYFactor, double nXShift, double nYShift, int eInterpolation, *NppStreamContext* nppStreamCtx)

3 channel 32-bit floating point image resize.

For common parameter descriptions, see *Common parameters for nppiResizeSqrPackedPixel functions:*.

NppStatus **nppiResizeSqrPixel_32f_C4R_Ctx**(const *Npp32f* *pSrc, *NppiSize* oSrcSize, int nSrcStep, *NppiRect* oSrcROI, *Npp32f* *pDst, int nDstStep, *NppiRect* oDstROI, double nXFactor, double nYFactor, double nXShift, double nYShift, int eInterpolation, *NppStreamContext* nppStreamCtx)

4 channel 32-bit floating point image resize.

For common parameter descriptions, see *Common parameters for nppiResizeSqrPackedPixel functions:*.

NppStatus **nppiResizeSqrPixel_32f_AC4R_Ctx**(const *Npp32f* *pSrc, *NppiSize* oSrcSize, int nSrcStep, *NppiRect* oSrcROI, *Npp32f* *pDst, int nDstStep, *NppiRect* oDstROI, double nXFactor, double nYFactor, double nXShift, double nYShift, int eInterpolation, *NppStreamContext* nppStreamCtx)

4 channel 32-bit floating point image resize not affecting alpha.

For common parameter descriptions, see *Common parameters for nppiResizeSqrPackedPixel functions:*.

NppStatus **nppiResizeSqrPixel_32f_P3R_Ctx**(const *Npp32f* *const pSrc[3], *NppiSize* oSrcSize, int nSrcStep, *NppiRect* oSrcROI, *Npp32f* *pDst[3], int nDstStep, *NppiRect* oDstROI, double nXFactor, double nYFactor, double nXShift, double nYShift, int eInterpolation, *NppStreamContext* nppStreamCtx)

3 channel 32-bit floating point planar image resize.

For common parameter descriptions, see *Common parameters for nppiResizeSqrPlanarPixel functions:*.

NppStatus **nppiResizeSqrPixel_32f_P4R_Ctx**(const *Npp32f* *const pSrc[4], *NppiSize* oSrcSize, int nSrcStep, *NppiRect* oSrcROI, *Npp32f* *pDst[4], int nDstStep, *NppiRect* oDstROI, double nXFactor, double nYFactor, double nXShift, double nYShift, int eInterpolation, *NppStreamContext* nppStreamCtx)

4 channel 32-bit floating point planar image resize.

For common parameter descriptions, see *Common parameters for nppiResizeSqrPlanarPixel functions:*.

NppStatus **nppiResizeSqrPixel_64f_C1R_Ctx**(const *Npp64f* *pSrc, *NppiSize* oSrcSize, int nSrcStep, *NppiRect* oSrcROI, *Npp64f* *pDst, int nDstStep, *NppiRect* oDstROI, double nXFactor, double nYFactor, double nXShift, double nYShift, int eInterpolation, *NppStreamContext* nppStreamCtx)

1 channel 64-bit floating point image resize.

For common parameter descriptions, see *Common parameters for nppiResizeSqrPackedPixel functions:*.

NppStatus **nppiResizeSqrPixel_64f_C3R_Ctx**(const *Npp64f* *pSrc, *NppiSize* oSrcSize, int nSrcStep, *NppiRect* oSrcROI, *Npp64f* *pDst, int nDstStep, *NppiRect* oDstROI, double nXFactor, double nYFactor, double nXShift, double nYShift, int eInterpolation, *NppStreamContext* nppStreamCtx)

3 channel 64-bit floating point image resize.

For common parameter descriptions, see *Common parameters for nppiResizeSqrPackedPixel functions:*.

NppStatus **nppiResizeSqrPixel_64f_C4R_Ctx**(const *Npp64f* *pSrc, *NppiSize* oSrcSize, int nSrcStep, *NppiRect* oSrcROI, *Npp64f* *pDst, int nDstStep, *NppiRect* oDstROI, double nXFactor, double nYFactor, double nXShift, double nYShift, int eInterpolation, *NppStreamContext* nppStreamCtx)

4 channel 64-bit floating point image resize.

For common parameter descriptions, see *Common parameters for nppiResizeSqrPackedPixel functions:*.

NppStatus **nppiResizeSqrPixel_64f_AC4R_Ctx**(const *Npp64f* *pSrc, *NppiSize* oSrcSize, int nSrcStep, *NppiRect* oSrcROI, *Npp64f* *pDst, int nDstStep, *NppiRect* oDstROI, double nXFactor, double nYFactor, double nXShift, double nYShift, int eInterpolation, *NppStreamContext* nppStreamCtx)

4 channel 64-bit floating point image resize not affecting alpha.

For common parameter descriptions, see *Common parameters for nppiResizeSqrPackedPixel functions:*.

NppStatus **nppiResizeSqrPixel_64f_P3R_Ctx**(const *Npp64f* *const pSrc[3], *NppiSize* oSrcSize, int nSrcStep, *NppiRect* oSrcROI, *Npp64f* *pDst[3], int nDstStep, *NppiRect* oDstROI, double nXFactor, double nYFactor, double nXShift, double nYShift, int eInterpolation, *NppStreamContext* nppStreamCtx)

3 channel 64-bit floating point planar image resize.

For common parameter descriptions, see *Common parameters for nppiResizeSqrPlanarPixel functions:*.

NppStatus **nppiResizeSqrPixel_64f_P4R_Ctx**(const *Npp64f* *const pSrc[4], *NppiSize* oSrcSize, int nSrcStep, *NppiRect* oSrcROI, *Npp64f* *pDst[4], int nDstStep, *NppiRect* oDstROI, double nXFactor, double nYFactor, double nXShift, double nYShift, int eInterpolation, *NppStreamContext* nppStreamCtx)

4 channel 64-bit floating point planar image resize.

For common parameter descriptions, see *Common parameters for nppiResizeSqrPlanarPixel functions:*.

NppStatus **nppiResizeAdvancedGetBufferHostSize_8u_C1R**(*NppiSize* oSrcROI, *NppiSize* oDstROI, int *hpBufferSize, int eInterpolationMode)

Buffer size for *nppiResizeSqrPixel_8u_C1R_Advanced_Ctx*.

Parameters

- **oSrcROI** – *Region-Of-Interest (ROI)*.
- **oDstROI** – *Region-Of-Interest (ROI)*.
- **hpBufferSize** – Required buffer size. Important: hpBufferSize is a *host pointer. Scratch Buffer and Host Pointer*.
- **eInterpolationMode** – The type of eInterpolation to perform resampling. Currently only supports NPPI_INTER_LANCZOS3_Advanced.

Returns

NPP_NULL_POINTER_ERROR if hpBufferSize is 0 (NULL), *ROI Related Error Codes*.

NppStatus **nppiResizeSqrPixel_8u_C1R_Advanced_Ctx**(const *Npp8u* *pSrc, *NppiSize* oSrcSize, int nSrcStep, *NppiRect* oSrcROI, *Npp8u* *pDst, int nDstStep, *NppiRect* oDstROI, double nXFactor, double nYFactor, *Npp8u* *pBuffer, int eInterpolationMode, *NppStreamContext* nppStreamCtx)

1 channel 8-bit unsigned image resize.

This primitive matches the behavior of GraphicsMagick++.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **oSrcSize** – Size in pixels of the source image.
- **oSrcROI** – Region of interest in the source image.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oDstROI** – Region of interest in the destination image.
- **nXFactor** – Factor by which x dimension is changed.
- **nYFactor** – Factor by which y dimension is changed.
- **pBuffer** – Device buffer that is used during calculations.
- **eInterpolationMode** – The type of eInterpolation to perform resampling. Currently only supports NPPI_INTER_LANCZOS3_Advanced.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*, *Resize Error Codes*

1.11.8. Resize

Resize functions use scale factor automatically determined by the width and height ratios of input and output *Region-Of-Interest (ROI)*.

This simplified function replaces the previous version which was deprecated in an earlier release. In this function the resize scale factor is automatically determined by the width and height ratios of oSrcRectROI and oDstRectROI. If either of those parameters intersect their respective image sizes then pixels outside the image size width and height will not be processed.

Resize supports the following interpolation modes:

```
NPPI_INTER_NN
NPPI_INTER_LINEAR
NPPI_INTER_CUBIC
NPPI_INTER_SUPER
NPPI_INTER_LANCZOS
```

The resize primitives return the following error codes: *Resize Error Codes*.

GetResizeTiledSourceOffset

Helper function that can be used when tiling a destination image with a source image using multiple Resize calls.

oSrcRectROI and oDstRectROI widths and heights should remain unmodified even if they will overlap source and destination image sizes. oDstRectROI offsets should be set to the destination offset of the new tile. Resize function processing will stop when source or destination image sizes are reached, any unavailable source image pixels beyond source image size will be border replicated. There is no particular association assumed between source and destination image locations. The values of oSrcRectROI.x and oSrcRectROI.y are ignored during this function call.

NppStatus **nppiGetResizeTiledSourceOffset**(*NppiRect* oSrcRectROI, *NppiRect* oDstRectROI, *NppiPoint* *pNewSrcRectOffset)

Parameters

- **oSrcRectROI** – Region of interest in the source image (may overlap source image size width and height).
- **oDstRectROI** – Region of interest in the destination image (may overlap destination image size width and height).
- **pNewSrcRectOffset** – Pointer to host memory *NppiPoint* object that will contain the new source image ROI offset to be used in the nppiResize call to generate that tile.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*, *Resize Error Codes*

Resize

Resizes images.

1.11.9. Common parameters for nppiResize packed pixel functions:

param pSrc
Source-Image Pointer to origin of source image.

param nSrcStep
Source-Image Line Step.

param oSrcSize
Size in pixels of the entire source image.

param oSrcRectROI
Region of interest in the source image (may overlap source image size width and height).

param pDst
Destination-Image Pointer to origin of destination image.

param nDstStep
Destination-Image Line Step.

param oDstSize
Size in pixels of the entire destination image.

param oDstRectROI
Region of interest in the destination image (may overlap destination image size width and height).

param eInterpolation
The type of eInterpolation to perform resampling (16f versions do not support Lanczos interpolation).

param nppStreamCtx
Application Managed Stream Context.

return
Image Data Related Error Codes, *ROI Related Error Codes*, *Resize Error Codes*

1.11.10. Common parameters for nppiResize planar pixel functions:

param pSrc
Source-Planar-Image Pointer Array (host memory array containing device memory image plane origin pointers).

param nSrcStep
Source-Image Line Step.

param oSrcSize
Size in pixels of the entire source image.

param oSrcRectROI
Region of interest in the source image (may overlap source image size width and height).

param pDst
Destination-Planar-Image Pointer Array (host memory array containing device memory image plane origin pointers).

param nDstStep
Destination-Image Line Step.

param oDstSize
Size in pixels of the entire destination image.

param oDstRectROI
Region of interest in the destination image (may overlap destination image size width and height).

param eInterpolation
The type of eInterpolation to perform resampling.

param nppStreamCtx
Application Managed Stream Context.

return
Image Data Related Error Codes, *ROI Related Error Codes*, *Resize Error Codes*

NppStatus **nppiResize_8u_C1R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *NppiSize* oSrcSize, *NppiRect* oSrcRectROI, *Npp8u* *pDst, int nDstStep, *NppiSize* oDstSize, *NppiRect* oDstRectROI, int eInterpolation, *NppStreamContext* nppStreamCtx)

1 channel 8-bit unsigned image resize.

For common parameter descriptions, see *Common parameters for nppiResize packed pixel functions:*.

NppStatus **nppiResize_8u_C3R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *NppiSize* oSrcSize, *NppiRect* oSrcRectROI, *Npp8u* *pDst, int nDstStep, *NppiSize* oDstSize, *NppiRect* oDstRectROI, int eInterpolation, *NppStreamContext* nppStreamCtx)

3 channel 8-bit unsigned image resize.

For common parameter descriptions, see *Common parameters for nppiResize packed pixel functions:*.

NppStatus **nppiResize_8u_C4R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *NppiSize* oSrcSize, *NppiRect* oSrcRectROI, *Npp8u* *pDst, int nDstStep, *NppiSize* oDstSize, *NppiRect* oDstRectROI, int eInterpolation, *NppStreamContext* nppStreamCtx)

4 channel 8-bit unsigned image resize.

For common parameter descriptions, see *Common parameters for nppiResize packed pixel functions:*.

NppStatus **nppiResize_8u_AC4R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *NppiSize* oSrcSize, *NppiRect* oSrcRectROI, *Npp8u* *pDst, int nDstStep, *NppiSize* oDstSize, *NppiRect* oDstRectROI, int eInterpolation, *NppStreamContext* nppStreamCtx)

4 channel 8-bit unsigned image resize not affecting alpha.

For common parameter descriptions, see *Common parameters for nppiResize packed pixel functions:*.

NppStatus **nppiResize_8u_P3R_Ctx**(const *Npp8u* *pSrc[3], int nSrcStep, *NppiSize* oSrcSize, *NppiRect* oSrcRectROI, *Npp8u* *pDst[3], int nDstStep, *NppiSize* oDstSize, *NppiRect* oDstRectROI, int eInterpolation, *NppStreamContext* nppStreamCtx)

3 channel 8-bit unsigned planar image resize.

For common parameter descriptions, see *Common parameters for nppiResize planar pixel functions:*.

NppStatus **nppiResize_8u_P4R_Ctx**(const *Npp8u* *pSrc[4], int nSrcStep, *NppiSize* oSrcSize, *NppiRect* oSrcRectROI, *Npp8u* *pDst[4], int nDstStep, *NppiSize* oDstSize, *NppiRect* oDstRectROI, int eInterpolation, *NppStreamContext* nppStreamCtx)

4 channel 8-bit unsigned planar image resize.

For common parameter descriptions, see *Common parameters for nppiResize planar pixel functions:*.

NppStatus **nppiResize_16u_C1R_Ctx**(const *Npp16u* *pSrc, int nSrcStep, *NppiSize* oSrcSize, *NppiRect* oSrcRectROI, *Npp16u* *pDst, int nDstStep, *NppiSize* oDstSize, *NppiRect* oDstRectROI, int eInterpolation, *NppStreamContext* nppStreamCtx)

1 channel 16-bit unsigned image resize.

For common parameter descriptions, see *Common parameters for nppiResize packed pixel functions:*.

NppStatus **nppiResize_16u_C3R_Ctx**(const *Npp16u* *pSrc, int nSrcStep, *NppiSize* oSrcSize, *NppiRect* oSrcRectROI, *Npp16u* *pDst, int nDstStep, *NppiSize* oDstSize, *NppiRect* oDstRectROI, int eInterpolation, *NppStreamContext* nppStreamCtx)

3 channel 16-bit unsigned image resize.

For common parameter descriptions, see *Common parameters for nppiResize packed pixel functions:*.

NppStatus **nppiResize_16u_C4R_Ctx**(const *Npp16u* *pSrc, int nSrcStep, *NppiSize* oSrcSize, *NppiRect* oSrcRectROI, *Npp16u* *pDst, int nDstStep, *NppiSize* oDstSize, *NppiRect* oDstRectROI, int eInterpolation, *NppStreamContext* nppStreamCtx)

4 channel 16-bit unsigned image resize.

For common parameter descriptions, see *Common parameters for nppiResize packed pixel functions:*.

NppStatus **nppiResize_16u_AC4R_Ctx**(const *Npp16u* *pSrc, int nSrcStep, *NppiSize* oSrcSize, *NppiRect* oSrcRectROI, *Npp16u* *pDst, int nDstStep, *NppiSize* oDstSize, *NppiRect* oDstRectROI, int eInterpolation, *NppStreamContext* nppStreamCtx)

4 channel 16-bit unsigned image resize not affecting alpha.

For common parameter descriptions, see *Common parameters for nppiResize packed pixel functions:*.

NppStatus **nppiResize_16u_P3R_Ctx**(const *Npp16u* *pSrc[3], int nSrcStep, *NppiSize* oSrcSize, *NppiRect* oSrcRectROI, *Npp16u* *pDst[3], int nDstStep, *NppiSize* oDstSize, *NppiRect* oDstRectROI, int eInterpolation, *NppStreamContext* nppStreamCtx)

3 channel 16-bit unsigned planar image resize.

For common parameter descriptions, see *Common parameters for nppiResize planar pixel functions:*.

NppStatus **nppiResize_16u_P4R_Ctx**(const *Npp16u* *pSrc[4], int nSrcStep, *NppiSize* oSrcSize, *NppiRect* oSrcRectROI, *Npp16u* *pDst[4], int nDstStep, *NppiSize* oDstSize, *NppiRect* oDstRectROI, int eInterpolation, *NppStreamContext* nppStreamCtx)

4 channel 16-bit unsigned planar image resize.

For common parameter descriptions, see *Common parameters for nppiResize planar pixel functions:*.

NppStatus **nppiResize_16s_C1R_Ctx**(const *Npp16s* *pSrc, int nSrcStep, *NppiSize* oSrcSize, *NppiRect* oSrcRectROI, *Npp16s* *pDst, int nDstStep, *NppiSize* oDstSize, *NppiRect* oDstRectROI, int eInterpolation, *NppStreamContext* nppStreamCtx)

1 channel 16-bit signed image resize.

For common parameter descriptions, see *Common parameters for nppiResize packed pixel functions:*.

NppStatus **nppiResize_16s_C3R_Ctx**(const *Npp16s* *pSrc, int nSrcStep, *NppiSize* oSrcSize, *NppiRect* oSrcRectROI, *Npp16s* *pDst, int nDstStep, *NppiSize* oDstSize, *NppiRect* oDstRectROI, int eInterpolation, *NppStreamContext* nppStreamCtx)

3 channel 16-bit signed image resize.

For common parameter descriptions, see *Common parameters for nppiResize packed pixel functions:*.

NppStatus **nppiResize_16s_C4R_Ctx**(const *Npp16s* *pSrc, int nSrcStep, *NppiSize* oSrcSize, *NppiRect* oSrcRectROI, *Npp16s* *pDst, int nDstStep, *NppiSize* oDstSize, *NppiRect* oDstRectROI, int eInterpolation, *NppStreamContext* nppStreamCtx)

4 channel 16-bit signed image resize.

For common parameter descriptions, see *Common parameters for nppiResize packed pixel functions:*.

NppStatus **nppiResize_16s_AC4R_Ctx**(const *Npp16s* *pSrc, int nSrcStep, *NppiSize* oSrcSize, *NppiRect* oSrcRectROI, *Npp16s* *pDst, int nDstStep, *NppiSize* oDstSize, *NppiRect* oDstRectROI, int eInterpolation, *NppStreamContext* nppStreamCtx)

4 channel 16-bit signed image resize not affecting alpha.

For common parameter descriptions, see *Common parameters for nppiResize packed pixel functions:*.

NppStatus **nppiResize_16s_P3R_Ctx**(const *Npp16s* *pSrc[3], int nSrcStep, *NppiSize* oSrcSize, *NppiRect* oSrcRectROI, *Npp16s* *pDst[3], int nDstStep, *NppiSize* oDstSize, *NppiRect* oDstRectROI, int eInterpolation, *NppStreamContext* nppStreamCtx)

3 channel 16-bit signed planar image resize.

For common parameter descriptions, see *Common parameters for nppiResize planar pixel functions:*.

NppStatus **nppiResize_16s_P4R_Ctx**(const *Npp16s* *pSrc[4], int nSrcStep, *NppiSize* oSrcSize, *NppiRect* oSrcRectROI, *Npp16s* *pDst[4], int nDstStep, *NppiSize* oDstSize, *NppiRect* oDstRectROI, int eInterpolation, *NppStreamContext* nppStreamCtx)

4 channel 16-bit signed planar image resize.

For common parameter descriptions, see *Common parameters for nppiResize planar pixel functions:*.

NppStatus **nppiResize_16f_C1R_Ctx**(const *Npp16f* *pSrc, int nSrcStep, *NppiSize* oSrcSize, *NppiRect* oSrcRectROI, *Npp16f* *pDst, int nDstStep, *NppiSize* oDstSize, *NppiRect* oDstRectROI, int eInterpolation, *NppStreamContext* nppStreamCtx)

1 channel 16-bit floating point image resize.

For common parameter descriptions, see *Common parameters for nppiResize packed pixel functions:*.

NppStatus **nppiResize_16f_C3R_Ctx**(const *Npp16f* *pSrc, int nSrcStep, *NppiSize* oSrcSize, *NppiRect* oSrcRectROI, *Npp16f* *pDst, int nDstStep, *NppiSize* oDstSize, *NppiRect* oDstRectROI, int eInterpolation, *NppStreamContext* nppStreamCtx)

3 channel 16-bit floating point image resize.

For common parameter descriptions, see *Common parameters for nppiResize packed pixel functions:*.

NppStatus **nppiResize_16f_C4R_Ctx**(const *Npp16f* *pSrc, int nSrcStep, *NppiSize* oSrcSize, *NppiRect* oSrcRectROI, *Npp16f* *pDst, int nDstStep, *NppiSize* oDstSize, *NppiRect* oDstRectROI, int eInterpolation, *NppStreamContext* nppStreamCtx)

4 channel 16-bit floating point image resize.

For common parameter descriptions, see *Common parameters for nppiResize packed pixel functions:*.

NppStatus **nppiResize_32f_C1R_Ctx**(const *Npp32f* *pSrc, int nSrcStep, *NppiSize* oSrcSize, *NppiRect* oSrcRectROI, *Npp32f* *pDst, int nDstStep, *NppiSize* oDstSize, *NppiRect* oDstRectROI, int eInterpolation, *NppStreamContext* nppStreamCtx)

1 channel 32-bit floating point image resize.

For common parameter descriptions, see *Common parameters for nppiResize packed pixel functions:*.

NppStatus **nppiResize_32f_C3R_Ctx**(const *Npp32f* *pSrc, int nSrcStep, *NppiSize* oSrcSize, *NppiRect* oSrcRectROI, *Npp32f* *pDst, int nDstStep, *NppiSize* oDstSize, *NppiRect* oDstRectROI, int eInterpolation, *NppStreamContext* nppStreamCtx)

3 channel 32-bit floating point image resize.

For common parameter descriptions, see *Common parameters for nppiResize packed pixel functions:*.

NppStatus **nppiResize_32f_C4R_Ctx**(const *Npp32f* *pSrc, int nSrcStep, *NppiSize* oSrcSize, *NppiRect* oSrcRectROI, *Npp32f* *pDst, int nDstStep, *NppiSize* oDstSize, *NppiRect* oDstRectROI, int eInterpolation, *NppStreamContext* nppStreamCtx)

4 channel 32-bit floating point image resize.

For common parameter descriptions, see *Common parameters for nppiResize packed pixel functions:*.

NppStatus **nppiResize_32f_AC4R_Ctx**(const *Npp32f* *pSrc, int nSrcStep, *NppiSize* oSrcSize, *NppiRect* oSrcRectROI, *Npp32f* *pDst, int nDstStep, *NppiSize* oDstSize, *NppiRect* oDstRectROI, int eInterpolation, *NppStreamContext* nppStreamCtx)

4 channel 32-bit floating point image resize not affecting alpha.

For common parameter descriptions, see *Common parameters for nppiResize packed pixel functions:*.

NppStatus **nppiResize_32f_P3R_Ctx**(const *Npp32f* *pSrc[3], int nSrcStep, *NppiSize* oSrcSize, *NppiRect* oSrcRectROI, *Npp32f* *pDst[3], int nDstStep, *NppiSize* oDstSize, *NppiRect* oDstRectROI, int eInterpolation, *NppStreamContext* nppStreamCtx)

3 channel 32-bit floating point planar image resize.

For common parameter descriptions, see *Common parameters for nppiResize planar pixel functions:*.

NppStatus **nppiResize_32f_P4R_Ctx**(const *Npp32f* *pSrc[4], int nSrcStep, *NppiSize* oSrcSize, *NppiRect* oSrcRectROI, *Npp32f* *pDst[4], int nDstStep, *NppiSize* oDstSize, *NppiRect* oDstRectROI, int eInterpolation, *NppStreamContext* nppStreamCtx)

4 channel 32-bit floating point planar image resize.

For common parameter descriptions, see *Common parameters for nppiResize planar pixel functions:*.

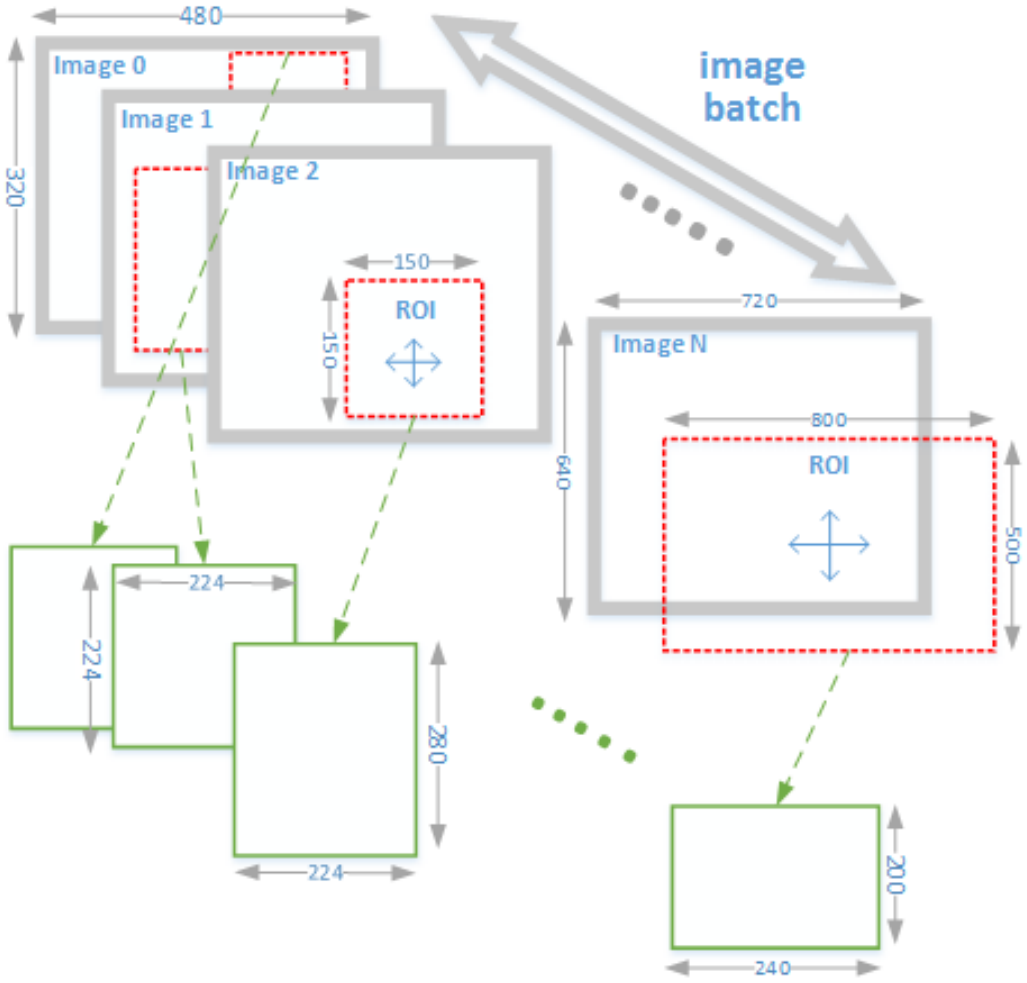
1.11.11. ResizeBatch

Above is the diagram of batch resize functions for variable ROIs. Figure shows the flexibility that the API can handle. The ROIs for source and destination images can be any rectangular width and height that reflects the needed resize factors, inside or beyond the image boundary.

ResizeBatch functions use scale factor automatically determined by the width and height ratios for each pair of input / output images in provided batches.

In this function as in nppiResize the resize scale factor is automatically determined by the width and height ratios of oSrcRectROI and oDstRectROI. If either of those parameters intersect their respective image sizes then pixels outside the image size width and height will not be processed. Details of the resize operation are described above in the Resize section. ResizeBatch generally takes the same

Diagram of batch resize functions for variable ROIs



parameter list as Resize except that there is a list of N instances of those parameters (N > 1) and that list is passed in device memory. A convenient data structure is provided that allows for easy initialization of the parameter lists. The only restriction on these functions is that there is one single source ROI rectangle and one single destination ROI rectangle which are applied respectively to each image in the batch. The primary purpose of this function is to provide improved performance for batches of smaller images as long as GPU resources are available. Therefore it is recommended that the function not be used for very large images as there may not be resources available for processing several large images simultaneously.

A single set of oSrcRectROI and oDstRectROI values are applied to each source image and destination image in the batch in the nppiResizeBatch version of the function while per image specific oSrcRectROI and oDstRectROI values can be used in the nppiResizeBatch_Advanced version of the function. Source and destination image sizes may vary but oSmallestSrcSize and oSmallestDstSize must be set to the smallest source and destination image sizes in the batch. The parameters in the *NppiResizeBatchCXR* structure represent the corresponding per-image nppiResize parameters for each image in the nppiResizeBatch functions and the *NppiImageDescriptor* and *NppiResizeBatchROI_Advanced* structures represent the corresponding per-image nppiResize parameters for the nppiResizeBatch_Advanced functions. The *NppiResizeBatchCXR* or *NppiImageDescriptor* and *NppiResizeBatchROI_Advanced* arrays must be in device memory.

ResizeBatch supports the following interpolation modes:

```
NPPI_INTER_NN
NPPI_INTER_LINEAR
NPPI_INTER_CUBIC
NPPI_INTER_SUPER
```

The resize primitives return the following error codes: *Resize Error Codes*.

1.11.11.1 Common parameters for nppiResizeBatch functions:

1.11.11.2 Common parameters for nppiResizeBatchAdvanced functions:

param oSmallestSrcSize
Size in pixels of the entire smallest source image width and height, may be from different images.

param oSrcRectROI
Region of interest in the source images (may overlap source image size width and height).

param oSmallestDstSize
Size in pixels of the entire smallest destination image width and height, may be from different images.

param oDstRectROI
Region of interest in the destination images (may overlap destination image size width and height).

param eInterpolation
The type of eInterpolation to perform resampling. Currently limited to NPPI_INTER_NN, NPPI_INTER_LINEAR, NPPI_INTER_CUBIC, or NPPI_INTER_SUPER.

param pBatchList
Device memory pointer to nBatchSize list of *NppiResizeBatchCXR* structures.

param pBatchSrc
Device pointer to *NppiImageDescriptor* list of source image descriptors. User needs to intialize this structure and copy it to device.

param pBatchDst
Device pointer to *NppiImageDescriptor* list of destination image descriptors. User needs to intialize this structure and copy it to device.

param pBatchROI
Device pointer to *NppiResizeBatchROI_Advanced* list of per-image variable ROIs. User needs to initialize this structure and copy it to device.

param nBatchSize
Number of *NppiResizeBatchCXR* structures in this call (must be > 1).

param nppStreamCtx
Application Managed Stream Context.

return
Image Data Related Error Codes, *ROI Related Error Codes*, *Resize Error Codes*

param nMaxWidth
The maximum width of all destination ROIs

param nMaxHeight
The maximum height of all destination ROIs

param pBatchSrc
Device pointer to *NppiImageDescriptor* list of source image descriptors. User needs to intialize this structure and copy it to device.

param pBatchDst
Device pointer to *NppiImageDescriptor* list of destination image descriptors. User needs to intialize this structure and copy it to device.

param pBatchROI
Device pointer to *NppiResizeBatchROI_Advanced* list of per-image variable ROIs. User needs to initialize this structure and copy it to device.

param nBatchSize
Number of images in a batch.

param eInterpolation
The type of eInterpolation to perform resampling.

param nppStreamCtx
Application Managed Stream Context.

return
Image Data Related Error Codes, *ROI Related Error Codes*, *Resize Error Codes*

Functions

NppStatus **nppiResizeBatch_8u_C1R_Ctx**(*NppiSize* oSmallestSrcSize, *NppiRect* oSrcRectROI, *NppiSize* oSmallestDstSize, *NppiRect* oDstRectROI, int eInterpolation, *NppiResizeBatchCXR* *pBatchList, unsigned int nBatchSize, *NppStreamContext* nppStreamCtx)

1 channel 8-bit image resize batch.

For common parameter descriptions, see *Common parameters for nppiResizeBatch functions:*.

NppStatus **nppiResizeBatch_8u_C3R_Ctx**(*NppiSize* oSmallestSrcSize, *NppiRect* oSrcRectROI, *NppiSize* oSmallestDstSize, *NppiRect* oDstRectROI, int eInterpolation, *NppiResizeBatchCXR* *pBatchList, unsigned int nBatchSize, *NppStreamContext* nppStreamCtx)

3 channel 8-bit image resize batch.

For common parameter descriptions, see *Common parameters for nppiResizeBatch functions:*.

NppStatus **nppiResizeBatch_8u_C4R_Ctx**(*NppiSize* oSmallestSrcSize, *NppiRect* oSrcRectROI, *NppiSize* oSmallestDstSize, *NppiRect* oDstRectROI, int eInterpolation, *NppiResizeBatchCXR* *pBatchList, unsigned int nBatchSize, *NppStreamContext* nppStreamCtx)

4 channel 8-bit image resize batch.

For common parameter descriptions, see *Common parameters for nppiResizeBatch functions:*.

NppStatus **nppiResizeBatch_8u_AC4R_Ctx**(*NppiSize* oSmallestSrcSize, *NppiRect* oSrcRectROI, *NppiSize* oSmallestDstSize, *NppiRect* oDstRectROI, int eInterpolation, *NppiResizeBatchCXR* *pBatchList, unsigned int nBatchSize, *NppStreamContext* nppStreamCtx)

4 channel 8-bit image resize batch not affecting alpha.

For common parameter descriptions, see *Common parameters for nppiResizeBatch functions:*.

NppStatus **nppiResizeBatch_32f_C1R_Ctx**(*NppiSize* oSmallestSrcSize, *NppiRect* oSrcRectROI, *NppiSize* oSmallestDstSize, *NppiRect* oDstRectROI, int eInterpolation, *NppiResizeBatchCXR* *pBatchList, unsigned int nBatchSize, *NppStreamContext* nppStreamCtx)

1 channel 32-bit floating point image resize batch.

For common parameter descriptions, see *Common parameters for nppiResizeBatch functions:*.

NppStatus **nppiResizeBatch_32f_C3R_Ctx**(*NppiSize* oSmallestSrcSize, *NppiRect* oSrcRectROI, *NppiSize* oSmallestDstSize, *NppiRect* oDstRectROI, int eInterpolation, *NppiResizeBatchCXR* *pBatchList, unsigned int nBatchSize, *NppStreamContext* nppStreamCtx)

3 channel 32-bit floating point image resize batch.

For common parameter descriptions, see *Common parameters for nppiResizeBatch functions:*.

NppStatus **nppiResizeBatch_32f_C4R_Ctx**(*NppiSize* oSmallestSrcSize, *NppiRect* oSrcRectROI, *NppiSize* oSmallestDstSize, *NppiRect* oDstRectROI, int eInterpolation, *NppiResizeBatchCXR* *pBatchList, unsigned int nBatchSize, *NppStreamContext* nppStreamCtx)

4 channel 32-bit floating point image resize batch.

For common parameter descriptions, see *Common parameters for nppiResizeBatch functions:*.

NppStatus **nppiResizeBatch_32f_AC4R_Ctx**(*NppiSize* oSmallestSrcSize, *NppiRect* oSrcRectROI, *NppiSize* oSmallestDstSize, *NppiRect* oDstRectROI, int eInterpolation, *NppiResizeBatchCXR* *pBatchList, unsigned int nBatchSize, *NppStreamContext* nppStreamCtx)

4 channel 32-bit floating point image resize batch not affecting alpha.

For common parameter descriptions, see *Common parameters for nppiResizeBatch functions:*.

NppStatus **nppiResizeBatch_8u_C1R_Advanced_Ctx**(int nMaxWidth, int nMaxHeight, *NppiImageDescriptor* *pBatchSrc, *NppiImageDescriptor* *pBatchDst, *NppiResizeBatchROI_Advanced* *pBatchROI, unsigned int nBatchSize, int eInterpolation, *NppStreamContext* nppStreamCtx)

1 channel 8-bit image resize batch for variable ROI.

For common parameter descriptions, see *Common parameters for nppiResizeBatchAdvanced functions:*.

NppStatus **nppiResizeBatch_8u_C3R_Advanced_Ctx**(int nMaxWidth, int nMaxHeight, *NppiImageDescriptor* *pBatchSrc, *NppiImageDescriptor* *pBatchDst, *NppiResizeBatchROI_Advanced* *pBatchROI, unsigned int nBatchSize, int eInterpolation, *NppStreamContext* nppStreamCtx)

3 channel 8-bit image resize batch for variable ROI.

For common parameter descriptions, see *Common parameters for nppiResizeBatchAdvanced functions:*.

NppStatus **nppiResizeBatch_8u_C4R_Advanced_Ctx**(int nMaxWidth, int nMaxHeight, *NppiImageDescriptor* *pBatchSrc, *NppiImageDescriptor* *pBatchDst, *NppiResizeBatchROI_Advanced* *pBatchROI, unsigned int nBatchSize, int eInterpolation, *NppStreamContext* nppStreamCtx)

4 channel 8-bit image resize batch for variable ROI.

For common parameter descriptions, see *Common parameters for nppiResizeBatchAdvanced functions:*.

NppStatus **nppiResizeBatch_8u_AC4R_Advanced_Ctx**(int nMaxWidth, int nMaxHeight, *NppiImageDescriptor* *pBatchSrc, *NppiImageDescriptor* *pBatchDst, *NppiResizeBatchROI_Advanced* *pBatchROI, unsigned int nBatchSize, int eInterpolation, *NppStreamContext* nppStreamCtx)

4 channel 8-bit image resize batch for variable ROI not affecting alpha.

For common parameter descriptions, see *Common parameters for nppiResizeBatchAdvanced functions:*.

NppStatus **nppiResizeBatch_16f_C1R_Advanced_Ctx**(int nMaxWidth, int nMaxHeight, *NppiImageDescriptor* *pBatchSrc, *NppiImageDescriptor* *pBatchDst, *NppiResizeBatchROI_Advanced* *pBatchROI, unsigned int nBatchSize, int eInterpolation, *NppStreamContext* nppStreamCtx)

1 channel 16-bit floating point image resize batch for variable ROI.

For common parameter descriptions, see *Common parameters for nppiResizeBatchAdvanced functions:*.

NppStatus **nppiResizeBatch_16f_C3R_Advanced_Ctx**(int nMaxWidth, int nMaxHeight, *NppiImageDescriptor* *pBatchSrc, *NppiImageDescriptor* *pBatchDst, *NppiResizeBatchROI_Advanced* *pBatchROI, unsigned int nBatchSize, int eInterpolation, *NppStreamContext* nppStreamCtx)

3 channel 16-bit floating point image resize batch for variable ROI.

For common parameter descriptions, see *Common parameters for nppiResizeBatchAdvanced functions:*.

NppStatus **nppiResizeBatch_16f_C4R_Advanced_Ctx**(int nMaxWidth, int nMaxHeight, *NppiImageDescriptor* *pBatchSrc, *NppiImageDescriptor* *pBatchDst, *NppiResizeBatchROI_Advanced* *pBatchROI, unsigned int nBatchSize, int eInterpolation, *NppStreamContext* nppStreamCtx)

4 channel 16-bit floating point image resize batch for variable ROI.

For common parameter descriptions, see *Common parameters for nppiResizeBatchAdvanced functions:*.

NppStatus **nppiResizeBatch_32f_C1R_Advanced_Ctx**(int nMaxWidth, int nMaxHeight, *NppiImageDescriptor* *pBatchSrc, *NppiImageDescriptor* *pBatchDst, *NppiResizeBatchROI_Advanced* *pBatchROI, unsigned int nBatchSize, int eInterpolation, *NppStreamContext* nppStreamCtx)

1 channel 32-bit floating point image resize batch for variable ROI.

For common parameter descriptions, see *Common parameters for nppiResizeBatchAdvanced functions:*.

NppStatus **nppiResizeBatch_32f_C3R_Advanced_Ctx**(int nMaxWidth, int nMaxHeight, *NppiImageDescriptor* *pBatchSrc, *NppiImageDescriptor* *pBatchDst, *NppiResizeBatchROI_Advanced* *pBatchROI, unsigned int nBatchSize, int eInterpolation, *NppStreamContext* nppStreamCtx)

3 channel 32-bit floating point image resize batch for variable ROI.

For common parameter descriptions, see *Common parameters for nppiResizeBatchAdvanced functions:*.

NppStatus **nppiResizeBatch_32f_C4R_Advanced_Ctx**(int nMaxWidth, int nMaxHeight, *NppiImageDescriptor* *pBatchSrc, *NppiImageDescriptor* *pBatchDst, *NppiResizeBatchROI_Advanced* *pBatchROI, unsigned int nBatchSize, int eInterpolation, *NppStreamContext* nppStreamCtx)

4 channel 32-bit floating point image resize batch for variable ROI.

For common parameter descriptions, see *Common parameters for nppiResizeBatchAdvanced functions:*.

NppStatus **nppiResizeBatch_32f_AC4R_Advanced_Ctx**(int nMaxWidth, int nMaxHeight, *NppiImageDescriptor* *pBatchSrc, *NppiImageDescriptor* *pBatchDst, *NppiResizeBatchROI_Advanced* *pBatchROI, unsigned int nBatchSize, int eInterpolation, *NppStreamContext* nppStreamCtx)

4 channel 32-bit floating point image resize batch for variable ROI not affecting alpha.

For common parameter descriptions, see *Common parameters for nppiResizeBatchAdvanced functions:*.

1.11.12. Remap

Routines providing remap functionality.

Remap supports the following interpolation modes:

NPPI_INTER_NN NPPI_INTER_LINEAR NPPI_INTER_CUBIC NPPI_INTER_CUBIC2P_BSPLINE NPPI_INTER_CUBIC2P_CATMULLROM NPPI_INTER_CUBIC2P_B05C03 NPPI_INTER_LANCZOS

Remap chooses source pixels using pixel coordinates explicitly supplied in two 2D device memory image arrays pointed to by the pXMap and pYMap pointers. The pXMap array contains the X coordinated and the pYMap array contains the Y coordinate of the corresponding source image pixel to use as input. These coordinates are in floating point format so fraction pixel positions can be used. The coordinates of the source pixel to sample are determined as follows:

nSrcX = pxMap[nDstX, nDstY] nSrcY = pyMap[nDstX, nDstY]

In the Remap functions below source image clip checking is handled as follows:

If the source pixel fractional x and y coordinates are greater than or equal to oSizeROI.x and less than oSizeROI.x + oSizeROI.width and greater than or equal to oSizeROI.y and less than oSizeROI.y + oSizeROI.height then the source pixel is considered to be within the source image clip rectangle and the source image is sampled. Otherwise the source image is not sampled and a destination pixel is not written to the destination image.

1.11.13. Error Codes

The remap primitives return the following error codes:

```
- NPP_WRONG_INTERSECTION_ROI_ERROR indicates an error condition if
  srcROIRect has no intersection with the source image.
- NPP_INTERPOLATION_ERROR if eInterpolation has an illegal value.
```

1.11.13.1 Common parameters for nppiRemap packed pixel functions:

1.11.13.2 Common parameters for nppiRemap planar pixel functions:

param pSrc
Source-Image Pointer.

param nSrcStep
Source-Image Line Step.

param oSrcSize
Size in pixels of the source image.

param oSrcROI
Region of interest in the source image.

param pXMap
Device memory pointer to 2D image array of X coordinate values to be used when sampling source image.

param nXMapStep
pXMap image array line step in bytes.

param pYMap
Device memory pointer to 2D image array of Y coordinate values to be used when sampling source image.

param nYMapStep
pYMap image array line step in bytes.

param pDst
Destination-Image Pointer.

param nDstStep
Destination-Image Line Step.

param oDstSizeROI
Region of interest size in the destination image.

param eInterpolation
The type of eInterpolation to perform resampling.

param nppStreamCtx
Application Managed Stream Context.

return
Image Data Related Error Codes, *ROI Related Error Codes*, *Error Codes*

param pSrc
Source-Planar-Image Pointer Array.

param nSrcStep
Source-Image Line Step.

param oSrcSize
Size in pixels of the source image.

param oSrcROI
Region of interest in the source image.

param pXMap
Device memory pointer to 2D image array of X coordinate values to be used when sampling source image.

param nXMapStep
pXMap image array line step in bytes.

param pYMap
Device memory pointer to 2D image array of Y coordinate values to be used when sampling source image.

param nYMapStep
pYMap image array line step in bytes.

param pDst
Destination-Planar-Image Pointer Array.

param nDstStep
Destination-Image Line Step.

param oDstSizeROI
Region of interest size in the destination image.

param eInterpolation
The type of eInterpolation to perform resampling.

param nppStreamCtx
Application Managed Stream Context.

return
Image Data Related Error Codes, *ROI Related Error Codes*, *Error Codes*

Remap

Remaps images.

NppStatus **nppiRemap_8u_C1R_Ctx**(const *Npp8u* *pSrc, *NppiSize* oSrcSize, int nSrcStep, *NppiRect* oSrcROI, const *Npp32f* *pXMap, int nXMapStep, const *Npp32f* *pYMap, int nYMapStep, *Npp8u* *pDst, int nDstStep, *NppiSize* oDstSizeROI, int eInterpolation, *NppStreamContext* nppStreamCtx)

1 channel 8-bit unsigned image remap.

For common parameter descriptions, see *Common parameters for nppiRemap packed pixel functions:*.

NppStatus **nppiRemap_8u_C3R_Ctx**(const *Npp8u* *pSrc, *NppiSize* oSrcSize, int nSrcStep, *NppiRect* oSrcROI, const *Npp32f* *pXMap, int nXMapStep, const *Npp32f* *pYMap, int nYMapStep, *Npp8u* *pDst, int nDstStep, *NppiSize* oDstSizeROI, int eInterpolation, *NppStreamContext* nppStreamCtx)

3 channel 8-bit unsigned image remap.

For common parameter descriptions, see *Common parameters for nppiRemap packed pixel functions:*.

NppStatus **nppiRemap_8u_C4R_Ctx**(const *Npp8u* *pSrc, *NppiSize* oSrcSize, int nSrcStep, *NppiRect* oSrcROI, const *Npp32f* *pXMap, int nXMapStep, const *Npp32f* *pYMap, int nYMapStep, *Npp8u* *pDst, int nDstStep, *NppiSize* oDstSizeROI, int eInterpolation, *NppStreamContext* nppStreamCtx)

4 channel 8-bit unsigned image remap.

For common parameter descriptions, see *Common parameters for nppiRemap packed pixel functions:*.

NppStatus **nppiRemap_8u_AC4R_Ctx**(const *Npp8u* *pSrc, *NppiSize* oSrcSize, int nSrcStep, *NppiRect* oSrcROI, const *Npp32f* *pXMap, int nXMapStep, const *Npp32f* *pYMap, int nYMapStep, *Npp8u* *pDst, int nDstStep, *NppiSize* oDstSizeROI, int eInterpolation, *NppStreamContext* nppStreamCtx)

4 channel 8-bit unsigned image remap not affecting alpha.

For common parameter descriptions, see *Common parameters for nppiRemap packed pixel functions:*.

NppStatus **nppiRemap_8u_P3R_Ctx**(const *Npp8u* *const pSrc[3], *NppiSize* oSrcSize, int nSrcStep, *NppiRect* oSrcROI, const *Npp32f* *pXMap, int nXMapStep, const *Npp32f* *pYMap, int nYMapStep, *Npp8u* *pDst[3], int nDstStep, *NppiSize* oDstSizeROI, int eInterpolation, *NppStreamContext* nppStreamCtx)

3 channel 8-bit unsigned planar image remap.

For common parameter descriptions, see *Common parameters for nppiRemap planar pixel functions:*.

NppStatus **nppiRemap_8u_P4R_Ctx**(const *Npp8u* *const pSrc[4], *NppiSize* oSrcSize, int nSrcStep, *NppiRect* oSrcROI, const *Npp32f* *pXMap, int nXMapStep, const *Npp32f* *pYMap, int nYMapStep, *Npp8u* *pDst[4], int nDstStep, *NppiSize* oDstSizeROI, int eInterpolation, *NppStreamContext* nppStreamCtx)

4 channel 8-bit unsigned planar image remap.

For common parameter descriptions, see *Common parameters for nppiRemap planar pixel functions:*.

NppStatus **nppiRemap_16u_C1R_Ctx**(const *Npp16u* *pSrc, *NppiSize* oSrcSize, int nSrcStep, *NppiRect* oSrcROI, const *Npp32f* *pXMap, int nXMapStep, const *Npp32f* *pYMap, int nYMapStep, *Npp16u* *pDst, int nDstStep, *NppiSize* oDstSizeROI, int eInterpolation, *NppStreamContext* nppStreamCtx)

1 channel 16-bit unsigned image remap.

For common parameter descriptions, see *Common parameters for nppiRemap packed pixel functions:*.

NppStatus **nppiRemap_16u_C3R_Ctx**(const *Npp16u* *pSrc, *NppiSize* oSrcSize, int nSrcStep, *NppiRect* oSrcROI, const *Npp32f* *pXMap, int nXMapStep, const *Npp32f* *pYMap, int nYMapStep, *Npp16u* *pDst, int nDstStep, *NppiSize* oDstSizeROI, int eInterpolation, *NppStreamContext* nppStreamCtx)

3 channel 16-bit unsigned image remap.

For common parameter descriptions, see *Common parameters for nppiRemap packed pixel functions:*.

NppStatus **nppiRemap_16u_C4R_Ctx**(const *Npp16u* *pSrc, *NppiSize* oSrcSize, int nSrcStep, *NppiRect* oSrcROI, const *Npp32f* *pXMap, int nXMapStep, const *Npp32f* *pYMap, int nYMapStep, *Npp16u* *pDst, int nDstStep, *NppiSize* oDstSizeROI, int eInterpolation, *NppStreamContext* nppStreamCtx)

4 channel 16-bit unsigned image remap.

For common parameter descriptions, see *Common parameters for nppiRemap packed pixel functions:*.

NppStatus **nppiRemap_16u_AC4R_Ctx**(const *Npp16u* *pSrc, *NppiSize* oSrcSize, int nSrcStep, *NppiRect* oSrcROI, const *Npp32f* *pXMap, int nXMapStep, const *Npp32f* *pYMap, int nYMapStep, *Npp16u* *pDst, int nDstStep, *NppiSize* oDstSizeROI, int eInterpolation, *NppStreamContext* nppStreamCtx)

4 channel 16-bit unsigned image remap not affecting alpha.

For common parameter descriptions, see *Common parameters for nppiRemap packed pixel functions:*.

NppStatus **nppiRemap_16u_P3R_Ctx**(const *Npp16u* *const pSrc[3], *NppiSize* oSrcSize, int nSrcStep, *NppiRect* oSrcROI, const *Npp32f* *pXMap, int nXMapStep, const *Npp32f* *pYMap, int nYMapStep, *Npp16u* *pDst[3], int nDstStep, *NppiSize* oDstSizeROI, int eInterpolation, *NppStreamContext* nppStreamCtx)

3 channel 16-bit unsigned planar image remap.

For common parameter descriptions, see *Common parameters for nppiRemap planar pixel functions:*.

NppStatus **nppiRemap_16u_P4R_Ctx**(const *Npp16u* *const pSrc[4], *NppiSize* oSrcSize, int nSrcStep, *NppiRect* oSrcROI, const *Npp32f* *pXMap, int nXMapStep, const *Npp32f* *pYMap, int nYMapStep, *Npp16u* *pDst[4], int nDstStep, *NppiSize* oDstSizeROI, int eInterpolation, *NppStreamContext* nppStreamCtx)

4 channel 16-bit unsigned planar image remap.

For common parameter descriptions, see *Common parameters for nppiRemap planar pixel functions:*.

NppStatus **nppiRemap_16s_C1R_Ctx**(const *Npp16s* *pSrc, *NppiSize* oSrcSize, int nSrcStep, *NppiRect* oSrcROI, const *Npp32f* *pXMap, int nXMapStep, const *Npp32f* *pYMap, int nYMapStep, *Npp16s* *pDst, int nDstStep, *NppiSize* oDstSizeROI, int eInterpolation, *NppStreamContext* nppStreamCtx)

1 channel 16-bit signed image remap.

For common parameter descriptions, see *Common parameters for nppiRemap packed pixel functions:*.

NppStatus **nppiRemap_16s_C3R_Ctx**(const *Npp16s* *pSrc, *NppiSize* oSrcSize, int nSrcStep, *NppiRect* oSrcROI, const *Npp32f* *pXMap, int nXMapStep, const *Npp32f* *pYMap, int nYMapStep, *Npp16s* *pDst, int nDstStep, *NppiSize* oDstSizeROI, int eInterpolation, *NppStreamContext* nppStreamCtx)

3 channel 16-bit signed image remap.

For common parameter descriptions, see *Common parameters for nppiRemap packed pixel functions:*.

NppStatus **nppiRemap_16s_C4R_Ctx**(const *Npp16s* *pSrc, *NppiSize* oSrcSize, int nSrcStep, *NppiRect* oSrcROI, const *Npp32f* *pXMap, int nXMapStep, const *Npp32f* *pYMap, int nYMapStep, *Npp16s* *pDst, int nDstStep, *NppiSize* oDstSizeROI, int eInterpolation, *NppStreamContext* nppStreamCtx)

4 channel 16-bit signed image remap.

For common parameter descriptions, see *Common parameters for nppiRemap packed pixel functions:*.

NppStatus **nppiRemap_16s_AC4R_Ctx**(const *Npp16s* *pSrc, *NppiSize* oSrcSize, int nSrcStep, *NppiRect* oSrcROI, const *Npp32f* *pXMap, int nXMapStep, const *Npp32f* *pYMap, int nYMapStep, *Npp16s* *pDst, int nDstStep, *NppiSize* oDstSizeROI, int eInterpolation, *NppStreamContext* nppStreamCtx)

4 channel 16-bit signed image remap not affecting alpha.

For common parameter descriptions, see *Common parameters for nppiRemap packed pixel functions:*.

NppStatus **nppiRemap_16s_P3R_Ctx**(const *Npp16s* *const pSrc[3], *NppiSize* oSrcSize, int nSrcStep, *NppiRect* oSrcROI, const *Npp32f* *pXMap, int nXMapStep, const *Npp32f* *pYMap, int nYMapStep, *Npp16s* *pDst[3], int nDstStep, *NppiSize* oDstSizeROI, int eInterpolation, *NppStreamContext* nppStreamCtx)

3 channel 16-bit signed planar image remap.

For common parameter descriptions, see *Common parameters for nppiRemap planar pixel functions:*.

NppStatus **nppiRemap_16s_P4R_Ctx**(const *Npp16s* *const pSrc[4], *NppiSize* oSrcSize, int nSrcStep, *NppiRect* oSrcROI, const *Npp32f* *pXMap, int nXMapStep, const *Npp32f* *pYMap, int nYMapStep, *Npp16s* *pDst[4], int nDstStep, *NppiSize* oDstSizeROI, int eInterpolation, *NppStreamContext* nppStreamCtx)

4 channel 16-bit signed planar image remap.

For common parameter descriptions, see *Common parameters for nppiRemap planar pixel functions:*.

NppStatus **nppiRemap_32f_C1R_Ctx**(const *Npp32f* *pSrc, *NppiSize* oSrcSize, int nSrcStep, *NppiRect* oSrcROI, const *Npp32f* *pXMap, int nXMapStep, const *Npp32f* *pYMap, int nYMapStep, *Npp32f* *pDst, int nDstStep, *NppiSize* oDstSizeROI, int eInterpolation, *NppStreamContext* nppStreamCtx)

1 channel 32-bit floating point image remap.

For common parameter descriptions, see *Common parameters for nppiRemap packed pixel functions:*.

NppStatus **nppiRemap_32f_C3R_Ctx**(const *Npp32f* *pSrc, *NppiSize* oSrcSize, int nSrcStep, *NppiRect* oSrcROI, const *Npp32f* *pXMap, int nXMapStep, const *Npp32f* *pYMap, int nYMapStep, *Npp32f* *pDst, int nDstStep, *NppiSize* oDstSizeROI, int eInterpolation, *NppStreamContext* nppStreamCtx)

3 channel 32-bit floating point image remap.

For common parameter descriptions, see *Common parameters for nppiRemap packed pixel functions:*.

NppStatus **nppiRemap_32f_C4R_Ctx**(const *Npp32f* *pSrc, *NppiSize* oSrcSize, int nSrcStep, *NppiRect* oSrcROI, const *Npp32f* *pXMap, int nXMapStep, const *Npp32f* *pYMap, int nYMapStep, *Npp32f* *pDst, int nDstStep, *NppiSize* oDstSizeROI, int eInterpolation, *NppStreamContext* nppStreamCtx)

4 channel 32-bit floating point image remap.

For common parameter descriptions, see *Common parameters for nppiRemap packed pixel functions:*.

NppStatus **nppiRemap_32f_AC4R_Ctx**(const *Npp32f* *pSrc, *NppiSize* oSrcSize, int nSrcStep, *NppiRect* oSrcROI, const *Npp32f* *pXMap, int nXMapStep, const *Npp32f* *pYMap, int nYMapStep, *Npp32f* *pDst, int nDstStep, *NppiSize* oDstSizeROI, int eInterpolation, *NppStreamContext* nppStreamCtx)

4 channel 32-bit floating point image remap not affecting alpha.

For common parameter descriptions, see *Common parameters for nppiRemap packed pixel functions:*.

NppStatus **nppiRemap_32f_P3R_Ctx**(const *Npp32f* *const pSrc[3], *NppiSize* oSrcSize, int nSrcStep, *NppiRect* oSrcROI, const *Npp32f* *pXMap, int nXMapStep, const *Npp32f* *pYMap, int nYMapStep, *Npp32f* *pDst[3], int nDstStep, *NppiSize* oDstSizeROI, int eInterpolation, *NppStreamContext* nppStreamCtx)

3 channel 32-bit floating point planar image remap.

For common parameter descriptions, see *Common parameters for nppiRemap planar pixel functions:*.

NppStatus **nppiRemap_32f_P4R_Ctx**(const *Npp32f* *const pSrc[4], *NppiSize* oSrcSize, int nSrcStep, *NppiRect* oSrcROI, const *Npp32f* *pXMap, int nXMapStep, const *Npp32f* *pYMap, int nYMapStep, *Npp32f* *pDst[4], int nDstStep, *NppiSize* oDstSizeROI, int eInterpolation, *NppStreamContext* nppStreamCtx)

4 channel 32-bit floating point planar image remap.

For common parameter descriptions, see *Common parameters for nppiRemap planar pixel functions:*.

NppStatus **nppiRemap_64f_C1R_Ctx**(const *Npp64f* *pSrc, *NppiSize* oSrcSize, int nSrcStep, *NppiRect* oSrcROI, const *Npp64f* *pXMap, int nXMapStep, const *Npp64f* *pYMap, int nYMapStep, *Npp64f* *pDst, int nDstStep, *NppiSize* oDstSizeROI, int eInterpolation, *NppStreamContext* nppStreamCtx)

1 channel 64-bit floating point image remap.

For common parameter descriptions, see *Common parameters for nppiRemap packed pixel functions:*.

NppStatus **nppiRemap_64f_C3R_Ctx**(const *Npp64f* *pSrc, *NppiSize* oSrcSize, int nSrcStep, *NppiRect* oSrcROI, const *Npp64f* *pXMap, int nXMapStep, const *Npp64f* *pYMap, int nYMapStep, *Npp64f* *pDst, int nDstStep, *NppiSize* oDstSizeROI, int eInterpolation, *NppStreamContext* nppStreamCtx)

3 channel 64-bit floating point image remap.

For common parameter descriptions, see *Common parameters for nppiRemap packed pixel functions:*.

NppStatus **nppiRemap_64f_C4R_Ctx**(const *Npp64f* *pSrc, *NppiSize* oSrcSize, int nSrcStep, *NppiRect* oSrcROI, const *Npp64f* *pXMap, int nXMapStep, const *Npp64f* *pYMap, int nYMapStep, *Npp64f* *pDst, int nDstStep, *NppiSize* oDstSizeROI, int eInterpolation, *NppStreamContext* nppStreamCtx)

4 channel 64-bit floating point image remap.

For common parameter descriptions, see *Common parameters for nppiRemap packed pixel functions:*.

NppStatus **nppiRemap_64f_AC4R_Ctx**(const *Npp64f* *pSrc, *NppiSize* oSrcSize, int nSrcStep, *NppiRect* oSrcROI, const *Npp64f* *pXMap, int nXMapStep, const *Npp64f* *pYMap, int nYMapStep, *Npp64f* *pDst, int nDstStep, *NppiSize* oDstSizeROI, int eInterpolation, *NppStreamContext* nppStreamCtx)

4 channel 64-bit floating point image remap not affecting alpha.

For common parameter descriptions, see *Common parameters for nppiRemap packed pixel functions:*.

NppStatus **nppiRemap_64f_P3R_Ctx**(const *Npp64f* *const pSrc[3], *NppiSize* oSrcSize, int nSrcStep, *NppiRect* oSrcROI, const *Npp64f* *pXMap, int nXMapStep, const *Npp64f* *pYMap, int nYMapStep, *Npp64f* *pDst[3], int nDstStep, *NppiSize* oDstSizeROI, int eInterpolation, *NppStreamContext* nppStreamCtx)

3 channel 64-bit floating point planar image remap.

For common parameter descriptions, see *Common parameters for nppiRemap planar pixel functions:*.

NppStatus **nppiRemap_64f_P4R_Ctx**(const *Npp64f* *const pSrc[4], *NppiSize* oSrcSize, int nSrcStep, *NppiRect* oSrcROI, const *Npp64f* *pXMap, int nXMapStep, const *Npp64f* *pYMap, int nYMapStep, *Npp64f* *pDst[4], int nDstStep, *NppiSize* oDstSizeROI, int eInterpolation, *NppStreamContext* nppStreamCtx)

4 channel 64-bit floating point planar image remap.

For common parameter descriptions, see *Common parameters for nppiRemap planar pixel functions:*.

1.11.14. Rotate

Rotates an image around the origin (0,0) and then shifts it.

1.11.15. Rotate Error Codes

- NPP_INTERPOLATION_ERROR if eInterpolation has an illegal value.
- NPP_RECTANGLE_ERROR Indicates an error condition if width or height of the intersection of the oSrcROI and source image is less than or equal to 1.
- NPP_WRONG_INTERSECTION_ROI_ERROR indicates an error condition if srcROIRect has no intersection with the source image.
- NPP_WRONG_INTERSECTION_QUAD_WARNING indicates a warning that no operation is performed if the transformed source ROI does not intersect the destination ROI.

1.11.15.1 Common parameters for nppiRotate functions:

param pSrc
Source-Image Pointer.

param nSrcStep
Source-Image Line Step.

param oSrcSize
Size in pixels of the source image

param oSrcROI
Region of interest in the source image.

param pDst
Destination-Image Pointer.

param nDstStep
Destination-Image Line Step.

param oDstROI
Region of interest in the destination image.

param nAngle
The angle of rotation in degrees.

param nShiftX
Shift along horizontal axis

param nShiftY
Shift along vertical axis

param eInterpolation
The type of interpolation to perform resampling

param nppStreamCtx
Application Managed Stream Context.

return
Image Data Related Error Codes, *ROI Related Error Codes*, *Rotate Error Codes*

Rotate

Rotates images.

NppStatus **nppiRotate_8u_C1R_Ctx**(const *Npp8u* *pSrc, *NppiSize* oSrcSize, int nSrcStep, *NppiRect* oSrcROI, *Npp8u* *pDst, int nDstStep, *NppiRect* oDstROI, double nAngle, double nShiftX, double nShiftY, int eInterpolation, *NppStreamContext* nppStreamCtx)

8-bit unsigned image rotate.

For common parameter descriptions, see *Common parameters for nppiRotate functions:*.

NppStatus **nppiRotate_8u_C3R_Ctx**(const *Npp8u* *pSrc, *NppiSize* oSrcSize, int nSrcStep, *NppiRect* oSrcROI, *Npp8u* *pDst, int nDstStep, *NppiRect* oDstROI, double nAngle, double nShiftX, double nShiftY, int eInterpolation, *NppStreamContext* nppStreamCtx)

3 channel 8-bit unsigned image rotate.

For common parameter descriptions, see *Common parameters for nppiRotate functions:*.

NppStatus **nppiRotate_8u_C4R_Ctx**(const *Npp8u* *pSrc, *NppiSize* oSrcSize, int nSrcStep, *NppiRect* oSrcROI, *Npp8u* *pDst, int nDstStep, *NppiRect* oDstROI, double nAngle, double nShiftX, double nShiftY, int eInterpolation, *NppStreamContext* nppStreamCtx)

4 channel 8-bit unsigned image rotate.

For common parameter descriptions, see *Common parameters for nppiRotate functions:*.

NppStatus **nppiRotate_8u_AC4R_Ctx**(const *Npp8u* *pSrc, *NppiSize* oSrcSize, int nSrcStep, *NppiRect* oSrcROI, *Npp8u* *pDst, int nDstStep, *NppiRect* oDstROI, double nAngle, double nShiftX, double nShiftY, int eInterpolation, *NppStreamContext* nppStreamCtx)

4 channel 8-bit unsigned image rotate ignoring alpha channel.

For common parameter descriptions, see *Common parameters for nppiRotate functions:*.

NppStatus **nppiRotate_16u_C1R_Ctx**(const *Npp16u* *pSrc, *NppiSize* oSrcSize, int nSrcStep, *NppiRect* oSrcROI, *Npp16u* *pDst, int nDstStep, *NppiRect* oDstROI, double nAngle, double nShiftX, double nShiftY, int eInterpolation, *NppStreamContext* nppStreamCtx)

16-bit unsigned image rotate.

For common parameter descriptions, see *Common parameters for nppiRotate functions:*.

NppStatus **nppiRotate_16u_C3R_Ctx**(const *Npp16u* *pSrc, *NppiSize* oSrcSize, int nSrcStep, *NppiRect* oSrcROI, *Npp16u* *pDst, int nDstStep, *NppiRect* oDstROI, double nAngle, double nShiftX, double nShiftY, int eInterpolation, *NppStreamContext* nppStreamCtx)

3 channel 16-bit unsigned image rotate.

For common parameter descriptions, see *Common parameters for nppiRotate functions:*.

NppStatus **nppiRotate_16u_C4R_Ctx**(const *Npp16u* *pSrc, *NppiSize* oSrcSize, int nSrcStep, *NppiRect* oSrcROI, *Npp16u* *pDst, int nDstStep, *NppiRect* oDstROI, double nAngle, double nShiftX, double nShiftY, int eInterpolation, *NppStreamContext* nppStreamCtx)

4 channel 16-bit unsigned image rotate.

For common parameter descriptions, see *Common parameters for nppiRotate functions:*.

NppStatus **nppiRotate_16u_AC4R_Ctx**(const *Npp16u* *pSrc, *NppiSize* oSrcSize, int nSrcStep, *NppiRect* oSrcROI, *Npp16u* *pDst, int nDstStep, *NppiRect* oDstROI, double nAngle, double nShiftX, double nShiftY, int eInterpolation, *NppStreamContext* nppStreamCtx)

4 channel 16-bit unsigned image rotate ignoring alpha channel.

For common parameter descriptions, see *Common parameters for nppiRotate functions:*.

NppStatus **nppiRotate_32f_C1R_Ctx**(const *Npp32f* *pSrc, *NppiSize* oSrcSize, int nSrcStep, *NppiRect* oSrcROI, *Npp32f* *pDst, int nDstStep, *NppiRect* oDstROI, double nAngle, double nShiftX, double nShiftY, int eInterpolation, *NppStreamContext* nppStreamCtx)

32-bit float image rotate.

For common parameter descriptions, see *Common parameters for nppiRotate functions:*.

NppStatus **nppiRotate_32f_C3R_Ctx**(const *Npp32f* *pSrc, *NppiSize* oSrcSize, int nSrcStep, *NppiRect* oSrcROI, *Npp32f* *pDst, int nDstStep, *NppiRect* oDstROI, double nAngle, double nShiftX, double nShiftY, int eInterpolation, *NppStreamContext* nppStreamCtx)

3 channel 32-bit float image rotate.

For common parameter descriptions, see *Common parameters for nppiRotate functions:*.

NppStatus **nppiRotate_32f_C4R_Ctx**(const *Npp32f* *pSrc, *NppiSize* oSrcSize, int nSrcStep, *NppiRect* oSrcROI, *Npp32f* *pDst, int nDstStep, *NppiRect* oDstROI, double nAngle, double nShiftX, double nShiftY, int eInterpolation, *NppStreamContext* nppStreamCtx)

4 channel 32-bit float image rotate.

For common parameter descriptions, see *Common parameters for nppiRotate functions:*.

NppStatus **nppiRotate_32f_AC4R_Ctx**(const *Npp32f* *pSrc, *NppiSize* oSrcSize, int nSrcStep, *NppiRect* oSrcROI, *Npp32f* *pDst, int nDstStep, *NppiRect* oDstROI, double nAngle, double nShiftX, double nShiftY, int eInterpolation, *NppStreamContext* nppStreamCtx)

4 channel 32-bit float image rotate ignoring alpha channel.

For common parameter descriptions, see *Common parameters for nppiRotate functions:*.

1.11.16. Rotate Utility Functions

The set of rotate utility functions.

Functions

NppStatus **nppiGetRotateQuad**(*NppiRect* oSrcROI, double aQuad[4][2], double nAngle, double nShiftX, double nShiftY)

Compute shape of rotated image.

Parameters

- **oSrcROI** – Region-of-interest of the source image.
- **aQuad** – Host memory array of 2D points. These points are the locations of the corners of the rotated ROI.
- **nAngle** – The rotation nAngle.
- **nShiftX** – Post-rotation shift in x-direction
- **nShiftY** – Post-rotation shift in y-direction

Returns

ROI Related Error Codes.

NppStatus **nppiGetRotateBound**(*NppiRect* oSrcROI, double aBoundingBox[2][2], double nAngle, double nShiftX, double nShiftY)

Compute bounding-box of rotated image.

Parameters

- **oSrcROI** – Region-of-interest of the source image.
- **aBoundingBox** – Two 2D points representing the bounding-box of the rotated image. All four points from nppiGetRotateQuad are contained inside the axis-aligned rectangle spanned by the the two points of this bounding box.
- **nAngle** – The rotation angle.
- **nShiftX** – Post-rotation shift in x-direction.
- **nShiftY** – Post-rotation shift in y-direction.

Returns

ROI Related Error Codes.

1.11.17. Mirror

Mirrors images horizontally, vertically or diagonally.

1.11.18. Mirror Error Codes

- NPP_MIRROR_FLIP_ERROR if flip has an illegal value.
- NPP_SIZE_ERROR if in_place ROI width or height are not even numbers.

1.11.18.1 Common parameters for nppiMirror functions:

param pSrcDst
In-Place Image Pointer for inplace functions.

param nSrcDstStep
In-Place-Image Line Step for inplace functions.

param pSrc
Source-Image Pointer for non-inplace functions.

param nSrcStep
Source-Image Line Step for non-inplace functions.

param pDst
Destination-Image Pointer for non-inplace functions.

param nDstStep
Destination-Image Line Step for non-inplace functions.

param oROI
Region-Of-Interest (ROI) (in_place ROI widths and heights must be even numbers).

param flip
Specifies the axis about which the image is to be mirrored.

param nppStreamCtx
Application Managed Stream Context.

return
Image Data Related Error Codes, *ROI Related Error Codes*, *Mirror Error Codes*

Mirror

Mirrors images.

NppStatus **nppiMirror_8u_C1R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *Npp8u* *pDst, int nDstStep, *NppiSize* oROI, *NppiAxis* flip, *NppStreamContext* nppStreamCtx)

1 channel 8-bit unsigned image mirror.

For common parameter descriptions, see *Common parameters for nppiMirror functions:*.

NppStatus **nppiMirror_8u_C1IR_Ctx**(*Npp8u* *pSrcDst, int nSrcDstStep, *NppiSize* oROI, *NppiAxis* flip, *NppStreamContext* nppStreamCtx)

1 channel 8-bit unsigned in place image mirror.

For common parameter descriptions, see *Common parameters for nppiMirror functions:*.

NppStatus **nppiMirror_8u_C3R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *Npp8u* *pDst, int nDstStep, *NppiSize* oROI, *NppiAxis* flip, *NppStreamContext* nppStreamCtx)

3 channel 8-bit unsigned image mirror.

For common parameter descriptions, see *Common parameters for nppiMirror functions:*.

NppStatus **nppiMirror_8u_C3IR_Ctx**(*Npp8u* *pSrcDst, int nSrcDstStep, *NppiSize* oROI, *NppiAxis* flip, *NppStreamContext* nppStreamCtx)

3 channel 8-bit unsigned in place image mirror.

For common parameter descriptions, see *Common parameters for nppiMirror functions:*.

NppStatus **nppiMirror_8u_C4R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *Npp8u* *pDst, int nDstStep, *NppiSize* oROI, *NppiAxis* flip, *NppStreamContext* nppStreamCtx)

4 channel 8-bit unsigned image mirror.

For common parameter descriptions, see *Common parameters for nppiMirror functions:*.

NppStatus **nppiMirror_8u_C4IR_Ctx**(*Npp8u* *pSrcDst, int nSrcDstStep, *NppiSize* oROI, *NppiAxis* flip, *NppStreamContext* nppStreamCtx)

4 channel 8-bit unsigned in place image mirror.

For common parameter descriptions, see *Common parameters for nppiMirror functions:*.

NppStatus **nppiMirror_8u_AC4R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *Npp8u* *pDst, int nDstStep, *NppiSize* oROI, *NppiAxis* flip, *NppStreamContext* nppStreamCtx)

4 channel 8-bit unsigned image mirror not affecting alpha.

For common parameter descriptions, see *Common parameters for nppiMirror functions:*.

NppStatus **nppiMirror_8u_AC4IR_Ctx**(*Npp8u* *pSrcDst, int nSrcDstStep, *NppiSize* oROI, *NppiAxis* flip, *NppStreamContext* nppStreamCtx)

4 channel 8-bit unsigned in place image mirror not affecting alpha.

For common parameter descriptions, see *Common parameters for nppiMirror functions:*.

NppStatus **nppiMirror_16u_C1R_Ctx**(const *Npp16u* *pSrc, int nSrcStep, *Npp16u* *pDst, int nDstStep, *NppiSize* oROI, *NppiAxis* flip, *NppStreamContext* nppStreamCtx)

1 channel 16-bit unsigned image mirror.

For common parameter descriptions, see *Common parameters for nppiMirror functions:*.

NppStatus **nppiMirror_16u_C1IR_Ctx**(*Npp16u* *pSrcDst, int nSrcDstStep, *NppiSize* oROI, *NppiAxis* flip, *NppStreamContext* nppStreamCtx)

1 channel 16-bit unsigned in place image mirror.

For common parameter descriptions, see *Common parameters for nppiMirror functions:*.

NppStatus **nppiMirror_16u_C3R_Ctx**(const *Npp16u* *pSrc, int nSrcStep, *Npp16u* *pDst, int nDstStep, *NppiSize* oROI, *NppiAxis* flip, *NppStreamContext* nppStreamCtx)

3 channel 16-bit unsigned image mirror.

For common parameter descriptions, see *Common parameters for nppiMirror functions:*.

NppStatus **nppiMirror_16u_C3IR_Ctx**(*Npp16u* *pSrcDst, int nSrcDstStep, *NppiSize* oROI, *NppiAxis* flip, *NppStreamContext* nppStreamCtx)

3 channel 16-bit unsigned in place image mirror.

For common parameter descriptions, see *Common parameters for nppiMirror functions:*.

NppStatus **nppiMirror_16u_C4R_Ctx**(const *Npp16u* *pSrc, int nSrcStep, *Npp16u* *pDst, int nDstStep, *NppiSize* oROI, *NppiAxis* flip, *NppStreamContext* nppStreamCtx)

4 channel 16-bit unsigned image mirror.

For common parameter descriptions, see *Common parameters for nppiMirror functions:*.

NppStatus **nppiMirror_16u_C4IR_Ctx**(*Npp16u* *pSrcDst, int nSrcDstStep, *NppiSize* oROI, *NppiAxis* flip, *NppStreamContext* nppStreamCtx)

4 channel 16-bit unsigned in place image mirror.

For common parameter descriptions, see *Common parameters for nppiMirror functions:*.

NppStatus **nppiMirror_16u_AC4R_Ctx**(const *Npp16u* *pSrc, int nSrcStep, *Npp16u* *pDst, int nDstStep, *NppiSize* oROI, *NppiAxis* flip, *NppStreamContext* nppStreamCtx)

4 channel 16-bit unsigned image mirror not affecting alpha.

For common parameter descriptions, see *Common parameters for nppiMirror functions:*.

NppStatus **nppiMirror_16u_AC4IR_Ctx**(*Npp16u* *pSrcDst, int nSrcDstStep, *NppiSize* oROI, *NppiAxis* flip, *NppStreamContext* nppStreamCtx)

4 channel 16-bit unsigned in place image mirror not affecting alpha.

For common parameter descriptions, see *Common parameters for nppiMirror functions:*.

NppStatus **nppiMirror_16s_C1R_Ctx**(const *Npp16s* *pSrc, int nSrcStep, *Npp16s* *pDst, int nDstStep, *NppiSize* oROI, *NppiAxis* flip, *NppStreamContext* nppStreamCtx)

1 channel 16-bit signed image mirror.

For common parameter descriptions, see *Common parameters for nppiMirror functions:*.

NppStatus **nppiMirror_16s_C1IR_Ctx**(*Npp16s* *pSrcDst, int nSrcDstStep, *NppiSize* oROI, *NppiAxis* flip, *NppStreamContext* nppStreamCtx)

1 channel 16-bit signed in place image mirror.

For common parameter descriptions, see *Common parameters for nppiMirror functions:*.

NppStatus **nppiMirror_16s_C3R_Ctx**(const *Npp16s* *pSrc, int nSrcStep, *Npp16s* *pDst, int nDstStep, *NppiSize* oROI, *NppiAxis* flip, *NppStreamContext* nppStreamCtx)

3 channel 16-bit signed image mirror.

For common parameter descriptions, see *Common parameters for nppiMirror functions:*.

NppStatus **nppiMirror_16s_C3IR_Ctx**(*Npp16s* *pSrcDst, int nSrcDstStep, *NppiSize* oROI, *NppiAxis* flip, *NppStreamContext* nppStreamCtx)

3 channel 16-bit signed in place image mirror.

For common parameter descriptions, see *Common parameters for nppiMirror functions:*.

NppStatus **nppiMirror_16s_C4R_Ctx**(const *Npp16s* *pSrc, int nSrcStep, *Npp16s* *pDst, int nDstStep, *NppiSize* oROI, *NppiAxis* flip, *NppStreamContext* nppStreamCtx)

4 channel 16-bit signed image mirror.

For common parameter descriptions, see *Common parameters for nppiMirror functions:*.

NppStatus **nppiMirror_16s_C4IR_Ctx**(*Npp16s* *pSrcDst, int nSrcDstStep, *NppiSize* oROI, *NppiAxis* flip, *NppStreamContext* nppStreamCtx)

4 channel 16-bit signed in place image mirror.

For common parameter descriptions, see *Common parameters for nppiMirror functions:*.

NppStatus **nppiMirror_16s_AC4R_Ctx**(const *Npp16s* *pSrc, int nSrcStep, *Npp16s* *pDst, int nDstStep, *NppiSize* oROI, *NppiAxis* flip, *NppStreamContext* nppStreamCtx)

4 channel 16-bit signed image mirror not affecting alpha.

For common parameter descriptions, see *Common parameters for nppiMirror functions:*.

NppStatus **nppiMirror_16s_AC4IR_Ctx**(*Npp16s* *pSrcDst, int nSrcDstStep, *NppiSize* oROI, *NppiAxis* flip, *NppStreamContext* nppStreamCtx)

4 channel 16-bit signed in place image mirror not affecting alpha.

For common parameter descriptions, see *Common parameters for nppiMirror functions:*.

NppStatus **nppiMirror_32s_C1R_Ctx**(const *Npp32s* *pSrc, int nSrcStep, *Npp32s* *pDst, int nDstStep, *NppiSize* oROI, *NppiAxis* flip, *NppStreamContext* nppStreamCtx)

1 channel 32-bit image mirror.

For common parameter descriptions, see *Common parameters for nppiMirror functions:*.

NppStatus **nppiMirror_32s_C1IR_Ctx**(*Npp32s* *pSrcDst, int nSrcDstStep, *NppiSize* oROI, *NppiAxis* flip, *NppStreamContext* nppStreamCtx)

1 channel 32-bit signed in place image mirror.

For common parameter descriptions, see *Common parameters for nppiMirror functions:*.

NppStatus **nppiMirror_32s_C3R_Ctx**(const *Npp32s* *pSrc, int nSrcStep, *Npp32s* *pDst, int nDstStep, *NppiSize* oROI, *NppiAxis* flip, *NppStreamContext* nppStreamCtx)

3 channel 32-bit image mirror.

For common parameter descriptions, see *Common parameters for nppiMirror functions:*.

NppStatus **nppiMirror_32s_C3IR_Ctx**(*Npp32s* *pSrcDst, int nSrcDstStep, *NppiSize* oROI, *NppiAxis* flip, *NppStreamContext* nppStreamCtx)

3 channel 32-bit signed in place image mirror.

For common parameter descriptions, see *Common parameters for nppiMirror functions:*.

NppStatus **nppiMirror_32s_C4R_Ctx**(const *Npp32s* *pSrc, int nSrcStep, *Npp32s* *pDst, int nDstStep, *NppiSize* oROI, *NppiAxis* flip, *NppStreamContext* nppStreamCtx)

4 channel 32-bit image mirror.

For common parameter descriptions, see *Common parameters for nppiMirror functions:*.

NppStatus **nppiMirror_32s_C4IR_Ctx**(*Npp32s* *pSrcDst, int nSrcDstStep, *NppiSize* oROI, *NppiAxis* flip, *NppStreamContext* nppStreamCtx)

4 channel 32-bit signed in place image mirror.

For common parameter descriptions, see *Common parameters for nppiMirror functions:*.

NppStatus **nppiMirror_32s_AC4R_Ctx**(const *Npp32s* *pSrc, int nSrcStep, *Npp32s* *pDst, int nDstStep, *NppiSize* oROI, *NppiAxis* flip, *NppStreamContext* nppStreamCtx)

4 channel 32-bit image mirror not affecting alpha.

For common parameter descriptions, see *Common parameters for nppiMirror functions:*.

NppStatus **nppiMirror_32s_AC4IR_Ctx**(*Npp32s* *pSrcDst, int nSrcDstStep, *NppiSize* oROI, *NppiAxis* flip, *NppStreamContext* nppStreamCtx)

4 channel 32-bit signed in place image mirror not affecting alpha.

For common parameter descriptions, see *Common parameters for nppiMirror functions:*.

NppStatus **nppiMirror_32f_C1R_Ctx**(const *Npp32f* *pSrc, int nSrcStep, *Npp32f* *pDst, int nDstStep, *NppiSize* oROI, *NppiAxis* flip, *NppStreamContext* nppStreamCtx)

1 channel 32-bit float image mirror.

For common parameter descriptions, see *Common parameters for nppiMirror functions:*.

NppStatus **nppiMirror_32f_C1IR_Ctx**(*Npp32f* *pSrcDst, int nSrcDstStep, *NppiSize* oROI, *NppiAxis* flip, *NppStreamContext* nppStreamCtx)

1 channel 32-bit float in place image mirror.

For common parameter descriptions, see *Common parameters for nppiMirror functions:*.

NppStatus **nppiMirror_32f_C3R_Ctx**(const *Npp32f* *pSrc, int nSrcStep, *Npp32f* *pDst, int nDstStep, *NppiSize* oROI, *NppiAxis* flip, *NppStreamContext* nppStreamCtx)

3 channel 32-bit float image mirror.

For common parameter descriptions, see *Common parameters for nppiMirror functions:*.

NppStatus **nppiMirror_32f_C3IR_Ctx**(*Npp32f* *pSrcDst, int nSrcDstStep, *NppiSize* oROI, *NppiAxis* flip, *NppStreamContext* nppStreamCtx)

3 channel 32-bit float in place image mirror.

For common parameter descriptions, see *Common parameters for nppiMirror functions:*.

NppStatus **nppiMirror_32f_C4R_Ctx**(const *Npp32f* *pSrc, int nSrcStep, *Npp32f* *pDst, int nDstStep, *NppiSize* oROI, *NppiAxis* flip, *NppStreamContext* nppStreamCtx)

4 channel 32-bit float image mirror.

For common parameter descriptions, see *Common parameters for nppiMirror functions:*.

NppStatus **nppiMirror_32f_C4IR_Ctx**(*Npp32f* *pSrcDst, int nSrcDstStep, *NppiSize* oROI, *NppiAxis* flip, *NppStreamContext* nppStreamCtx)

4 channel 32-bit float in place image mirror.

For common parameter descriptions, see *Common parameters for nppiMirror functions:*.

NppStatus **nppiMirror_32f_AC4R_Ctx**(const *Npp32f* *pSrc, int nSrcStep, *Npp32f* *pDst, int nDstStep, *NppiSize* oROI, *NppiAxis* flip, *NppStreamContext* nppStreamCtx)

4 channel 32-bit float image mirror not affecting alpha.

For common parameter descriptions, see *Common parameters for nppiMirror functions:*.

NppStatus **nppiMirror_32f_AC4IR_Ctx**(*Npp32f* *pSrcDst, int nSrcDstStep, *NppiSize* oROI, *NppiAxis* flip, *NppStreamContext* nppStreamCtx)

4 channel 32-bit float in place image mirror not affecting alpha.

For common parameter descriptions, see *Common parameters for nppiMirror functions:*.

1.11.19. Affine Transforms

1.11.19.1 Affine Transforms

The set of affine transform functions available in the library.

1.11.19.1.1 Affine Transform Error Codes

- NPP_RECTANGLE_ERROR Indicates an error condition if width or height of the intersection of the oSrcROI and source image is less than or equal to 1
- NPP_WRONG_INTERSECTION_ROI_ERROR Indicates an error condition if oSrcROI has no intersection with the source image
- NPP_INTERPOLATION_ERROR Indicates an error condition if interpolation has an illegal value
- NPP_COEFFICIENT_ERROR Indicates an error condition if coefficient values are invalid
- NPP_WRONG_INTERSECTION_QUAD_WARNING Indicates a warning that no operation is performed if the transformed source ROI has no intersection with the destination ROI

1.11.19.2 Affine Transform Utility Functions

The set of affine transform utility functions.

Functions

NppStatus **nppiGetAffineTransform**(*NppiRect* oSrcROI, const double aQuad[4][2], double aCoeffs[2][3])

Computes affine transform coefficients based on source ROI and destination quadrilateral.

The function computes the coefficients of an affine transformation that maps the given source ROI (axis aligned rectangle with integer coordinates) to a quadrilateral in the destination image.

An affine transform in 2D is fully determined by the mapping of just three vertices. This function's API allows for passing a complete quadrilateral effectively making the problem overdetermined. What this means in practice is, that for certain quadrilaterals it is not possible to find an affine transform that would map all four corners of the source ROI to the four vertices of that quadrilateral.

The function circumvents this problem by only looking at the first three vertices of the destination image quadrilateral to determine the affine transformation's coefficients. If the destination quadrilateral is indeed one that cannot be mapped using an affine transformation the functions informs the user of this situation by returning a NPP_AFFINE_QUAD_INCORRECT_WARNING.

Parameters

- **oSrcROI** – The source ROI. This rectangle needs to be at least one pixel wide and high. If either width or height are less than one an NPP_RECTANGLE_ERROR is returned.
- **aQuad** – Host memory array containing the destination quadrilateral.
- **aCoeffs** – Host memory array containing the resulting affine transform coefficients.

Returns

Error codes:

- NPP_SIZE_ERROR Indicates an error condition if any image dimension has zero or negative value
- NPP_RECTANGLE_ERROR Indicates an error condition if width or height of the intersection of the oSrcROI and source image is less than or equal to 1
- NPP_COEFFICIENT_ERROR Indicates an error condition if coefficient values are invalid
- NPP_AFFINE_QUAD_INCORRECT_WARNING Indicates a warning when quad does not conform to the transform properties. Fourth vertex is ignored, internally computed coordinates are used instead

NppStatus **nppiGetAffineQuad**(*NppiRect* oSrcROI, double aQuad[4][2], const double aCoeffs[2][3])

Compute shape of transformed image.

This method computes the quadrilateral in the destination image that the source ROI is transformed into by the affine transformation expressed by the coefficients array (aCoeffs).

Parameters

- **oSrcROI** – The source ROI.
- **aQuad** – Host memory array that receives the resulting destination quadrangle.
- **aCoeffs** – Host memory array containing the affine transform coefficients.

Returns

Error codes:

- NPP_SIZE_ERROR Indicates an error condition if any image dimension has zero or negative value
- NPP_RECTANGLE_ERROR Indicates an error condition if width or height of the intersection of the oSrcROI and source image is less than or equal to 1
- NPP_COEFFICIENT_ERROR Indicates an error condition if coefficient values are invalid

NppStatus **nppiGetAffineBound**(*NppiRect* oSrcROI, double aBound[2][2], const double aCoeffs[2][3])

Compute bounding-box of transformed image.

The method effectively computes the bounding box (axis aligned rectangle) of the transformed source ROI (see *nppiGetAffineQuad()*).

Parameters

- **oSrcROI** – The source ROI.
- **aBound** – The resulting bounding box.
- **aCoeffs** – Host memory array containing the affine transform coefficients.

Returns

Error codes:

- NPP_SIZE_ERROR Indicates an error condition if any image dimension has zero or negative value
- NPP_RECTANGLE_ERROR Indicates an error condition if width or height of the intersection of the oSrcROI and source image is less than or equal to 1
- NPP_COEFFICIENT_ERROR Indicates an error condition if coefficient values are invalid

1.11.19.3 Affine Transform

Transforms (warps) an image based on an affine transform.

The affine transform is given as a 2×3 matrix (C). A pixel location (x, y) in the source image is mapped to (x', y') in the destination image. The destination coordinates are:

$$x' = c_{00}\, x + c_{01}\, y + c_{02}$$
$$y' = c_{10}\, x + c_{11}\, y + c_{12}$$

The transform matrix is

$$C = \begin{bmatrix} c_{00} & c_{01} & c_{02} \\ c_{10} & c_{11} & c_{12} \end{bmatrix}$$

Affine transforms decompose into a linear part and a shift. The 2×2 matrix

$$L = \begin{bmatrix} c_{00} & c_{01} \\ c_{10} & c_{11} \end{bmatrix}$$

represents the linear transform, and the vector

$$v = \begin{bmatrix} c_{02} \\ c_{12} \end{bmatrix}$$

is the post-transform translation; i.e., after applying L, translate by v.

1.11.19.3.1 Common parameters for nppiWarpAffine packed pixel functions:

1.11.19.3.2 Common parameters for nppiWarpAffine planar pixel functions:

param pSrc
Source-Image Pointer.

param oSrcSize
Size of source image in pixels.

param nSrcStep
Source-Image Line Step.

param oSrcROI
Source ROI.

param pDst
Destination-Image Pointer.

param nDstStep
Destination-Image Line Step.

param oDstROI
Destination ROI.

param aCoeffs
Host memory array containing the affine transform coefficients.

param eInterpolation
Interpolation mode: can be NPPI_INTER_NN, NPPI_INTER_LINEAR or NPPI_INTER_CUBIC.

param nppStreamCtx
Application Managed Stream Context.

return
Image Data Related Error Codes, *ROI Related Error Codes*, *Affine Transform Error Codes*

param pSrc
Source-Planar-Image Pointer Array (host memory array containing device memory image plane pointers).

param oSrcSize
Size of source image in pixels.

param nSrcStep
Source-Image Line Step.

param oSrcROI
Source ROI.

param pDst
Destination-Planar-Image Pointer Array. (host memory array containing device memory image plane pointers)

param nDstStep
Destination-Image Line Step.

param oDstROI
Destination ROI.

param aCoeffs
Host memory array containing the affine transform coefficients.

param eInterpolation
Interpolation mode: can be NPPI_INTER_NN, NPPI_INTER_LINEAR or NPPI_INTER_CUBIC.

param nppStreamCtx
Application Managed Stream Context.

return
Image Data Related Error Codes, *ROI Related Error Codes*, *Affine Transform Error Codes*

Functions

NppStatus **nppiWarpAffine_8u_C1R_Ctx**(const *Npp8u* *pSrc, *NppiSize* oSrcSize, int nSrcStep, *NppiRect* oSrcROI, *Npp8u* *pDst, int nDstStep, *NppiRect* oDstROI, const double aCoeffs[2][3], int eInterpolation, *NppStreamContext* nppStreamCtx)

Single-channel 8-bit unsigned affine warp.

For common parameter descriptions, see *Common parameters for nppiWarpAffine packed pixel functions:*.

NppStatus **nppiWarpAffine_8u_C3R_Ctx**(const *Npp8u* *pSrc, *NppiSize* oSrcSize, int nSrcStep, *NppiRect* oSrcROI, *Npp8u* *pDst, int nDstStep, *NppiRect* oDstROI, const double aCoeffs[2][3], int eInterpolation, *NppStreamContext* nppStreamCtx)

Three-channel 8-bit unsigned affine warp.

For common parameter descriptions, see *Common parameters for nppiWarpAffine packed pixel functions:*.

NppStatus **nppiWarpAffine_8u_C4R_Ctx**(const *Npp8u* *pSrc, *NppiSize* oSrcSize, int nSrcStep, *NppiRect* oSrcROI, *Npp8u* *pDst, int nDstStep, *NppiRect* oDstROI, const double aCoeffs[2][3], int eInterpolation, *NppStreamContext* nppStreamCtx)

Four-channel 8-bit unsigned affine warp.

For common parameter descriptions, see *Common parameters for nppiWarpAffine packed pixel functions:*.

NppStatus **nppiWarpAffine_8u_AC4R_Ctx**(const *Npp8u* *pSrc, *NppiSize* oSrcSize, int nSrcStep, *NppiRect* oSrcROI, *Npp8u* *pDst, int nDstStep, *NppiRect* oDstROI, const double aCoeffs[2][3], int eInterpolation, *NppStreamContext* nppStreamCtx)

Four-channel 8-bit unsigned affine warp, ignoring alpha channel.

For common parameter descriptions, see *Common parameters for nppiWarpAffine packed pixel functions:*.

NppStatus **nppiWarpAffine_8u_P3R_Ctx**(const *Npp8u* *pSrc[3], *NppiSize* oSrcSize, int nSrcStep, *NppiRect* oSrcROI, *Npp8u* *pDst[3], int nDstStep, *NppiRect* oDstROI, const double aCoeffs[2][3], int eInterpolation, *NppStreamContext* nppStreamCtx)

Three-channel planar 8-bit unsigned affine warp.

For common parameter descriptions, see *Common parameters for nppiWarpAffine planar pixel functions:*.

NppStatus **nppiWarpAffine_8u_P4R_Ctx**(const *Npp8u* *pSrc[4], *NppiSize* oSrcSize, int nSrcStep, *NppiRect* oSrcROI, *Npp8u* *pDst[4], int nDstStep, *NppiRect* oDstROI, const double aCoeffs[2][3], int eInterpolation, *NppStreamContext* nppStreamCtx)

Four-channel planar 8-bit unsigned affine warp.

For common parameter descriptions, see *Common parameters for nppiWarpAffine planar pixel functions:*.

NppStatus **nppiWarpAffine_16u_C1R_Ctx**(const *Npp16u* *pSrc, *NppiSize* oSrcSize, int nSrcStep, *NppiRect* oSrcROI, *Npp16u* *pDst, int nDstStep, *NppiRect* oDstROI, const double aCoeffs[2][3], int eInterpolation, *NppStreamContext* nppStreamCtx)

Single-channel 16-bit unsigned affine warp.

For common parameter descriptions, see *Common parameters for nppiWarpAffine packed pixel functions:*.

NppStatus **nppiWarpAffine_16u_C3R_Ctx**(const *Npp16u* *pSrc, *NppiSize* oSrcSize, int nSrcStep, *NppiRect* oSrcROI, *Npp16u* *pDst, int nDstStep, *NppiRect* oDstROI, const double aCoeffs[2][3], int eInterpolation, *NppStreamContext* nppStreamCtx)

Three-channel 16-bit unsigned affine warp.

For common parameter descriptions, see *Common parameters for nppiWarpAffine packed pixel functions:*.

NppStatus **nppiWarpAffine_16u_C4R_Ctx**(const *Npp16u* *pSrc, *NppiSize* oSrcSize, int nSrcStep, *NppiRect* oSrcROI, *Npp16u* *pDst, int nDstStep, *NppiRect* oDstROI, const double aCoeffs[2][3], int eInterpolation, *NppStreamContext* nppStreamCtx)

Four-channel 16-bit unsigned affine warp.

For common parameter descriptions, see *Common parameters for nppiWarpAffine packed pixel functions:*.

NppStatus **nppiWarpAffine_16u_AC4R_Ctx**(const *Npp16u* *pSrc, *NppiSize* oSrcSize, int nSrcStep, *NppiRect* oSrcROI, *Npp16u* *pDst, int nDstStep, *NppiRect* oDstROI, const double aCoeffs[2][3], int eInterpolation, *NppStreamContext* nppStreamCtx)

Four-channel 16-bit unsigned affine warp, ignoring alpha channel.

For common parameter descriptions, see *Common parameters for nppiWarpAffine packed pixel functions:*.

NppStatus **nppiWarpAffine_16u_P3R_Ctx**(const *Npp16u* *pSrc[3], *NppiSize* oSrcSize, int nSrcStep, *NppiRect* oSrcROI, *Npp16u* *pDst[3], int nDstStep, *NppiRect* oDstROI, const double aCoeffs[2][3], int eInterpolation, *NppStreamContext* nppStreamCtx)

Three-channel planar 16-bit unsigned affine warp.

For common parameter descriptions, see *Common parameters for nppiWarpAffine planar pixel functions:*.

NppStatus **nppiWarpAffine_16u_P4R_Ctx**(const *Npp16u* *pSrc[4], *NppiSize* oSrcSize, int nSrcStep, *NppiRect* oSrcROI, *Npp16u* *pDst[4], int nDstStep, *NppiRect* oDstROI, const double aCoeffs[2][3], int eInterpolation, *NppStreamContext* nppStreamCtx)

Four-channel planar 16-bit unsigned affine warp.

For common parameter descriptions, see *Common parameters for nppiWarpAffine planar pixel functions:*.

NppStatus **nppiWarpAffine_32s_C1R_Ctx**(const *Npp32s* *pSrc, *NppiSize* oSrcSize, int nSrcStep, *NppiRect* oSrcROI, *Npp32s* *pDst, int nDstStep, *NppiRect* oDstROI, const double aCoeffs[2][3], int eInterpolation, *NppStreamContext* nppStreamCtx)

Single-channel 32-bit signed affine warp.

For common parameter descriptions, see *Common parameters for nppiWarpAffine packed pixel functions:*.

NppStatus **nppiWarpAffine_32s_C3R_Ctx**(const *Npp32s* *pSrc, *NppiSize* oSrcSize, int nSrcStep, *NppiRect* oSrcROI, *Npp32s* *pDst, int nDstStep, *NppiRect* oDstROI, const double aCoeffs[2][3], int eInterpolation, *NppStreamContext* nppStreamCtx)

Three-channel 32-bit signed affine warp.

For common parameter descriptions, see *Common parameters for nppiWarpAffine packed pixel functions:*.

NppStatus **nppiWarpAffine_32s_C4R_Ctx**(const *Npp32s* *pSrc, *NppiSize* oSrcSize, int nSrcStep, *NppiRect* oSrcROI, *Npp32s* *pDst, int nDstStep, *NppiRect* oDstROI, const double aCoeffs[2][3], int eInterpolation, *NppStreamContext* nppStreamCtx)

Four-channel 32-bit signed affine warp.

For common parameter descriptions, see *Common parameters for nppiWarpAffine packed pixel functions:*.

NppStatus **nppiWarpAffine_32s_AC4R_Ctx**(const *Npp32s* *pSrc, *NppiSize* oSrcSize, int nSrcStep, *NppiRect* oSrcROI, *Npp32s* *pDst, int nDstStep, *NppiRect* oDstROI, const double aCoeffs[2][3], int eInterpolation, *NppStreamContext* nppStreamCtx)

Four-channel 32-bit signed affine warp, ignoring alpha channel.

For common parameter descriptions, see *Common parameters for nppiWarpAffine packed pixel functions:*.

NppStatus **nppiWarpAffine_32s_P3R_Ctx**(const *Npp32s* *pSrc[3], *NppiSize* oSrcSize, int nSrcStep, *NppiRect* oSrcROI, *Npp32s* *pDst[3], int nDstStep, *NppiRect* oDstROI, const double aCoeffs[2][3], int eInterpolation, *NppStreamContext* nppStreamCtx)

Three-channel planar 32-bit signed affine warp.

For common parameter descriptions, see *Common parameters for nppiWarpAffine planar pixel functions:*.

NppStatus **nppiWarpAffine_32s_P4R_Ctx**(const *Npp32s* *pSrc[4], *NppiSize* oSrcSize, int nSrcStep, *NppiRect* oSrcROI, *Npp32s* *pDst[4], int nDstStep, *NppiRect* oDstROI, const double aCoeffs[2][3], int eInterpolation, *NppStreamContext* nppStreamCtx)

Four-channel planar 32-bit signed affine warp.

For common parameter descriptions, see *Common parameters for nppiWarpAffine planar pixel functions:*.

NppStatus **nppiWarpAffine_16f_C1R_Ctx**(const *Npp16f* *pSrc, *NppiSize* oSrcSize, int nSrcStep, *NppiRect* oSrcROI, *Npp16f* *pDst, int nDstStep, *NppiRect* oDstROI, const double aCoeffs[2][3], int eInterpolation, *NppStreamContext* nppStreamCtx)

Single-channel 16-bit floating-point affine warp.

For common parameter descriptions, see *Common parameters for nppiWarpAffine packed pixel functions:*.

NppStatus **nppiWarpAffine_16f_C3R_Ctx**(const *Npp16f* *pSrc, *NppiSize* oSrcSize, int nSrcStep, *NppiRect* oSrcROI, *Npp16f* *pDst, int nDstStep, *NppiRect* oDstROI, const double aCoeffs[2][3], int eInterpolation, *NppStreamContext* nppStreamCtx)

Three-channel 16-bit floating-point affine warp.

For common parameter descriptions, see *Common parameters for nppiWarpAffine packed pixel functions:*.

NppStatus **nppiWarpAffine_16f_C4R_Ctx**(const *Npp16f* *pSrc, *NppiSize* oSrcSize, int nSrcStep, *NppiRect* oSrcROI, *Npp16f* *pDst, int nDstStep, *NppiRect* oDstROI, const double aCoeffs[2][3], int eInterpolation, *NppStreamContext* nppStreamCtx)

Four-channel 16-bit floating-point affine warp.

For common parameter descriptions, see *Common parameters for nppiWarpAffine packed pixel functions:*.

NppStatus **nppiWarpAffine_32f_C1R_Ctx**(const *Npp32f* *pSrc, *NppiSize* oSrcSize, int nSrcStep, *NppiRect* oSrcROI, *Npp32f* *pDst, int nDstStep, *NppiRect* oDstROI, const double aCoeffs[2][3], int eInterpolation, *NppStreamContext* nppStreamCtx)

Single-channel 32-bit floating-point affine warp.

For common parameter descriptions, see *Common parameters for nppiWarpAffine packed pixel functions:*.

NppStatus **nppiWarpAffine_32f_C3R_Ctx**(const *Npp32f* *pSrc, *NppiSize* oSrcSize, int nSrcStep, *NppiRect* oSrcROI, *Npp32f* *pDst, int nDstStep, *NppiRect* oDstROI, const double aCoeffs[2][3], int eInterpolation, *NppStreamContext* nppStreamCtx)

Three-channel 32-bit floating-point affine warp.

For common parameter descriptions, see *Common parameters for nppiWarpAffine packed pixel functions:*.

NppStatus **nppiWarpAffine_32f_C4R_Ctx**(const *Npp32f* *pSrc, *NppiSize* oSrcSize, int nSrcStep, *NppiRect* oSrcROI, *Npp32f* *pDst, int nDstStep, *NppiRect* oDstROI, const double aCoeffs[2][3], int eInterpolation, *NppStreamContext* nppStreamCtx)

Four-channel 32-bit floating-point affine warp.

For common parameter descriptions, see *Common parameters for nppiWarpAffine packed pixel functions:*.

NppStatus **nppiWarpAffine_32f_AC4R_Ctx**(const *Npp32f* *pSrc, *NppiSize* oSrcSize, int nSrcStep, *NppiRect* oSrcROI, *Npp32f* *pDst, int nDstStep, *NppiRect* oDstROI, const double aCoeffs[2][3], int eInterpolation, *NppStreamContext* nppStreamCtx)

Four-channel 32-bit floating-point affine warp, ignoring alpha channel.

For common parameter descriptions, see *Common parameters for nppiWarpAffine packed pixel functions:*.

NppStatus **nppiWarpAffine_32f_P3R_Ctx**(const *Npp32f* *pSrc[3], *NppiSize* oSrcSize, int nSrcStep, *NppiRect* oSrcROI, *Npp32f* *pDst[3], int nDstStep, *NppiRect* oDstROI, const double aCoeffs[2][3], int eInterpolation, *NppStreamContext* nppStreamCtx)

Three-channel planar 32-bit floating-point affine warp.

For common parameter descriptions, see *Common parameters for nppiWarpAffine planar pixel functions:*.

NppStatus **nppiWarpAffine_32f_P4R_Ctx**(const *Npp32f* *pSrc[4], *NppiSize* oSrcSize, int nSrcStep, *NppiRect* oSrcROI, *Npp32f* *pDst[4], int nDstStep, *NppiRect* oDstROI, const double aCoeffs[2][3], int eInterpolation, *NppStreamContext* nppStreamCtx)

Four-channel planar 32-bit floating-point affine warp.

For common parameter descriptions, see *Common parameters for nppiWarpAffine planar pixel functions:*.

NppStatus **nppiWarpAffine_64f_C1R_Ctx**(const *Npp64f* *pSrc, *NppiSize* oSrcSize, int nSrcStep, *NppiRect* oSrcROI, *Npp64f* *pDst, int nDstStep, *NppiRect* oDstROI, const double aCoeffs[2][3], int eInterpolation, *NppStreamContext* nppStreamCtx)

Single-channel 64-bit floating-point affine warp.

For common parameter descriptions, see *Common parameters for nppiWarpAffine packed pixel functions:*.

NppStatus **nppiWarpAffine_64f_C3R_Ctx**(const *Npp64f* *pSrc, *NppiSize* oSrcSize, int nSrcStep, *NppiRect* oSrcROI, *Npp64f* *pDst, int nDstStep, *NppiRect* oDstROI, const double aCoeffs[2][3], int eInterpolation, *NppStreamContext* nppStreamCtx)

Three-channel 64-bit floating-point affine warp.

For common parameter descriptions, see *Common parameters for nppiWarpAffine packed pixel functions:*.

NppStatus **nppiWarpAffine_64f_C4R_Ctx**(const *Npp64f* *pSrc, *NppiSize* oSrcSize, int nSrcStep, *NppiRect* oSrcROI, *Npp64f* *pDst, int nDstStep, *NppiRect* oDstROI, const double aCoeffs[2][3], int eInterpolation, *NppStreamContext* nppStreamCtx)

Four-channel 64-bit floating-point affine warp.

For common parameter descriptions, see *Common parameters for nppiWarpAffine packed pixel functions:*.

NppStatus **nppiWarpAffine_64f_AC4R_Ctx**(const *Npp64f* *pSrc, *NppiSize* oSrcSize, int nSrcStep, *NppiRect* oSrcROI, *Npp64f* *pDst, int nDstStep, *NppiRect* oDstROI, const double aCoeffs[2][3], int eInterpolation, *NppStreamContext* nppStreamCtx)

Four-channel 64-bit floating-point affine warp, ignoring alpha channel.

For common parameter descriptions, see *Common parameters for nppiWarpAffine packed pixel functions:*.

NppStatus **nppiWarpAffine_64f_P3R_Ctx**(const *Npp64f* *aSrc[3], *NppiSize* oSrcSize, int nSrcStep, *NppiRect* oSrcROI, *Npp64f* *aDst[3], int nDstStep, *NppiRect* oDstROI, const double aCoeffs[2][3], int eInterpolation, *NppStreamContext* nppStreamCtx)

Three-channel planar 64-bit floating-point affine warp.

For common parameter descriptions, see *Common parameters for nppiWarpAffine planar pixel functions:*.

NppStatus **nppiWarpAffine_64f_P4R_Ctx**(const *Npp64f* *aSrc[4], *NppiSize* oSrcSize, int nSrcStep, *NppiRect* oSrcROI, *Npp64f* *aDst[4], int nDstStep, *NppiRect* oDstROI, const double aCoeffs[2][3], int eInterpolation, *NppStreamContext* nppStreamCtx)

Four-channel planar 64-bit floating-point affine warp.

For common parameter descriptions, see *Common parameters for nppiWarpAffine planar pixel functions:*.

1.11.19.4 Affine Transform Batch

Details of the warp affine operation are described above in the WarpAffine section. WarpAffineBatch generally takes the same parameter list as WarpAffine except that there is a list of N instances of those parameters (N > 1) and that list is passed in device memory. A convenient data structure is provided that allows for easy initialization of the parameter lists. The aTransformedCoeffs array is for internal use only and should not be directly initialized by the application. The only restriction on these functions is that there is one single source ROI rectangle and one single destination ROI rectangle which are applied respectively to each image in the batch. The primary purpose of this function is to provide improved performance for batches of smaller images as long as GPU resources are available. Therefore it is recommended that the function not be used for very large images as there may not be resources available for processing several large images simultaneously.

A single set of oSrcRectROI and oDstRectROI values are applied to each source image and destination image in the batch. Source and destination image sizes may vary but oSmallestSrcSize must be set to the smallest source and image size in the batch. The parameters in the *NppiWarpAffineBatchCXR* structure represent the corresponding per-image nppiWarpAffine parameters for each image in the batch. The *NppiWarpAffineBatchCXR* array must be in device memory. The nppiWarpAffineBatchInit function MUST be called AFTER the application has initialized the array of *NppiWarpAffineBatchCXR* structures and BEFORE calling any of the nppiWarpAffineBatch functions to so that the aTransformed-Coeffs array can be internally pre-initialized for each image in the batch. The batch size passed to nppiWarpAffineBatchInit must match the batch size passed to the corresponding warp affine batch function.

WarpAffineBatch supports the following interpolation modes:

```
NPPI_INTER_NN
NPPI_INTER_LINEAR
NPPI_INTER_CUBIC
```

1.11.19.4.1 Codes

The warp affine primitives return the following error codes:

```
    - NPP_RECTANGLE_ERROR if either destination ROI width or
      height is less than 1 pixel.
    - NPP_INTERPOLATION_ERROR if eInterpolation has an illegal value.
    - NPP_SIZE_ERROR if source size width or height is less than 2 pixels.
```

1.11.19.5 Common parameters for nppiWarpAffineBatch functions:

param oSmallestSrcSize
Size in pixels of the entire smallest source image width and height, may be from different images.

param oSrcRectROI
Region of interest in the source images.

param oDstRectROI
Region of interest in the destination images.

param eInterpolation
The type of eInterpolation to perform resampling. Currently limited to NPPI_INTER_NN, NPPI_INTER_LINEAR, or NPPI_INTER_CUBIC.

param pBatchList
Device memory pointer to nBatchSize list of *NppiWarpAffineBatchCXR* structures.

param nBatchSize
Number of *NppiWarpAffineBatchCXR* structures in this call (must be > 1).

param nppStreamCtx
Application Managed Stream Context.

return
Image Data Related Error Codes, *ROI Related Error Codes*

Functions

NppStatus **nppiWarpAffineBatchInit_Ctx**(*NppiWarpAffineBatchCXR* *pBatchList, unsigned int nBatchSize, *NppStreamContext* nppStreamCtx)

Initializes the aTransformdedCoeffs array in pBatchList for each image in the list.

MUST be called before calling the corresponding warp affine batch function whenever any of the transformation matrices in the list have changed.

Parameters

- **pBatchList** – Device memory pointer to nBatchSize list of *NppiWarpAffineBatchCXR* structures.
- **nBatchSize** – Number of *NppiWarpAffineBatchCXR* structures in this call (must be > 1).
- **nppStreamCtx** – *Application Managed Stream Context*.

NppStatus **nppiWarpAffineBatch_8u_C1R_Ctx**(*NppiSize* oSmallestSrcSize, *NppiRect* oSrcRectROI, *NppiRect* oDstRectROI, int eInterpolation, *NppiWarpAffineBatchCXR* *pBatchList, unsigned int nBatchSize, *NppStreamContext* nppStreamCtx)

1 channel 8-bit unsigned integer image warp affine batch.

For common parameter descriptions, see *Common parameters for nppiWarpAffineBatch functions:*.

NppStatus **nppiWarpAffineBatch_8u_C3R_Ctx**(*NppiSize* oSmallestSrcSize, *NppiRect* oSrcRectROI, *NppiRect* oDstRectROI, int eInterpolation, *NppiWarpAffineBatchCXR* *pBatchList, unsigned int nBatchSize, *NppStreamContext* nppStreamCtx)

3 channel 8-bit unsigned integer image warp affine batch.

For common parameter descriptions, see *Common parameters for nppiWarpAffineBatch functions:*.

NppStatus **nppiWarpAffineBatch_8u_C4R_Ctx**(*NppiSize* oSmallestSrcSize, *NppiRect* oSrcRectROI, *NppiRect* oDstRectROI, int eInterpolation, *NppiWarpAffineBatchCXR* *pBatchList, unsigned int nBatchSize, *NppStreamContext* nppStreamCtx)

4 channel 8-bit unsigned integer image warp affine batch.

For common parameter descriptions, see *Common parameters for nppiWarpAffineBatch functions:*.

NppStatus **nppiWarpAffineBatch_8u_AC4R_Ctx**(*NppiSize* oSmallestSrcSize, *NppiRect* oSrcRectROI, *NppiRect* oDstRectROI, int eInterpolation, *NppiWarpAffineBatchCXR* *pBatchList, unsigned int nBatchSize, *NppStreamContext* nppStreamCtx)

4 channel 8-bit unsigned integer image warp affine batch not affecting alpha.

For common parameter descriptions, see *Common parameters for nppiWarpAffineBatch functions:*.

NppStatus **nppiWarpAffineBatch_16f_C1R_Ctx**(*NppiSize* oSmallestSrcSize, *NppiRect* oSrcRectROI, *NppiRect* oDstRectROI, int eInterpolation, *NppiWarpAffineBatchCXR* *pBatchList, unsigned int nBatchSize, *NppStreamContext* nppStreamCtx)

1 channel 16-bit floating point image warp affine batch.

For common parameter descriptions, see *Common parameters for nppiWarpAffineBatch functions:*.

NppStatus **nppiWarpAffineBatch_16f_C3R_Ctx**(*NppiSize* oSmallestSrcSize, *NppiRect* oSrcRectROI, *NppiRect* oDstRectROI, int eInterpolation, *NppiWarpAffineBatchCXR* *pBatchList, unsigned int nBatchSize, *NppStreamContext* nppStreamCtx)

3 channel 16-bit floating point image warp affine batch.

For common parameter descriptions, see *Common parameters for nppiWarpAffineBatch functions:*.

NppStatus **nppiWarpAffineBatch_16f_C4R_Ctx**(*NppiSize* oSmallestSrcSize, *NppiRect* oSrcRectROI, *NppiRect* oDstRectROI, int eInterpolation, *NppiWarpAffineBatchCXR* *pBatchList, unsigned int nBatchSize, *NppStreamContext* nppStreamCtx)

4 channel 16-bit floating point image warp affine batch.

For common parameter descriptions, see *Common parameters for nppiWarpAffineBatch functions:*.

NppStatus **nppiWarpAffineBatch_32f_C1R_Ctx**(*NppiSize* oSmallestSrcSize, *NppiRect* oSrcRectROI, *NppiRect* oDstRectROI, int eInterpolation, *NppiWarpAffineBatchCXR* *pBatchList, unsigned int nBatchSize, *NppStreamContext* nppStreamCtx)

1 channel 32-bit floating point image warp affine batch.

For common parameter descriptions, see *Common parameters for nppiWarpAffineBatch functions:*.

NppStatus **nppiWarpAffineBatch_32f_C3R_Ctx**(*NppiSize* oSmallestSrcSize, *NppiRect* oSrcRectROI, *NppiRect* oDstRectROI, int eInterpolation, *NppiWarpAffineBatchCXR* *pBatchList, unsigned int nBatchSize, *NppStreamContext* nppStreamCtx)

3 channel 32-bit floating point image warp affine batch.

For common parameter descriptions, see *Common parameters for nppiWarpAffineBatch functions:*.

NppStatus **nppiWarpAffineBatch_32f_C4R_Ctx**(*NppiSize* oSmallestSrcSize, *NppiRect* oSrcRectROI, *NppiRect* oDstRectROI, int eInterpolation, *NppiWarpAffineBatchCXR* *pBatchList, unsigned int nBatchSize, *NppStreamContext* nppStreamCtx)

4 channel 32-bit floating point image warp affine batch.

For common parameter descriptions, see *Common parameters for nppiWarpAffineBatch functions:*.

NppStatus **nppiWarpAffineBatch_32f_AC4R_Ctx**(*NppiSize* oSmallestSrcSize, *NppiRect* oSrcRectROI, *NppiRect* oDstRectROI, int eInterpolation, *NppiWarpAffineBatchCXR* *pBatchList, unsigned int nBatchSize, *NppStreamContext* nppStreamCtx)

4 channel 32-bit floating point image warp affine batch not affecting alpha.

For common parameter descriptions, see *Common parameters for nppiWarpAffineBatch functions:*.

1.11.19.6 Backwards Affine Transform

Transforms (warps) an image based on an affine transform.

The affine transform is given as a 2×3 matrix (C). A pixel location (x, y) in the source image is mapped to (x', y') in the destination image. The destination coordinates satisfy:

$$x = c_{00}\, x' + c_{01}\, y' + c_{02}$$
$$y = c_{10}\, x' + c_{11}\, y' + c_{12}$$

with

$$C = \begin{bmatrix} c_{00} & c_{01} & c_{02} \\ c_{10} & c_{11} & c_{12} \end{bmatrix}.$$

In other words, given C, the source coordinates are transformed to the destination using the inverse matrix C^{-1}:

$$M = C^{-1} = \begin{bmatrix} m_{00} & m_{01} & m_{02} \\ m_{10} & m_{11} & m_{12} \end{bmatrix}$$

and the forward mapping is

$$x' = m_{00}\,x + m_{01}\,y + m_{02}$$
$$y' = m_{10}\,x + m_{11}\,y + m_{12}$$

1.11.19.6.1 Common parameters for nppiWarpAffineBack packed pixel functions:

1.11.19.6.2 Common parameters for nppiWarpAffineBack planar pixel functions:

param pSrc
Source-Image Pointer.

param oSrcSize
Size of source image in pixels.

param nSrcStep
Source-Image Line Step.

param oSrcROI
Source ROI.

param pDst
Destination-Image Pointer.

param nDstStep
Destination-Image Line Step.

param oDstROI
Destination ROI.

param aCoeffs
Host memory array containing the affine transform coefficients.

param eInterpolation
Interpolation mode: can be NPPI_INTER_NN, NPPI_INTER_LINEAR or NPPI_INTER_CUBIC.

param nppStreamCtx
Application Managed Stream Context.

return
Image Data Related Error Codes, *ROI Related Error Codes*, *Affine Transform Error Codes*

param pSrc
Source-Planar-Image Pointer Array (host memory array containing device memory image plane pointers).

param oSrcSize
Size of source image in pixels.

param nSrcStep
Source-Image Line Step.

param oSrcROI
Source ROI.

param pDst
Destination-Planar-Image Pointer Array (host memory array containing device memory image plane pointers).

param nDstStep
Destination-Image Line Step.

param oDstROI
Destination ROI.

param aCoeffs
Host memory array containing the affine transform coefficients.

param eInterpolation
Interpolation mode: can be NPPI_INTER_NN, NPPI_INTER_LINEAR or NPPI_INTER_CUBIC.

param nppStreamCtx
Application Managed Stream Context.

return
Image Data Related Error Codes, *ROI Related Error Codes*, *Affine Transform Error Codes*

Functions

NppStatus **nppiWarpAffineBack_8u_C1R_Ctx**(const *Npp8u* *pSrc, *NppiSize* oSrcSize, int nSrcStep, *NppiRect* oSrcROI, *Npp8u* *pDst, int nDstStep, *NppiRect* oDstROI, const double aCoeffs[2][3], int eInterpolation, *NppStreamContext* nppStreamCtx)

Single-channel 8-bit unsigned integer backwards affine warp.

For common parameter descriptions, see *Common parameters for nppiWarpAffineBack packed pixel functions:*.

NppStatus **nppiWarpAffineBack_8u_C3R_Ctx**(const *Npp8u* *pSrc, *NppiSize* oSrcSize, int nSrcStep, *NppiRect* oSrcROI, *Npp8u* *pDst, int nDstStep, *NppiRect* oDstROI, const double aCoeffs[2][3], int eInterpolation, *NppStreamContext* nppStreamCtx)

Three-channel 8-bit unsigned integer backwards affine warp.

For common parameter descriptions, see *Common parameters for nppiWarpAffineBack packed pixel functions:*.

NppStatus **nppiWarpAffineBack_8u_C4R_Ctx**(const *Npp8u* *pSrc, *NppiSize* oSrcSize, int nSrcStep, *NppiRect* oSrcROI, *Npp8u* *pDst, int nDstStep, *NppiRect* oDstROI, const double aCoeffs[2][3], int eInterpolation, *NppStreamContext* nppStreamCtx)

Four-channel 8-bit unsigned integer backwards affine warp.

For common parameter descriptions, see *Common parameters for nppiWarpAffineBack packed pixel functions:*.

NppStatus **nppiWarpAffineBack_8u_AC4R_Ctx**(const *Npp8u* *pSrc, *NppiSize* oSrcSize, int nSrcStep, *NppiRect* oSrcROI, *Npp8u* *pDst, int nDstStep, *NppiRect* oDstROI, const double aCoeffs[2][3], int eInterpolation, *NppStreamContext* nppStreamCtx)

Four-channel 8-bit unsigned integer backwards affine warp, ignoring alpha channel.

For common parameter descriptions, see *Common parameters for nppiWarpAffineBack packed pixel functions:*.

NppStatus **nppiWarpAffineBack_8u_P3R_Ctx**(const *Npp8u* *pSrc[3], *NppiSize* oSrcSize, int nSrcStep, *NppiRect* oSrcROI, *Npp8u* *pDst[3], int nDstStep, *NppiRect* oDstROI, const double aCoeffs[2][3], int eInterpolation, *NppStreamContext* nppStreamCtx)

Three-channel planar 8-bit unsigned integer backwards affine warp.

For common parameter descriptions, see *Common parameters for nppiWarpAffineBack planar pixel functions:*.

NppStatus **nppiWarpAffineBack_8u_P4R_Ctx**(const *Npp8u* *pSrc[4], *NppiSize* oSrcSize, int nSrcStep, *NppiRect* oSrcROI, *Npp8u* *pDst[4], int nDstStep, *NppiRect* oDstROI, const double aCoeffs[2][3], int eInterpolation, *NppStreamContext* nppStreamCtx)

Four-channel planar 8-bit unsigned integer backwards affine warp.

For common parameter descriptions, see *Common parameters for nppiWarpAffineBack planar pixel functions:*.

NppStatus **nppiWarpAffineBack_16u_C1R_Ctx**(const *Npp16u* *pSrc, *NppiSize* oSrcSize, int nSrcStep, *NppiRect* oSrcROI, *Npp16u* *pDst, int nDstStep, *NppiRect* oDstROI, const double aCoeffs[2][3], int eInterpolation, *NppStreamContext* nppStreamCtx)

Single-channel 16-bit unsigned integer backwards affine warp.

For common parameter descriptions, see *Common parameters for nppiWarpAffineBack packed pixel functions:*.

NppStatus **nppiWarpAffineBack_16u_C3R_Ctx**(const *Npp16u* *pSrc, *NppiSize* oSrcSize, int nSrcStep, *NppiRect* oSrcROI, *Npp16u* *pDst, int nDstStep, *NppiRect* oDstROI, const double aCoeffs[2][3], int eInterpolation, *NppStreamContext* nppStreamCtx)

Three-channel 16-bit unsigned integer backwards affine warp.

For common parameter descriptions, see *Common parameters for nppiWarpAffineBack packed pixel functions:*.

NppStatus **nppiWarpAffineBack_16u_C4R_Ctx**(const *Npp16u* *pSrc, *NppiSize* oSrcSize, int nSrcStep, *NppiRect* oSrcROI, *Npp16u* *pDst, int nDstStep, *NppiRect* oDstROI, const double aCoeffs[2][3], int eInterpolation, *NppStreamContext* nppStreamCtx)

Four-channel 16-bit unsigned integer backwards affine warp.

For common parameter descriptions, see *Common parameters for nppiWarpAffineBack packed pixel functions:*.

NppStatus **nppiWarpAffineBack_16u_AC4R_Ctx**(const *Npp16u* *pSrc, *NppiSize* oSrcSize, int nSrcStep, *NppiRect* oSrcROI, *Npp16u* *pDst, int nDstStep, *NppiRect* oDstROI, const double aCoeffs[2][3], int eInterpolation, *NppStreamContext* nppStreamCtx)

Four-channel 16-bit unsigned integer backwards affine warp, ignoring alpha channel.

For common parameter descriptions, see *Common parameters for nppiWarpAffineBack packed pixel functions:*.

NppStatus **nppiWarpAffineBack_16u_P3R_Ctx**(const *Npp16u* *pSrc[3], *NppiSize* oSrcSize, int nSrcStep, *NppiRect* oSrcROI, *Npp16u* *pDst[3], int nDstStep, *NppiRect* oDstROI, const double aCoeffs[2][3], int eInterpolation, *NppStreamContext* nppStreamCtx)

Three-channel planar 16-bit unsigned integer backwards affine warp.

For common parameter descriptions, see *Common parameters for nppiWarpAffineBack planar pixel functions:*.

NppStatus **nppiWarpAffineBack_16u_P4R_Ctx**(const *Npp16u* *pSrc[4], *NppiSize* oSrcSize, int nSrcStep, *NppiRect* oSrcROI, *Npp16u* *pDst[4], int nDstStep, *NppiRect* oDstROI, const double aCoeffs[2][3], int eInterpolation, *NppStreamContext* nppStreamCtx)

Four-channel planar 16-bit unsigned integer backwards affine warp.

For common parameter descriptions, see *Common parameters for nppiWarpAffineBack planar pixel functions:*.

NppStatus **nppiWarpAffineBack_32s_C1R_Ctx**(const *Npp32s* *pSrc, *NppiSize* oSrcSize, int nSrcStep, *NppiRect* oSrcROI, *Npp32s* *pDst, int nDstStep, *NppiRect* oDstROI, const double aCoeffs[2][3], int eInterpolation, *NppStreamContext* nppStreamCtx)

Single-channel 32-bit signed integer backwards affine warp.

For common parameter descriptions, see *Common parameters for nppiWarpAffineBack packed pixel functions:*.

NppStatus **nppiWarpAffineBack_32s_C3R_Ctx**(const *Npp32s* *pSrc, *NppiSize* oSrcSize, int nSrcStep, *NppiRect* oSrcROI, *Npp32s* *pDst, int nDstStep, *NppiRect* oDstROI, const double aCoeffs[2][3], int eInterpolation, *NppStreamContext* nppStreamCtx)

Three-channel 32-bit signed integer backwards affine warp.

For common parameter descriptions, see *Common parameters for nppiWarpAffineBack packed pixel functions:*.

NppStatus **nppiWarpAffineBack_32s_C4R_Ctx**(const *Npp32s* *pSrc, *NppiSize* oSrcSize, int nSrcStep, *NppiRect* oSrcROI, *Npp32s* *pDst, int nDstStep, *NppiRect* oDstROI, const double aCoeffs[2][3], int eInterpolation, *NppStreamContext* nppStreamCtx)

Four-channel 32-bit signed integer backwards affine warp.

For common parameter descriptions, see *Common parameters for nppiWarpAffineBack packed pixel functions:*.

NppStatus **nppiWarpAffineBack_32s_AC4R_Ctx**(const *Npp32s* *pSrc, *NppiSize* oSrcSize, int nSrcStep, *NppiRect* oSrcROI, *Npp32s* *pDst, int nDstStep, *NppiRect* oDstROI, const double aCoeffs[2][3], int eInterpolation, *NppStreamContext* nppStreamCtx)

Four-channel 32-bit signed integer backwards affine warp, ignoring alpha channel.

For common parameter descriptions, see *Common parameters for nppiWarpAffineBack packed pixel functions:*.

NppStatus **nppiWarpAffineBack_32s_P3R_Ctx**(const *Npp32s* *pSrc[3], *NppiSize* oSrcSize, int nSrcStep, *NppiRect* oSrcROI, *Npp32s* *pDst[3], int nDstStep, *NppiRect* oDstROI, const double aCoeffs[2][3], int eInterpolation, *NppStreamContext* nppStreamCtx)

Three-channel planar 32-bit signed integer backwards affine warp.

For common parameter descriptions, see *Common parameters for nppiWarpAffineBack planar pixel functions:*.

NppStatus **nppiWarpAffineBack_32s_P4R_Ctx**(const *Npp32s* *pSrc[4], *NppiSize* oSrcSize, int nSrcStep, *NppiRect* oSrcROI, *Npp32s* *pDst[4], int nDstStep, *NppiRect* oDstROI, const double aCoeffs[2][3], int eInterpolation, *NppStreamContext* nppStreamCtx)

Four-channel planar 32-bit signed integer backwards affine warp.

For common parameter descriptions, see *Common parameters for nppiWarpAffineBack planar pixel functions:*.

NppStatus **nppiWarpAffineBack_32f_C1R_Ctx**(const *Npp32f* *pSrc, *NppiSize* oSrcSize, int nSrcStep, *NppiRect* oSrcROI, *Npp32f* *pDst, int nDstStep, *NppiRect* oDstROI, const double aCoeffs[2][3], int eInterpolation, *NppStreamContext* nppStreamCtx)

Single-channel 32-bit floating-point backwards affine warp.

For common parameter descriptions, see *Common parameters for nppiWarpAffineBack packed pixel functions:*.

NppStatus **nppiWarpAffineBack_32f_C3R_Ctx**(const *Npp32f* *pSrc, *NppiSize* oSrcSize, int nSrcStep, *NppiRect* oSrcROI, *Npp32f* *pDst, int nDstStep, *NppiRect* oDstROI, const double aCoeffs[2][3], int eInterpolation, *NppStreamContext* nppStreamCtx)

Three-channel 32-bit floating-point backwards affine warp.

For common parameter descriptions, see *Common parameters for nppiWarpAffineBack packed pixel functions:*.

NppStatus **nppiWarpAffineBack_32f_C4R_Ctx**(const *Npp32f* *pSrc, *NppiSize* oSrcSize, int nSrcStep, *NppiRect* oSrcROI, *Npp32f* *pDst, int nDstStep, *NppiRect* oDstROI, const double aCoeffs[2][3], int eInterpolation, *NppStreamContext* nppStreamCtx)

Four-channel 32-bit floating-point backwards affine warp.

For common parameter descriptions, see *Common parameters for nppiWarpAffineBack packed pixel functions:*.

NppStatus **nppiWarpAffineBack_32f_AC4R_Ctx**(const *Npp32f* *pSrc, *NppiSize* oSrcSize, int nSrcStep, *NppiRect* oSrcROI, *Npp32f* *pDst, int nDstStep, *NppiRect* oDstROI, const double aCoeffs[2][3], int eInterpolation, *NppStreamContext* nppStreamCtx)

Four-channel 32-bit floating-point backwards affine warp, ignoring alpha channel.

For common parameter descriptions, see *Common parameters for nppiWarpAffineBack packed pixel functions:*.

NppStatus **nppiWarpAffineBack_32f_P3R_Ctx**(const *Npp32f* *pSrc[3], *NppiSize* oSrcSize, int nSrcStep, *NppiRect* oSrcROI, *Npp32f* *pDst[3], int nDstStep, *NppiRect* oDstROI, const double aCoeffs[2][3], int eInterpolation, *NppStreamContext* nppStreamCtx)

Three-channel planar 32-bit floating-point backwards affine warp.

For common parameter descriptions, see *Common parameters for nppiWarpAffineBack planar pixel functions:*.

NppStatus **nppiWarpAffineBack_32f_P4R_Ctx**(const *Npp32f* *pSrc[4], *NppiSize* oSrcSize, int nSrcStep, *NppiRect* oSrcROI, *Npp32f* *pDst[4], int nDstStep, *NppiRect* oDstROI, const double aCoeffs[2][3], int eInterpolation, *NppStreamContext* nppStreamCtx)

Four-channel planar 32-bit floating-point backwards affine warp.

For common parameter descriptions, see *Common parameters for nppiWarpAffineBack planar pixel functions:*.

1.11.19.7 Quad-Based Affine Transform

Transforms (warps) an image based on an affine transform.

The affine transform is computed such that it maps a quadrilateral in source image space to a quadrilateral in destination image space.

An affine transform is fully determined by the mapping of 3 discrete points. The following primitives compute an affine transformation matrix that maps the first three corners of the source quad are mapped to the first three vertices of the destination image quad. If the fourth vertices do not match the transform, an NPP_AFFINE_QUAD_INCORRECT_WARNING is returned by the primitive.

1.11.19.7.1 Common parameters for nppiWarpAffineQuad packed pixel functions:

1.11.19.7.2 Common parameters for nppiWarpAffineQuad planar pixel functions:

param pSrc
Source-Image Pointer.

param oSrcSize
Size of source image in pixels.

param nSrcStep
Source-Image Line Step.

param oSrcROI
Source ROI.

param aSrcQuad
Source quad.

param pDst
Destination-Image Pointer.

param nDstStep
Destination-Image Line Step.

param oDstROI
Destination ROI.

param aDstQuad
Destination quad.

param eInterpolation
Interpolation mode: can be NPPI_INTER_NN, NPPI_INTER_LINEAR or NPPI_INTER_CUBIC.

param nppStreamCtx
Application Managed Stream Context.

return
Image Data Related Error Codes, *ROI Related Error Codes*, *Affine Transform Error Codes*

param pSrc
Source-Planar-Image Pointer Array (host memory array containing device memory image plane pointers).

param oSrcSize
Size of source image in pixels.

param nSrcStep
Source-Image Line Step.

param oSrcROI
Source ROI

param aSrcQuad
Source quad.

param pDst
Destination-Planar-Image Pointer Array (host memory array containing device memory image plane pointers).

param nDstStep
Destination-Image Line Step.

param oDstROI
Destination ROI

param aDstQuad
Destination quad.

param eInterpolation
Interpolation mode: can be NPPI_INTER_NN, NPPI_INTER_LINEAR or NPPI_INTER_CUBIC

param nppStreamCtx
Application Managed Stream Context.

return
Image Data Related Error Codes, *ROI Related Error Codes*, *Affine Transform Error Codes*

Functions

NppStatus **nppiWarpAffineQuad_8u_C1R_Ctx**(const *Npp8u* *pSrc, *NppiSize* oSrcSize, int nSrcStep, *NppiRect* oSrcROI, const double aSrcQuad[4][2], *Npp8u* *pDst, int nDstStep, *NppiRect* oDstROI, const double aDstQuad[4][2], int eInterpolation, *NppStreamContext* nppStreamCtx)

Single-channel 32-bit floating-point quad-based affine warp.

For common parameter descriptions, see *Common parameters for nppiWarpAffineQuad packed pixel functions:*.

NppStatus **nppiWarpAffineQuad_8u_C3R_Ctx**(const *Npp8u* *pSrc, *NppiSize* oSrcSize, int nSrcStep, *NppiRect* oSrcROI, const double aSrcQuad[4][2], *Npp8u* *pDst, int nDstStep, *NppiRect* oDstROI, const double aDstQuad[4][2], int eInterpolation, *NppStreamContext* nppStreamCtx)

Three-channel 8-bit unsigned integer quad-based affine warp.

For common parameter descriptions, see *Common parameters for nppiWarpAffineQuad packed pixel functions:*.

NppStatus **nppiWarpAffineQuad_8u_C4R_Ctx**(const *Npp8u* *pSrc, *NppiSize* oSrcSize, int nSrcStep, *NppiRect* oSrcROI, const double aSrcQuad[4][2], *Npp8u* *pDst, int nDstStep, *NppiRect* oDstROI, const double aDstQuad[4][2], int eInterpolation, *NppStreamContext* nppStreamCtx)

Four-channel 8-bit unsigned integer quad-based affine warp.

For common parameter descriptions, see *Common parameters for nppiWarpAffineQuad packed pixel functions:*.

NppStatus **nppiWarpAffineQuad_8u_AC4R_Ctx**(const *Npp8u* *pSrc, *NppiSize* oSrcSize, int nSrcStep, *NppiRect* oSrcROI, const double aSrcQuad[4][2], *Npp8u* *pDst, int nDstStep, *NppiRect* oDstROI, const double aDstQuad[4][2], int eInterpolation, *NppStreamContext* nppStreamCtx)

Four-channel 8-bit unsigned integer quad-based affine warp, ignoring alpha channel.

For common parameter descriptions, see *Common parameters for nppiWarpAffineQuad packed pixel functions:*.

NppStatus **nppiWarpAffineQuad_8u_P3R_Ctx**(const *Npp8u* *pSrc[3], *NppiSize* oSrcSize, int nSrcStep, *NppiRect* oSrcROI, const double aSrcQuad[4][2], *Npp8u* *pDst[3], int nDstStep, *NppiRect* oDstROI, const double aDstQuad[4][2], int eInterpolation, *NppStreamContext* nppStreamCtx)

Three-channel planar 8-bit unsigned integer quad-based affine warp.

For common parameter descriptions, see *Common parameters for nppiWarpAffineQuad planar pixel functions:*.

NppStatus **nppiWarpAffineQuad_8u_P4R_Ctx**(const *Npp8u* *pSrc[4], *NppiSize* oSrcSize, int nSrcStep, *NppiRect* oSrcROI, const double aSrcQuad[4][2], *Npp8u* *pDst[4], int nDstStep, *NppiRect* oDstROI, const double aDstQuad[4][2], int eInterpolation, *NppStreamContext* nppStreamCtx)

Four-channel planar 8-bit unsigned integer quad-based affine warp.

For common parameter descriptions, see *Common parameters for nppiWarpAffineQuad planar pixel functions:*.

NppStatus **nppiWarpAffineQuad_16u_C1R_Ctx**(const *Npp16u* *pSrc, *NppiSize* oSrcSize, int nSrcStep, *NppiRect* oSrcROI, const double aSrcQuad[4][2], *Npp16u* *pDst, int nDstStep, *NppiRect* oDstROI, const double aDstQuad[4][2], int eInterpolation, *NppStreamContext* nppStreamCtx)

Single-channel 16-bit unsigned integer quad-based affine warp.

For common parameter descriptions, see *Common parameters for nppiWarpAffineQuad packed pixel functions:*.

NppStatus **nppiWarpAffineQuad_16u_C3R_Ctx**(const *Npp16u* *pSrc, *NppiSize* oSrcSize, int nSrcStep, *NppiRect* oSrcROI, const double aSrcQuad[4][2], *Npp16u* *pDst, int nDstStep, *NppiRect* oDstROI, const double aDstQuad[4][2], int eInterpolation, *NppStreamContext* nppStreamCtx)

Three-channel 16-bit unsigned integer quad-based affine warp.

For common parameter descriptions, see *Common parameters for nppiWarpAffineQuad packed pixel functions:*.

NppStatus **nppiWarpAffineQuad_16u_C4R_Ctx**(const *Npp16u* *pSrc, *NppiSize* oSrcSize, int nSrcStep, *NppiRect* oSrcROI, const double aSrcQuad[4][2], *Npp16u* *pDst, int nDstStep, *NppiRect* oDstROI, const double aDstQuad[4][2], int eInterpolation, *NppStreamContext* nppStreamCtx)

Four-channel 16-bit unsigned integer quad-based affine warp.

For common parameter descriptions, see *Common parameters for nppiWarpAffineQuad packed pixel functions:*.

NppStatus **nppiWarpAffineQuad_16u_AC4R_Ctx**(const *Npp16u* *pSrc, *NppiSize* oSrcSize, int nSrcStep, *NppiRect* oSrcROI, const double aSrcQuad[4][2], *Npp16u* *pDst, int nDstStep, *NppiRect* oDstROI, const double aDstQuad[4][2], int eInterpolation, *NppStreamContext* nppStreamCtx)

Four-channel 16-bit unsigned integer quad-based affine warp, ignoring alpha channel.

For common parameter descriptions, see *Common parameters for nppiWarpAffineQuad packed pixel functions:*.

NppStatus **nppiWarpAffineQuad_16u_P3R_Ctx**(const *Npp16u* *pSrc[3], *NppiSize* oSrcSize, int nSrcStep, *NppiRect* oSrcROI, const double aSrcQuad[4][2], *Npp16u* *pDst[3], int nDstStep, *NppiRect* oDstROI, const double aDstQuad[4][2], int eInterpolation, *NppStreamContext* nppStreamCtx)

Three-channel planar 16-bit unsigned integer quad-based affine warp.

For common parameter descriptions, see *Common parameters for nppiWarpAffineQuad planar pixel functions:*.

NppStatus **nppiWarpAffineQuad_16u_P4R_Ctx**(const *Npp16u* *pSrc[4], *NppiSize* oSrcSize, int nSrcStep, *NppiRect* oSrcROI, const double aSrcQuad[4][2], *Npp16u* *pDst[4], int nDstStep, *NppiRect* oDstROI, const double aDstQuad[4][2], int eInterpolation, *NppStreamContext* nppStreamCtx)

Four-channel planar 16-bit unsigned integer quad-based affine warp.

For common parameter descriptions, see *Common parameters for nppiWarpAffineQuad planar pixel functions:*.

NppStatus **nppiWarpAffineQuad_32s_C1R_Ctx**(const *Npp32s* *pSrc, *NppiSize* oSrcSize, int nSrcStep, *NppiRect* oSrcROI, const double aSrcQuad[4][2], *Npp32s* *pDst, int nDstStep, *NppiRect* oDstROI, const double aDstQuad[4][2], int eInterpolation, *NppStreamContext* nppStreamCtx)

Single-channel 32-bit signed integer quad-based affine warp.

For common parameter descriptions, see *Common parameters for nppiWarpAffineQuad packed pixel functions:*.

NppStatus **nppiWarpAffineQuad_32s_C3R_Ctx**(const *Npp32s* *pSrc, *NppiSize* oSrcSize, int nSrcStep, *NppiRect* oSrcROI, const double aSrcQuad[4][2], *Npp32s* *pDst, int nDstStep, *NppiRect* oDstROI, const double aDstQuad[4][2], int eInterpolation, *NppStreamContext* nppStreamCtx)

Three-channel 32-bit signed integer quad-based affine warp.

For common parameter descriptions, see *Common parameters for nppiWarpAffineQuad packed pixel functions:*.

NppStatus **nppiWarpAffineQuad_32s_C4R_Ctx**(const *Npp32s* *pSrc, *NppiSize* oSrcSize, int nSrcStep, *NppiRect* oSrcROI, const double aSrcQuad[4][2], *Npp32s* *pDst, int nDstStep, *NppiRect* oDstROI, const double aDstQuad[4][2], int eInterpolation, *NppStreamContext* nppStreamCtx)

Four-channel 32-bit signed integer quad-based affine warp.

For common parameter descriptions, see *Common parameters for nppiWarpAffineQuad packed pixel functions:*.

NppStatus **nppiWarpAffineQuad_32s_AC4R_Ctx**(const *Npp32s* *pSrc, *NppiSize* oSrcSize, int nSrcStep, *NppiRect* oSrcROI, const double aSrcQuad[4][2], *Npp32s* *pDst, int nDstStep, *NppiRect* oDstROI, const double aDstQuad[4][2], int eInterpolation, *NppStreamContext* nppStreamCtx)

Four-channel 32-bit signed integer quad-based affine warp, ignoring alpha channel.

For common parameter descriptions, see *Common parameters for nppiWarpAffineQuad packed pixel functions:*.

NppStatus **nppiWarpAffineQuad_32s_P3R_Ctx**(const *Npp32s* *pSrc[3], *NppiSize* oSrcSize, int nSrcStep, *NppiRect* oSrcROI, const double aSrcQuad[4][2], *Npp32s* *pDst[3], int nDstStep, *NppiRect* oDstROI, const double aDstQuad[4][2], int eInterpolation, *NppStreamContext* nppStreamCtx)

Three-channel planar 32-bit signed integer quad-based affine warp.

For common parameter descriptions, see *Common parameters for nppiWarpAffineQuad planar pixel functions:*.

NppStatus **nppiWarpAffineQuad_32s_P4R_Ctx**(const *Npp32s* *pSrc[4], *NppiSize* oSrcSize, int nSrcStep, *NppiRect* oSrcROI, const double aSrcQuad[4][2], *Npp32s* *pDst[4], int nDstStep, *NppiRect* oDstROI, const double aDstQuad[4][2], int eInterpolation, *NppStreamContext* nppStreamCtx)

Four-channel planar 32-bit signed integer quad-based affine warp.

For common parameter descriptions, see *Common parameters for nppiWarpAffineQuad planar pixel functions:*.

NppStatus **nppiWarpAffineQuad_32f_C1R_Ctx**(const *Npp32f* *pSrc, *NppiSize* oSrcSize, int nSrcStep, *NppiRect* oSrcROI, const double aSrcQuad[4][2], *Npp32f* *pDst, int nDstStep, *NppiRect* oDstROI, const double aDstQuad[4][2], int eInterpolation, *NppStreamContext* nppStreamCtx)

Single-channel 32-bit floating-point quad-based affine warp.

For common parameter descriptions, see *Common parameters for nppiWarpAffineQuad packed pixel functions:*.

NppStatus **nppiWarpAffineQuad_32f_C3R_Ctx**(const *Npp32f* *pSrc, *NppiSize* oSrcSize, int nSrcStep, *NppiRect* oSrcROI, const double aSrcQuad[4][2], *Npp32f* *pDst, int nDstStep, *NppiRect* oDstROI, const double aDstQuad[4][2], int eInterpolation, *NppStreamContext* nppStreamCtx)

Three-channel 32-bit floating-point quad-based affine warp.

For common parameter descriptions, see *Common parameters for nppiWarpAffineQuad packed pixel functions:*.

NppStatus **nppiWarpAffineQuad_32f_C4R_Ctx**(const *Npp32f* *pSrc, *NppiSize* oSrcSize, int nSrcStep, *NppiRect* oSrcROI, const double aSrcQuad[4][2], *Npp32f* *pDst, int nDstStep, *NppiRect* oDstROI, const double aDstQuad[4][2], int eInterpolation, *NppStreamContext* nppStreamCtx)

Four-channel 32-bit floating-point quad-based affine warp.

For common parameter descriptions, see *Common parameters for nppiWarpAffineQuad packed pixel functions:*.

NppStatus **nppiWarpAffineQuad_32f_AC4R_Ctx**(const *Npp32f* *pSrc, *NppiSize* oSrcSize, int nSrcStep, *NppiRect* oSrcROI, const double aSrcQuad[4][2], *Npp32f* *pDst, int nDstStep, *NppiRect* oDstROI, const double aDstQuad[4][2], int eInterpolation, *NppStreamContext* nppStreamCtx)

Four-channel 32-bit floating-point quad-based affine warp, ignoring alpha channel.

For common parameter descriptions, see *Common parameters for nppiWarpAffineQuad packed pixel functions:*.

NppStatus **nppiWarpAffineQuad_32f_P3R_Ctx**(const *Npp32f* *pSrc[3], *NppiSize* oSrcSize, int nSrcStep, *NppiRect* oSrcROI, const double aSrcQuad[4][2], *Npp32f* *pDst[3], int nDstStep, *NppiRect* oDstROI, const double aDstQuad[4][2], int eInterpolation, *NppStreamContext* nppStreamCtx)

Three-channel planar 32-bit floating-point quad-based affine warp.

For common parameter descriptions, see *Common parameters for nppiWarpAffineQuad planar pixel functions:*.

NppStatus **nppiWarpAffineQuad_32f_P4R_Ctx**(const *Npp32f* *pSrc[4], *NppiSize* oSrcSize, int nSrcStep, *NppiRect* oSrcROI, const double aSrcQuad[4][2], *Npp32f* *pDst[4], int nDstStep, *NppiRect* oDstROI, const double aDstQuad[4][2], int eInterpolation, *NppStreamContext* nppStreamCtx)

Four-channel planar 32-bit floating-point quad-based affine warp.

For common parameter descriptions, see *Common parameters for nppiWarpAffineQuad planar pixel functions:*.

1.11.20. Perspective Transforms

1.11.20.1 Perspective Transform

The set of perspective transform functions available in the library.

1.11.20.1.1 Perspective Transform Error Codes

- NPP_RECTANGLE_ERROR Indicates an error condition if width or height of the intersection of the oSrcROI and source image is less than or equal to 1
- NPP_WRONG_INTERSECTION_ROI_ERROR Indicates an error condition if oSrcROI has no intersection with the source image
- NPP_INTERPOLATION_ERROR Indicates an error condition if interpolation has an illegal value
- NPP_COEFFICIENT_ERROR Indicates an error condition if coefficient values are invalid
- NPP_WRONG_INTERSECTION_QUAD_WARNING Indicates a warning that no operation is performed if the transformed source ROI has no intersection with the destination ROI

The set of perspective transform utility functions.

Functions

NppStatus **nppiGetPerspectiveTransform**(*NppiRect* oSrcROI, const double quad[4][2], double aCoeffs[3][3])

Calculates perspective transform coefficients given source rectangular ROI and its destination quadrangle projection.

Parameters

- **oSrcROI** – Source ROI
- **quad** – Destination quadrangle
- **aCoeffs** – Host memory array containing the perspective transform coefficients.

Returns

Error codes:

- NPP_SIZE_ERROR Indicates an error condition if any image dimension has zero or negative value
- NPP_RECTANGLE_ERROR Indicates an error condition if width or height of the intersection of the oSrcROI and source image is less than or equal to 1
- NPP_COEFFICIENT_ERROR Indicates an error condition if coefficient values are invalid

NppStatus **nppiGetPerspectiveQuad**(*NppiRect* oSrcROI, double quad[4][2], const double aCoeffs[3][3])

Calculates perspective transform projection of given source rectangular ROI.

Parameters

- **oSrcROI** – Source ROI
- **quad** – Destination quadrangle
- **aCoeffs** – Host memory array containing the perspective transform coefficients.

Returns

Error codes:

- NPP_SIZE_ERROR Indicates an error condition if any image dimension has zero or negative value
- NPP_RECTANGLE_ERROR Indicates an error condition if width or height of the intersection of the oSrcROI and source image is less than or equal to 1
- NPP_COEFFICIENT_ERROR Indicates an error condition if coefficient values are invalid

NppStatus **nppiGetPerspectiveBound**(*NppiRect* oSrcROI, double bound[2][2], const double aCoeffs[3][3])

Calculates bounding box of the perspective transform projection of the given source rectangular ROI.

Parameters

- **oSrcROI** – Source ROI
- **bound** – Bounding box of the transformed source ROI
- **aCoeffs** – Host memory array containing the perspective transform coefficients.

Returns

Error codes:

- NPP_SIZE_ERROR Indicates an error condition if any image dimension has zero or negative value
- NPP_RECTANGLE_ERROR Indicates an error condition if width or height of the intersection of the oSrcROI and source image is less than or equal to 1
- NPP_COEFFICIENT_ERROR Indicates an error condition if coefficient values are invalid

1.11.20.2 Perspective Transform

Transforms (warps) an image based on a perspective transform.

The perspective (projective) transform is given as a 3×3 matrix (C). A pixel location (x, y) in the source image is mapped to (x', y') in the destination image as:

$$x' = \frac{c_{00}\, x + c_{01}\, y + c_{02}}{c_{20}\, x + c_{21}\, y + c_{22}},$$
$$y' = \frac{c_{10}\, x + c_{11}\, y + c_{12}}{c_{20}\, x + c_{21}\, y + c_{22}}.$$

where

$$C = \begin{bmatrix} c_{00} & c_{01} & c_{02} \\ c_{10} & c_{11} & c_{12} \\ c_{20} & c_{21} & c_{22} \end{bmatrix}.$$

1.11.20.2.1 Common parameters for nppiWarpPerspective packed pixel functions:

1.11.20.2.2 Common parameters for nppiWarpPerspective planar pixel functions:

Note: The denominator $c_{20}\, x + c_{21}\, y + c_{22} \neq 0$ for valid image points.

param pSrc
Source-Image Pointer.

param oSrcSize
Size of source image in pixels.

param nSrcStep
Source-Image Line Step.

param oSrcROI
Source ROI.

param pDst
Destination-Image Pointer.

param nDstStep
Destination-Image Line Step.

param oDstROI
Destination ROI.

param aCoeffs
Host memory array containing the perspective transform coefficients.

param eInterpolation
Interpolation mode: can be NPPI_INTER_NN, NPPI_INTER_LINEAR or NPPI_INTER_CUBIC.

param nppStreamCtx
Application Managed Stream Context.

return
Image Data Related Error Codes, *ROI Related Error Codes*, *Perspective Transform Error Codes*

param pSrc
Source-Planar-Image Pointer Array (host memory array containing device memory image plane pointers).

param oSrcSize
Size of source image in pixels.

param nSrcStep
Source-Image Line Step.

param oSrcROI
Source ROI.

param pDst
Destination-Planar-Image Pointer Array (host memory array containing device memory image plane pointers).

param nDstStep
Destination-Image Line Step.

param oDstROI
Destination ROI.

param aCoeffs
Host memory array containing the perspective transform coefficients.

param eInterpolation
Interpolation mode: can be NPPI_INTER_NN, NPPI_INTER_LINEAR or NPPI_INTER_CUBIC.

param nppStreamCtx
Application Managed Stream Context.

return
Image Data Related Error Codes, *ROI Related Error Codes*, *Perspective Transform Error Codes*

Functions

NppStatus **nppiWarpPerspective_8u_C1R_Ctx**(const *Npp8u* *pSrc, *NppiSize* oSrcSize, int nSrcStep, *NppiRect* oSrcROI, *Npp8u* *pDst, int nDstStep, *NppiRect* oDstROI, const double aCoeffs[3][3], int eInterpolation, *NppStreamContext* nppStreamCtx)

Single-channel 8-bit unsigned integer perspective warp.

For common parameter descriptions, see *Common parameters for nppiWarpPerspective packed pixel functions:*.

NppStatus **nppiWarpPerspective_8u_C3R_Ctx**(const *Npp8u* *pSrc, *NppiSize* oSrcSize, int nSrcStep, *NppiRect* oSrcROI, *Npp8u* *pDst, int nDstStep, *NppiRect* oDstROI, const double aCoeffs[3][3], int eInterpolation, *NppStreamContext* nppStreamCtx)

Three-channel 8-bit unsigned integer perspective warp.

For common parameter descriptions, see *Common parameters for nppiWarpPerspective packed pixel functions:*.

NppStatus **nppiWarpPerspective_8u_C4R_Ctx**(const *Npp8u* *pSrc, *NppiSize* oSrcSize, int nSrcStep, *NppiRect* oSrcROI, *Npp8u* *pDst, int nDstStep, *NppiRect* oDstROI, const double aCoeffs[3][3], int eInterpolation, *NppStreamContext* nppStreamCtx)

Four-channel 8-bit unsigned integer perspective warp.

For common parameter descriptions, see *Common parameters for nppiWarpPerspective packed pixel functions:*.

NppStatus **nppiWarpPerspective_8u_AC4R_Ctx**(const *Npp8u* *pSrc, *NppiSize* oSrcSize, int nSrcStep, *NppiRect* oSrcROI, *Npp8u* *pDst, int nDstStep, *NppiRect* oDstROI, const double aCoeffs[3][3], int eInterpolation, *NppStreamContext* nppStreamCtx)

Four-channel 8-bit unsigned integer perspective warp, ignoring alpha channel.

For common parameter descriptions, see *Common parameters for nppiWarpPerspective packed pixel functions:*.

NppStatus **nppiWarpPerspective_8u_P3R_Ctx**(const *Npp8u* *pSrc[3], *NppiSize* oSrcSize, int nSrcStep, *NppiRect* oSrcROI, *Npp8u* *pDst[3], int nDstStep, *NppiRect* oDstROI, const double aCoeffs[3][3], int eInterpolation, *NppStreamContext* nppStreamCtx)

Three-channel planar 8-bit unsigned integer perspective warp.

For common parameter descriptions, see *Common parameters for nppiWarpPerspective planar pixel functions:*.

NppStatus **nppiWarpPerspective_8u_P4R_Ctx**(const *Npp8u* *pSrc[4], *NppiSize* oSrcSize, int nSrcStep, *NppiRect* oSrcROI, *Npp8u* *pDst[4], int nDstStep, *NppiRect* oDstROI, const double aCoeffs[3][3], int eInterpolation, *NppStreamContext* nppStreamCtx)

Four-channel planar 8-bit unsigned integer perspective warp.

For common parameter descriptions, see *Common parameters for nppiWarpPerspective planar pixel functions:*.

NppStatus **nppiWarpPerspective_16u_C1R_Ctx**(const *Npp16u* *pSrc, *NppiSize* oSrcSize, int nSrcStep, *NppiRect* oSrcROI, *Npp16u* *pDst, int nDstStep, *NppiRect* oDstROI, const double aCoeffs[3][3], int eInterpolation, *NppStreamContext* nppStreamCtx)

Single-channel 16-bit unsigned integer perspective warp.

For common parameter descriptions, see *Common parameters for nppiWarpPerspective packed pixel functions:*.

NppStatus **nppiWarpPerspective_16u_C3R_Ctx**(const *Npp16u* *pSrc, *NppiSize* oSrcSize, int nSrcStep, *NppiRect* oSrcROI, *Npp16u* *pDst, int nDstStep, *NppiRect* oDstROI, const double aCoeffs[3][3], int eInterpolation, *NppStreamContext* nppStreamCtx)

Three-channel 16-bit unsigned integer perspective warp.

For common parameter descriptions, see *Common parameters for nppiWarpPerspective packed pixel functions:*.

NppStatus **nppiWarpPerspective_16u_C4R_Ctx**(const *Npp16u* *pSrc, *NppiSize* oSrcSize, int nSrcStep, *NppiRect* oSrcROI, *Npp16u* *pDst, int nDstStep, *NppiRect* oDstROI, const double aCoeffs[3][3], int eInterpolation, *NppStreamContext* nppStreamCtx)

Four-channel 16-bit unsigned integer perspective warp.

For common parameter descriptions, see *Common parameters for nppiWarpPerspective packed pixel functions:*.

NppStatus **nppiWarpPerspective_16u_AC4R_Ctx**(const *Npp16u* *pSrc, *NppiSize* oSrcSize, int nSrcStep, *NppiRect* oSrcROI, *Npp16u* *pDst, int nDstStep, *NppiRect* oDstROI, const double aCoeffs[3][3], int eInterpolation, *NppStreamContext* nppStreamCtx)

Four-channel 16-bit unsigned integer perspective warp, igoring alpha channel.

For common parameter descriptions, see *Common parameters for nppiWarpPerspective packed pixel functions:*.

NppStatus **nppiWarpPerspective_16u_P3R_Ctx**(const *Npp16u* *pSrc[3], *NppiSize* oSrcSize, int nSrcStep, *NppiRect* oSrcROI, *Npp16u* *pDst[3], int nDstStep, *NppiRect* oDstROI, const double aCoeffs[3][3], int eInterpolation, *NppStreamContext* nppStreamCtx)

Three-channel planar 16-bit unsigned integer perspective warp.

For common parameter descriptions, see *Common parameters for nppiWarpPerspective planar pixel functions:*.

NppStatus **nppiWarpPerspective_16u_P4R_Ctx**(const *Npp16u* *pSrc[4], *NppiSize* oSrcSize, int nSrcStep, *NppiRect* oSrcROI, *Npp16u* *pDst[4], int nDstStep, *NppiRect* oDstROI, const double aCoeffs[3][3], int eInterpolation, *NppStreamContext* nppStreamCtx)

Four-channel planar 16-bit unsigned integer perspective warp.

For common parameter descriptions, see *Common parameters for nppiWarpPerspective planar pixel functions:*.

NppStatus **nppiWarpPerspective_32s_C1R_Ctx**(const *Npp32s* *pSrc, *NppiSize* oSrcSize, int nSrcStep, *NppiRect* oSrcROI, *Npp32s* *pDst, int nDstStep, *NppiRect* oDstROI, const double aCoeffs[3][3], int eInterpolation, *NppStreamContext* nppStreamCtx)

Single-channel 32-bit signed integer perspective warp.

For common parameter descriptions, see *Common parameters for nppiWarpPerspective packed pixel functions:*.

NppStatus **nppiWarpPerspective_32s_C3R_Ctx**(const *Npp32s* *pSrc, *NppiSize* oSrcSize, int nSrcStep, *NppiRect* oSrcROI, *Npp32s* *pDst, int nDstStep, *NppiRect* oDstROI, const double aCoeffs[3][3], int eInterpolation, *NppStreamContext* nppStreamCtx)

Three-channel 32-bit signed integer perspective warp.

For common parameter descriptions, see *Common parameters for nppiWarpPerspective packed pixel functions:*.

NppStatus **nppiWarpPerspective_32s_C4R_Ctx**(const *Npp32s* *pSrc, *NppiSize* oSrcSize, int nSrcStep, *NppiRect* oSrcROI, *Npp32s* *pDst, int nDstStep, *NppiRect* oDstROI, const double aCoeffs[3][3], int eInterpolation, *NppStreamContext* nppStreamCtx)

Four-channel 32-bit signed integer perspective warp.

For common parameter descriptions, see *Common parameters for nppiWarpPerspective packed pixel functions:*.

NppStatus **nppiWarpPerspective_32s_AC4R_Ctx**(const *Npp32s* *pSrc, *NppiSize* oSrcSize, int nSrcStep, *NppiRect* oSrcROI, *Npp32s* *pDst, int nDstStep, *NppiRect* oDstROI, const double aCoeffs[3][3], int eInterpolation, *NppStreamContext* nppStreamCtx)

Four-channel 32-bit signed integer perspective warp, igoring alpha channel.

For common parameter descriptions, see *Common parameters for nppiWarpPerspective packed pixel functions:*.

NppStatus **nppiWarpPerspective_32s_P3R_Ctx**(const *Npp32s* *pSrc[3], *NppiSize* oSrcSize, int nSrcStep, *NppiRect* oSrcROI, *Npp32s* *pDst[3], int nDstStep, *NppiRect* oDstROI, const double aCoeffs[3][3], int eInterpolation, *NppStreamContext* nppStreamCtx)

Three-channel planar 32-bit signed integer perspective warp.

For common parameter descriptions, see *Common parameters for nppiWarpPerspective planar pixel functions:*.

NppStatus **nppiWarpPerspective_32s_P4R_Ctx**(const *Npp32s* *pSrc[4], *NppiSize* oSrcSize, int nSrcStep, *NppiRect* oSrcROI, *Npp32s* *pDst[4], int nDstStep, *NppiRect* oDstROI, const double aCoeffs[3][3], int eInterpolation, *NppStreamContext* nppStreamCtx)

Four-channel planar 32-bit signed integer perspective warp.

For common parameter descriptions, see *Common parameters for nppiWarpPerspective planar pixel functions:*.

NppStatus **nppiWarpPerspective_16f_C1R_Ctx**(const *Npp16f* *pSrc, *NppiSize* oSrcSize, int nSrcStep, *NppiRect* oSrcROI, *Npp16f* *pDst, int nDstStep, *NppiRect* oDstROI, const double aCoeffs[3][3], int eInterpolation, *NppStreamContext* nppStreamCtx)

Single-channel 16-bit floating-point perspective warp.

For common parameter descriptions, see *Common parameters for nppiWarpPerspective packed pixel functions:*.

NppStatus **nppiWarpPerspective_16f_C3R_Ctx**(const *Npp16f* *pSrc, *NppiSize* oSrcSize, int nSrcStep, *NppiRect* oSrcROI, *Npp16f* *pDst, int nDstStep, *NppiRect* oDstROI, const double aCoeffs[3][3], int eInterpolation, *NppStreamContext* nppStreamCtx)

Three-channel 16-bit floating-point perspective warp.

For common parameter descriptions, see *Common parameters for nppiWarpPerspective packed pixel functions:*.

NppStatus **nppiWarpPerspective_16f_C4R_Ctx**(const *Npp16f* *pSrc, *NppiSize* oSrcSize, int nSrcStep, *NppiRect* oSrcROI, *Npp16f* *pDst, int nDstStep, *NppiRect* oDstROI, const double aCoeffs[3][3], int eInterpolation, *NppStreamContext* nppStreamCtx)

Four-channel 16-bit floating-point perspective warp.

For common parameter descriptions, see *Common parameters for nppiWarpPerspective packed pixel functions:*.

NppStatus **nppiWarpPerspective_32f_C1R_Ctx**(const *Npp32f* *pSrc, *NppiSize* oSrcSize, int nSrcStep, *NppiRect* oSrcROI, *Npp32f* *pDst, int nDstStep, *NppiRect* oDstROI, const double aCoeffs[3][3], int eInterpolation, *NppStreamContext* nppStreamCtx)

Single-channel 32-bit floating-point perspective warp.

For common parameter descriptions, see *Common parameters for nppiWarpPerspective packed pixel functions:*.

NppStatus **nppiWarpPerspective_32f_C3R_Ctx**(const *Npp32f* *pSrc, *NppiSize* oSrcSize, int nSrcStep, *NppiRect* oSrcROI, *Npp32f* *pDst, int nDstStep, *NppiRect* oDstROI, const double aCoeffs[3][3], int eInterpolation, *NppStreamContext* nppStreamCtx)

Three-channel 32-bit floating-point perspective warp.

For common parameter descriptions, see *Common parameters for nppiWarpPerspective packed pixel functions:*.

NppStatus **nppiWarpPerspective_32f_C4R_Ctx**(const *Npp32f* *pSrc, *NppiSize* oSrcSize, int nSrcStep, *NppiRect* oSrcROI, *Npp32f* *pDst, int nDstStep, *NppiRect* oDstROI, const double aCoeffs[3][3], int eInterpolation, *NppStreamContext* nppStreamCtx)

Four-channel 32-bit floating-point perspective warp.

For common parameter descriptions, see *Common parameters for nppiWarpPerspective packed pixel functions:*.

NppStatus **nppiWarpPerspective_32f_AC4R_Ctx**(const *Npp32f* *pSrc, *NppiSize* oSrcSize, int nSrcStep, *NppiRect* oSrcROI, *Npp32f* *pDst, int nDstStep, *NppiRect* oDstROI, const double aCoeffs[3][3], int eInterpolation, *NppStreamContext* nppStreamCtx)

Four-channel 32-bit floating-point perspective warp, ignoring alpha channel.

For common parameter descriptions, see *Common parameters for nppiWarpPerspective packed pixel functions:*.

NppStatus **nppiWarpPerspective_32f_P3R_Ctx**(const *Npp32f* *pSrc[3], *NppiSize* oSrcSize, int nSrcStep, *NppiRect* oSrcROI, *Npp32f* *pDst[3], int nDstStep, *NppiRect* oDstROI, const double aCoeffs[3][3], int eInterpolation, *NppStreamContext* nppStreamCtx)

Three-channel planar 32-bit floating-point perspective warp.

For common parameter descriptions, see *Common parameters for nppiWarpPerspective planar pixel functions:*.

NppStatus **nppiWarpPerspective_32f_P4R_Ctx**(const *Npp32f* *pSrc[4], *NppiSize* oSrcSize, int nSrcStep, *NppiRect* oSrcROI, *Npp32f* *pDst[4], int nDstStep, *NppiRect* oDstROI, const double aCoeffs[3][3], int eInterpolation, *NppStreamContext* nppStreamCtx)

Four-channel planar 32-bit floating-point perspective warp.

For common parameter descriptions, see *Common parameters for nppiWarpPerspective planar pixel functions:*.

1.11.20.3 Perspective Transform Batch

Details of the warp perspective operation are described above in the WarpPerspective section. WarpPerspectiveBatch generally takes the same parameter list as WarpPerspective except that there is a list of N instances of those parameters (N > 1) and that list is passed in device memory. A convenient data structure is provided that allows for easy initialization of the parameter lists. The aTransformedCoeffs array is for internal use only and should not be directly initialized by the application. The only restriction on these functions is that there is one single source ROI rectangle and one single destination ROI rectangle which are applied respectively to each image in the batch. The primary purpose of this function is to provide improved performance for batches of smaller images as long as GPU resources are available. Therefore it is recommended that the function not be used for very large images as there may not be resources available for processing several large images simultaneously.

A single set of oSrcRectROI and oDstRectROI values are applied to each source image and destination image in the batch. Source and destination image sizes may vary but oSmallestSrcSize must be set to the smallest source and image size in the batch. The parameters in the *NppiWarpPerspectiveBatchCXR* structure represent the corresponding per-image nppiWarpPerspective parameters for each image in the batch. The *NppiWarpPerspectiveBatchCXR* array must be in device memory. The nppiWarpPerspectiveBatchInit function MUST be called AFTER the application has initialized the array of *NppiWarpPerspectiveBatchCXR* structures and BEFORE calling any of the nppiWarpPerspectiveBatch functions to so that the aTransformedCoeffs array can be internally pre-initialized for each image in the batch.

The batch size passed to nppiWarpPerspectiveBatchInit must match the batch size passed to the corresponding warp perspective batch function.

WarpPerspectiveBatch supports the following interpolation modes:

```
NPPI_INTER_NN
NPPI_INTER_LINEAR
NPPI_INTER_CUBIC
```

1.11.20.3.1 Common parameters for nppiWarpPerspectiveBatch functions:

param oSmallestSrcSize
Size in pixels of the entire smallest source image width and height, may be from different images.

param oSrcRectROI
Region of interest in the source images.

param oDstRectROI
Region of interest in the destination images.

param eInterpolation
The type of eInterpolation to perform resampling. Currently limited to NPPI_INTER_NN, NPPI_INTER_LINEAR, or NPPI_INTER_CUBIC.

param pBatchList
Device memory pointer to nBatchSize list of *NppiWarpPerspectiveBatchCXR* structures.

param nBatchSize
Number of *NppiWarpPerspectiveBatchCXR* structures in this call (must be > 1).

param nppStreamCtx
Application Managed Stream Context.

return
Image Data Related Error Codes, *ROI Related Error Codes*

Functions

NppStatus **nppiWarpPerspectiveBatchInit_Ctx**(*NppiWarpPerspectiveBatchCXR* *pBatchList, unsigned int nBatchSize, *NppStreamContext* nppStreamCtx)

Initializes the aTransformdedCoeffs array in pBatchList for each image in the list.

MUST be called before calling the corresponding warp perspective batch function whenever any of the transformation matrices in the list have changed.

Parameters

- **pBatchList** – Device memory pointer to nBatchSize list of *NppiWarpPerspectiveBatchCXR* structures.

- **nBatchSize** – Number of *NppiWarpPerspectiveBatchCXR* structures in this call (must be > 1).
- **nppStreamCtx** – *Application Managed Stream Context*.

NppStatus **nppiWarpPerspectiveBatch_8u_C1R_Ctx**(*NppiSize* oSmallestSrcSize, *NppiRect* oSrcRectROI, *NppiRect* oDstRectROI, int eInterpolation, *NppiWarpPerspectiveBatchCXR* *pBatchList, unsigned int nBatchSize, *NppStreamContext* nppStreamCtx)

1 channel 8-bit unsigned integer image warp perspective batch.

For common parameter descriptions, see *Common parameters for nppiWarpPerspectiveBatch functions:*.

NppStatus **nppiWarpPerspectiveBatch_8u_C3R_Ctx**(*NppiSize* oSmallestSrcSize, *NppiRect* oSrcRectROI, *NppiRect* oDstRectROI, int eInterpolation, *NppiWarpPerspectiveBatchCXR* *pBatchList, unsigned int nBatchSize, *NppStreamContext* nppStreamCtx)

3 channel 8-bit unsigned integer image warp perspective batch.

For common parameter descriptions, see *Common parameters for nppiWarpPerspectiveBatch functions:*.

NppStatus **nppiWarpPerspectiveBatch_8u_C4R_Ctx**(*NppiSize* oSmallestSrcSize, *NppiRect* oSrcRectROI, *NppiRect* oDstRectROI, int eInterpolation, *NppiWarpPerspectiveBatchCXR* *pBatchList, unsigned int nBatchSize, *NppStreamContext* nppStreamCtx)

4 channel 8-bit unsigned integer image warp perspective batch.

For common parameter descriptions, see *Common parameters for nppiWarpPerspectiveBatch functions:*.

NppStatus **nppiWarpPerspectiveBatch_8u_AC4R_Ctx**(*NppiSize* oSmallestSrcSize, *NppiRect* oSrcRectROI, *NppiRect* oDstRectROI, int eInterpolation, *NppiWarpPerspectiveBatchCXR* *pBatchList, unsigned int nBatchSize, *NppStreamContext* nppStreamCtx)

4 channel 8-bit unsigned integer image warp perspective batch not affecting alpha.

For common parameter descriptions, see *Common parameters for nppiWarpPerspectiveBatch functions:*.

NppStatus **nppiWarpPerspectiveBatch_16f_C1R_Ctx**(*NppiSize* oSmallestSrcSize, *NppiRect* oSrcRectROI, *NppiRect* oDstRectROI, int eInterpolation, *NppiWarpPerspectiveBatchCXR* *pBatchList, unsigned int nBatchSize, *NppStreamContext* nppStreamCtx)

1 channel 16-bit floating point image warp perspective batch.

For common parameter descriptions, see *Common parameters for nppiWarpPerspectiveBatch functions:*.

NppStatus **nppiWarpPerspectiveBatch_16f_C3R_Ctx**(*NppiSize* oSmallestSrcSize, *NppiRect* oSrcRectROI, *NppiRect* oDstRectROI, int eInterpolation, *NppiWarpPerspectiveBatchCXR* *pBatchList, unsigned int nBatchSize, *NppStreamContext* nppStreamCtx)

3 channel 16-bit floating point image warp perspective batch.

For common parameter descriptions, see *Common parameters for nppiWarpPerspectiveBatch functions:*.

NppStatus **nppiWarpPerspectiveBatch_16f_C4R_Ctx**(*NppiSize* oSmallestSrcSize, *NppiRect* oSrcRectROI, *NppiRect* oDstRectROI, int eInterpolation, *NppiWarpPerspectiveBatchCXR* *pBatchList, unsigned int nBatchSize, *NppStreamContext* nppStreamCtx)

4 channel 16-bit floating point image warp perspective batch.

For common parameter descriptions, see *Common parameters for nppiWarpPerspectiveBatch functions:*.

NppStatus **nppiWarpPerspectiveBatch_32f_C1R_Ctx**(*NppiSize* oSmallestSrcSize, *NppiRect* oSrcRectROI, *NppiRect* oDstRectROI, int eInterpolation, *NppiWarpPerspectiveBatchCXR* *pBatchList, unsigned int nBatchSize, *NppStreamContext* nppStreamCtx)

1 channel 32-bit floating point image warp perspective batch.

For common parameter descriptions, see *Common parameters for nppiWarpPerspectiveBatch functions:*.

NppStatus **nppiWarpPerspectiveBatch_32f_C3R_Ctx**(*NppiSize* oSmallestSrcSize, *NppiRect* oSrcRectROI, *NppiRect* oDstRectROI, int eInterpolation, *NppiWarpPerspectiveBatchCXR* *pBatchList, unsigned int nBatchSize, *NppStreamContext* nppStreamCtx)

3 channel 32-bit floating point image warp perspective batch.

For common parameter descriptions, see *Common parameters for nppiWarpPerspectiveBatch functions:*.

NppStatus **nppiWarpPerspectiveBatch_32f_C4R_Ctx**(*NppiSize* oSmallestSrcSize, *NppiRect* oSrcRectROI, *NppiRect* oDstRectROI, int eInterpolation, *NppiWarpPerspectiveBatchCXR* *pBatchList, unsigned int nBatchSize, *NppStreamContext* nppStreamCtx)

4 channel 32-bit floating point image warp perspective batch.

For common parameter descriptions, see *Common parameters for nppiWarpPerspectiveBatch functions:*.

NppStatus **nppiWarpPerspectiveBatch_32f_AC4R_Ctx**(*NppiSize* oSmallestSrcSize, *NppiRect* oSrcRectROI, *NppiRect* oDstRectROI, int eInterpolation, *NppiWarpPerspectiveBatchCXR* *pBatchList, unsigned int nBatchSize, *NppStreamContext* nppStreamCtx)

4 channel 32-bit floating point image warp perspective batch not affecting alpha.

For common parameter descriptions, see *Common parameters for nppiWarpPerspectiveBatch functions:*.

1.11.20.4 Backwards Perspective Transform

Transforms (warps) an image based on a perspective transform.

The perspective (projective) transform is given by a 3×3 matrix (C). A pixel location (x, y) in the source image maps to (x', y') in the destination as:

$$x' = \frac{c_{00}\,x + c_{01}\,y + c_{02}}{c_{20}\,x + c_{21}\,y + c_{22}},$$
$$y' = \frac{c_{10}\,x + c_{11}\,y + c_{12}}{c_{20}\,x + c_{21}\,y + c_{22}}.$$

where

$$C = \begin{bmatrix} c_{00} & c_{01} & c_{02} \\ c_{10} & c_{11} & c_{12} \\ c_{20} & c_{21} & c_{22} \end{bmatrix}.$$

Conversely, if $M = C^{-1}$, the destination coordinates (x', y') map back to source:

$$x = \frac{m_{00}\,x' + m_{01}\,y' + m_{02}}{m_{20}\,x' + m_{21}\,y' + m_{22}},$$
$$y = \frac{m_{10}\,x' + m_{11}\,y' + m_{12}}{m_{20}\,x' + m_{21}\,y' + m_{22}}.$$

1.11.20.4.1 Common parameters for nppiWarpPerspectiveBack packed pixel functions:

1.11.20.4.2 Common parameters for nppiWarpPerspectiveBack planar pixel functions:

Note: The denominators must be nonzero (valid homogeneous coordinate): $c_{20}\,x + c_{21}\,y + c_{22} \neq 0$ and $m_{20}\,x' + m_{21}\,y' + m_{22} \neq 0$; also $\det(C) \neq 0$.

param pSrc
Source-Image Pointer.

param oSrcSize
Size of source image in pixels.

param nSrcStep
Source-Image Line Step.

param oSrcROI
Source ROI.

param pDst
Destination-Image Pointer.

param nDstStep
Destination-Image Line Step.

param oDstROI
Destination ROI.

param aCoeffs
Host memory array containing the perspective transform coefficients.

param eInterpolation
Interpolation mode: can be NPPI_INTER_NN, NPPI_INTER_LINEAR or NPPI_INTER_CUBIC.

param nppStreamCtx
Application Managed Stream Context.

return
Image Data Related Error Codes, *ROI Related Error Codes*, *Perspective Transform Error Codes*

param pSrc
Source-Planar-Image Pointer Array (host memory array containing device memory image plane pointers).

param oSrcSize
Size of source image in pixels.

param nSrcStep
Source-Image Line Step.

param oSrcROI
Source ROI.

param pDst
Destination-Planar-Image Pointer Array (host memory array containing device memory image plane pointers).

param nDstStep
Destination-Image Line Step.

param oDstROI
Destination ROI.

param aCoeffs
Host memory array containing the perspective transform coefficients.

param eInterpolation
Interpolation mode: can be NPPI_INTER_NN, NPPI_INTER_LINEAR or NPPI_INTER_CUBIC.

param nppStreamCtx
Application Managed Stream Context.

return
Image Data Related Error Codes, *ROI Related Error Codes*, *Perspective Transform Error Codes*

Functions

NppStatus **nppiWarpPerspectiveBack_8u_C1R_Ctx**(const *Npp8u* *pSrc, *NppiSize* oSrcSize, int nSrcStep, *NppiRect* oSrcROI, *Npp8u* *pDst, int nDstStep, *NppiRect* oDstROI, const double aCoeffs[3][3], int eInterpolation, *NppStreamContext* nppStreamCtx)

Single-channel 8-bit unsigned integer backwards perspective warp.

For common parameter descriptions, see *Common parameters for nppiWarpPerspectiveBack packed pixel functions:*.

NppStatus **nppiWarpPerspectiveBack_8u_C3R_Ctx**(const *Npp8u* *pSrc, *NppiSize* oSrcSize, int nSrcStep, *NppiRect* oSrcROI, *Npp8u* *pDst, int nDstStep, *NppiRect* oDstROI, const double aCoeffs[3][3], int eInterpolation, *NppStreamContext* nppStreamCtx)

Three-channel 8-bit unsigned integer backwards perspective warp.

For common parameter descriptions, see *Common parameters for nppiWarpPerspectiveBack packed pixel functions:*.

NppStatus **nppiWarpPerspectiveBack_8u_C4R_Ctx**(const *Npp8u* *pSrc, *NppiSize* oSrcSize, int nSrcStep, *NppiRect* oSrcROI, *Npp8u* *pDst, int nDstStep, *NppiRect* oDstROI, const double aCoeffs[3][3], int eInterpolation, *NppStreamContext* nppStreamCtx)

Four-channel 8-bit unsigned integer backwards perspective warp.

For common parameter descriptions, see *Common parameters for nppiWarpPerspectiveBack packed pixel functions:*.

NppStatus **nppiWarpPerspectiveBack_8u_AC4R_Ctx**(const *Npp8u* *pSrc, *NppiSize* oSrcSize, int nSrcStep, *NppiRect* oSrcROI, *Npp8u* *pDst, int nDstStep, *NppiRect* oDstROI, const double aCoeffs[3][3], int eInterpolation, *NppStreamContext* nppStreamCtx)

Four-channel 8-bit unsigned integer backwards perspective warp, igoring alpha channel.

For common parameter descriptions, see *Common parameters for nppiWarpPerspectiveBack packed pixel functions:*.

NppStatus **nppiWarpPerspectiveBack_8u_P3R_Ctx**(const *Npp8u* *pSrc[3], *NppiSize* oSrcSize, int nSrcStep, *NppiRect* oSrcROI, *Npp8u* *pDst[3], int nDstStep, *NppiRect* oDstROI, const double aCoeffs[3][3], int eInterpolation, *NppStreamContext* nppStreamCtx)

Three-channel planar 8-bit unsigned integer backwards perspective warp.

For common parameter descriptions, see *Common parameters for nppiWarpPerspectiveBack planar pixel functions:*.

NppStatus **nppiWarpPerspectiveBack_8u_P4R_Ctx**(const *Npp8u* *pSrc[4], *NppiSize* oSrcSize, int nSrcStep, *NppiRect* oSrcROI, *Npp8u* *pDst[4], int nDstStep, *NppiRect* oDstROI, const double aCoeffs[3][3], int eInterpolation, *NppStreamContext* nppStreamCtx)

Four-channel planar 8-bit unsigned integer backwards perspective warp.

For common parameter descriptions, see *Common parameters for nppiWarpPerspectiveBack planar pixel functions:*.

NppStatus **nppiWarpPerspectiveBack_16u_C1R_Ctx**(const *Npp16u* *pSrc, *NppiSize* oSrcSize, int nSrcStep, *NppiRect* oSrcROI, *Npp16u* *pDst, int nDstStep, *NppiRect* oDstROI, const double aCoeffs[3][3], int eInterpolation, *NppStreamContext* nppStreamCtx)

Single-channel 16-bit unsigned integer backwards perspective warp.

For common parameter descriptions, see *Common parameters for nppiWarpPerspectiveBack packed pixel functions:*.

NppStatus **nppiWarpPerspectiveBack_16u_C3R_Ctx**(const *Npp16u* *pSrc, *NppiSize* oSrcSize, int nSrcStep, *NppiRect* oSrcROI, *Npp16u* *pDst, int nDstStep, *NppiRect* oDstROI, const double aCoeffs[3][3], int eInterpolation, *NppStreamContext* nppStreamCtx)

Three-channel 16-bit unsigned integer backwards perspective warp.

For common parameter descriptions, see *Common parameters for nppiWarpPerspectiveBack packed pixel functions:*.

NppStatus **nppiWarpPerspectiveBack_16u_C4R_Ctx**(const *Npp16u* *pSrc, *NppiSize* oSrcSize, int nSrcStep, *NppiRect* oSrcROI, *Npp16u* *pDst, int nDstStep, *NppiRect* oDstROI, const double aCoeffs[3][3], int eInterpolation, *NppStreamContext* nppStreamCtx)

Four-channel 16-bit unsigned integer backwards perspective warp.

For common parameter descriptions, see *Common parameters for nppiWarpPerspectiveBack packed pixel functions:*.

NppStatus **nppiWarpPerspectiveBack_16u_AC4R_Ctx**(const *Npp16u* *pSrc, *NppiSize* oSrcSize, int nSrcStep, *NppiRect* oSrcROI, *Npp16u* *pDst, int nDstStep, *NppiRect* oDstROI, const double aCoeffs[3][3], int eInterpolation, *NppStreamContext* nppStreamCtx)

Four-channel 16-bit unsigned integer backwards perspective warp, ignoring alpha channel.

For common parameter descriptions, see *Common parameters for nppiWarpPerspectiveBack packed pixel functions:*.

NppStatus **nppiWarpPerspectiveBack_16u_P3R_Ctx**(const *Npp16u* *pSrc[3], *NppiSize* oSrcSize, int nSrcStep, *NppiRect* oSrcROI, *Npp16u* *pDst[3], int nDstStep, *NppiRect* oDstROI, const double aCoeffs[3][3], int eInterpolation, *NppStreamContext* nppStreamCtx)

Four-channel planar 16-bit unsigned integer backwards perspective warp.

For common parameter descriptions, see *Common parameters for nppiWarpPerspectiveBack planar pixel functions:*.

NppStatus **nppiWarpPerspectiveBack_16u_P4R_Ctx**(const *Npp16u* *pSrc[4], *NppiSize* oSrcSize, int nSrcStep, *NppiRect* oSrcROI, *Npp16u* *pDst[4], int nDstStep, *NppiRect* oDstROI, const double aCoeffs[3][3], int eInterpolation, *NppStreamContext* nppStreamCtx)

Four-channel planar 16-bit unsigned integer backwards perspective warp.

For common parameter descriptions, see *Common parameters for nppiWarpPerspectiveBack planar pixel functions:*.

NppStatus **nppiWarpPerspectiveBack_32s_C1R_Ctx**(const *Npp32s* *pSrc, *NppiSize* oSrcSize, int nSrcStep, *NppiRect* oSrcROI, *Npp32s* *pDst, int nDstStep, *NppiRect* oDstROI, const double aCoeffs[3][3], int eInterpolation, *NppStreamContext* nppStreamCtx)

Single-channel 32-bit signed integer backwards perspective warp.

For common parameter descriptions, see *Common parameters for nppiWarpPerspectiveBack packed pixel functions:*.

NppStatus **nppiWarpPerspectiveBack_32s_C3R_Ctx**(const *Npp32s* *pSrc, *NppiSize* oSrcSize, int nSrcStep, *NppiRect* oSrcROI, *Npp32s* *pDst, int nDstStep, *NppiRect* oDstROI, const double aCoeffs[3][3], int eInterpolation, *NppStreamContext* nppStreamCtx)

Three-channel 32-bit signed integer backwards perspective warp.

For common parameter descriptions, see *Common parameters for nppiWarpPerspectiveBack packed pixel functions:*.

NppStatus **nppiWarpPerspectiveBack_32s_C4R_Ctx**(const *Npp32s* *pSrc, *NppiSize* oSrcSize, int nSrcStep, *NppiRect* oSrcROI, *Npp32s* *pDst, int nDstStep, *NppiRect* oDstROI, const double aCoeffs[3][3], int eInterpolation, *NppStreamContext* nppStreamCtx)

Four-channel 32-bit signed integer backwards perspective warp.

For common parameter descriptions, see *Common parameters for nppiWarpPerspectiveBack packed pixel functions:*.

NppStatus **nppiWarpPerspectiveBack_32s_AC4R_Ctx**(const *Npp32s* *pSrc, *NppiSize* oSrcSize, int nSrcStep, *NppiRect* oSrcROI, *Npp32s* *pDst, int nDstStep, *NppiRect* oDstROI, const double aCoeffs[3][3], int eInterpolation, *NppStreamContext* nppStreamCtx)

Four-channel 32-bit signed integer backwards perspective warp, ignoring alpha channel.

For common parameter descriptions, see *Common parameters for nppiWarpPerspectiveBack packed pixel functions:*.

NppStatus **nppiWarpPerspectiveBack_32s_P3R_Ctx**(const *Npp32s* *pSrc[3], *NppiSize* oSrcSize, int nSrcStep, *NppiRect* oSrcROI, *Npp32s* *pDst[3], int nDstStep, *NppiRect* oDstROI, const double aCoeffs[3][3], int eInterpolation, *NppStreamContext* nppStreamCtx)

Three-channel planar 32-bit signed integer backwards perspective warp.

For common parameter descriptions, see *Common parameters for nppiWarpPerspectiveBack planar pixel functions:*.

NppStatus **nppiWarpPerspectiveBack_32s_P4R_Ctx**(const *Npp32s* *pSrc[4], *NppiSize* oSrcSize, int nSrcStep, *NppiRect* oSrcROI, *Npp32s* *pDst[4], int nDstStep, *NppiRect* oDstROI, const double aCoeffs[3][3], int eInterpolation, *NppStreamContext* nppStreamCtx)

Four-channel planar 32-bit signed integer backwards perspective warp.

For common parameter descriptions, see *Common parameters for nppiWarpPerspectiveBack planar pixel functions:*.

NppStatus **nppiWarpPerspectiveBack_32f_C1R_Ctx**(const *Npp32f* *pSrc, *NppiSize* oSrcSize, int nSrcStep, *NppiRect* oSrcROI, *Npp32f* *pDst, int nDstStep, *NppiRect* oDstROI, const double aCoeffs[3][3], int eInterpolation, *NppStreamContext* nppStreamCtx)

Single-channel 32-bit floating-point backwards perspective warp.

For common parameter descriptions, see *Common parameters for nppiWarpPerspectiveBack packed pixel functions:*.

NppStatus **nppiWarpPerspectiveBack_32f_C3R_Ctx**(const *Npp32f* *pSrc, *NppiSize* oSrcSize, int nSrcStep, *NppiRect* oSrcROI, *Npp32f* *pDst, int nDstStep, *NppiRect* oDstROI, const double aCoeffs[3][3], int eInterpolation, *NppStreamContext* nppStreamCtx)

Three-channel 32-bit floating-point backwards perspective warp.

For common parameter descriptions, see *Common parameters for nppiWarpPerspectiveBack packed pixel functions:*.

NppStatus **nppiWarpPerspectiveBack_32f_C4R_Ctx**(const *Npp32f* *pSrc, *NppiSize* oSrcSize, int nSrcStep, *NppiRect* oSrcROI, *Npp32f* *pDst, int nDstStep, *NppiRect* oDstROI, const double aCoeffs[3][3], int eInterpolation, *NppStreamContext* nppStreamCtx)

Four-channel 32-bit floating-point backwards perspective warp.

For common parameter descriptions, see *Common parameters for nppiWarpPerspectiveBack packed pixel functions:*.

NppStatus **nppiWarpPerspectiveBack_32f_AC4R_Ctx**(const *Npp32f* *pSrc, *NppiSize* oSrcSize, int nSrcStep, *NppiRect* oSrcROI, *Npp32f* *pDst, int nDstStep, *NppiRect* oDstROI, const double aCoeffs[3][3], int eInterpolation, *NppStreamContext* nppStreamCtx)

Four-channel 32-bit floating-point backwards perspective warp, ignorning alpha channel.

For common parameter descriptions, see *Common parameters for nppiWarpPerspectiveBack packed pixel functions:*.

NppStatus **nppiWarpPerspectiveBack_32f_P3R_Ctx**(const *Npp32f* *pSrc[3], *NppiSize* oSrcSize, int nSrcStep, *NppiRect* oSrcROI, *Npp32f* *pDst[3], int nDstStep, *NppiRect* oDstROI, const double aCoeffs[3][3], int eInterpolation, *NppStreamContext* nppStreamCtx)

Three-channel planar 32-bit floating-point backwards perspective warp.

For common parameter descriptions, see *Common parameters for nppiWarpPerspectiveBack planar pixel functions:*.

NppStatus **nppiWarpPerspectiveBack_32f_P4R_Ctx**(const *Npp32f* *pSrc[4], *NppiSize* oSrcSize, int nSrcStep, *NppiRect* oSrcROI, *Npp32f* *pDst[4], int nDstStep, *NppiRect* oDstROI, const double aCoeffs[3][3], int eInterpolation, *NppStreamContext* nppStreamCtx)

Four-channel planar 32-bit floating-point backwards perspective warp.

For common parameter descriptions, see *Common parameters for nppiWarpPerspectiveBack planar pixel functions:*.

1.11.20.5 Quad-Based Perspective Transform

Transforms (warps) an image based on an perspective transform.

The perspective transform is computed such that it maps a quadrilateral in source image space to a quadrilateral in destination image space.

1.11.20.5.1 Common parameters for nppiWarpPerspectiveQuad packed pixel functions:

1.11.20.5.2 Common parameters for nppiWarpPerspectiveQuad planar pixel functions:

param pSrc
Source-Image Pointer.

param oSrcSize
Size of source image in pixels.

param nSrcStep
Source-Image Line Step.

param oSrcROI
Source ROI.

param aSrcQuad
Source quad.

param pDst
Destination-Image Pointer.

param nDstStep
Destination-Image Line Step.

param oDstROI
Destination ROI.

param aDstQuad
Destination quad.

param eInterpolation
Interpolation mode: can be NPPI_INTER_NN, NPPI_INTER_LINEAR or NPPI_INTER_CUBIC.

param nppStreamCtx
Application Managed Stream Context.

return
Image Data Related Error Codes, *ROI Related Error Codes*, *Perspective Transform Error Codes*

param pSrc
Source-Planar-Image Pointer Array (host memory array containing device memory image plane pointers).

param oSrcSize
Size of source image in pixels.

param nSrcStep
Source-Image Line Step.

param oSrcROI
Source ROI.

param aSrcQuad
Source quad.

param pDst
Destination-Planar-Image Pointer Array (host memory array containing device memory image plane pointers).

param nDstStep
Destination-Image Line Step.

param oDstROI
Destination ROI.

param aDstQuad
Destination quad.

param eInterpolation
Interpolation mode: can be NPPI_INTER_NN, NPPI_INTER_LINEAR or NPPI_INTER_CUBIC.

param nppStreamCtx
Application Managed Stream Context.

return
Image Data Related Error Codes, *ROI Related Error Codes*, *Perspective Transform Error Codes*

Functions

NppStatus **nppiWarpPerspectiveQuad_8u_C1R_Ctx**(const *Npp8u* *pSrc, *NppiSize* oSrcSize, int nSrcStep, *NppiRect* oSrcROI, const double aSrcQuad[4][2], *Npp8u* *pDst, int nDstStep, *NppiRect* oDstROI, const double aDstQuad[4][2], int eInterpolation, *NppStreamContext* nppStreamCtx)

Single-channel 8-bit unsigned integer quad-based perspective warp.

For common parameter descriptions, see *Common parameters for nppiWarpPerspectiveQuad packed pixel functions:*.

NppStatus **nppiWarpPerspectiveQuad_8u_C3R_Ctx**(const *Npp8u* *pSrc, *NppiSize* oSrcSize, int nSrcStep, *NppiRect* oSrcROI, const double aSrcQuad[4][2], *Npp8u* *pDst, int nDstStep, *NppiRect* oDstROI, const double aDstQuad[4][2], int eInterpolation, *NppStreamContext* nppStreamCtx)

Three-channel 8-bit unsigned integer quad-based perspective warp.

For common parameter descriptions, see *Common parameters for nppiWarpPerspectiveQuad packed pixel functions:*.

NppStatus **nppiWarpPerspectiveQuad_8u_C4R_Ctx**(const *Npp8u* *pSrc, *NppiSize* oSrcSize, int nSrcStep, *NppiRect* oSrcROI, const double aSrcQuad[4][2], *Npp8u* *pDst, int nDstStep, *NppiRect* oDstROI, const double aDstQuad[4][2], int eInterpolation, *NppStreamContext* nppStreamCtx)

Four-channel 8-bit unsigned integer quad-based perspective warp.

For common parameter descriptions, see *Common parameters for nppiWarpPerspectiveQuad packed pixel functions:*.

NppStatus **nppiWarpPerspectiveQuad_8u_AC4R_Ctx**(const *Npp8u* *pSrc, *NppiSize* oSrcSize, int nSrcStep, *NppiRect* oSrcROI, const double aSrcQuad[4][2], *Npp8u* *pDst, int nDstStep, *NppiRect* oDstROI, const double aDstQuad[4][2], int eInterpolation, *NppStreamContext* nppStreamCtx)

Four-channel 8-bit unsigned integer quad-based perspective warp, ignoring alpha channel.

For common parameter descriptions, see *Common parameters for nppiWarpPerspectiveQuad packed pixel functions:*.

NppStatus **nppiWarpPerspectiveQuad_8u_P3R_Ctx**(const *Npp8u* *pSrc[3], *NppiSize* oSrcSize, int nSrcStep, *NppiRect* oSrcROI, const double aSrcQuad[4][2], *Npp8u* *pDst[3], int nDstStep, *NppiRect* oDstROI, const double aDstQuad[4][2], int eInterpolation, *NppStreamContext* nppStreamCtx)

Three-channel planar 8-bit unsigned integer quad-based perspective warp.

For common parameter descriptions, see *Common parameters for nppiWarpPerspectiveQuad planar pixel functions:*.

NppStatus **nppiWarpPerspectiveQuad_8u_P4R_Ctx**(const *Npp8u* *pSrc[4], *NppiSize* oSrcSize, int nSrcStep, *NppiRect* oSrcROI, const double aSrcQuad[4][2], *Npp8u* *pDst[4], int nDstStep, *NppiRect* oDstROI, const double aDstQuad[4][2], int eInterpolation, *NppStreamContext* nppStreamCtx)

Four-channel planar 8-bit unsigned integer quad-based perspective warp.

For common parameter descriptions, see *Common parameters for nppiWarpPerspectiveQuad planar pixel functions:*.

NppStatus **nppiWarpPerspectiveQuad_16u_C1R_Ctx**(const *Npp16u* *pSrc, *NppiSize* oSrcSize, int nSrcStep, *NppiRect* oSrcROI, const double aSrcQuad[4][2], *Npp16u* *pDst, int nDstStep, *NppiRect* oDstROI, const double aDstQuad[4][2], int eInterpolation, *NppStreamContext* nppStreamCtx)

Single-channel 16-bit unsigned integer quad-based perspective warp.

For common parameter descriptions, see *Common parameters for nppiWarpPerspectiveQuad packed pixel functions:*.

NppStatus **nppiWarpPerspectiveQuad_16u_C3R_Ctx**(const *Npp16u* *pSrc, *NppiSize* oSrcSize, int nSrcStep, *NppiRect* oSrcROI, const double aSrcQuad[4][2], *Npp16u* *pDst, int nDstStep, *NppiRect* oDstROI, const double aDstQuad[4][2], int eInterpolation, *NppStreamContext* nppStreamCtx)

Three-channel 16-bit unsigned integer quad-based perspective warp.

For common parameter descriptions, see *Common parameters for nppiWarpPerspectiveQuad packed pixel functions:*.

NppStatus **nppiWarpPerspectiveQuad_16u_C4R_Ctx**(const *Npp16u* *pSrc, *NppiSize* oSrcSize, int nSrcStep, *NppiRect* oSrcROI, const double aSrcQuad[4][2], *Npp16u* *pDst, int nDstStep, *NppiRect* oDstROI, const double aDstQuad[4][2], int eInterpolation, *NppStreamContext* nppStreamCtx)

Four-channel 16-bit unsigned integer quad-based perspective warp.

For common parameter descriptions, see *Common parameters for nppiWarpPerspectiveQuad packed pixel functions:*.

NppStatus **nppiWarpPerspectiveQuad_16u_AC4R_Ctx**(const *Npp16u* *pSrc, *NppiSize* oSrcSize, int nSrcStep, *NppiRect* oSrcROI, const double aSrcQuad[4][2], *Npp16u* *pDst, int nDstStep, *NppiRect* oDstROI, const double aDstQuad[4][2], int eInterpolation, *NppStreamContext* nppStreamCtx)

Four-channel 16-bit unsigned integer quad-based perspective warp, ignoring alpha channel.

For common parameter descriptions, see *Common parameters for nppiWarpPerspectiveQuad packed pixel functions:*.

NppStatus **nppiWarpPerspectiveQuad_16u_P3R_Ctx**(const *Npp16u* *pSrc[3], *NppiSize* oSrcSize, int nSrcStep, *NppiRect* oSrcROI, const double aSrcQuad[4][2], *Npp16u* *pDst[3], int nDstStep, *NppiRect* oDstROI, const double aDstQuad[4][2], int eInterpolation, *NppStreamContext* nppStreamCtx)

Three-channel planar 16-bit unsigned integer quad-based perspective warp.

For common parameter descriptions, see *Common parameters for nppiWarpPerspectiveQuad planar pixel functions:*.

NppStatus **nppiWarpPerspectiveQuad_16u_P4R_Ctx**(const *Npp16u* *pSrc[4], *NppiSize* oSrcSize, int nSrcStep, *NppiRect* oSrcROI, const double aSrcQuad[4][2], *Npp16u* *pDst[4], int nDstStep, *NppiRect* oDstROI, const double aDstQuad[4][2], int eInterpolation, *NppStreamContext* nppStreamCtx)

Four-channel planar 16-bit unsigned integer quad-based perspective warp.

For common parameter descriptions, see *Common parameters for nppiWarpPerspectiveQuad planar pixel functions:*.

NppStatus **nppiWarpPerspectiveQuad_32s_C1R_Ctx**(const *Npp32s* *pSrc, *NppiSize* oSrcSize, int nSrcStep, *NppiRect* oSrcROI, const double aSrcQuad[4][2], *Npp32s* *pDst, int nDstStep, *NppiRect* oDstROI, const double aDstQuad[4][2], int eInterpolation, *NppStreamContext* nppStreamCtx)

Single-channel 32-bit signed integer quad-based perspective warp.

For common parameter descriptions, see *Common parameters for nppiWarpPerspectiveQuad packed pixel functions:*.

NppStatus **nppiWarpPerspectiveQuad_32s_C3R_Ctx**(const *Npp32s* *pSrc, *NppiSize* oSrcSize, int nSrcStep, *NppiRect* oSrcROI, const double aSrcQuad[4][2], *Npp32s* *pDst, int nDstStep, *NppiRect* oDstROI, const double aDstQuad[4][2], int eInterpolation, *NppStreamContext* nppStreamCtx)

Three-channel 32-bit signed integer quad-based perspective warp.

For common parameter descriptions, see *Common parameters for nppiWarpPerspectiveQuad packed pixel functions:*.

NppStatus **nppiWarpPerspectiveQuad_32s_C4R_Ctx**(const *Npp32s* *pSrc, *NppiSize* oSrcSize, int nSrcStep, *NppiRect* oSrcROI, const double aSrcQuad[4][2], *Npp32s* *pDst, int nDstStep, *NppiRect* oDstROI, const double aDstQuad[4][2], int eInterpolation, *NppStreamContext* nppStreamCtx)

Four-channel 32-bit signed integer quad-based perspective warp.

For common parameter descriptions, see *Common parameters for nppiWarpPerspectiveQuad packed pixel functions:*.

NppStatus **nppiWarpPerspectiveQuad_32s_AC4R_Ctx**(const *Npp32s* *pSrc, *NppiSize* oSrcSize, int nSrcStep, *NppiRect* oSrcROI, const double aSrcQuad[4][2], *Npp32s* *pDst, int nDstStep, *NppiRect* oDstROI, const double aDstQuad[4][2], int eInterpolation, *NppStreamContext* nppStreamCtx)

Four-channel 32-bit signed integer quad-based perspective warp, ignoring alpha channel.

For common parameter descriptions, see *Common parameters for nppiWarpPerspectiveQuad packed pixel functions:*.

NppStatus **nppiWarpPerspectiveQuad_32s_P3R_Ctx**(const *Npp32s* *pSrc[3], *NppiSize* oSrcSize, int nSrcStep, *NppiRect* oSrcROI, const double aSrcQuad[4][2], *Npp32s* *pDst[3], int nDstStep, *NppiRect* oDstROI, const double aDstQuad[4][2], int eInterpolation, *NppStreamContext* nppStreamCtx)

Three-channel planar 32-bit signed integer quad-based perspective warp.

For common parameter descriptions, see *Common parameters for nppiWarpPerspectiveQuad planar pixel functions:*.

NppStatus **nppiWarpPerspectiveQuad_32s_P4R_Ctx**(const *Npp32s* *pSrc[4], *NppiSize* oSrcSize, int nSrcStep, *NppiRect* oSrcROI, const double aSrcQuad[4][2], *Npp32s* *pDst[4], int nDstStep, *NppiRect* oDstROI, const double aDstQuad[4][2], int eInterpolation, *NppStreamContext* nppStreamCtx)

Four-channel planar 32-bit signed integer quad-based perspective warp.

For common parameter descriptions, see *Common parameters for nppiWarpPerspectiveQuad planar pixel functions:*.

NppStatus **nppiWarpPerspectiveQuad_32f_C1R_Ctx**(const *Npp32f* *pSrc, *NppiSize* oSrcSize, int nSrcStep, *NppiRect* oSrcROI, const double aSrcQuad[4][2], *Npp32f* *pDst, int nDstStep, *NppiRect* oDstROI, const double aDstQuad[4][2], int eInterpolation, *NppStreamContext* nppStreamCtx)

Single-channel 32-bit floating-point quad-based perspective warp.

For common parameter descriptions, see *Common parameters for nppiWarpPerspectiveQuad packed pixel functions:*.

NppStatus **nppiWarpPerspectiveQuad_32f_C3R_Ctx**(const *Npp32f* *pSrc, *NppiSize* oSrcSize, int nSrcStep, *NppiRect* oSrcROI, const double aSrcQuad[4][2], *Npp32f* *pDst, int nDstStep, *NppiRect* oDstROI, const double aDstQuad[4][2], int eInterpolation, *NppStreamContext* nppStreamCtx)

Three-channel 32-bit floating-point quad-based perspective warp.

For common parameter descriptions, see *Common parameters for nppiWarpPerspectiveQuad packed pixel functions:*.

NppStatus **nppiWarpPerspectiveQuad_32f_C4R_Ctx**(const *Npp32f* *pSrc, *NppiSize* oSrcSize, int nSrcStep, *NppiRect* oSrcROI, const double aSrcQuad[4][2], *Npp32f* *pDst, int nDstStep, *NppiRect* oDstROI, const double aDstQuad[4][2], int eInterpolation, *NppStreamContext* nppStreamCtx)

Four-channel 32-bit floating-point quad-based perspective warp.

For common parameter descriptions, see *Common parameters for nppiWarpPerspectiveQuad packed pixel functions:*.

NppStatus **nppiWarpPerspectiveQuad_32f_AC4R_Ctx**(const *Npp32f* *pSrc, *NppiSize* oSrcSize, int nSrcStep, *NppiRect* oSrcROI, const double aSrcQuad[4][2], *Npp32f* *pDst, int nDstStep, *NppiRect* oDstROI, const double aDstQuad[4][2], int eInterpolation, *NppStreamContext* nppStreamCtx)

Four-channel 32-bit floating-point quad-based perspective warp, ignoring alpha channel.

For common parameter descriptions, see *Common parameters for nppiWarpPerspectiveQuad packed pixel functions:*.

NppStatus **nppiWarpPerspectiveQuad_32f_P3R_Ctx**(const *Npp32f* *pSrc[3], *NppiSize* oSrcSize, int nSrcStep, *NppiRect* oSrcROI, const double aSrcQuad[4][2], *Npp32f* *pDst[3], int nDstStep, *NppiRect* oDstROI, const double aDstQuad[4][2], int eInterpolation, *NppStreamContext* nppStreamCtx)

Three-channel planar 32-bit floating-point quad-based perspective warp.

For common parameter descriptions, see *Common parameters for nppiWarpPerspectiveQuad planar pixel functions:*.

NppStatus **nppiWarpPerspectiveQuad_32f_P4R_Ctx**(const *Npp32f* *pSrc[4], *NppiSize* oSrcSize, int nSrcStep, *NppiRect* oSrcROI, const double aSrcQuad[4][2], *Npp32f* *pDst[4], int nDstStep, *NppiRect* oDstROI, const double aDstQuad[4][2], int eInterpolation, *NppStreamContext* nppStreamCtx)

Four-channel planar 32-bit floating-point quad-based perspective warp.

For common parameter descriptions, see *Common parameters for nppiWarpPerspectiveQuad planar pixel functions:*.

1.12. Image Linear Transforms Functions

Linear image transformations.

These functions can be found in the nppist library. Linking to only the sub-libraries that you use can significantly save link time, application load time, and CUDA runtime startup time when using dynamic libraries.

1.12.1. Fourier Transforms

The set of Fourier transform functions available in the library.

Functions

NppStatus **nppiMagnitude_32fc32f_C1R_Ctx**(const *Npp32fc* *pSrc, int nSrcStep, *Npp32f* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

32-bit floating point complex to 32-bit floating point magnitude.

Converts complex-number pixel image to single channel image computing the result pixels as the magnitude of the complex values.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiMagnitudeSqr_32fc32f_C1R_Ctx**(const *Npp32fc* *pSrc, int nSrcStep, *Npp32f* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

32-bit floating point complex to 32-bit floating point squared magnitude.

Converts complex-number pixel image to single channel image computing the result pixels as the squared magnitude of the complex values.

The squared magnitude is an itermediate result of magnitude computation and can thus be computed faster than actual magnitude. If magnitudes are required for sorting/comparing only, using this function instead of nppiMagnitude_32fc32f_C1R can be a worthwhile performance optimization.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **nppStreamCtx** – *Application Managed Stream Context*

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

1.13. Image Morphological Operations

Morphological image operations.

Morphological operations are classified as *Neighborhood Operations*.

These functions can be found in the nppim library. Linking to only the sub-libraries that you use can significantly save link time, application load time, and CUDA runtime startup time when using dynamic libraries.

1.13.1. Dilation Functions

1.13.1.1 Image Dilate

1.13.1.1.1 Dilation

Dilation computes the output pixel as the maximum pixel value of the pixels under the mask. Pixels who's corresponding mask values are zero do not participate in the maximum search.

It is the user's responsibility to avoid *Sampling Beyond Image Boundaries*.

1.13.1.1.1.1 Common parameters for nppiDilate functions:

param pSrc
Source-Image Pointer.

param nSrcStep
Source-Image Line Step.

param pDst
Destination-Image Pointer.

param nDstStep
Destination-Image Line Step.

param oSizeROI
Region-Of-Interest (ROI).

param pMask
Device memory pointer to the start address of the mask array (non-zero values select participating pixels).

param oMaskSize
Width and Height mask array.

param oAnchor
X and Y offsets of the mask origin frame of reference w.r.t the source pixel.

param nppStreamCtx
Application Managed Stream Context.

return
Image Data Related Error Codes, *ROI Related Error Codes*

Functions

NppStatus **nppiDilate_8u_C1R_Ctx**(const *Npp8u* *pSrc, *Npp32s* nSrcStep, *Npp8u* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, const *Npp8u* *pMask, *NppiSize* oMaskSize, *NppiPoint* oAnchor, *NppStreamContext* nppStreamCtx)

Single-channel 8-bit unsigned integer dilation.

For common parameter descriptions, see *Common parameters for nppiDilate functions:*.

NppStatus **nppiDilate_8u_C3R_Ctx**(const *Npp8u* *pSrc, *Npp32s* nSrcStep, *Npp8u* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, const *Npp8u* *pMask, *NppiSize* oMaskSize, *NppiPoint* oAnchor, *NppStreamContext* nppStreamCtx)

Three-channel 8-bit unsigned integer dilation.

For common parameter descriptions, see *Common parameters for nppiDilate functions:*.

NppStatus **nppiDilate_8u_C4R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp8u* *pMask, *NppiSize* oMaskSize, *NppiPoint* oAnchor, *NppStreamContext* nppStreamCtx)

Four-channel 8-bit unsigned integer dilation.

For common parameter descriptions, see *Common parameters for nppiDilate functions:*.

NppStatus **nppiDilate_8u_AC4R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp8u* *pMask, *NppiSize* oMaskSize, *NppiPoint* oAnchor, *NppStreamContext* nppStreamCtx)

Four-channel 8-bit unsigned integer dilation, ignoring alpha-channel.

For common parameter descriptions, see *Common parameters for nppiDilate functions:*.

NppStatus **nppiDilate_16u_C1R_Ctx**(const *Npp16u* *pSrc, *Npp32s* nSrcStep, *Npp16u* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, const *Npp8u* *pMask, *NppiSize* oMaskSize, *NppiPoint* oAnchor, *NppStreamContext* nppStreamCtx)

Single-channel 16-bit unsigned integer dilation.

For common parameter descriptions, see *Common parameters for nppiDilate functions:*.

NppStatus **nppiDilate_16u_C3R_Ctx**(const *Npp16u* *pSrc, *Npp32s* nSrcStep, *Npp16u* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, const *Npp8u* *pMask, *NppiSize* oMaskSize, *NppiPoint* oAnchor, *NppStreamContext* nppStreamCtx)

Three-channel 16-bit unsigned integer dilation.

For common parameter descriptions, see *Common parameters for nppiDilate functions:*.

NppStatus **nppiDilate_16u_C4R_Ctx**(const *Npp16u* *pSrc, int nSrcStep, *Npp16u* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp8u* *pMask, *NppiSize* oMaskSize, *NppiPoint* oAnchor, *NppStreamContext* nppStreamCtx)

Four-channel 16-bit unsigned integer dilation.

For common parameter descriptions, see *Common parameters for nppiDilate functions:*.

NppStatus **nppiDilate_16u_AC4R_Ctx**(const *Npp16u* *pSrc, int nSrcStep, *Npp16u* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp8u* *pMask, *NppiSize* oMaskSize, *NppiPoint* oAnchor, *NppStreamContext* nppStreamCtx)

Four-channel 16-bit unsigned integer dilation, ignoring alpha-channel.

For common parameter descriptions, see *Common parameters for nppiDilate functions:*.

NppStatus **nppiDilate_32f_C1R_Ctx**(const *Npp32f* *pSrc, *Npp32s* nSrcStep, *Npp32f* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, const *Npp8u* *pMask, *NppiSize* oMaskSize, *NppiPoint* oAnchor, *NppStreamContext* nppStreamCtx)

Single-channel 32-bit floating-point dilation.

For common parameter descriptions, see *Common parameters for nppiDilate functions:*.

NppStatus **nppiDilate_32f_C3R_Ctx**(const *Npp32f* *pSrc, *Npp32s* nSrcStep, *Npp32f* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, const *Npp8u* *pMask, *NppiSize* oMaskSize, *NppiPoint* oAnchor, *NppStreamContext* nppStreamCtx)

Three-channel 32-bit floating-point dilation.

For common parameter descriptions, see *Common parameters for nppiDilate functions:*.

NppStatus **nppiDilate_32f_C4R_Ctx**(const *Npp32f* *pSrc, int nSrcStep, *Npp32f* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp8u* *pMask, *NppiSize* oMaskSize, *NppiPoint* oAnchor, *NppStreamContext* nppStreamCtx)

Four-channel 32-bit floating-point dilation.

For common parameter descriptions, see *Common parameters for nppiDilate functions:*.

NppStatus **nppiDilate_32f_AC4R_Ctx**(const *Npp32f* *pSrc, int nSrcStep, *Npp32f* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp8u* *pMask, *NppiSize* oMaskSize, *NppiPoint* oAnchor, *NppStreamContext* nppStreamCtx)

Four-channel 32-bit floating-point dilation, ignoring alpha-channel.

For common parameter descriptions, see *Common parameters for nppiDilate functions:*.

1.13.1.2 Image Dilate Border

1.13.1.2.1 Dilation with border control

Dilation computes the output pixel as the maximum pixel value of the pixels under the mask. Pixels who's corresponding mask values are zero do not participate in the maximum search. For gray scale dilation the mask contains signed mask values which are added to the corresponding source image sample value before determining the maximum value after clamping.

If any portion of the mask overlaps the source image boundary the requested border type operation is applied to all mask pixels which fall outside of the source image.

Currently only the NPP_BORDER_REPLICATE border type operation is supported.

1.13.1.2.1.1 Common parameters for nppiDilateBorder functions:

param pSrc
Source-Image Pointer.

param nSrcStep
Source-Image Line Step.

param oSrcSize
Source image width and height in pixels relative to pSrc.

param oSrcOffset
Source image starting point relative to pSrc.

param pDst
Destination-Image Pointer.

param nDstStep
Destination-Image Line Step.

param oSizeROI
Region-Of-Interest (ROI).

param pMask
Device memory pointer to the start address of the mask array (non-zero values select participating pixels).

param oMaskSize
Width and Height mask array.

param oAnchor
X and Y offsets of the mask origin frame of reference w.r.t the source pixel.

param eBorderType
The border type operation to be applied at source image border boundaries.

param nppStreamCtx
Application Managed Stream Context.

return
Image Data Related Error Codes, *ROI Related Error Codes*

Functions

NppStatus **nppiDilateBorder_8u_C1R_Ctx**(const *Npp8u* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp8u* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, const *Npp8u* *pMask, *NppiSize* oMaskSize, *NppiPoint* oAnchor, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Single-channel 8-bit unsigned integer dilation with border control.

For common parameter descriptions, see *Common parameters for nppiDilateBorder functions:*.

NppStatus **nppiDilateBorder_8u_C3R_Ctx**(const *Npp8u* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp8u* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, const *Npp8u* *pMask, *NppiSize* oMaskSize, *NppiPoint* oAnchor, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Three-channel 8-bit unsigned integer dilation with border control.

For common parameter descriptions, see *Common parameters for nppiDilateBorder functions:*.

NppStatus **nppiDilateBorder_8u_C4R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp8u* *pMask, *NppiSize* oMaskSize, *NppiPoint* oAnchor, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Four-channel 8-bit unsigned integer dilation with border control.

For common parameter descriptions, see *Common parameters for nppiDilateBorder functions:*.

NppStatus **nppiDilateBorder_8u_AC4R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp8u* *pMask, *NppiSize* oMaskSize, *NppiPoint* oAnchor, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Four-channel 8-bit unsigned integer dilation with border control, ignoring alpha-channel.

For common parameter descriptions, see *Common parameters for nppiDilateBorder functions:*.

NppStatus **nppiDilateBorder_16u_C1R_Ctx**(const *Npp16u* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp16u* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, const *Npp8u* *pMask, *NppiSize* oMaskSize, *NppiPoint* oAnchor, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Single-channel 16-bit unsigned integer dilation with border control.

For common parameter descriptions, see *Common parameters for nppiDilateBorder functions:*.

NppStatus **nppiDilateBorder_16u_C3R_Ctx**(const *Npp16u* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp16u* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, const *Npp8u* *pMask, *NppiSize* oMaskSize, *NppiPoint* oAnchor, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Three-channel 16-bit unsigned integer dilation with border control.

For common parameter descriptions, see *Common parameters for nppiDilateBorder functions:*.

NppStatus **nppiDilateBorder_16u_C4R_Ctx**(const *Npp16u* *pSrc, int nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp16u* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp8u* *pMask, *NppiSize* oMaskSize, *NppiPoint* oAnchor, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Four-channel 16-bit unsigned integer dilation with border control.

For common parameter descriptions, see *Common parameters for nppiDilateBorder functions:*.

NppStatus **nppiDilateBorder_16u_AC4R_Ctx**(const *Npp16u* *pSrc, int nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp16u* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp8u* *pMask, *NppiSize* oMaskSize, *NppiPoint* oAnchor, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Four-channel 16-bit unsigned integer dilation with border control, ignoring alpha-channel.

For common parameter descriptions, see *Common parameters for nppiDilateBorder functions:*.

NppStatus **nppiDilateBorder_32f_C1R_Ctx**(const *Npp32f* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp32f* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, const *Npp8u* *pMask, *NppiSize* oMaskSize, *NppiPoint* oAnchor, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Single-channel 32-bit floating-point dilation with border control.

For common parameter descriptions, see *Common parameters for nppiDilateBorder functions:*.

NppStatus **nppiDilateBorder_32f_C3R_Ctx**(const *Npp32f* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp32f* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, const *Npp8u* *pMask, *NppiSize* oMaskSize, *NppiPoint* oAnchor, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Three-channel 32-bit floating-point dilation with border control.

For common parameter descriptions, see *Common parameters for nppiDilateBorder functions:*.

NppStatus **nppiDilateBorder_32f_C4R_Ctx**(const *Npp32f* *pSrc, int nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp32f* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp8u* *pMask, *NppiSize* oMaskSize, *NppiPoint* oAnchor, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Four-channel 32-bit floating-point dilation with border control.

For common parameter descriptions, see *Common parameters for nppiDilateBorder functions:*.

NppStatus **nppiDilateBorder_32f_AC4R_Ctx**(const *Npp32f* *pSrc, int nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp32f* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp8u* *pMask, *NppiSize* oMaskSize, *NppiPoint* oAnchor, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Four-channel 32-bit floating-point dilation with border control, ignoring alpha-channel.

For common parameter descriptions, see *Common parameters for nppiDilateBorder functions:*.

NppStatus **nppiGrayDilateBorder_8u_C1R_Ctx**(const *Npp8u* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp8u* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, const *Npp32s* *pMask, *NppiSize* oMaskSize, *NppiPoint* oAnchor, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Single-channel 8-bit unsigned integer gray scale dilation with border control.

For common parameter descriptions, see *Common parameters for nppiDilateBorder functions:*.

NppStatus **nppiGrayDilateBorder_32f_C1R_Ctx**(const *Npp32f* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp32f* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, const *Npp32f* *pMask, *NppiSize* oMaskSize, *NppiPoint* oAnchor, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Single-channel 32-bit floating point gray scale dilation with border control.

For common parameter descriptions, see *Common parameters for nppiDilateBorder functions:*.

1.13.1.3 Image Dilate 3x3

1.13.1.3.1 Dilate3x3

Dilation using a 3x3 mask with the anchor at its center pixel.

It is the user's responsibility to avoid *Sampling Beyond Image Boundaries*.

1.13.1.3.1.1 Common parameters for nppiDilate3x3 functions:

param pSrc
Source-Image Pointer.

param nSrcStep
Source-Image Line Step.

param pDst
Destination-Image Pointer.

param nDstStep
Destination-Image Line Step.

param oSizeROI
Region-Of-Interest (ROI).

param nppStreamCtx
Application Managed Stream Context.

return
Image Data Related Error Codes, *ROI Related Error Codes*

Functions

NppStatus **nppiDilate3x3_8u_C1R_Ctx**(const *Npp8u* *pSrc, *Npp32s* nSrcStep, *Npp8u* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Single-channel 8-bit unsigned integer 3x3 dilation.

For common parameter descriptions, see *Common parameters for nppiDilate3x3 functions:*.

NppStatus **nppiDilate3x3_8u_C3R_Ctx**(const *Npp8u* *pSrc, *Npp32s* nSrcStep, *Npp8u* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Three-channel 8-bit unsigned integer 3x3 dilation.

For common parameter descriptions, see *Common parameters for nppiDilate3x3 functions:*.

NppStatus **nppiDilate3x3_8u_C4R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four-channel 8-bit unsigned integer 3x3 dilation.

For common parameter descriptions, see *Common parameters for nppiDilate3x3 functions:*.

NppStatus **nppiDilate3x3_8u_AC4R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four-channel 8-bit unsigned integer 3x3 dilation, ignoring alpha-channel.

For common parameter descriptions, see *Common parameters for nppiDilate3x3 functions:*.

NppStatus **nppiDilate3x3_16u_C1R_Ctx**(const *Npp16u* *pSrc, *Npp32s* nSrcStep, *Npp16u* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Single-channel 16-bit unsigned integer 3x3 dilation.

For common parameter descriptions, see *Common parameters for nppiDilate3x3 functions:*.

NppStatus **nppiDilate3x3_16u_C3R_Ctx**(const *Npp16u* *pSrc, *Npp32s* nSrcStep, *Npp16u* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Three-channel 16-bit unsigned integer 3x3 dilation.

For common parameter descriptions, see *Common parameters for nppiDilate3x3 functions:*.

NppStatus **nppiDilate3x3_16u_C4R_Ctx**(const *Npp16u* *pSrc, int nSrcStep, *Npp16u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four-channel 16-bit unsigned integer 3x3 dilation.

For common parameter descriptions, see *Common parameters for nppiDilate3x3 functions:*.

NppStatus **nppiDilate3x3_16u_AC4R_Ctx**(const *Npp16u* *pSrc, int nSrcStep, *Npp16u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four-channel 16-bit unsigned integer 3x3 dilation, ignoring alpha-channel.

For common parameter descriptions, see *Common parameters for nppiDilate3x3 functions:*.

NppStatus **nppiDilate3x3_32f_C1R_Ctx**(const *Npp32f* *pSrc, *Npp32s* nSrcStep, *Npp32f* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Single-channel 32-bit floating-point 3x3 dilation.

For common parameter descriptions, see *Common parameters for nppiDilate3x3 functions:*.

NppStatus **nppiDilate3x3_32f_C3R_Ctx**(const *Npp32f* *pSrc, *Npp32s* nSrcStep, *Npp32f* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Three-channel 32-bit floating-point 3x3 dilation.

For common parameter descriptions, see *Common parameters for nppiDilate3x3 functions:*.

NppStatus **nppiDilate3x3_32f_C4R_Ctx**(const *Npp32f* *pSrc, int nSrcStep, *Npp32f* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four-channel 32-bit floating-point 3x3 dilation.

For common parameter descriptions, see *Common parameters for nppiDilate3x3 functions:*.

NppStatus **nppiDilate3x3_32f_AC4R_Ctx**(const *Npp32f* *pSrc, int nSrcStep, *Npp32f* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four-channel 32-bit floating-point 3x3 dilation, ignoring alpha-channel.

For common parameter descriptions, see *Common parameters for nppiDilate3x3 functions:*.

NppStatus **nppiDilate3x3_64f_C1R_Ctx**(const *Npp64f* *pSrc, *Npp32s* nSrcStep, *Npp64f* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Single-channel 64-bit floating-point 3x3 dilation.

For common parameter descriptions, see *Common parameters for nppiDilate3x3 functions:*.

1.13.1.4 Image Dilate 3x3 Border

1.13.1.4.1 Dilate3x3Border

Dilation using a 3x3 mask with the anchor at its center pixel with border control.

If any portion of the mask overlaps the source image boundary the requested border type operation is applied to all mask pixels which fall outside of the source image.

Currently only the NPP_BORDER_REPLICATE border type operation is supported.

1.13.1.4.1.1 Common parameters for nppiDilate3x3Border functions:

param pSrc
Source-Image Pointer.

param nSrcStep
Source-Image Line Step.

param oSrcSize
Source image width and height in pixels relative to pSrc.

param oSrcOffset
Source image starting point relative to pSrc.

param pDst
Destination-Image Pointer.

param nDstStep
Destination-Image Line Step.

param oSizeROI
Region-Of-Interest (ROI).

param eBorderType
The border type operation to be applied at source image border boundaries.

param nppStreamCtx
Application Managed Stream Context.

return
Image Data Related Error Codes, *ROI Related Error Codes*

Functions

NppStatus **nppiDilate3x3Border_8u_C1R_Ctx**(const *Npp8u* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp8u* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Single-channel 8-bit unsigned integer 3x3 dilation with border control.

For common parameter descriptions, see *Common parameters for nppiDilate3x3Border functions:*.

NppStatus **nppiDilate3x3Border_8u_C3R_Ctx**(const *Npp8u* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp8u* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Three-channel 8-bit unsigned integer 3x3 dilation with border control.

For common parameter descriptions, see *Common parameters for nppiDilate3x3Border functions:*.

NppStatus **nppiDilate3x3Border_8u_C4R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Four-channel 8-bit unsigned integer 3x3 dilation with border control.

For common parameter descriptions, see *Common parameters for nppiDilate3x3Border functions:*.

NppStatus **nppiDilate3x3Border_8u_AC4R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Four-channel 8-bit unsigned integer 3x3 dilation with border control, ignoring alpha-channel.

For common parameter descriptions, see *Common parameters for nppiDilate3x3Border functions:*.

NppStatus **nppiDilate3x3Border_16u_C1R_Ctx**(const *Npp16u* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp16u* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Single-channel 16-bit unsigned integer 3x3 dilation with border control.

For common parameter descriptions, see *Common parameters for nppiDilate3x3Border functions:*.

NppStatus **nppiDilate3x3Border_16u_C3R_Ctx**(const *Npp16u* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp16u* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Three-channel 16-bit unsigned integer 3x3 dilation with border control.

NppStatus **nppiDilate3x3Border_16u_C4R_Ctx**(const *Npp16u* *pSrc, int nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp16u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Four-channel 16-bit unsigned integer 3x3 dilation with border control.

NppStatus **nppiDilate3x3Border_16u_AC4R_Ctx**(const *Npp16u* *pSrc, int nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp16u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Four-channel 16-bit unsigned integer 3x3 dilation with border control, ignoring alpha-channel.

NppStatus **nppiDilate3x3Border_32f_C1R_Ctx**(const *Npp32f* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp32f* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Single-channel 32-bit floating-point 3x3 dilation with border control.

For common parameter descriptions, see *Common parameters for nppiDilate3x3Border functions:*.

NppStatus **nppiDilate3x3Border_32f_C3R_Ctx**(const *Npp32f* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp32f* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Three-channel 32-bit floating-point 3x3 dilation with border control.

For common parameter descriptions, see *Common parameters for nppiDilate3x3Border functions:*.

NppStatus **nppiDilate3x3Border_32f_C4R_Ctx**(const *Npp32f* *pSrc, int nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp32f* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Four-channel 32-bit floating-point 3x3 dilation with border control.

For common parameter descriptions, see *Common parameters for nppiDilate3x3Border functions:*.

NppStatus **nppiDilate3x3Border_32f_AC4R_Ctx**(const *Npp32f* *pSrc, int nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp32f* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Four-channel 32-bit floating-point 3x3 dilation with border control, ignoring alpha-channel.

For common parameter descriptions, see *Common parameters for nppiDilate3x3Border functions:*.

1.13.2. Erosion Functions

1.13.2.1 Image Erode

1.13.2.1.1 Erode

Erosion computes the output pixel as the minimum pixel value of the pixels under the mask. Pixels who's corresponding mask values are zero do not participate in the maximum search.

It is the user's responsibility to avoid *Sampling Beyond Image Boundaries*.

1.13.2.1.1.1 Common parameters for nppiErode functions:

param pSrc
Source-Image Pointer.

param nSrcStep
Source-Image Line Step.

param pDst
Destination-Image Pointer.

param nDstStep
Destination-Image Line Step.

param oSizeROI
Region-Of-Interest (ROI).

param pMask
Device memory pointer to the start address of the mask array (non-zero values select participating pixels).

param oMaskSize
Width and Height mask array.

param oAnchor
X and Y offsets of the mask origin frame of reference w.r.t the source pixel.

param nppStreamCtx
Application Managed Stream Context.

return
Image Data Related Error Codes, *ROI Related Error Codes*

Functions

NppStatus **nppiErode_8u_C1R_Ctx**(const *Npp8u* *pSrc, *Npp32s* nSrcStep, *Npp8u* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, const *Npp8u* *pMask, *NppiSize* oMaskSize, *NppiPoint* oAnchor, *NppStreamContext* nppStreamCtx)

Single-channel 8-bit unsigned integer erosion.

For common parameter descriptions, see *Common parameters for nppiErode functions:*.

NppStatus **nppiErode_8u_C3R_Ctx**(const *Npp8u* *pSrc, *Npp32s* nSrcStep, *Npp8u* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, const *Npp8u* *pMask, *NppiSize* oMaskSize, *NppiPoint* oAnchor, *NppStreamContext* nppStreamCtx)

Three-channel 8-bit unsigned integer erosion.

For common parameter descriptions, see *Common parameters for nppiErode functions:*.

NppStatus **nppiErode_8u_C4R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp8u* *pMask, *NppiSize* oMaskSize, *NppiPoint* oAnchor, *NppStreamContext* nppStreamCtx)

Four-channel 8-bit unsigned integer erosion.

For common parameter descriptions, see *Common parameters for nppiErode functions:*.

NppStatus **nppiErode_8u_AC4R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp8u* *pMask, *NppiSize* oMaskSize, *NppiPoint* oAnchor, *NppStreamContext* nppStreamCtx)

Four-channel 8-bit unsigned integer erosion, ignoring alpha-channel.

For common parameter descriptions, see *Common parameters for nppiErode functions:*.

NppStatus **nppiErode_16u_C1R_Ctx**(const *Npp16u* *pSrc, *Npp32s* nSrcStep, *Npp16u* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, const *Npp8u* *pMask, *NppiSize* oMaskSize, *NppiPoint* oAnchor, *NppStreamContext* nppStreamCtx)

Single-channel 16-bit unsigned integer erosion.

For common parameter descriptions, see *Common parameters for nppiErode functions:*.

NppStatus **nppiErode_16u_C3R_Ctx**(const *Npp16u* *pSrc, *Npp32s* nSrcStep, *Npp16u* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, const *Npp8u* *pMask, *NppiSize* oMaskSize, *NppiPoint* oAnchor, *NppStreamContext* nppStreamCtx)

Three-channel 16-bit unsigned integer erosion.

NppStatus **nppiErode_16u_C4R_Ctx**(const *Npp16u* *pSrc, int nSrcStep, *Npp16u* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp8u* *pMask, *NppiSize* oMaskSize, *NppiPoint* oAnchor, *NppStreamContext* nppStreamCtx)

Four-channel 16-bit unsigned integer erosion.

For common parameter descriptions, see *Common parameters for nppiErode functions:*.

NppStatus **nppiErode_16u_AC4R_Ctx**(const *Npp16u* *pSrc, int nSrcStep, *Npp16u* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp8u* *pMask, *NppiSize* oMaskSize, *NppiPoint* oAnchor, *NppStreamContext* nppStreamCtx)

Four-channel 16-bit unsigned integer erosion, ignoring alpha-channel.

For common parameter descriptions, see *Common parameters for nppiErode functions:*.

NppStatus **nppiErode_32f_C1R_Ctx**(const *Npp32f* *pSrc, *Npp32s* nSrcStep, *Npp32f* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, const *Npp8u* *pMask, *NppiSize* oMaskSize, *NppiPoint* oAnchor, *NppStreamContext* nppStreamCtx)

Single-channel 32-bit floating-point erosion.

For common parameter descriptions, see *Common parameters for nppiErode functions:*.

NppStatus **nppiErode_32f_C3R_Ctx**(const *Npp32f* *pSrc, *Npp32s* nSrcStep, *Npp32f* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, const *Npp8u* *pMask, *NppiSize* oMaskSize, *NppiPoint* oAnchor, *NppStreamContext* nppStreamCtx)

Three-channel 32-bit floating-point erosion.

For common parameter descriptions, see *Common parameters for nppiErode functions:*.

NppStatus **nppiErode_32f_C4R_Ctx**(const *Npp32f* *pSrc, int nSrcStep, *Npp32f* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp8u* *pMask, *NppiSize* oMaskSize, *NppiPoint* oAnchor, *NppStreamContext* nppStreamCtx)

Four-channel 32-bit floating-point erosion.

For common parameter descriptions, see *Common parameters for nppiErode functions:*.

NppStatus **nppiErode_32f_AC4R_Ctx**(const *Npp32f* *pSrc, int nSrcStep, *Npp32f* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp8u* *pMask, *NppiSize* oMaskSize, *NppiPoint* oAnchor, *NppStreamContext* nppStreamCtx)

Four-channel 32-bit floating-point erosion, ignoring alpha-channel.

For common parameter descriptions, see *Common parameters for nppiErode functions:*.

1.13.2.2 Image Erode Border

1.13.2.2.1 Erosion with border control

Erosion computes the output pixel as the minimum pixel value of the pixels under the mask. Pixels who's corresponding mask values are zero do not participate in the minimum search. For gray scale erosion the mask contains signed mask values which are added to the corresponding source image sample value before determining the minimum value after clamping.

If any portion of the mask overlaps the source image boundary the requested border type operation is applied to all mask pixels which fall outside of the source image.

Currently only the NPP_BORDER_REPLICATE border type operation is supported.

1.13.2.2.1.1 Common parameters for nppiErodeBorder functions:

param pSrc
Source-Image Pointer.

param nSrcStep
Source-Image Line Step.

param oSrcSize
Source image width and height in pixels relative to pSrc.

param oSrcOffset
Source image starting point relative to pSrc.

param pDst
Destination-Image Pointer.

param nDstStep
Destination-Image Line Step.

param oSizeROI
Region-Of-Interest (ROI).

param pMask
Device memory pointer to the start address of the mask array (non-zero values select participating pixels).

param oMaskSize
Width and Height mask array.

param oAnchor
X and Y offsets of the mask origin frame of reference w.r.t the source pixel.

param eBorderType
The border type operation to be applied at source image border boundaries.

param nppStreamCtx
Application Managed Stream Context.

return
Image Data Related Error Codes, *ROI Related Error Codes*

Functions

NppStatus **nppiErodeBorder_8u_C1R_Ctx**(const *Npp8u* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp8u* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, const *Npp8u* *pMask, *NppiSize* oMaskSize, *NppiPoint* oAnchor, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Single-channel 8-bit unsigned integer erosion with border control.

For common parameter descriptions, see *Common parameters for nppiErodeBorder functions:*.

NppStatus **nppiErodeBorder_8u_C3R_Ctx**(const *Npp8u* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp8u* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, const *Npp8u* *pMask, *NppiSize* oMaskSize, *NppiPoint* oAnchor, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Three-channel 8-bit unsigned integer erosion with border control.

For common parameter descriptions, see *Common parameters for nppiErodeBorder functions:*.

NppStatus **nppiErodeBorder_8u_C4R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp8u* *pMask, *NppiSize* oMaskSize, *NppiPoint* oAnchor, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Four-channel 8-bit unsigned integer erosion with border control.

For common parameter descriptions, see *Common parameters for nppiErodeBorder functions:*.

NppStatus **nppiErodeBorder_8u_AC4R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp8u* *pMask, *NppiSize* oMaskSize, *NppiPoint* oAnchor, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Four-channel 8-bit unsigned integer erosion with border control, ignoring alpha-channel.

For common parameter descriptions, see *Common parameters for nppiErodeBorder functions:*.

NppStatus **nppiErodeBorder_16u_C1R_Ctx**(const *Npp16u* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp16u* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, const *Npp8u* *pMask, *NppiSize* oMaskSize, *NppiPoint* oAnchor, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Single-channel 16-bit unsigned integer erosion with border control.

For common parameter descriptions, see *Common parameters for nppiErodeBorder functions:*.

NppStatus **nppiErodeBorder_16u_C3R_Ctx**(const *Npp16u* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp16u* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, const *Npp8u* *pMask, *NppiSize* oMaskSize, *NppiPoint* oAnchor, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Three-channel 16-bit unsigned integer erosion with border control.

For common parameter descriptions, see *Common parameters for nppiErodeBorder functions:*.

NppStatus **nppiErodeBorder_16u_C4R_Ctx**(const *Npp16u* *pSrc, int nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp16u* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp8u* *pMask, *NppiSize* oMaskSize, *NppiPoint* oAnchor, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Four-channel 16-bit unsigned integer erosion with border control.

For common parameter descriptions, see *Common parameters for nppiErodeBorder functions:*.

NppStatus **nppiErodeBorder_16u_AC4R_Ctx**(const *Npp16u* *pSrc, int nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp16u* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp8u* *pMask, *NppiSize* oMaskSize, *NppiPoint* oAnchor, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Four-channel 16-bit unsigned integer erosion with border control, ignoring alpha-channel.

For common parameter descriptions, see *Common parameters for nppiErodeBorder functions:*.

NppStatus **nppiErodeBorder_32f_C1R_Ctx**(const *Npp32f* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp32f* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, const *Npp8u* *pMask, *NppiSize* oMaskSize, *NppiPoint* oAnchor, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Single-channel 32-bit floating-point erosion with border control.

For common parameter descriptions, see *Common parameters for nppiErodeBorder functions:*.

NppStatus **nppiErodeBorder_32f_C3R_Ctx**(const *Npp32f* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp32f* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, const *Npp8u* *pMask, *NppiSize* oMaskSize, *NppiPoint* oAnchor, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Three-channel 32-bit floating-point erosion with border control.

For common parameter descriptions, see *Common parameters for nppiErodeBorder functions:*.

NppStatus **nppiErodeBorder_32f_C4R_Ctx**(const *Npp32f* *pSrc, int nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp32f* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp8u* *pMask, *NppiSize* oMaskSize, *NppiPoint* oAnchor, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Four-channel 32-bit floating-point erosion with border control.

For common parameter descriptions, see *Common parameters for nppiErodeBorder functions:*.

NppStatus **nppiErodeBorder_32f_AC4R_Ctx**(const *Npp32f* *pSrc, int nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp32f* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp8u* *pMask, *NppiSize* oMaskSize, *NppiPoint* oAnchor, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Four-channel 32-bit floating-point erosion with border control, ignoring alpha-channel.

For common parameter descriptions, see *Common parameters for nppiErodeBorder functions:*.

NppStatus **nppiGrayErodeBorder_8u_C1R_Ctx**(const *Npp8u* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp8u* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, const *Npp32s* *pMask, *NppiSize* oMaskSize, *NppiPoint* oAnchor, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Single-channel 8-bit unsigned integer gray scale erosion with border control.

For common parameter descriptions, see *Common parameters for nppiErodeBorder functions:*.

NppStatus **nppiGrayErodeBorder_32f_C1R_Ctx**(const *Npp32f* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp32f* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, const *Npp32f* *pMask, *NppiSize* oMaskSize, *NppiPoint* oAnchor, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Single-channel 32-bit floating point gray scale erosion with border control.

For common parameter descriptions, see *Common parameters for nppiErodeBorder functions:*.

1.13.2.3 Image Erode 3x3

1.13.2.3.1 Erode3x3

Erosion using a 3x3 mask with the anchor at its center pixel.

It is the user's responsibility to avoid *Sampling Beyond Image Boundaries*.

1.13.2.3.1.1 Common parameters for nppiErode3x3 functions:

param pSrc
Source-Image Pointer.

param nSrcStep
Source-Image Line Step.

param pDst
Destination-Image Pointer.

param nDstStep
Destination-Image Line Step.

param oSizeROI
Region-Of-Interest (ROI).

param nppStreamCtx
Application Managed Stream Context.

return
Image Data Related Error Codes, *ROI Related Error Codes*

Functions

NppStatus **nppiErode3x3_8u_C1R_Ctx**(const *Npp8u* *pSrc, *Npp32s* nSrcStep, *Npp8u* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Single-channel 8-bit unsigned integer 3x3 erosion.

For common parameter descriptions, see *Common parameters for nppiErode3x3 functions:*.

NppStatus **nppiErode3x3_8u_C3R_Ctx**(const *Npp8u* *pSrc, *Npp32s* nSrcStep, *Npp8u* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Three-channel 8-bit unsigned integer 3x3 erosion.

For common parameter descriptions, see *Common parameters for nppiErode3x3 functions:*.

NppStatus **nppiErode3x3_8u_C4R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four-channel 8-bit unsigned integer 3x3 erosion.

For common parameter descriptions, see *Common parameters for nppiErode3x3 functions:*.

NppStatus **nppiErode3x3_8u_AC4R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four-channel 8-bit unsigned integer 3x3 erosion, ignoring alpha-channel.

For common parameter descriptions, see *Common parameters for nppiErode3x3 functions:*.

NppStatus **nppiErode3x3_16u_C1R_Ctx**(const *Npp16u* *pSrc, *Npp32s* nSrcStep, *Npp16u* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Single-channel 16-bit unsigned integer 3x3 erosion.

For common parameter descriptions, see *Common parameters for nppiErode3x3 functions:*.

NppStatus **nppiErode3x3_16u_C3R_Ctx**(const *Npp16u* *pSrc, *Npp32s* nSrcStep, *Npp16u* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Three-channel 16-bit unsigned integer 3x3 erosion.

For common parameter descriptions, see *Common parameters for nppiErode3x3 functions:*.

NppStatus **nppiErode3x3_16u_C4R_Ctx**(const *Npp16u* *pSrc, int nSrcStep, *Npp16u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four-channel 16-bit unsigned integer 3x3 erosion.

For common parameter descriptions, see *Common parameters for nppiErode3x3 functions:*.

NppStatus **nppiErode3x3_16u_AC4R_Ctx**(const *Npp16u* *pSrc, int nSrcStep, *Npp16u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four-channel 16-bit unsigned integer 3x3 erosion, ignoring alpha-channel.

For common parameter descriptions, see *Common parameters for nppiErode3x3 functions:*.

NppStatus **nppiErode3x3_32f_C1R_Ctx**(const *Npp32f* *pSrc, *Npp32s* nSrcStep, *Npp32f* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Single-channel 32-bit floating-point 3x3 erosion.

For common parameter descriptions, see *Common parameters for nppiErode3x3 functions:*.

NppStatus **nppiErode3x3_32f_C3R_Ctx**(const *Npp32f* *pSrc, *Npp32s* nSrcStep, *Npp32f* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Three-channel 32-bit floating-point 3x3 erosion.

For common parameter descriptions, see *Common parameters for nppiErode3x3 functions:*.

NppStatus **nppiErode3x3_32f_C4R_Ctx**(const *Npp32f* *pSrc, int nSrcStep, *Npp32f* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four-channel 32-bit floating-point 3x3 erosion.

For common parameter descriptions, see *Common parameters for nppiErode3x3 functions:*.

NppStatus **nppiErode3x3_32f_AC4R_Ctx**(const *Npp32f* *pSrc, int nSrcStep, *Npp32f* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four-channel 32-bit floating-point 3x3 erosion, ignoring alpha-channel.

For common parameter descriptions, see *Common parameters for nppiErode3x3 functions:*.

NppStatus **nppiErode3x3_64f_C1R_Ctx**(const *Npp64f* *pSrc, *Npp32s* nSrcStep, *Npp64f* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Single-channel 64-bit floating-point 3x3 erosion.

For common parameter descriptions, see *Common parameters for nppiErode3x3 functions:*.

1.13.2.4 Image Erode 3x3 Border

1.13.2.4.1 Erode3x3Border

Erosion using a 3x3 mask with the anchor at its center pixel with border control.

If any portion of the mask overlaps the source image boundary the requested border type operation is applied to all mask pixels which fall outside of the source image.

Currently only the NPP_BORDER_REPLICATE border type operation is supported.

1.13.2.4.1.1 Common parameters for nppiErode3x3Border functions:

param pSrc
Source-Image Pointer.

param nSrcStep
Source-Image Line Step.

param oSrcSize
Source image width and height in pixels relative to pSrc.

param oSrcOffset
Source image starting point relative to pSrc.

param pDst
Destination-Image Pointer.

param nDstStep
Destination-Image Line Step.

param oSizeROI
Region-Of-Interest (ROI).

param eBorderType
The border type operation to be applied at source image border boundaries.

param nppStreamCtx
Application Managed Stream Context.

return
Image Data Related Error Codes, *ROI Related Error Codes*

Functions

NppStatus **nppiErode3x3Border_8u_C1R_Ctx**(const *Npp8u* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp8u* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Single-channel 8-bit unsigned integer 3x3 erosion with border control.

For common parameter descriptions, see *Common parameters for nppiErode3x3Border functions:*.

NppStatus **nppiErode3x3Border_8u_C3R_Ctx**(const *Npp8u* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp8u* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Three-channel 8-bit unsigned integer 3x3 erosion with border control.

For common parameter descriptions, see *Common parameters for nppiErode3x3Border functions:*.

NppStatus **nppiErode3x3Border_8u_C4R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Four-channel 8-bit unsigned integer 3x3 erosion with border control.

For common parameter descriptions, see *Common parameters for nppiErode3x3Border functions:*.

NppStatus **nppiErode3x3Border_8u_AC4R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Four-channel 8-bit unsigned integer 3x3 erosion with border control, ignoring alpha-channel.

For common parameter descriptions, see *Common parameters for nppiErode3x3Border functions:*.

NppStatus **nppiErode3x3Border_16u_C1R_Ctx**(const *Npp16u* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp16u* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Single-channel 16-bit unsigned integer 3x3 erosion with border control.

For common parameter descriptions, see *Common parameters for nppiErode3x3Border functions:*.

NppStatus **nppiErode3x3Border_16u_C3R_Ctx**(const *Npp16u* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp16u* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Three-channel 16-bit unsigned integer 3x3 erosion with border control.

For common parameter descriptions, see *Common parameters for nppiErode3x3Border functions:*.

NppStatus **nppiErode3x3Border_16u_C4R_Ctx**(const *Npp16u* *pSrc, int nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp16u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Four-channel 16-bit unsigned integer 3x3 erosion with border control.

For common parameter descriptions, see *Common parameters for nppiErode3x3Border functions:*.

NppStatus **nppiErode3x3Border_16u_AC4R_Ctx**(const *Npp16u* *pSrc, int nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp16u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Four-channel 16-bit unsigned integer 3x3 erosion with border control, ignoring alpha-channel.

For common parameter descriptions, see *Common parameters for nppiErode3x3Border functions:*.

NppStatus **nppiErode3x3Border_32f_C1R_Ctx**(const *Npp32f* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp32f* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Single-channel 32-bit floating-point 3x3 erosion with border control.

For common parameter descriptions, see *Common parameters for nppiErode3x3Border functions:*.

NppStatus **nppiErode3x3Border_32f_C3R_Ctx**(const *Npp32f* *pSrc, *Npp32s* nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp32f* *pDst, *Npp32s* nDstStep, *NppiSize* oSizeROI, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Three-channel 32-bit floating-point 3x3 erosion with border control.

For common parameter descriptions, see *Common parameters for nppiErode3x3Border functions:*.

NppStatus **nppiErode3x3Border_32f_C4R_Ctx**(const *Npp32f* *pSrc, int nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp32f* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Four-channel 32-bit floating-point 3x3 erosion with border control.

For common parameter descriptions, see *Common parameters for nppiErode3x3Border functions:*.

NppStatus **nppiErode3x3Border_32f_AC4R_Ctx**(const *Npp32f* *pSrc, int nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp32f* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

Four-channel 32-bit floating-point 3x3 erosion with border control, ignoring alpha-channel.

For common parameter descriptions, see *Common parameters for nppiErode3x3Border functions:*.

1.13.3. Image Complex Morphphological Operations

1.13.3.1 Image Morph

1.13.3.1.1 ComplexImageMorphology

Complex image morphological operations.

1.13.3.2 Image Morph Get Buffer Size

1.13.3.2.1 MorphGetBufferSize

Before calling any of the MorphCloseBorder, MorphOpenBorder, MorphTopHatBorder, MorphBlackHatBorder, or MorphGradientBorder functions the application first needs to call the corresponding MorphGetBufferSize to determine the amount of device memory to allocate as a working buffer. The application allocated device memory is then passed as the pBuffer parameter to the corresponding MorphXXXBorder function.

1.13.3.2.1.1 Common parameters for nppiMorphGetBufferSize functions:

param oSizeROI
Region-Of-Interest (ROI).

param hpBufferSize
Required buffer size in bytes.

Functions

NppStatus **nppiMorphGetBufferSize_8u_C1R**(*NppiSize* oSizeROI, int *hpBufferSize)

Calculate scratch buffer size needed for 1 channel 8-bit unsigned integer MorphCloseBorder, MorphOpenBorder, MorphTopHatBorder, MorphBlackHatBorder, or MorphGradientBorder function based on destination image oSizeROI width and height.

For common parameter descriptions, see *Common parameters for nppiMorphGetBufferSize functions:*.

NppStatus **nppiMorphGetBufferSize_8u_C3R**(*NppiSize* oSizeROI, int *hpBufferSize)

Calculate scratch buffer size needed for 3 channel 8-bit unsigned integer MorphCloseBorder, MorphOpenBorder, MorphTopHatBorder, MorphBlackHatBorder or MorphGradientBorder function based on destination image oSizeROI width and height.

For common parameter descriptions, see *Common parameters for nppiMorphGetBufferSize functions:*.

NppStatus **nppiMorphGetBufferSize_8u_C4R**(*NppiSize* oSizeROI, int *hpBufferSize)

Calculate scratch buffer size needed for 4 channel 8-bit unsigned integer MorphCloseBorder, MorphOpenBorder, MorphTopHatBorder, MorphBlackHatBorder, or MorphGradientBorder function based on destination image oSizeROI width and height.

For common parameter descriptions, see *Common parameters for nppiMorphGetBufferSize functions:*.

NppStatus **nppiMorphGetBufferSize_16u_C1R**(*NppiSize* oSizeROI, int *hpBufferSize)

Calculate scratch buffer size needed for 1 channel 16-bit unsigned integer MorphCloseBorder, MorphOpenBorder, MorphTopHatBorder, MorphBlackHatBorder, or MorphGradientBorder function based on destination image oSizeROI width and height.

For common parameter descriptions, see *Common parameters for nppiMorphGetBufferSize functions:*.

NppStatus **nppiMorphGetBufferSize_16s_C1R**(*NppiSize* oSizeROI, int *hpBufferSize)

Calculate scratch buffer size needed for 1 channel 16-bit signed integer MorphCloseBorder, MorphOpenBorder, MorphTopHatBorder, MorphBlackHatBorder, or MorphGradientBorder function based on destination image oSizeROI width and height.

For common parameter descriptions, see *Common parameters for nppiMorphGetBufferSize functions:*.

NppStatus **nppiMorphGetBufferSize_32f_C1R**(*NppiSize* oSizeROI, int *hpBufferSize)

Calculate scratch buffer size needed for 1 channel 32-bit floating point MorphCloseBorder, MorphOpenBorder, MorphTopHatBorder, MorphBlackHatBorder, or MorphGradientBorder function based on destination image oSizeROI width and height.

For common parameter descriptions, see *Common parameters for nppiMorphGetBufferSize functions:*.

NppStatus **nppiMorphGetBufferSize_32f_C3R**(*NppiSize* oSizeROI, int *hpBufferSize)

Calculate scratch buffer size needed for 3 channel 32-bit floating point MorphCloseBorder, MorphOpenBorder, MorphTopHatBorder, MorphBlackHatBorder, or MorphGradientBorder function based on destination image oSizeROI width and height.

For common parameter descriptions, see *Common parameters for nppiMorphGetBufferSize functions:*.

NppStatus **nppiMorphGetBufferSize_32f_C4R**(*NppiSize* oSizeROI, int *hpBufferSize)

Calculate scratch buffer size needed for 4 channel 32-bit floating point MorphCloseBorder, MorphOpenBorder, MorphTopHatBorder, MorphBlackHatBorder, or MorphGradientBorder function based on destination image oSizeROI width and height.

For common parameter descriptions, see *Common parameters for nppiMorphGetBufferSize functions:*.

1.13.3.3 Image Morph Close Border

1.13.3.3.1 MorphCloseBorder

Dilation followed by Erosion with border control.

Morphological close computes the output pixel as the maximum pixel value of the pixels under the mask followed by a second pass using the result of the first pass as input which outputs the minimum pixel value of the pixels under the same mask. Pixels who's corresponding mask values are zero do not participate in the maximum or minimum search.

If any portion of the mask overlaps the source image boundary the requested border type operation is applied to all mask pixels which fall outside of the source image. The mask is centered over the source image pixel being tested.

Before calling any of the MorphCloseBorder functions the application first needs to call the corresponding MorphGetBufferSize to determine the amount of device memory to allocate as a working buffer. The allocated device memory is then passed as the pBuffer parameter to the corresponding MorphCloseBorder function.

Use the oSrcOffset and oSrcSize parameters to control where the border control operation is applied to the source image ROI borders.

Currently only the NPP_BORDER_REPLICATE border type operation is supported.

1.13.3.3.1.1 Common parameters for nppiMorphCloseBorder functions:

param pSrc
Source-Image Pointer.

param nSrcStep
Source-Image Line Step.

param oSrcSize
Source image width and height in pixels relative to pSrc.

param oSrcOffset
Source image starting point relative to pSrc.

param pDst
Destination-Image Pointer.

param nDstStep
Destination-Image Line Step.

param oSizeROI
Region-Of-Interest (ROI).

param pMask
Device memory pointer to the start address of the mask array (non-zero values select participating pixels).

param oMaskSize
Width and Height mask array.

param oAnchor
X and Y offsets of the mask origin frame of reference w.r.t the source pixel.

param pBuffer
Pointer to device memory scratch buffer at least as large as value returned by the corresponding MorphGetBufferSize call.

param eBorderType
The border type operation to be applied at source image border boundaries.

param nppStreamCtx
Application Managed Stream Context.

return
Image Data Related Error Codes, *ROI Related Error Codes*

Functions

NppStatus **nppiMorphCloseBorder_8u_C1R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp8u* *pMask, *NppiSize* oMaskSize, *NppiPoint* oAnchor, *Npp8u* *pBuffer, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

1 channel 8-bit unsigned integer morphological close with border control.

For common parameter descriptions, see *Common parameters for nppiMorphCloseBorder functions:*.

NppStatus **nppiMorphCloseBorder_8u_C3R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp8u* *pMask, *NppiSize* oMaskSize, *NppiPoint* oAnchor, *Npp8u* *pBuffer, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

3 channel 8-bit unsigned integer morphological close with border control.

For common parameter descriptions, see *Common parameters for nppiMorphCloseBorder functions:*.

NppStatus **nppiMorphCloseBorder_8u_C4R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp8u* *pMask, *NppiSize* oMaskSize, *NppiPoint* oAnchor, *Npp8u* *pBuffer, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

4 channel 8-bit unsigned integer morphological close with border control.

For common parameter descriptions, see *Common parameters for nppiMorphCloseBorder functions:*.

NppStatus **nppiMorphCloseBorder_16u_C1R_Ctx**(const *Npp16u* *pSrc, int nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp16u* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp8u* *pMask, *NppiSize* oMaskSize, *NppiPoint* oAnchor, *Npp8u* *pBuffer, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

1 channel 16-bit unsigned integer morphological close with border control.

For common parameter descriptions, see *Common parameters for nppiMorphCloseBorder functions:*.

NppStatus **nppiMorphCloseBorder_16s_C1R_Ctx**(const *Npp16s* *pSrc, int nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp16s* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp8u* *pMask, *NppiSize* oMaskSize, *NppiPoint* oAnchor, *Npp8u* *pBuffer, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

1 channel 16-bit signed integer morphological close with border control.

For common parameter descriptions, see *Common parameters for nppiMorphCloseBorder functions:*.

NppStatus **nppiMorphCloseBorder_32f_C1R_Ctx**(const *Npp32f* *pSrc, int nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp32f* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp8u* *pMask, *NppiSize* oMaskSize, *NppiPoint* oAnchor, *Npp8u* *pBuffer, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

1 channel 32-bit floating point morphological close with border control.

For common parameter descriptions, see *Common parameters for nppiMorphCloseBorder functions:*.

NppStatus **nppiMorphCloseBorder_32f_C3R_Ctx**(const *Npp32f* *pSrc, int nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp32f* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp8u* *pMask, *NppiSize* oMaskSize, *NppiPoint* oAnchor, *Npp8u* *pBuffer, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

3 channel 32-bit floating point morphological close with border control.

For common parameter descriptions, see *Common parameters for nppiMorphCloseBorder functions:*.

NppStatus **nppiMorphCloseBorder_32f_C4R_Ctx**(const *Npp32f* *pSrc, int nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp32f* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp8u* *pMask, *NppiSize* oMaskSize, *NppiPoint* oAnchor, *Npp8u* *pBuffer, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

4 channel 32-bit floating point morphological close with border control.

For common parameter descriptions, see *Common parameters for nppiMorphCloseBorder functions:*.

1.13.3.4 Image Morph Open Border

1.13.3.4.1 MorphOpenBorder

Erosion followed by Dilation with border control.

Morphological open computes the output pixel as the minimum pixel value of the pixels under the mask followed by a second pass using the result of the first pass as input which outputs the maximum pixel value of the pixels under the same mask. Pixels who's corresponding mask values are zero do not participate in the minimum or maximum search.

If any portion of the mask overlaps the source image boundary the requested border type operation is applied to all mask pixels which fall outside of the source image. The mask is centered over the source image pixel being tested.

Before calling any of the MorphOpenBorder functions the application first needs to call the corresponding MorphGetBufferSize to determine the amount of device memory to allocate as a working buffer. The allocated device memory is then passed as the pBuffer parameter to the corresponding MorphOpenBorder function.

Use the oSrcOffset and oSrcSize parameters to control where the border control operation is applied to the source image ROI borders.

Currently only the NPP_BORDER_REPLICATE border type operation is supported.

1.13.3.4.1.1 Common parameters for nppiMorphOpenBorder functions:

param pSrc
Source-Image Pointer.

param nSrcStep
Source-Image Line Step.

param oSrcSize
Source image width and height in pixels relative to pSrc.

param oSrcOffset
Source image starting point relative to pSrc.

param pDst
Destination-Image Pointer.

param nDstStep
Destination-Image Line Step.

param oSizeROI
Region-Of-Interest (ROI).

param pMask
Device memory pointer to the start address of the mask array (non-zero values select participating pixels).

param oMaskSize
Width and Height mask array.

param oAnchor
X and Y offsets of the mask origin frame of reference w.r.t the source pixel.

param pBuffer
Pointer to device memory scratch buffer at least as large as value returned by the corresponding MorphGetBufferSize call.

param eBorderType
The border type operation to be applied at source image border boundaries.

param nppStreamCtx
Application Managed Stream Context.

return
Image Data Related Error Codes, *ROI Related Error Codes*

Functions

NppStatus **nppiMorphOpenBorder_8u_C1R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp8u* *pMask, *NppiSize* oMaskSize, *NppiPoint* oAnchor, *Npp8u* *pBuffer, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

1 channel 8-bit unsigned integer morphological open with border control.

For common parameter descriptions, see *Common parameters for nppiMorphOpenBorder functions:*.

NppStatus **nppiMorphOpenBorder_8u_C3R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp8u* *pMask, *NppiSize* oMaskSize, *NppiPoint* oAnchor, *Npp8u* *pBuffer, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

3 channel 8-bit unsigned integer morphological open with border control.

For common parameter descriptions, see *Common parameters for nppiMorphOpenBorder functions:*.

NppStatus **nppiMorphOpenBorder_8u_C4R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp8u* *pMask, *NppiSize* oMaskSize, *NppiPoint* oAnchor, *Npp8u* *pBuffer, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

4 channel 8-bit unsigned integer morphological open with border control.

For common parameter descriptions, see *Common parameters for nppiMorphOpenBorder functions:*.

NppStatus **nppiMorphOpenBorder_16u_C1R_Ctx**(const *Npp16u* *pSrc, int nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp16u* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp8u* *pMask, *NppiSize* oMaskSize, *NppiPoint* oAnchor, *Npp8u* *pBuffer, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

1 channel 16-bit unsigned integer morphological open with border control.

For common parameter descriptions, see *Common parameters for nppiMorphOpenBorder functions:*.

NppStatus **nppiMorphOpenBorder_16s_C1R_Ctx**(const *Npp16s* *pSrc, int nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp16s* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp8u* *pMask, *NppiSize* oMaskSize, *NppiPoint* oAnchor, *Npp8u* *pBuffer, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

1 channel 16-bit signed integer morphological open with border control.

For common parameter descriptions, see *Common parameters for nppiMorphOpenBorder functions:*.

NppStatus **nppiMorphOpenBorder_32f_C1R_Ctx**(const *Npp32f* *pSrc, int nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp32f* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp8u* *pMask, *NppiSize* oMaskSize, *NppiPoint* oAnchor, *Npp8u* *pBuffer, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

1 channel 32-bit floating point morphological open with border control.

For common parameter descriptions, see *Common parameters for nppiMorphOpenBorder functions:*.

NppStatus **nppiMorphOpenBorder_32f_C3R_Ctx**(const *Npp32f* *pSrc, int nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp32f* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp8u* *pMask, *NppiSize* oMaskSize, *NppiPoint* oAnchor, *Npp8u* *pBuffer, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

3 channel 32-bit floating point morphological open with border control.

For common parameter descriptions, see *Common parameters for nppiMorphOpenBorder functions:*.

NppStatus **nppiMorphOpenBorder_32f_C4R_Ctx**(const *Npp32f* *pSrc, int nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp32f* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp8u* *pMask, *NppiSize* oMaskSize, *NppiPoint* oAnchor, *Npp8u* *pBuffer, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

4 channel 32-bit floating point morphological open with border control.

For common parameter descriptions, see *Common parameters for nppiMorphOpenBorder functions:*.

1.13.3.5 Image Morph Top Hat Border

1.13.3.5.1 MorphToHatBorder

Source pixel minus the morphological open pixel result with border control.

Morphological top hat computes the output pixel as the source pixel minus the morphological open result of the pixels under the mask. Pixels who's corresponding mask values are zero do not participate in the maximum or minimum search.

If any portion of the mask overlaps the source image boundary the requested border type operation is applied to all mask pixels which fall outside of the source image. The mask is centered over the source image pixel being tested.

Before calling any of the MorphTopHatBorder functions the application first needs to call the corresponding MorphGetBufferSize to determine the amount of device memory to allocate as a working buffer. The allocated device memory is then passed as the pBuffer parameter to the corresponding MorphTopHatBorder function.

Use the oSrcOffset and oSrcSize parameters to control where the border control operation is applied to the source image ROI borders.

Currently only the NPP_BORDER_REPLICATE border type operation is supported.

1.13.3.5.1.1 Common parameters for nppiMorphTopHatBorder functions:

param pSrc
Source-Image Pointer.

param nSrcStep
Source-Image Line Step.

param oSrcSize
Source image width and height in pixels relative to pSrc.

param oSrcOffset
Source image starting point relative to pSrc.

param pDst
Destination-Image Pointer.

param nDstStep
Destination-Image Line Step.

param oSizeROI
Region-Of-Interest (ROI).

param pMask
Device memory pointer to the start address of the mask array (non-zero values select participating pixels).

param oMaskSize
Width and Height mask array.

param oAnchor
X and Y offsets of the mask origin frame of reference w.r.t the source pixel.

param pBuffer
Pointer to device memory scratch buffer at least as large as value returned by the corresponding MorphGetBufferSize call.

param eBorderType
The border type operation to be applied at source image border boundaries.

param nppStreamCtx
Application Managed Stream Context.

return
Image Data Related Error Codes, *ROI Related Error Codes*

Functions

NppStatus **nppiMorphTopHatBorder_8u_C1R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp8u* *pMask, *NppiSize* oMaskSize, *NppiPoint* oAnchor, *Npp8u* *pBuffer, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

1 channel 8-bit unsigned integer morphological top hat with border control.

For common parameter descriptions, see *Common parameters for nppiMorphTopHatBorder functions:*.

NppStatus **nppiMorphTopHatBorder_8u_C3R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp8u* *pMask, *NppiSize* oMaskSize, *NppiPoint* oAnchor, *Npp8u* *pBuffer, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

3 channel 8-bit unsigned integer morphological top hat with border control.

For common parameter descriptions, see *Common parameters for nppiMorphTopHatBorder functions:*.

NppStatus **nppiMorphTopHatBorder_8u_C4R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp8u* *pMask, *NppiSize* oMaskSize, *NppiPoint* oAnchor, *Npp8u* *pBuffer, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

4 channel 8-bit unsigned integer morphological top hat with border control.

For common parameter descriptions, see *Common parameters for nppiMorphTopHatBorder functions:*.

NppStatus **nppiMorphTopHatBorder_16u_C1R_Ctx**(const *Npp16u* *pSrc, int nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp16u* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp8u* *pMask, *NppiSize* oMaskSize, *NppiPoint* oAnchor, *Npp8u* *pBuffer, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

1 channel 16-bit unsigned integer morphological top hat with border control.

For common parameter descriptions, see *Common parameters for nppiMorphTopHatBorder functions:*.

NppStatus **nppiMorphTopHatBorder_16s_C1R_Ctx**(const *Npp16s* *pSrc, int nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp16s* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp8u* *pMask, *NppiSize* oMaskSize, *NppiPoint* oAnchor, *Npp8u* *pBuffer, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

1 channel 16-bit signed integer morphological top hat with border control.

For common parameter descriptions, see *Common parameters for nppiMorphTopHatBorder functions:*.

NppStatus **nppiMorphTopHatBorder_32f_C1R_Ctx**(const *Npp32f* *pSrc, int nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp32f* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp8u* *pMask, *NppiSize* oMaskSize, *NppiPoint* oAnchor, *Npp8u* *pBuffer, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

1 channel 32-bit floating point morphological top hat with border control.

For common parameter descriptions, see *Common parameters for nppiMorphTopHatBorder functions:*.

NppStatus **nppiMorphTopHatBorder_32f_C3R_Ctx**(const *Npp32f* *pSrc, int nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp32f* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp8u* *pMask, *NppiSize* oMaskSize, *NppiPoint* oAnchor, *Npp8u* *pBuffer, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

3 channel 32-bit floating point morphological top hat with border control.

For common parameter descriptions, see *Common parameters for nppiMorphTopHatBorder functions:*.

NppStatus **nppiMorphTopHatBorder_32f_C4R_Ctx**(const *Npp32f* *pSrc, int nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp32f* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp8u* *pMask, *NppiSize* oMaskSize, *NppiPoint* oAnchor, *Npp8u* *pBuffer, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

4 channel 32-bit floating point morphological top hat with border control.

For common parameter descriptions, see *Common parameters for nppiMorphTopHatBorder functions:*.

1.13.3.6 Image Morph Black Hat Border

1.13.3.6.1 MorphBlackHatBorder

Morphological close pixel result minus source pixel with border control.

Morphological black hat computes the output pixel as the morphological close pixel value of the pixels under the mask minus the source pixel value. Pixels who's corresponding mask values are zero do not participate in the maximum or minimum search.

If any portion of the mask overlaps the source image boundary the requested border type operation is applied to all mask pixels which fall outside of the source image. The mask is centered over the source image pixel being tested.

Before calling any of the MorphBlackHatBorder functions the application first needs to call the corresponding MorphGetBufferSize to determine the amount of device memory to allocate as a working buffer. The allocated device memory is then passed as the pBuffer parameter to the corresponding MorphBlackHatBorder function.

Use the oSrcOffset and oSrcSize parameters to control where the border control operation is applied to the source image ROI borders.

Currently only the NPP_BORDER_REPLICATE border type operation is supported.

1.13.3.6.1.1 Common parameters for nppiMorphBlackHatBorder functions:

param pSrc
Source-Image Pointer.

param nSrcStep
Source-Image Line Step.

param oSrcSize
Source image width and height in pixels relative to pSrc.

param oSrcOffset
Source image starting point relative to pSrc.

param pDst
Destination-Image Pointer.

param nDstStep
Destination-Image Line Step.

param oSizeROI
Region-Of-Interest (ROI).

param pMask
Device memory pointer to the start address of the mask array (non-zero values select participating pixels).

param oMaskSize
Width and Height mask array.

param oAnchor
X and Y offsets of the mask origin frame of reference w.r.t the source pixel.

param pBuffer
Pointer to device memory scratch buffer at least as large as value returned by the corresponding MorphGetBufferSize call.

param eBorderType
The border type operation to be applied at source image border boundaries.

param nppStreamCtx
Application Managed Stream Context.

return
Image Data Related Error Codes, *ROI Related Error Codes*

Functions

NppStatus **nppiMorphBlackHatBorder_8u_C1R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp8u* *pMask, *NppiSize* oMaskSize, *NppiPoint* oAnchor, *Npp8u* *pBuffer, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

1 channel 8-bit unsigned integer morphological black hat with border control.

For common parameter descriptions, see *Common parameters for nppiMorphBlackHatBorder functions:*.

NppStatus **nppiMorphBlackHatBorder_8u_C3R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp8u* *pMask, *NppiSize* oMaskSize, *NppiPoint* oAnchor, *Npp8u* *pBuffer, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

3 channel 8-bit unsigned integer morphological black hat with border control.

For common parameter descriptions, see *Common parameters for nppiMorphBlackHatBorder functions:*.

NppStatus **nppiMorphBlackHatBorder_8u_C4R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp8u* *pMask, *NppiSize* oMaskSize, *NppiPoint* oAnchor, *Npp8u* *pBuffer, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

4 channel 8-bit unsigned integer morphological black hat with border control.

For common parameter descriptions, see *Common parameters for nppiMorphBlackHatBorder functions:*.

NppStatus **nppiMorphBlackHatBorder_16u_C1R_Ctx**(const *Npp16u* *pSrc, int nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp16u* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp8u* *pMask, *NppiSize* oMaskSize, *NppiPoint* oAnchor, *Npp8u* *pBuffer, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

1 channel 16-bit unsigned integer morphological black hat with border control.

For common parameter descriptions, see *Common parameters for nppiMorphBlackHatBorder functions:*.

NppStatus **nppiMorphBlackHatBorder_16s_C1R_Ctx**(const *Npp16s* *pSrc, int nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp16s* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp8u* *pMask, *NppiSize* oMaskSize, *NppiPoint* oAnchor, *Npp8u* *pBuffer, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

1 channel 16-bit signed integer morphological black hat with border control.

For common parameter descriptions, see *Common parameters for nppiMorphBlackHatBorder functions:*.

NppStatus **nppiMorphBlackHatBorder_32f_C1R_Ctx**(const *Npp32f* *pSrc, int nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp32f* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp8u* *pMask, *NppiSize* oMaskSize, *NppiPoint* oAnchor, *Npp8u* *pBuffer, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

1 channel 32-bit floating point morphological black hat with border control.

For common parameter descriptions, see *Common parameters for nppiMorphBlackHatBorder functions:*.

NppStatus **nppiMorphBlackHatBorder_32f_C3R_Ctx**(const *Npp32f* *pSrc, int nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp32f* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp8u* *pMask, *NppiSize* oMaskSize, *NppiPoint* oAnchor, *Npp8u* *pBuffer, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

3 channel 32-bit floating point morphological black hat with border control.

For common parameter descriptions, see *Common parameters for nppiMorphBlackHatBorder functions:*.

NppStatus **nppiMorphBlackHatBorder_32f_C4R_Ctx**(const *Npp32f* *pSrc, int nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp32f* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp8u* *pMask, *NppiSize* oMaskSize, *NppiPoint* oAnchor, *Npp8u* *pBuffer, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

4 channel 32-bit floating point morphological black hat with border control.

For common parameter descriptions, see *Common parameters for nppiMorphBlackHatBorder functions:*.

1.13.3.7 Image Morph Gradient Border

1.13.3.7.1 MorphGradientBorder

Morphological dilated pixel result minus morphological eroded pixel result with border control.

Morphological gradient computes the output pixel as the morphological dilated pixel value of the pixels under the mask minus the morphological eroded pixel value of the pixels under the mask. Pixels who's corresponding mask values are zero do not participate in the maximum or minimum search.

If any portion of the mask overlaps the source image boundary the requested border type operation is applied to all mask pixels which fall outside of the source image. The mask is centered over the source image pixel being tested.

Before calling any of the MorphGradientBorder functions the application first needs to call the corresponding MorphGetBufferSize to determine the amount of device memory to allocate as a working buffer. The allocated device memory is then passed as the pBuffer parameter to the corresponding MorphGradientBorder function.

Use the oSrcOffset and oSrcSize parameters to control where the border control operation is applied to the source image ROI borders.

Currently only the NPP_BORDER_REPLICATE border type operation is supported.

1.13.3.7.1.1 Common parameters for nppiMorphGradientBorder functions:

param pSrc
Source-Image Pointer.

param nSrcStep
Source-Image Line Step.

param oSrcSize
Source image width and height in pixels relative to pSrc.

param oSrcOffset
Source image starting point relative to pSrc.

param pDst
Destination-Image Pointer.

param nDstStep
Destination-Image Line Step.

param oSizeROI
Region-Of-Interest (ROI).

param pMask
Device memory pointer to the start address of the mask array (non-zero values select participating pixels).

param oMaskSize
Width and Height mask array.

param oAnchor
X and Y offsets of the mask origin frame of reference w.r.t the source pixel.

param pBuffer
Pointer to device memory scratch buffer at least as large as value returned by the corresponding MorphGetBufferSize call.

param eBorderType
The border type operation to be applied at source image border boundaries.

param nppStreamCtx
Application Managed Stream Context.

return
Image Data Related Error Codes, *ROI Related Error Codes*

Functions

NppStatus **nppiMorphGradientBorder_8u_C1R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp8u* *pMask, *NppiSize* oMaskSize, *NppiPoint* oAnchor, *Npp8u* *pBuffer, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

1 channel 8-bit unsigned integer morphological gradient with border control.

For common parameter descriptions, see *Common parameters for nppiMorphGradientBorder functions:*.

NppStatus **nppiMorphGradientBorder_8u_C3R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp8u* *pMask, *NppiSize* oMaskSize, *NppiPoint* oAnchor, *Npp8u* *pBuffer, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

3 channel 8-bit unsigned integer morphological gradient with border control.

For common parameter descriptions, see *Common parameters for nppiMorphGradientBorder functions:*.

NppStatus **nppiMorphGradientBorder_8u_C4R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp8u* *pMask, *NppiSize* oMaskSize, *NppiPoint* oAnchor, *Npp8u* *pBuffer, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

4 channel 8-bit unsigned integer morphological gradient with border control.

For common parameter descriptions, see *Common parameters for nppiMorphGradientBorder functions:*.

NppStatus **nppiMorphGradientBorder_16u_C1R_Ctx**(const *Npp16u* *pSrc, int nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp16u* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp8u* *pMask, *NppiSize* oMaskSize, *NppiPoint* oAnchor, *Npp8u* *pBuffer, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

1 channel 16-bit unsigned integer morphological gradient with border control.

For common parameter descriptions, see *Common parameters for nppiMorphGradientBorder functions:*.

NppStatus **nppiMorphGradientBorder_16s_C1R_Ctx**(const *Npp16s* *pSrc, int nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp16s* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp8u* *pMask, *NppiSize* oMaskSize, *NppiPoint* oAnchor, *Npp8u* *pBuffer, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

1 channel 16-bit signed integer morphological gradient with border control.

For common parameter descriptions, see *Common parameters for nppiMorphGradientBorder functions:*.

NppStatus **nppiMorphGradientBorder_32f_C1R_Ctx**(const *Npp32f* *pSrc, int nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp32f* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp8u* *pMask, *NppiSize* oMaskSize, *NppiPoint* oAnchor, *Npp8u* *pBuffer, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

1 channel 32-bit floating point morphological gradient with border control.

For common parameter descriptions, see *Common parameters for nppiMorphGradientBorder functions:*.

NppStatus **nppiMorphGradientBorder_32f_C3R_Ctx**(const *Npp32f* *pSrc, int nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp32f* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp8u* *pMask, *NppiSize* oMaskSize, *NppiPoint* oAnchor, *Npp8u* *pBuffer, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

3 channel 32-bit floating point morphological gradient with border control.

For common parameter descriptions, see *Common parameters for nppiMorphGradientBorder functions:*.

NppStatus **nppiMorphGradientBorder_32f_C4R_Ctx**(const *Npp32f* *pSrc, int nSrcStep, *NppiSize* oSrcSize, *NppiPoint* oSrcOffset, *Npp32f* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp8u* *pMask, *NppiSize* oMaskSize, *NppiPoint* oAnchor, *Npp8u* *pBuffer, *NppiBorderType* eBorderType, *NppStreamContext* nppStreamCtx)

4 channel 32-bit floating point morphological gradient with border control.

For common parameter descriptions, see *Common parameters for nppiMorphGradientBorder functions:*.

1.14. Image Statistics Functions

Primitives for computing the statistical properties of an image.

Some statistical primitives also require scratch buffer during the computation. For details, please refer to *Scratch Buffer and Host Pointer*.

These functions can be found in the nppist library. Linking to only the sub-libraries that you use can significantly save link time, application load time, and CUDA runtime startup time when using dynamic libraries.

1.14.1. CommonGetBufferHostSizeParameters

Common parameters for nppiGetBufferHostSize functions include:

param oSizeROI
Region-Of-Interest (ROI).

param hpBufferSize
Required buffer size. Important: hpBufferSize is a *host pointer*. *Scratch Buffer and Host Pointer*.

param nppStreamCtx
Application Managed Stream Context.

return
NPP_NULL_POINTER_ERROR if hpBufferSize is 0 (NULL), *ROI Related Error Codes*.

1.14.2. Image Sum

1.14.2.1 Sum

Primitives for computing the sum of all the pixel values in an image.

Sum

Given an image $pSrc$ with width W and height H, the sum will be computed as

$$Sum = \sum_{j=0}^{H-1} \sum_{i=0}^{W-1} pSrc(j,i)$$

All the results are stored in a 64-bit double precision format, except for two primitives *nppiSum_8u64s_C1R_Ctx* and *nppiSum_8u64s_C4R_Ctx*. The sum functions require additional scratch buffer for computations.

1.14.2.2 Common parameters for nppiSum functions include:

param pSrc
Source-Image Pointer.

param nSrcStep
Source-Image Line Step.

param oSizeROI
Region-Of-Interest (ROI).

param pDeviceBuffer
Pointer to the required device memory allocation, *Scratch Buffer and Host Pointer*. Use nppiSumGetBufferHostSize_XX_XXX to determine the minimum number of bytes required.

param pSum
Device memory pointer to the computed sum.

param nppStreamCtx
Application Managed Stream Context.

return
Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiSum_8u_C1R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *NppiSize* oSizeROI, *Npp8u* *pDeviceBuffer, *Npp64f* *pSum, *NppStreamContext* nppStreamCtx)

One-channel 8-bit unsigned image sum.

For common parameter descriptions, see *Common parameters for nppiSum functions include:*.

NppStatus **nppiSum_8u64s_C1R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *NppiSize* oSizeROI, *Npp8u* *pDeviceBuffer, *Npp64s* *pSum, *NppStreamContext* nppStreamCtx)

One-channel 8-bit unsigned image sum.

The result is 64-bit long long integer.

For common parameter descriptions, see *Common parameters for nppiSum functions include:*.

NppStatus **nppiSum_16u_C1R_Ctx**(const *Npp16u* *pSrc, int nSrcStep, *NppiSize* oSizeROI, *Npp8u* *pDeviceBuffer, *Npp64f* *pSum, *NppStreamContext* nppStreamCtx)

One-channel 16-bit unsigned image sum.

For common parameter descriptions, see *Common parameters for nppiSum functions include:*.

NppStatus **nppiSum_16s_C1R_Ctx**(const *Npp16s* *pSrc, int nSrcStep, *NppiSize* oSizeROI, *Npp8u* *pDeviceBuffer, *Npp64f* *pSum, *NppStreamContext* nppStreamCtx)

One-channel 16-bit signed image sum.

For common parameter descriptions, see *Common parameters for nppiSum functions include:*.

NppStatus **nppiSum_32f_C1R_Ctx**(const *Npp32f* *pSrc, int nSrcStep, *NppiSize* oSizeROI, *Npp8u* *pDeviceBuffer, *Npp64f* *pSum, *NppStreamContext* nppStreamCtx)

One-channel 32-bit floating point image sum.

For common parameter descriptions, see *Common parameters for nppiSum functions include:*.

NppStatus **nppiSum_8u_C3R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *NppiSize* oSizeROI, *Npp8u* *pDeviceBuffer, *Npp64f* aSum[3], *NppStreamContext* nppStreamCtx)

Three-channel 8-bit unsigned image sum.

For common parameter descriptions, see *Common parameters for nppiSum functions include:*.

NppStatus **nppiSum_16u_C3R_Ctx**(const *Npp16u* *pSrc, int nSrcStep, *NppiSize* oSizeROI, *Npp8u* *pDeviceBuffer, *Npp64f* aSum[3], *NppStreamContext* nppStreamCtx)

Three-channel 16-bit unsigned image sum.

For common parameter descriptions, see *Common parameters for nppiSum functions include:*.

NppStatus **nppiSum_16s_C3R_Ctx**(const *Npp16s* *pSrc, int nSrcStep, *NppiSize* oSizeROI, *Npp8u* *pDeviceBuffer, *Npp64f* aSum[3], *NppStreamContext* nppStreamCtx)

Three-channel 16-bit signed image sum.

For common parameter descriptions, see *Common parameters for nppiSum functions include:*.

NppStatus **nppiSum_32f_C3R_Ctx**(const *Npp32f* *pSrc, int nSrcStep, *NppiSize* oSizeROI, *Npp8u* *pDeviceBuffer, *Npp64f* aSum[3], *NppStreamContext* nppStreamCtx)

Three-channel 32-bit floating point image sum.

For common parameter descriptions, see *Common parameters for nppiSum functions include:*.

NppStatus **nppiSum_8u_AC4R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *NppiSize* oSizeROI, *Npp8u* *pDeviceBuffer, *Npp64f* aSum[3], *NppStreamContext* nppStreamCtx)

Four-channel 8-bit unsigned image sum ignoring alpha channel.

For common parameter descriptions, see *Common parameters for nppiSum functions include:*.

NppStatus **nppiSum_16u_AC4R_Ctx**(const *Npp16u* *pSrc, int nSrcStep, *NppiSize* oSizeROI, *Npp8u* *pDeviceBuffer, *Npp64f* aSum[3], *NppStreamContext* nppStreamCtx)

Four-channel 16-bit unsigned image sum ignoring alpha channel.

For common parameter descriptions, see *Common parameters for nppiSum functions include:*.

NppStatus **nppiSum_16s_AC4R_Ctx**(const *Npp16s* *pSrc, int nSrcStep, *NppiSize* oSizeROI, *Npp8u* *pDeviceBuffer, *Npp64f* aSum[3], *NppStreamContext* nppStreamCtx)

Four-channel 16-bit signed image sum ignoring alpha channel.

For common parameter descriptions, see *Common parameters for nppiSum functions include:*.

NppStatus **nppiSum_32f_AC4R_Ctx**(const *Npp32f* *pSrc, int nSrcStep, *NppiSize* oSizeROI, *Npp8u* *pDeviceBuffer, *Npp64f* aSum[3], *NppStreamContext* nppStreamCtx)

Four-channel 32-bit floating point image sum ignoring alpha channel.

For common parameter descriptions, see *Common parameters for nppiSum functions include:*.

NppStatus **nppiSum_8u_C4R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *NppiSize* oSizeROI, *Npp8u* *pDeviceBuffer, *Npp64f* aSum[4], *NppStreamContext* nppStreamCtx)

Four-channel 8-bit unsigned image sum.

For common parameter descriptions, see *Common parameters for nppiSum functions include:*.

NppStatus **nppiSum_8u64s_C4R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *NppiSize* oSizeROI, *Npp8u* *pDeviceBuffer, *Npp64s* aSum[4], *NppStreamContext* nppStreamCtx)

Four-channel 8-bit unsigned image sum.

The result is 64-bit long long integer.

For common parameter descriptions, see *Common parameters for nppiSum functions include:*.

NppStatus **nppiSum_16u_C4R_Ctx**(const *Npp16u* *pSrc, int nSrcStep, *NppiSize* oSizeROI, *Npp8u* *pDeviceBuffer, *Npp64f* aSum[4], *NppStreamContext* nppStreamCtx)

Four-channel 16-bit unsigned image sum.

For common parameter descriptions, see *Common parameters for nppiSum functions include:*.

NppStatus **nppiSum_16s_C4R_Ctx**(const *Npp16s* *pSrc, int nSrcStep, *NppiSize* oSizeROI, *Npp8u* *pDeviceBuffer, *Npp64f* aSum[4], *NppStreamContext* nppStreamCtx)

Four-channel 16-bit signed image sum.

For common parameter descriptions, see *Common parameters for nppiSum functions include:*.

NppStatus **nppiSum_32f_C4R_Ctx**(const *Npp32f* *pSrc, int nSrcStep, *NppiSize* oSizeROI, *Npp8u* *pDeviceBuffer, *Npp64f* aSum[4], *NppStreamContext* nppStreamCtx)

Four-channel 32-bit floating point image sum.

For common parameter descriptions, see *Common parameters for nppiSum functions include:*.

SumGetBufferHostSize

Companion primitives for computing the device buffer size (in bytes) required by the sum primitives.

1.14.2.3 CommonSumGetBufferHostSizeParameters

Common parameters for nppiSumGetBufferHostSize functions include:

param oSizeROI
Region-Of-Interest (ROI).

param hpBufferSize
Required buffer size. Important: hpBufferSize is a *host pointer.* *Scratch Buffer and Host Pointer*.

param nppStreamCtx
Application Managed Stream Context.

return
NPP_NULL_POINTER_ERROR if hpBufferSize is 0 (NULL), *ROI Related Error Codes*.

NppStatus **nppiSumGetBufferHostSize_8u_C1R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiSum_8u_C1R_Ctx*.

For common parameter descriptions, see *CommonSumGetBufferHostSizeParameters*.

NppStatus **nppiSumGetBufferHostSize_8u64s_C1R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiSum_8u64s_C1R_Ctx*.

For common parameter descriptions, see *CommonSumGetBufferHostSizeParameters*.

NppStatus **nppiSumGetBufferHostSize_16u_C1R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiSum_16u_C1R_Ctx*.

For common parameter descriptions, see *CommonSumGetBufferHostSizeParameters*.

NppStatus **nppiSumGetBufferHostSize_16s_C1R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiSum_16s_C1R_Ctx*.

For common parameter descriptions, see *CommonSumGetBufferHostSizeParameters*.

NppStatus **nppiSumGetBufferHostSize_32f_C1R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiSum_32f_C1R_Ctx*.

For common parameter descriptions, see *CommonSumGetBufferHostSizeParameters*.

NppStatus **nppiSumGetBufferHostSize_8u_C3R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiSum_8u_C3R_Ctx*.

For common parameter descriptions, see *CommonSumGetBufferHostSizeParameters*.

NppStatus **nppiSumGetBufferHostSize_16u_C3R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiSum_16u_C3R_Ctx*.

For common parameter descriptions, see *CommonSumGetBufferHostSizeParameters*.

NppStatus **nppiSumGetBufferHostSize_16s_C3R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiSum_16s_C3R_Ctx*.

For common parameter descriptions, see *CommonSumGetBufferHostSizeParameters*.

NppStatus **nppiSumGetBufferHostSize_32f_C3R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiSum_32f_C3R_Ctx*.

For common parameter descriptions, see *CommonSumGetBufferHostSizeParameters*.

NppStatus **nppiSumGetBufferHostSize_8u_AC4R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiSum_8u_AC4R_Ctx*.

For common parameter descriptions, see *CommonSumGetBufferHostSizeParameters*.

NppStatus **nppiSumGetBufferHostSize_16u_AC4R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiSum_16u_AC4R_Ctx*.

For common parameter descriptions, see *CommonSumGetBufferHostSizeParameters*.

NppStatus **nppiSumGetBufferHostSize_16s_AC4R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiSum_16s_AC4R_Ctx*.

For common parameter descriptions, see *CommonSumGetBufferHostSizeParameters*.

NppStatus **nppiSumGetBufferHostSize_32f_AC4R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiSum_32f_AC4R_Ctx*.

For common parameter descriptions, see *CommonSumGetBufferHostSizeParameters*.

NppStatus **nppiSumGetBufferHostSize_8u64s_C4R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiSum_8u64s_C4R_Ctx*.

For common parameter descriptions, see *CommonSumGetBufferHostSizeParameters*.

NppStatus **nppiSumGetBufferHostSize_8u_C4R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiSum_8u_C4R_Ctx*.

For common parameter descriptions, see *CommonSumGetBufferHostSizeParameters*.

NppStatus **nppiSumGetBufferHostSize_16u_C4R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiSum_16u_C4R_Ctx*.

For common parameter descriptions, see *CommonSumGetBufferHostSizeParameters*.

NppStatus **nppiSumGetBufferHostSize_16s_C4R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiSum_16s_C4R_Ctx*.

For common parameter descriptions, see *CommonSumGetBufferHostSizeParameters*.

NppStatus **nppiSumGetBufferHostSize_32f_C4R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiSum_32f_C4R_Ctx*.

For common parameter descriptions, see *CommonSumGetBufferHostSizeParameters*.

1.14.3. Image Min

1.14.3.1 Min

Primitives for computing the minimal pixel value of an image.

Min

The scratch buffer is required by the min functions.

1.14.3.2 Common parameters for nppiMin functions include:

param pSrc
Source-Image Pointer.

param nSrcStep
Source-Image Line Step.

param oSizeROI
Region-Of-Interest (ROI).

param pDeviceBuffer
Pointer to the required device memory allocation, *Scratch Buffer and Host Pointer*. Use nppiMinGetBufferHostSize_XX_XXX to determine the minimum number of bytes required.

param pMin
Device memory pointer to the computed min.

param nppStreamCtx
Application Managed Stream Context.

return
Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiMin_8u_C1R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *NppiSize* oSizeROI, *Npp8u* *pDeviceBuffer, *Npp8u* *pMin, *NppStreamContext* nppStreamCtx)

One-channel 8-bit unsigned image min.

For common parameter descriptions, see *Common parameters for nppiMin functions include:*.

NppStatus **nppiMin_16u_C1R_Ctx**(const *Npp16u* *pSrc, int nSrcStep, *NppiSize* oSizeROI, *Npp8u* *pDeviceBuffer, *Npp16u* *pMin, *NppStreamContext* nppStreamCtx)

One-channel 16-bit unsigned image min.

For common parameter descriptions, see *Common parameters for nppiMin functions include:*.

NppStatus **nppiMin_16s_C1R_Ctx**(const *Npp16s* *pSrc, int nSrcStep, *NppiSize* oSizeROI, *Npp8u* *pDeviceBuffer, *Npp16s* *pMin, *NppStreamContext* nppStreamCtx)

One-channel 16-bit signed image min.

For common parameter descriptions, see *Common parameters for nppiMin functions include:*.

NppStatus **nppiMin_32f_C1R_Ctx**(const *Npp32f* *pSrc, int nSrcStep, *NppiSize* oSizeROI, *Npp8u* *pDeviceBuffer, *Npp32f* *pMin, *NppStreamContext* nppStreamCtx)

One-channel 32-bit floating point image min.

For common parameter descriptions, see *Common parameters for nppiMin functions include:*.

NppStatus **nppiMin_8u_C3R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *NppiSize* oSizeROI, *Npp8u* *pDeviceBuffer, *Npp8u* aMin[3], *NppStreamContext* nppStreamCtx)

Three-channel 8-bit unsigned image min.

For common parameter descriptions, see *Common parameters for nppiMin functions include:*.

NppStatus **nppiMin_16u_C3R_Ctx**(const *Npp16u* *pSrc, int nSrcStep, *NppiSize* oSizeROI, *Npp8u* *pDeviceBuffer, *Npp16u* aMin[3], *NppStreamContext* nppStreamCtx)

Three-channel 16-bit unsigned image min.

For common parameter descriptions, see *Common parameters for nppiMin functions include:*.

NppStatus **nppiMin_16s_C3R_Ctx**(const *Npp16s* *pSrc, int nSrcStep, *NppiSize* oSizeROI, *Npp8u* *pDeviceBuffer, *Npp16s* aMin[3], *NppStreamContext* nppStreamCtx)

Three-channel 16-bit signed image min.

For common parameter descriptions, see *Common parameters for nppiMin functions include:*.

NppStatus **nppiMin_32f_C3R_Ctx**(const *Npp32f* *pSrc, int nSrcStep, *NppiSize* oSizeROI, *Npp8u* *pDeviceBuffer, *Npp32f* aMin[3], *NppStreamContext* nppStreamCtx)

Three-channel 32-bit floating point image min.

For common parameter descriptions, see *Common parameters for nppiMin functions include:*.

NppStatus **nppiMin_8u_C4R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *NppiSize* oSizeROI, *Npp8u* *pDeviceBuffer, *Npp8u* aMin[4], *NppStreamContext* nppStreamCtx)

Four-channel 8-bit unsigned image min.

For common parameter descriptions, see *Common parameters for nppiMin functions include:*.

NppStatus **nppiMin_16u_C4R_Ctx**(const *Npp16u* *pSrc, int nSrcStep, *NppiSize* oSizeROI, *Npp8u* *pDeviceBuffer, *Npp16u* aMin[4], *NppStreamContext* nppStreamCtx)

Four-channel 16-bit unsigned image min.

For common parameter descriptions, see *Common parameters for nppiMin functions include:*.

NppStatus **nppiMin_16s_C4R_Ctx**(const *Npp16s* *pSrc, int nSrcStep, *NppiSize* oSizeROI, *Npp8u* *pDeviceBuffer, *Npp16s* aMin[4], *NppStreamContext* nppStreamCtx)

Four-channel 16-bit signed image min.

For common parameter descriptions, see *Common parameters for nppiMin functions include:*.

NppStatus **nppiMin_32f_C4R_Ctx**(const *Npp32f* *pSrc, int nSrcStep, *NppiSize* oSizeROI, *Npp8u* *pDeviceBuffer, *Npp32f* aMin[4], *NppStreamContext* nppStreamCtx)

Four-channel 32-bit floating point image min.

For common parameter descriptions, see *Common parameters for nppiMin functions include:*.

NppStatus **nppiMin_8u_AC4R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *NppiSize* oSizeROI, *Npp8u* *pDeviceBuffer, *Npp8u* aMin[3], *NppStreamContext* nppStreamCtx)

Four-channel 8-bit unsigned image min ignoring alpha channel.

For common parameter descriptions, see *Common parameters for nppiMin functions include:*.

NppStatus **nppiMin_16u_AC4R_Ctx**(const *Npp16u* *pSrc, int nSrcStep, *NppiSize* oSizeROI, *Npp8u* *pDeviceBuffer, *Npp16u* aMin[3], *NppStreamContext* nppStreamCtx)

Four-channel 16-bit unsigned image min ignoring alpha channel.

For common parameter descriptions, see *Common parameters for nppiMin functions include:*.

NppStatus **nppiMin_16s_AC4R_Ctx**(const *Npp16s* *pSrc, int nSrcStep, *NppiSize* oSizeROI, *Npp8u* *pDeviceBuffer, *Npp16s* aMin[3], *NppStreamContext* nppStreamCtx)

Four-channel 16-bit signed image min ignoring alpha channel.

For common parameter descriptions, see *Common parameters for nppiMin functions include:*.

NppStatus **nppiMin_32f_AC4R_Ctx**(const *Npp32f* *pSrc, int nSrcStep, *NppiSize* oSizeROI, *Npp8u* *pDeviceBuffer, *Npp32f* aMin[3], *NppStreamContext* nppStreamCtx)

Four-channel 32-bit floating point image min ignoring alpha channel.

For common parameter descriptions, see *Common parameters for nppiMin functions include:*.

MinGetBufferHostSize

Companion primitives for computing the device buffer size (in bytes) required by the min primitives.

1.14.3.3 CommonMinGetBufferHostSizeParameters

Common parameters for nppiMinGetBufferHostSize functions include:

param oSizeROI
Region-Of-Interest (ROI).

param hpBufferSize
Required buffer size. Important: hpBufferSize is a *host pointer.* *Scratch Buffer and Host Pointer*.

param nppStreamCtx
Application Managed Stream Context.

return
NPP_NULL_POINTER_ERROR if hpBufferSize is 0 (NULL), *ROI Related Error Codes*.

NppStatus **nppiMinGetBufferHostSize_8u_C1R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiMin_8u_C1R_Ctx*.

For common parameter descriptions, see *CommonMinGetBufferHostSizeParameters*.

NppStatus **nppiMinGetBufferHostSize_16u_C1R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiMin_16u_C1R_Ctx*.

For common parameter descriptions, see *CommonMinGetBufferHostSizeParameters*.

NppStatus **nppiMinGetBufferHostSize_16s_C1R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiMin_16s_C1R_Ctx*.

For common parameter descriptions, see *CommonMinGetBufferHostSizeParameters*.

NppStatus **nppiMinGetBufferHostSize_32f_C1R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiMin_32f_C1R_Ctx*.

For common parameter descriptions, see *CommonMinGetBufferHostSizeParameters*.

NppStatus **nppiMinGetBufferHostSize_8u_C3R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiMin_8u_C3R_Ctx*.

For common parameter descriptions, see *CommonMinGetBufferHostSizeParameters*.

NppStatus **nppiMinGetBufferHostSize_16u_C3R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiMin_16u_C3R_Ctx*.

For common parameter descriptions, see *CommonMinGetBufferHostSizeParameters*.

NppStatus **nppiMinGetBufferHostSize_16s_C3R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiMin_16s_C3R_Ctx*.

For common parameter descriptions, see *CommonMinGetBufferHostSizeParameters*.

NppStatus **nppiMinGetBufferHostSize_32f_C3R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiMin_32f_C3R_Ctx*.

For common parameter descriptions, see *CommonMinGetBufferHostSizeParameters*.

NppStatus **nppiMinGetBufferHostSize_8u_C4R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiMin_8u_C4R_Ctx*.

For common parameter descriptions, see *CommonMinGetBufferHostSizeParameters*.

NppStatus **nppiMinGetBufferHostSize_16u_C4R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiMin_16u_C4R_Ctx*.

For common parameter descriptions, see *CommonMinGetBufferHostSizeParameters*.

NppStatus **nppiMinGetBufferHostSize_16s_C4R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiMin_16s_C4R_Ctx*.

For common parameter descriptions, see *CommonMinGetBufferHostSizeParameters*.

NppStatus **nppiMinGetBufferHostSize_32f_C4R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiMin_32f_C4R_Ctx*.

For common parameter descriptions, see *CommonMinGetBufferHostSizeParameters*.

NppStatus **nppiMinGetBufferHostSize_8u_AC4R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiMin_8u_AC4R_Ctx*.

For common parameter descriptions, see *CommonMinGetBufferHostSizeParameters*.

NppStatus **nppiMinGetBufferHostSize_16u_AC4R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiMin_16u_AC4R_Ctx*.

For common parameter descriptions, see *CommonMinGetBufferHostSizeParameters*.

NppStatus **nppiMinGetBufferHostSize_16s_AC4R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiMin_16s_AC4R_Ctx*.

For common parameter descriptions, see *CommonMinGetBufferHostSizeParameters*.

NppStatus **nppiMinGetBufferHostSize_32f_AC4R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiMin_32f_AC4R_Ctx*.

For common parameter descriptions, see *CommonMinGetBufferHostSizeParameters*.

1.14.4. Image Min Index

1.14.4.1 MinIndx

Primitives for computing the minimal value and its indices (X and Y coordinates) of an image.

MinIndx

If there are several minima in the selected ROI, the function returns one on the top leftmost position. The scratch buffer is required by the functions.

1.14.4.2 Common parameters for nppiMinIndx functions include:

param pSrc
Source-Image Pointer.

param nSrcStep
Source-Image Line Step.

param oSizeROI
Region-Of-Interest (ROI).

param pDeviceBuffer
Pointer to the required device memory allocation, *Scratch Buffer and Host Pointer* Use nppiMinIndxGetBufferHostSize_XX_XXX to determine the minimum number of bytes required.

param pMin
Device memory pointer to the computed min result.

param pIndexX
Device memory pointer to the X coordinate of the image min value.

param pIndexY
Device memory pointer to the Y coordinate of the image min value.

param nppStreamCtx
Application Managed Stream Context.

return
Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiMinIndx_8u_C1R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *NppiSize* oSizeROI, *Npp8u* *pDeviceBuffer, *Npp8u* *pMin, int *pIndexX, int *pIndexY, *NppStreamContext* nppStreamCtx)

One-channel 8-bit unsigned image MinIndx.

For common parameter descriptions, see *Common parameters for nppiMinIndx functions include:*>.

NppStatus **nppiMinIndx_16u_C1R_Ctx**(const *Npp16u* *pSrc, int nSrcStep, *NppiSize* oSizeROI, *Npp8u* *pDeviceBuffer, *Npp16u* *pMin, int *pIndexX, int *pIndexY, *NppStreamContext* nppStreamCtx)

One-channel 16-bit unsigned image MinIndx.

For common parameter descriptions, see *Common parameters for nppiMinIndx functions include:*.

NppStatus **nppiMinIndx_16s_C1R_Ctx**(const *Npp16s* *pSrc, int nSrcStep, *NppiSize* oSizeROI, *Npp8u* *pDeviceBuffer, *Npp16s* *pMin, int *pIndexX, int *pIndexY, *NppStreamContext* nppStreamCtx)

One-channel 16-bit signed image MinIndx.

For common parameter descriptions, see *Common parameters for nppiMinIndx functions include:*.

NppStatus **nppiMinIndx_32f_C1R_Ctx**(const *Npp32f* *pSrc, int nSrcStep, *NppiSize* oSizeROI, *Npp8u* *pDeviceBuffer, *Npp32f* *pMin, int *pIndexX, int *pIndexY, *NppStreamContext* nppStreamCtx)

One-channel 32-bit floating point image MinIndx.

For common parameter descriptions, see *Common parameters for nppiMinIndx functions include:*.

NppStatus **nppiMinIndx_8u_C3R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *NppiSize* oSizeROI, *Npp8u* *pDeviceBuffer, *Npp8u* aMin[3], int aIndexX[3], int aIndexY[3], *NppStreamContext* nppStreamCtx)

Three-channel 8-bit unsigned image MinIndx.

For common parameter descriptions, see *Common parameters for nppiMinIndx functions include:*.

NppStatus **nppiMinIndx_16u_C3R_Ctx**(const *Npp16u* *pSrc, int nSrcStep, *NppiSize* oSizeROI, *Npp8u* *pDeviceBuffer, *Npp16u* aMin[3], int aIndexX[3], int aIndexY[3], *NppStreamContext* nppStreamCtx)

Three-channel 16-bit unsigned image MinIndx.

For common parameter descriptions, see *Common parameters for nppiMinIndx functions include:*.

NppStatus **nppiMinIndx_16s_C3R_Ctx**(const *Npp16s* *pSrc, int nSrcStep, *NppiSize* oSizeROI, *Npp8u* *pDeviceBuffer, *Npp16s* aMin[3], int aIndexX[3], int aIndexY[3], *NppStreamContext* nppStreamCtx)

Three-channel 16-bit signed image MinIndx.

For common parameter descriptions, see *Common parameters for nppiMinIndx functions include:*.

NppStatus **nppiMinIndx_32f_C3R_Ctx**(const *Npp32f* *pSrc, int nSrcStep, *NppiSize* oSizeROI, *Npp8u* *pDeviceBuffer, *Npp32f* aMin[3], int aIndexX[3], int aIndexY[3], *NppStreamContext* nppStreamCtx)

Three-channel 32-bit floating point image MinIndx.

For common parameter descriptions, see *Common parameters for nppiMinIndx functions include:*.

NppStatus **nppiMinIndx_8u_C4R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *NppiSize* oSizeROI, *Npp8u* *pDeviceBuffer, *Npp8u* aMin[4], int aIndexX[4], int aIndexY[4], *NppStreamContext* nppStreamCtx)

Four-channel 8-bit unsigned image MinIndx.

For common parameter descriptions, see *Common parameters for nppiMinIndx functions include:*.

NppStatus **nppiMinIndx_16u_C4R_Ctx**(const *Npp16u* *pSrc, int nSrcStep, *NppiSize* oSizeROI, *Npp8u* *pDeviceBuffer, *Npp16u* aMin[4], int aIndexX[4], int aIndexY[4], *NppStreamContext* nppStreamCtx)

Four-channel 16-bit unsigned image MinIndx.

For common parameter descriptions, see *Common parameters for nppiMinIndx functions include:*.

NppStatus **nppiMinIndx_16s_C4R_Ctx**(const *Npp16s* *pSrc, int nSrcStep, *NppiSize* oSizeROI, *Npp8u* *pDeviceBuffer, *Npp16s* aMin[4], int aIndexX[4], int aIndexY[4], *NppStreamContext* nppStreamCtx)

Four-channel 16-bit signed image MinIndx.

For common parameter descriptions, see *Common parameters for nppiMinIndx functions include:*.

NppStatus **nppiMinIndx_32f_C4R_Ctx**(const *Npp32f* *pSrc, int nSrcStep, *NppiSize* oSizeROI, *Npp8u* *pDeviceBuffer, *Npp32f* aMin[4], int aIndexX[4], int aIndexY[4], *NppStreamContext* nppStreamCtx)

Four-channel 32-bit floating point image MinIndx.

For common parameter descriptions, see *Common parameters for nppiMinIndx functions include:*.

NppStatus **nppiMinIndx_8u_AC4R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *NppiSize* oSizeROI, *Npp8u* *pDeviceBuffer, *Npp8u* aMin[3], int aIndexX[3], int aIndexY[3], *NppStreamContext* nppStreamCtx)

Four-channel 8-bit unsigned image MinIndx ignoring alpha channel.

For common parameter descriptions, see *Common parameters for nppiMinIndx functions include:*.

NppStatus **nppiMinIndx_16u_AC4R_Ctx**(const *Npp16u* *pSrc, int nSrcStep, *NppiSize* oSizeROI, *Npp8u* *pDeviceBuffer, *Npp16u* aMin[3], int aIndexX[3], int aIndexY[3], *NppStreamContext* nppStreamCtx)

Four-channel 16-bit unsigned image MinIndx ignoring alpha channel.

For common parameter descriptions, see *Common parameters for nppiMinIndx functions include:*.

NppStatus **nppiMinIndx_16s_AC4R_Ctx**(const *Npp16s* *pSrc, int nSrcStep, *NppiSize* oSizeROI, *Npp8u* *pDeviceBuffer, *Npp16s* aMin[3], int aIndexX[3], int aIndexY[3], *NppStreamContext* nppStreamCtx)

Four-channel 16-bit signed image MinIndx ignoring alpha channel.

For common parameter descriptions, see *Common parameters for nppiMinIndx functions include:*.

NppStatus **nppiMinIndx_32f_AC4R_Ctx**(const *Npp32f* *pSrc, int nSrcStep, *NppiSize* oSizeROI, *Npp8u* *pDeviceBuffer, *Npp32f* aMin[3], int aIndexX[3], int aIndexY[3], *NppStreamContext* nppStreamCtx)

Four-channel 32-bit floating point image MinIndx ignoring alpha channel.

For common parameter descriptions, see *Common parameters for nppiMinIndx functions include:*.

MinIndxGetBufferHostSize

Companion primitives for computing the device buffer size (in bytes) required by the MinIndx primitives.

1.14.4.3 CommonMinIndxGetBufferHostSizeParameters

Common parameters for nppiMinIndxGetBufferHostSize functions include:

param oSizeROI
Region-Of-Interest (ROI).

param hpBufferSize
Required buffer size. Important: hpBufferSize is a *host pointer.* *Scratch Buffer and Host Pointer*.

param nppStreamCtx
Application Managed Stream Context.

return
NPP_NULL_POINTER_ERROR if hpBufferSize is 0 (NULL), *ROI Related Error Codes*.

NppStatus **nppiMinIndxGetBufferHostSize_8u_C1R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Computes the device scratch buffer size (in bytes) for nppiMinIndx_8u_C1R_Ctx.

For common parameter descriptions, see *CommonMinIndxGetBufferHostSizeParameters*.

NppStatus **nppiMinIndxGetBufferHostSize_16u_C1R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Computes the device scratch buffer size (in bytes) for nppiMinIndx_16u_C1R_Ctx.

For common parameter descriptions, see *CommonMinIndxGetBufferHostSizeParameters*.

NppStatus **nppiMinIndxGetBufferHostSize_16s_C1R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Computes the device scratch buffer size (in bytes) for nppiMinIndx_16s_C1R_Ctx.

For common parameter descriptions, see *CommonMinIndxGetBufferHostSizeParameters*.

NppStatus **nppiMinIndxGetBufferHostSize_32f_C1R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Computes the device scratch buffer size (in bytes) for nppiMinIndx_32f_C1R_Ctx.

For common parameter descriptions, see *CommonMinIndxGetBufferHostSizeParameters*.

NppStatus **nppiMinIndxGetBufferHostSize_8u_C3R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Computes the device scratch buffer size (in bytes) for nppiMinIndx_8u_C3R_Ctx.

For common parameter descriptions, see *CommonMinIndxGetBufferHostSizeParameters*.

NppStatus **nppiMinIndxGetBufferHostSize_16u_C3R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Computes the device scratch buffer size (in bytes) for nppiMinIndx_16u_C3R_Ctx.

For common parameter descriptions, see *CommonMinIndxGetBufferHostSizeParameters*.

NppStatus **nppiMinIndxGetBufferHostSize_16s_C3R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Computes the device scratch buffer size (in bytes) for nppiMinIndx_16s_C3R_Ctx.

For common parameter descriptions, see *CommonMinIndxGetBufferHostSizeParameters*.

NppStatus **nppiMinIndxGetBufferHostSize_32f_C3R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Computes the device scratch buffer size (in bytes) for nppiMinIndx_32f_C3R_Ctx.

For common parameter descriptions, see *CommonMinIndxGetBufferHostSizeParameters*.

NppStatus **nppiMinIndxGetBufferHostSize_8u_C4R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Computes the device scratch buffer size (in bytes) for nppiMinIndx_8u_C4R_Ctx.

For common parameter descriptions, see *CommonMinIndxGetBufferHostSizeParameters*.

NppStatus **nppiMinIndxGetBufferHostSize_16u_C4R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Computes the device scratch buffer size (in bytes) for nppiMinIndx_16u_C4R_Ctx.

For common parameter descriptions, see *CommonMinIndxGetBufferHostSizeParameters*.

NppStatus **nppiMinIndxGetBufferHostSize_16s_C4R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Computes the device scratch buffer size (in bytes) for nppiMinIndx_16s_C4R_Ctx.

For common parameter descriptions, see *CommonMinIndxGetBufferHostSizeParameters*.

NppStatus **nppiMinIndxGetBufferHostSize_32f_C4R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Computes the device scratch buffer size (in bytes) for nppiMinIndx_32f_C4R_Ctx.

For common parameter descriptions, see *CommonMinIndxGetBufferHostSizeParameters*.

NppStatus **nppiMinIndxGetBufferHostSize_8u_AC4R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Computes the device scratch buffer size (in bytes) for nppiMinIndx_8u_AC4R_Ctx.

For common parameter descriptions, see *CommonMinIndxGetBufferHostSizeParameters*.

NppStatus **nppiMinIndxGetBufferHostSize_16u_AC4R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Computes the device scratch buffer size (in bytes) for nppiMinIndx_8u_AC4R_Ctx.

For common parameter descriptions, see *CommonMinIndxGetBufferHostSizeParameters*.

NppStatus **nppiMinIndxGetBufferHostSize_16s_AC4R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Computes the device scratch buffer size (in bytes) for nppiMinIndx_16u_AC4R_Ctx.

For common parameter descriptions, see *CommonMinIndxGetBufferHostSizeParameters*.

NppStatus **nppiMinIndxGetBufferHostSize_32f_AC4R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Computes the device scratch buffer size (in bytes) for nppiMinIndx_32f_AC4R_Ctx.

For common parameter descriptions, see *CommonMinIndxGetBufferHostSizeParameters*.

1.14.5. Image Max

1.14.5.1 Max

Primitives for computing the maximal pixel value of an image.

1.14.5.1.1 Common parameters for nppiMax functions include:

param pSrc
Source-Image Pointer.

param nSrcStep
Source-Image Line Step.

param oSizeROI
Region-Of-Interest (ROI).

param pDeviceBuffer
Pointer to the required device memory allocation, *Scratch Buffer and Host Pointer*. Use nppiMaxGetBufferHostSize_XX_XXX to determine the minimum number of bytes required.

param pMax
Device memory pointer to the computed max.

param nppStreamCtx
Application Managed Stream Context.

return
Image Data Related Error Codes, *ROI Related Error Codes*

Max

The scratch buffer is required by the functions.

NppStatus **nppiMax_8u_C1R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *NppiSize* oSizeROI, *Npp8u* *pDeviceBuffer, *Npp8u* *pMax, *NppStreamContext* nppStreamCtx)

One-channel 8-bit unsigned image Max.

For common parameter descriptions, see *Common parameters for nppiMax functions include:*.

NppStatus **nppiMax_16u_C1R_Ctx**(const *Npp16u* *pSrc, int nSrcStep, *NppiSize* oSizeROI, *Npp8u* *pDeviceBuffer, *Npp16u* *pMax, *NppStreamContext* nppStreamCtx)

One-channel 16-bit unsigned image Max.

For common parameter descriptions, see *Common parameters for nppiMax functions include:*.

NppStatus **nppiMax_16s_C1R_Ctx**(const *Npp16s* *pSrc, int nSrcStep, *NppiSize* oSizeROI, *Npp8u* *pDeviceBuffer, *Npp16s* *pMax, *NppStreamContext* nppStreamCtx)

One-channel 16-bit signed image Max.

For common parameter descriptions, see *Common parameters for nppiMax functions include:*.

NppStatus **nppiMax_32f_C1R_Ctx**(const *Npp32f* *pSrc, int nSrcStep, *NppiSize* oSizeROI, *Npp8u* *pDeviceBuffer, *Npp32f* *pMax, *NppStreamContext* nppStreamCtx)

One-channel 32-bit floating point image Max.

For common parameter descriptions, see *Common parameters for nppiMax functions include:*.

NppStatus **nppiMax_8u_C3R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *NppiSize* oSizeROI, *Npp8u* *pDeviceBuffer, *Npp8u* aMax[3], *NppStreamContext* nppStreamCtx)

Three-channel 8-bit unsigned image Max.

For common parameter descriptions, see *Common parameters for nppiMax functions include:*.

NppStatus **nppiMax_16u_C3R_Ctx**(const *Npp16u* *pSrc, int nSrcStep, *NppiSize* oSizeROI, *Npp8u* *pDeviceBuffer, *Npp16u* aMax[3], *NppStreamContext* nppStreamCtx)

Three-channel 16-bit unsigned image Max.

For common parameter descriptions, see *Common parameters for nppiMax functions include:*.

NppStatus **nppiMax_16s_C3R_Ctx**(const *Npp16s* *pSrc, int nSrcStep, *NppiSize* oSizeROI, *Npp8u* *pDeviceBuffer, *Npp16s* aMax[3], *NppStreamContext* nppStreamCtx)

Three-channel 16-bit signed image Max.

For common parameter descriptions, see *Common parameters for nppiMax functions include:*.

NppStatus **nppiMax_32f_C3R_Ctx**(const *Npp32f* *pSrc, int nSrcStep, *NppiSize* oSizeROI, *Npp8u* *pDeviceBuffer, *Npp32f* aMax[3], *NppStreamContext* nppStreamCtx)

Three-channel 32-bit floating point image Max.

For common parameter descriptions, see *Common parameters for nppiMax functions include:*.

NppStatus **nppiMax_8u_C4R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *NppiSize* oSizeROI, *Npp8u* *pDeviceBuffer, *Npp8u* aMax[4], *NppStreamContext* nppStreamCtx)

Four-channel 8-bit unsigned image Max.

For common parameter descriptions, see *Common parameters for nppiMax functions include:*.

NppStatus **nppiMax_16u_C4R_Ctx**(const *Npp16u* *pSrc, int nSrcStep, *NppiSize* oSizeROI, *Npp8u* *pDeviceBuffer, *Npp16u* aMax[4], *NppStreamContext* nppStreamCtx)

Four-channel 16-bit unsigned image Max.

For common parameter descriptions, see *Common parameters for nppiMax functions include:*.

NppStatus **nppiMax_16s_C4R_Ctx**(const *Npp16s* *pSrc, int nSrcStep, *NppiSize* oSizeROI, *Npp8u* *pDeviceBuffer, *Npp16s* aMax[4], *NppStreamContext* nppStreamCtx)

For common parameter descriptions, see *Common parameters for nppiMax functions include:*.

NppStatus **nppiMax_32f_C4R_Ctx**(const *Npp32f* *pSrc, int nSrcStep, *NppiSize* oSizeROI, *Npp8u* *pDeviceBuffer, *Npp32f* aMax[4], *NppStreamContext* nppStreamCtx)

Four-channel 32-bit floating point image Max.

For common parameter descriptions, see *Common parameters for nppiMax functions include:*.

NppStatus **nppiMax_8u_AC4R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *NppiSize* oSizeROI, *Npp8u* *pDeviceBuffer, *Npp8u* aMax[3], *NppStreamContext* nppStreamCtx)

Four-channel 8-bit unsigned image Max ignoring alpha channel.

For common parameter descriptions, see *Common parameters for nppiMax functions include:*.

NppStatus **nppiMax_16u_AC4R_Ctx**(const *Npp16u* *pSrc, int nSrcStep, *NppiSize* oSizeROI, *Npp8u* *pDeviceBuffer, *Npp16u* aMax[3], *NppStreamContext* nppStreamCtx)

Four-channel 16-bit unsigned image Max ignoring alpha channel.

For common parameter descriptions, see *Common parameters for nppiMax functions include:*.

NppStatus **nppiMax_16s_AC4R_Ctx**(const *Npp16s* *pSrc, int nSrcStep, *NppiSize* oSizeROI, *Npp8u* *pDeviceBuffer, *Npp16s* aMax[3], *NppStreamContext* nppStreamCtx)

Four-channel 16-bit signed image Max ignoring alpha channel.

For common parameter descriptions, see *Common parameters for nppiMax functions include:*.

NppStatus **nppiMax_32f_AC4R_Ctx**(const *Npp32f* *pSrc, int nSrcStep, *NppiSize* oSizeROI, *Npp8u* *pDeviceBuffer, *Npp32f* aMax[3], *NppStreamContext* nppStreamCtx)

Four-channel 32-bit floating point image Max ignoring alpha channel.

For common parameter descriptions, see *Common parameters for nppiMax functions include:*.

MaxGetBufferHostSize

Companion primitives for computing the device buffer size (in bytes) required by the Max primitives.

1.14.5.2 CommonMaxGetBufferHostSizeParameters

Common parameters for nppiMaxGetBufferHostSize functions include:

param oSizeROI
Region-Of-Interest (ROI).

param hpBufferSize
Required buffer size. Important: hpBufferSize is a *host pointer.* *Scratch Buffer and Host Pointer*.

param nppStreamCtx
Application Managed Stream Context.

return
NPP_NULL_POINTER_ERROR if hpBufferSize is 0 (NULL), *ROI Related Error Codes*.

NppStatus **nppiMaxGetBufferHostSize_8u_C1R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiMax_8u_C1R_Ctx*.

For common parameter descriptions, see *CommonMaxGetBufferHostSizeParameters*.

NppStatus **nppiMaxGetBufferHostSize_16u_C1R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiMax_16u_C1R_Ctx*.

For common parameter descriptions, see *CommonMaxGetBufferHostSizeParameters*.

NppStatus **nppiMaxGetBufferHostSize_16s_C1R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiMax_16s_C1R_Ctx*.

For common parameter descriptions, see *CommonMaxGetBufferHostSizeParameters*.

NppStatus **nppiMaxGetBufferHostSize_32f_C1R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiMax_32f_C1R_Ctx*.

For common parameter descriptions, see *CommonMaxGetBufferHostSizeParameters*.

NppStatus **nppiMaxGetBufferHostSize_8u_C3R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiMax_8u_C3R_Ctx*.

For common parameter descriptions, see *CommonMaxGetBufferHostSizeParameters*.

NppStatus **nppiMaxGetBufferHostSize_16u_C3R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiMax_16u_C3R_Ctx*.

For common parameter descriptions, see *CommonMaxGetBufferHostSizeParameters*.

NppStatus **nppiMaxGetBufferHostSize_16s_C3R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiMax_16s_C3R_Ctx*.

For common parameter descriptions, see *CommonMaxGetBufferHostSizeParameters*.

NppStatus **nppiMaxGetBufferHostSize_32f_C3R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiMax_32f_C3R_Ctx*.

For common parameter descriptions, see *CommonMaxGetBufferHostSizeParameters*.

NppStatus **nppiMaxGetBufferHostSize_8u_C4R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiMax_8u_C4R_Ctx*.

For common parameter descriptions, see *CommonMaxGetBufferHostSizeParameters*.

NppStatus **nppiMaxGetBufferHostSize_16u_C4R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiMax_16u_C4R_Ctx*.

For common parameter descriptions, see *CommonMaxGetBufferHostSizeParameters*.

NppStatus **nppiMaxGetBufferHostSize_16s_C4R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiMax_16s_C4R_Ctx*.

For common parameter descriptions, see *CommonMaxGetBufferHostSizeParameters*.

NppStatus **nppiMaxGetBufferHostSize_32f_C4R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiMax_32f_C4R_Ctx*.

For common parameter descriptions, see *CommonMaxGetBufferHostSizeParameters*.

NppStatus **nppiMaxGetBufferHostSize_8u_AC4R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiMax_8u_AC4R_Ctx*.

For common parameter descriptions, see *CommonMaxGetBufferHostSizeParameters*.

NppStatus **nppiMaxGetBufferHostSize_16u_AC4R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiMax_16u_AC4R_Ctx*.

For common parameter descriptions, see *CommonMaxGetBufferHostSizeParameters*.

NppStatus **nppiMaxGetBufferHostSize_16s_AC4R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiMax_16s_AC4R_Ctx*.

For common parameter descriptions, see *CommonMaxGetBufferHostSizeParameters*.

NppStatus **nppiMaxGetBufferHostSize_32f_AC4R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiMax_32f_AC4R_Ctx*.

For common parameter descriptions, see *CommonMaxGetBufferHostSizeParameters*.

1.14.6. Image Max Index

1.14.6.1 MaxIndx

Primitives for computing the maximal value and its indices (X and Y coordinates) of an image.

MaxIndx

If there are several maxima in the selected region of interest, the function returns one on the top leftmost position.

The scratch buffer is required by the functions.

1.14.6.2 Common parameters for nppiMaxIndx functions include:

param pSrc
Source-Image Pointer.

param nSrcStep
Source-Image Line Step.

param oSizeROI
Region-Of-Interest (ROI).

param pDeviceBuffer
Pointer to the required device memory allocation, *Scratch Buffer and Host Pointer* Use nppiMaxIndxGetBufferHostSize_XX_XXX to determine the minimum number of bytes required.

param pMax
Device memory pointer to the computed max result.

param pIndexX
Device memory pointer to the X coordinate of the image max value.

param pIndexY
Device memory pointer to the Y coordinate of the image max value.

param nppStreamCtx
Application Managed Stream Context.

return
Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiMaxIndx_8u_C1R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *NppiSize* oSizeROI, *Npp8u* *pDeviceBuffer, *Npp8u* *pMax, int *pIndexX, int *pIndexY, *NppStreamContext* nppStreamCtx)

One-channel 8-bit unsigned image MaxIndx.

For common parameter descriptions, see *Common parameters for nppiMaxIndx functions include:*.

NppStatus **nppiMaxIndx_16u_C1R_Ctx**(const *Npp16u* *pSrc, int nSrcStep, *NppiSize* oSizeROI, *Npp8u* *pDeviceBuffer, *Npp16u* *pMax, int *pIndexX, int *pIndexY, *NppStreamContext* nppStreamCtx)

One-channel 16-bit unsigned image MaxIndx.

For common parameter descriptions, see *Common parameters for nppiMaxIndx functions include:*.

NppStatus **nppiMaxIndx_16s_C1R_Ctx**(const *Npp16s* *pSrc, int nSrcStep, *NppiSize* oSizeROI, *Npp8u* *pDeviceBuffer, *Npp16s* *pMax, int *pIndexX, int *pIndexY, *NppStreamContext* nppStreamCtx)

One-channel 16-bit signed image MaxIndx.

For common parameter descriptions, see *Common parameters for nppiMaxIndx functions include:*.

NppStatus **nppiMaxIndx_32f_C1R_Ctx**(const *Npp32f* *pSrc, int nSrcStep, *NppiSize* oSizeROI, *Npp8u* *pDeviceBuffer, *Npp32f* *pMax, int *pIndexX, int *pIndexY, *NppStreamContext* nppStreamCtx)

One-channel 32-bit floating point image MaxIndx.

For common parameter descriptions, see *Common parameters for nppiMaxIndx functions include:*.

NppStatus **nppiMaxIndx_8u_C3R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *NppiSize* oSizeROI, *Npp8u* *pDeviceBuffer, *Npp8u* aMax[3], int aIndexX[3], int aIndexY[3], *NppStreamContext* nppStreamCtx)

Three-channel 8-bit unsigned image MaxIndx.

For common parameter descriptions, see *Common parameters for nppiMaxIndx functions include:*.

NppStatus **nppiMaxIndx_16u_C3R_Ctx**(const *Npp16u* *pSrc, int nSrcStep, *NppiSize* oSizeROI, *Npp8u* *pDeviceBuffer, *Npp16u* aMax[3], int aIndexX[3], int aIndexY[3], *NppStreamContext* nppStreamCtx)

Three-channel 16-bit unsigned image MaxIndx.

For common parameter descriptions, see *Common parameters for nppiMaxIndx functions include:*.

NppStatus **nppiMaxIndx_16s_C3R_Ctx**(const *Npp16s* *pSrc, int nSrcStep, *NppiSize* oSizeROI, *Npp8u* *pDeviceBuffer, *Npp16s* aMax[3], int aIndexX[3], int aIndexY[3], *NppStreamContext* nppStreamCtx)

Three-channel 16-bit signed image MaxIndx.

For common parameter descriptions, see *Common parameters for nppiMaxIndx functions include:*.

NppStatus **nppiMaxIndx_32f_C3R_Ctx**(const *Npp32f* *pSrc, int nSrcStep, *NppiSize* oSizeROI, *Npp8u* *pDeviceBuffer, *Npp32f* aMax[3], int aIndexX[3], int aIndexY[3], *NppStreamContext* nppStreamCtx)

Three-channel 32-bit floating point image MaxIndx.

For common parameter descriptions, see *Common parameters for nppiMaxIndx functions include:*.

NppStatus **nppiMaxIndx_8u_C4R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *NppiSize* oSizeROI, *Npp8u* *pDeviceBuffer, *Npp8u* aMax[4], int aIndexX[4], int aIndexY[4], *NppStreamContext* nppStreamCtx)

Four-channel 8-bit unsigned image MaxIndx.

For common parameter descriptions, see *Common parameters for nppiMaxIndx functions include:*.

NppStatus **nppiMaxIndx_16u_C4R_Ctx**(const *Npp16u* *pSrc, int nSrcStep, *NppiSize* oSizeROI, *Npp8u* *pDeviceBuffer, *Npp16u* aMax[4], int aIndexX[4], int aIndexY[4], *NppStreamContext* nppStreamCtx)

Four-channel 16-bit unsigned image MaxIndx.

For common parameter descriptions, see *Common parameters for nppiMaxIndx functions include:*.

NppStatus **nppiMaxIndx_16s_C4R_Ctx**(const *Npp16s* *pSrc, int nSrcStep, *NppiSize* oSizeROI, *Npp8u* *pDeviceBuffer, *Npp16s* aMax[4], int aIndexX[4], int aIndexY[4], *NppStreamContext* nppStreamCtx)

Four-channel 16-bit signed image MaxIndx.

For common parameter descriptions, see *Common parameters for nppiMaxIndx functions include:*.

NppStatus **nppiMaxIndx_32f_C4R_Ctx**(const *Npp32f* *pSrc, int nSrcStep, *NppiSize* oSizeROI, *Npp8u* *pDeviceBuffer, *Npp32f* aMax[4], int aIndexX[4], int aIndexY[4], *NppStreamContext* nppStreamCtx)

Four-channel 32-bit floating point image MaxIndx.

For common parameter descriptions, see *Common parameters for nppiMaxIndx functions include:*.

NppStatus **nppiMaxIndx_8u_AC4R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *NppiSize* oSizeROI, *Npp8u* *pDeviceBuffer, *Npp8u* aMax[3], int aIndexX[3], int aIndexY[3], *NppStreamContext* nppStreamCtx)

Four-channel 8-bit unsigned image MaxIndx ignoring alpha channel.

For common parameter descriptions, see *Common parameters for nppiMaxIndx functions include:*.

NppStatus **nppiMaxIndx_16u_AC4R_Ctx**(const *Npp16u* *pSrc, int nSrcStep, *NppiSize* oSizeROI, *Npp8u* *pDeviceBuffer, *Npp16u* aMax[3], int aIndexX[3], int aIndexY[3], *NppStreamContext* nppStreamCtx)

Four-channel 16-bit unsigned image MaxIndx ignoring alpha channel.

For common parameter descriptions, see *Common parameters for nppiMaxIndx functions include:*.

NppStatus **nppiMaxIndx_16s_AC4R_Ctx**(const *Npp16s* *pSrc, int nSrcStep, *NppiSize* oSizeROI, *Npp8u* *pDeviceBuffer, *Npp16s* aMax[3], int aIndexX[3], int aIndexY[3], *NppStreamContext* nppStreamCtx)

Four-channel 16-bit signed image MaxIndx ignoring alpha channel.

For common parameter descriptions, see *Common parameters for nppiMaxIndx functions include:*.

NppStatus **nppiMaxIndx_32f_AC4R_Ctx**(const *Npp32f* *pSrc, int nSrcStep, *NppiSize* oSizeROI, *Npp8u* *pDeviceBuffer, *Npp32f* aMax[3], int aIndexX[3], int aIndexY[3], *NppStreamContext* nppStreamCtx)

Four-channel 32-bit floating point image MaxIndx ignoring alpha channel.

For common parameter descriptions, see *Common parameters for nppiMaxIndx functions include:*.

MaxIndxGetBufferHostSize

Companion primitives for computing the device buffer size (in bytes) required by the MaxIndx primitives.

1.14.6.3 CommonMaxIndxGetBufferHostSizeParameters

Common parameters for nppiMaxIndxGetBufferHostSize functions include:

param oSizeROI
Region-Of-Interest (ROI).

param hpBufferSize
Required buffer size. Important: hpBufferSize is a *host pointer.* *Scratch Buffer and Host Pointer*.

param nppStreamCtx
Application Managed Stream Context.

return
NPP_NULL_POINTER_ERROR if hpBufferSize is 0 (NULL), *ROI Related Error Codes*.

NppStatus **nppiMaxIndxGetBufferHostSize_8u_C1R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Computes the device scratch buffer size (in bytes) for nppiMaxIndx_8u_C1R_Ctx.

For common parameter descriptions, see *CommonMaxIndxGetBufferHostSizeParameters*.

NppStatus **nppiMaxIndxGetBufferHostSize_16u_C1R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Computes the device scratch buffer size (in bytes) for nppiMaxIndx_16u_C1R_Ctx.

For common parameter descriptions, see *CommonMaxIndxGetBufferHostSizeParameters*.

NppStatus **nppiMaxIndxGetBufferHostSize_16s_C1R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Computes the device scratch buffer size (in bytes) for nppiMaxIndx_16s_C1R_Ctx.

For common parameter descriptions, see *CommonMaxIndxGetBufferHostSizeParameters*.

NppStatus **nppiMaxIndxGetBufferHostSize_32f_C1R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Computes the device scratch buffer size (in bytes) for nppiMaxIndx_32f_C1R_Ctx.

For common parameter descriptions, see *CommonMaxIndxGetBufferHostSizeParameters*.

NppStatus **nppiMaxIndxGetBufferHostSize_8u_C3R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Computes the device scratch buffer size (in bytes) for nppiMaxIndx_8u_C3R_Ctx.

For common parameter descriptions, see *CommonMaxIndxGetBufferHostSizeParameters*.

NppStatus **nppiMaxIndxGetBufferHostSize_16u_C3R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Computes the device scratch buffer size (in bytes) for nppiMaxIndx_16u_C3R_Ctx.

For common parameter descriptions, see *CommonMaxIndxGetBufferHostSizeParameters*.

NppStatus **nppiMaxIndxGetBufferHostSize_16s_C3R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Computes the device scratch buffer size (in bytes) for nppiMaxIndx_16s_C3R_Ctx.

For common parameter descriptions, see *CommonMaxIndxGetBufferHostSizeParameters*.

NppStatus **nppiMaxIndxGetBufferHostSize_32f_C3R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Computes the device scratch buffer size (in bytes) for nppiMaxIndx_32f_C3R_Ctx.

For common parameter descriptions, see *CommonMaxIndxGetBufferHostSizeParameters*.

NppStatus **nppiMaxIndxGetBufferHostSize_8u_C4R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Computes the device scratch buffer size (in bytes) for nppiMaxIndx_8u_C4R_Ctx.

For common parameter descriptions, see *CommonMaxIndxGetBufferHostSizeParameters*.

NppStatus **nppiMaxIndxGetBufferHostSize_16u_C4R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Computes the device scratch buffer size (in bytes) for nppiMaxIndx_16u_C4R_Ctx.

For common parameter descriptions, see *CommonMaxIndxGetBufferHostSizeParameters*.

NppStatus **nppiMaxIndxGetBufferHostSize_16s_C4R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Computes the device scratch buffer size (in bytes) for nppiMaxIndx_16s_C4R_Ctx.

For common parameter descriptions, see *CommonMaxIndxGetBufferHostSizeParameters*.

NppStatus **nppiMaxIndxGetBufferHostSize_32f_C4R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Computes the device scratch buffer size (in bytes) for nppiMaxIndx_32f_C4R_Ctx.

For common parameter descriptions, see *CommonMaxIndxGetBufferHostSizeParameters*.

NppStatus **nppiMaxIndxGetBufferHostSize_8u_AC4R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Computes the device scratch buffer size (in bytes) for nppiMaxIndx_8u_AC4R_Ctx.

For common parameter descriptions, see *CommonMaxIndxGetBufferHostSizeParameters*.

NppStatus **nppiMaxIndxGetBufferHostSize_16u_AC4R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Computes the device scratch buffer size (in bytes) for nppiMaxIndx_8u_AC4R_Ctx.

For common parameter descriptions, see *CommonMaxIndxGetBufferHostSizeParameters*.

NppStatus **nppiMaxIndxGetBufferHostSize_16s_AC4R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Computes the device scratch buffer size (in bytes) for nppiMaxIndx_16u_AC4R_Ctx.

For common parameter descriptions, see *CommonMaxIndxGetBufferHostSizeParameters*.

NppStatus **nppiMaxIndxGetBufferHostSize_32f_AC4R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Computes the device scratch buffer size (in bytes) for nppiMaxIndx_32f_AC4R_Ctx.

For common parameter descriptions, see *CommonMaxIndxGetBufferHostSizeParameters*.

1.14.7. Image MinMax

1.14.7.1 MinMax

Primitives for computing both the minimal and the maximal values of an image.

MinMax

The functions require the device scratch buffer.

1.14.7.2 Common parameters for nppiMinMax functions include:

param pSrc
Source-Image Pointer.

param nSrcStep
Source-Image Line Step.

param oSizeROI
Region-Of-Interest (ROI).

param pMin
Device memory pointer to the computed minimal result.

param pMax
Device memory pointer to the computed maximal result.

param pDeviceBuffer
Buffer to a scratch memory. Use nppiMinMax_XX_XXX to determine the minimum number of bytes required.

param nppStreamCtx
Application Managed Stream Context.

return
Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiMinMax_8u_C1R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *NppiSize* oSizeROI, *Npp8u* *pMin, *Npp8u* *pMax, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

One-channel 8-bit unsigned image MinMax.

NppStatus **nppiMinMax_16u_C1R_Ctx**(const *Npp16u* *pSrc, int nSrcStep, *NppiSize* oSizeROI, *Npp16u* *pMin, *Npp16u* *pMax, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

One-channel 16-bit unsigned image MinMax.

For common parameter descriptions, see *Common parameters for nppiMinMax functions include:*.

NppStatus **nppiMinMax_16s_C1R_Ctx**(const *Npp16s* *pSrc, int nSrcStep, *NppiSize* oSizeROI, *Npp16s* *pMin, *Npp16s* *pMax, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

One-channel 16-bit signed image MinMax.

For common parameter descriptions, see *Common parameters for nppiMinMax functions include:*.

NppStatus **nppiMinMax_32f_C1R_Ctx**(const *Npp32f* *pSrc, int nSrcStep, *NppiSize* oSizeROI, *Npp32f* *pMin, *Npp32f* *pMax, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

One-channel 32-bit floating point image MinMax.

For common parameter descriptions, see *Common parameters for nppiMinMax functions include:*.

NppStatus **nppiMinMax_8u_C3R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *NppiSize* oSizeROI, *Npp8u* aMin[3], *Npp8u* aMax[3], *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Three-channel 8-bit unsigned image MinMax.

For common parameter descriptions, see *Common parameters for nppiMinMax functions include:*.

NppStatus **nppiMinMax_16u_C3R_Ctx**(const *Npp16u* *pSrc, int nSrcStep, *NppiSize* oSizeROI, *Npp16u* aMin[3], *Npp16u* aMax[3], *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Three-channel 16-bit unsigned image MinMax.

For common parameter descriptions, see *Common parameters for nppiMinMax functions include:*.

NppStatus **nppiMinMax_16s_C3R_Ctx**(const *Npp16s* *pSrc, int nSrcStep, *NppiSize* oSizeROI, *Npp16s* aMin[3], *Npp16s* aMax[3], *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Three-channel 16-bit signed image MinMax.

For common parameter descriptions, see *Common parameters for nppiMinMax functions include:*.

NppStatus **nppiMinMax_32f_C3R_Ctx**(const *Npp32f* *pSrc, int nSrcStep, *NppiSize* oSizeROI, *Npp32f* aMin[3], *Npp32f* aMax[3], *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Three-channel 32-bit floating point image MinMax.

For common parameter descriptions, see *Common parameters for nppiMinMax functions include:*.

NppStatus **nppiMinMax_8u_AC4R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *NppiSize* oSizeROI, *Npp8u* aMin[3], *Npp8u* aMax[3], *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Four-channel 8-bit unsigned image MinMax ignoring alpha channel.

For common parameter descriptions, see *Common parameters for nppiMinMax functions include:*.

NppStatus **nppiMinMax_16u_AC4R_Ctx**(const *Npp16u* *pSrc, int nSrcStep, *NppiSize* oSizeROI, *Npp16u* aMin[3], *Npp16u* aMax[3], *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Four-channel 16-bit unsigned image MinMax ignoring alpha channel.

For common parameter descriptions, see *Common parameters for nppiMinMax functions include:*.

NppStatus **nppiMinMax_16s_AC4R_Ctx**(const *Npp16s* *pSrc, int nSrcStep, *NppiSize* oSizeROI, *Npp16s* aMin[3], *Npp16s* aMax[3], *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

For common parameter descriptions, see *Common parameters for nppiMinMax functions include:*.

NppStatus **nppiMinMax_32f_AC4R_Ctx**(const *Npp32f* *pSrc, int nSrcStep, *NppiSize* oSizeROI, *Npp32f* aMin[3], *Npp32f* aMax[3], *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Four-channel 32-bit floating point image MinMax ignoring alpha channel.

For common parameter descriptions, see *Common parameters for nppiMinMax functions include:*.

NppStatus **nppiMinMax_8u_C4R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *NppiSize* oSizeROI, *Npp8u* aMin[4], *Npp8u* aMax[4], *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Four-channel 8-bit unsigned image MinMax.

For common parameter descriptions, see *Common parameters for nppiMinMax functions include:*.

NppStatus **nppiMinMax_16u_C4R_Ctx**(const *Npp16u* *pSrc, int nSrcStep, *NppiSize* oSizeROI, *Npp16u* aMin[4], *Npp16u* aMax[4], *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Four-channel 16-bit unsigned image MinMax.

For common parameter descriptions, see *Common parameters for nppiMinMax functions include:*.

NppStatus **nppiMinMax_16s_C4R_Ctx**(const *Npp16s* *pSrc, int nSrcStep, *NppiSize* oSizeROI, *Npp16s* aMin[4], *Npp16s* aMax[4], *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Four-channel 16-bit signed image MinMax.

For common parameter descriptions, see *Common parameters for nppiMinMax functions include:*.

NppStatus **nppiMinMax_32f_C4R_Ctx**(const *Npp32f* *pSrc, int nSrcStep, *NppiSize* oSizeROI, *Npp32f* aMin[4], *Npp32f* aMax[4], *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Four-channel 32-bit floating point image MinMax.

For common parameter descriptions, see *Common parameters for nppiMinMax functions include:*.

MinMaxGetBufferHostSize

Companion primitives for computing the device buffer size (in bytes) required by the MinMax primitives.

1.14.7.3 CommonMinMaxGetBufferHostSizeParameters

Common parameters for nppiMinMaxGetBufferHostSize functions include:

param oSizeROI
Region-Of-Interest (ROI).

param hpBufferSize
Required buffer size. Important: hpBufferSize is a *host pointer.* *Scratch Buffer and Host Pointer*.

param nppStreamCtx
Application Managed Stream Context.

return
NPP_NULL_POINTER_ERROR if hpBufferSize is 0 (NULL), *ROI Related Error Codes*.

NppStatus **nppiMinMaxGetBufferHostSize_8u_C1R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiMinMax_8u_C1R_Ctx*.

For common parameter descriptions, see *CommonMinMaxGetBufferHostSizeParameters*.

NppStatus **nppiMinMaxGetBufferHostSize_16u_C1R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiMinMax_16u_C1R_Ctx*.

For common parameter descriptions, see *CommonMinMaxGetBufferHostSizeParameters*.

NppStatus **nppiMinMaxGetBufferHostSize_16s_C1R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiMinMax_16s_C1R_Ctx*.

For common parameter descriptions, see *CommonMinMaxGetBufferHostSizeParameters*.

NppStatus **nppiMinMaxGetBufferHostSize_32f_C1R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiMinMax_32f_C1R_Ctx*.

For common parameter descriptions, see *CommonMinMaxGetBufferHostSizeParameters*.

NppStatus **nppiMinMaxGetBufferHostSize_8u_C3R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiMinMax_8u_C3R_Ctx*.

For common parameter descriptions, see *CommonMinMaxGetBufferHostSizeParameters*.

NppStatus **nppiMinMaxGetBufferHostSize_16u_C3R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiMinMax_16u_C3R_Ctx*.

For common parameter descriptions, see *CommonMinMaxGetBufferHostSizeParameters*.

NppStatus **nppiMinMaxGetBufferHostSize_16s_C3R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiMinMax_16s_C3R_Ctx*.

For common parameter descriptions, see *CommonMinMaxGetBufferHostSizeParameters*.

NppStatus **nppiMinMaxGetBufferHostSize_32f_C3R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiMinMax_32f_C3R_Ctx*.

For common parameter descriptions, see *CommonMinMaxGetBufferHostSizeParameters*.

NppStatus **nppiMinMaxGetBufferHostSize_8u_AC4R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiMinMax_8u_AC4R_Ctx*.

For common parameter descriptions, see *CommonMinMaxGetBufferHostSizeParameters*.

NppStatus **nppiMinMaxGetBufferHostSize_16u_AC4R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiMinMax_16u_AC4R_Ctx*.

For common parameter descriptions, see *CommonMinMaxGetBufferHostSizeParameters*.

NppStatus **nppiMinMaxGetBufferHostSize_16s_AC4R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiMinMax_16s_AC4R_Ctx*.

For common parameter descriptions, see *CommonMinMaxGetBufferHostSizeParameters*.

NppStatus **nppiMinMaxGetBufferHostSize_32f_AC4R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiMinMax_32f_AC4R_Ctx*.

For common parameter descriptions, see *CommonMinMaxGetBufferHostSizeParameters*.

NppStatus **nppiMinMaxGetBufferHostSize_8u_C4R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiMinMax_8u_C4R_Ctx*.

For common parameter descriptions, see *CommonMinMaxGetBufferHostSizeParameters*.

NppStatus **nppiMinMaxGetBufferHostSize_16u_C4R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiMinMax_16u_C4R_Ctx*.

For common parameter descriptions, see *CommonMinMaxGetBufferHostSizeParameters*.

NppStatus **nppiMinMaxGetBufferHostSize_16s_C4R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiMinMax_16s_C4R_Ctx*.

For common parameter descriptions, see *CommonMinMaxGetBufferHostSizeParameters*.

NppStatus **nppiMinMaxGetBufferHostSize_32f_C4R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

For common parameter descriptions, see *CommonMinMaxGetBufferHostSizeParameters*.

1.14.8. Image Mean

1.14.8.1 Mean

Primitives for computing the arithmetic mean of all the pixel values in an image.

Mean

Given an image $pSrc$ with width W and height H, the arithmetic mean will be computed as

$$Mean = \frac{1}{W \cdot H} \sum_{j=0}^{H-1} \sum_{i=0}^{W-1} pSrc(j,i)$$

The mean functions require additional scratch buffer for computations.

1.14.8.2 Common parameters for nppiMean functions include:

param pSrc
Source-Image Pointer.

param nSrcStep
Source-Image Line Step.

param oSizeROI
Region-Of-Interest (ROI).

param pMask
Mask-Image Pointer.

param nMaskStep
Mask-Image Line Step.

param nCOI
Channel_of_Interest Number.

param pDeviceBuffer
Pointer to the required device memory allocation, *Scratch Buffer and Host Pointer* Use nppiMeanGetBufferHostSize_XX_XXX to determine the minimum number of bytes required.

param pMean
Device memory pointer to the computed mean result.

param nppStreamCtx
Application Managed Stream Context.

return
Image Data Related Error Codes, *ROI Related Error Codes*, or NPP_COI_ERROR if an invalid channel of interest is specified.s

NppStatus **nppiMean_8u_C1R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *NppiSize* oSizeROI, *Npp8u* *pDeviceBuffer, *Npp64f* *pMean, *NppStreamContext* nppStreamCtx)

One-channel 8-bit unsigned image Mean.

For common parameter descriptions, see *Common parameters for nppiMean functions include:*.

NppStatus **nppiMean_16u_C1R_Ctx**(const *Npp16u* *pSrc, int nSrcStep, *NppiSize* oSizeROI, *Npp8u* *pDeviceBuffer, *Npp64f* *pMean, *NppStreamContext* nppStreamCtx)

One-channel 16-bit unsigned image Mean.

For common parameter descriptions, see *Common parameters for nppiMean functions include:*.

NppStatus **nppiMean_16s_C1R_Ctx**(const *Npp16s* *pSrc, int nSrcStep, *NppiSize* oSizeROI, *Npp8u* *pDeviceBuffer, *Npp64f* *pMean, *NppStreamContext* nppStreamCtx)

One-channel 16-bit signed image Mean.

For common parameter descriptions, see *Common parameters for nppiMean functions include:*.

NppStatus **nppiMean_32f_C1R_Ctx**(const *Npp32f* *pSrc, int nSrcStep, *NppiSize* oSizeROI, *Npp8u* *pDeviceBuffer, *Npp64f* *pMean, *NppStreamContext* nppStreamCtx)

One-channel 32-bit floating point image Mean.

For common parameter descriptions, see *Common parameters for nppiMean functions include:*.

NppStatus **nppiMean_8u_C3R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *NppiSize* oSizeROI, *Npp8u* *pDeviceBuffer, *Npp64f* aMean[3], *NppStreamContext* nppStreamCtx)

Three-channel 8-bit unsigned image Mean.

For common parameter descriptions, see *Common parameters for nppiMean functions include:*.

NppStatus **nppiMean_16u_C3R_Ctx**(const *Npp16u* *pSrc, int nSrcStep, *NppiSize* oSizeROI, *Npp8u* *pDeviceBuffer, *Npp64f* aMean[3], *NppStreamContext* nppStreamCtx)

Three-channel 16-bit unsigned image Mean.

For common parameter descriptions, see *Common parameters for nppiMean functions include:*.

NppStatus **nppiMean_16s_C3R_Ctx**(const *Npp16s* *pSrc, int nSrcStep, *NppiSize* oSizeROI, *Npp8u* *pDeviceBuffer, *Npp64f* aMean[3], *NppStreamContext* nppStreamCtx)

Three-channel 16-bit signed image Mean.

For common parameter descriptions, see *Common parameters for nppiMean functions include:*.

NppStatus **nppiMean_32f_C3R_Ctx**(const *Npp32f* *pSrc, int nSrcStep, *NppiSize* oSizeROI, *Npp8u* *pDeviceBuffer, *Npp64f* aMean[3], *NppStreamContext* nppStreamCtx)

Three-channel 32-bit floating point image Mean.

For common parameter descriptions, see *Common parameters for nppiMean functions include:*.

NppStatus **nppiMean_8u_C4R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *NppiSize* oSizeROI, *Npp8u* *pDeviceBuffer, *Npp64f* aMean[4], *NppStreamContext* nppStreamCtx)

Four-channel 8-bit unsigned image Mean.

For common parameter descriptions, see *Common parameters for nppiMean functions include:*.

NppStatus **nppiMean_16u_C4R_Ctx**(const *Npp16u* *pSrc, int nSrcStep, *NppiSize* oSizeROI, *Npp8u* *pDeviceBuffer, *Npp64f* aMean[4], *NppStreamContext* nppStreamCtx)

Four-channel 16-bit unsigned image Mean.

For common parameter descriptions, see *Common parameters for nppiMean functions include:*.

NppStatus **nppiMean_16s_C4R_Ctx**(const *Npp16s* *pSrc, int nSrcStep, *NppiSize* oSizeROI, *Npp8u* *pDeviceBuffer, *Npp64f* aMean[4], *NppStreamContext* nppStreamCtx)

Four-channel 16-bit signed image Mean.

For common parameter descriptions, see *Common parameters for nppiMean functions include:*.

NppStatus **nppiMean_32f_C4R_Ctx**(const *Npp32f* *pSrc, int nSrcStep, *NppiSize* oSizeROI, *Npp8u* *pDeviceBuffer, *Npp64f* aMean[4], *NppStreamContext* nppStreamCtx)

Four-channel 32-bit floating point image Mean.

For common parameter descriptions, see *Common parameters for nppiMean functions include:*.

NppStatus **nppiMean_8u_AC4R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *NppiSize* oSizeROI, *Npp8u* *pDeviceBuffer, *Npp64f* aMean[3], *NppStreamContext* nppStreamCtx)

Four-channel 8-bit unsigned image Mean ignoring alpha channel.

For common parameter descriptions, see *Common parameters for nppiMean functions include:*.

NppStatus **nppiMean_16u_AC4R_Ctx**(const *Npp16u* *pSrc, int nSrcStep, *NppiSize* oSizeROI, *Npp8u* *pDeviceBuffer, *Npp64f* aMean[3], *NppStreamContext* nppStreamCtx)

Four-channel 16-bit unsigned image Mean ignoring alpha channel.

For common parameter descriptions, see *Common parameters for nppiMean functions include:*.

NppStatus **nppiMean_16s_AC4R_Ctx**(const *Npp16s* *pSrc, int nSrcStep, *NppiSize* oSizeROI, *Npp8u* *pDeviceBuffer, *Npp64f* aMean[3], *NppStreamContext* nppStreamCtx)

Four-channel 16-bit signed image Mean ignoring alpha channel.

For common parameter descriptions, see *Common parameters for nppiMean functions include:*.

NppStatus **nppiMean_32f_AC4R_Ctx**(const *Npp32f* *pSrc, int nSrcStep, *NppiSize* oSizeROI, *Npp8u* *pDeviceBuffer, *Npp64f* aMean[3], *NppStreamContext* nppStreamCtx)

Four-channel 32-bit floating point image Mean ignoring alpha channel.

For common parameter descriptions, see *Common parameters for nppiMean functions include:*.

NppStatus **nppiMean_8u_C1MR_Ctx**(const *Npp8u* *pSrc, int nSrcStep, const *Npp8u* *pMask, int nMaskStep, *NppiSize* oSizeROI, *Npp8u* *pDeviceBuffer, *Npp64f* *pMean, *NppStreamContext* nppStreamCtx)

Masked one-channel 8-bit unsigned image Mean.

For common parameter descriptions, see *Common parameters for nppiMean functions include:*.

NppStatus **nppiMean_8s_C1MR_Ctx**(const *Npp8s* *pSrc, int nSrcStep, const *Npp8u* *pMask, int nMaskStep, *NppiSize* oSizeROI, *Npp8u* *pDeviceBuffer, *Npp64f* *pMean, *NppStreamContext* nppStreamCtx)

Masked one-channel 8-bit signed image Mean.

For common parameter descriptions, see *Common parameters for nppiMean functions include:*.

NppStatus **nppiMean_16u_C1MR_Ctx**(const *Npp16u* *pSrc, int nSrcStep, const *Npp8u* *pMask, int nMaskStep, *NppiSize* oSizeROI, *Npp8u* *pDeviceBuffer, *Npp64f* *pMean, *NppStreamContext* nppStreamCtx)

Masked one-channel 16-bit unsigned image Mean.

For common parameter descriptions, see *Common parameters for nppiMean functions include:*.

NppStatus **nppiMean_32f_C1MR_Ctx**(const *Npp32f* *pSrc, int nSrcStep, const *Npp8u* *pMask, int nMaskStep, *NppiSize* oSizeROI, *Npp8u* *pDeviceBuffer, *Npp64f* *pMean, *NppStreamContext* nppStreamCtx)

Masked one-channel 32-bit floating point image Mean.

For common parameter descriptions, see *Common parameters for nppiMean functions include:*.

NppStatus **nppiMean_8u_C3CMR_Ctx**(const *Npp8u* *pSrc, int nSrcStep, const *Npp8u* *pMask, int nMaskStep, *NppiSize* oSizeROI, int nCOI, *Npp8u* *pDeviceBuffer, *Npp64f* *pMean, *NppStreamContext* nppStreamCtx)

Masked three-channel 8-bit unsigned image Mean affecting only single channel.

For common parameter descriptions, see *Common parameters for nppiMean functions include:*.

NppStatus **nppiMean_8s_C3CMR_Ctx**(const *Npp8s* *pSrc, int nSrcStep, const *Npp8u* *pMask, int nMaskStep, *NppiSize* oSizeROI, int nCOI, *Npp8u* *pDeviceBuffer, *Npp64f* *pMean, *NppStreamContext* nppStreamCtx)

Masked three-channel 8-bit signed image Mean affecting only single channel.

For common parameter descriptions, see *Common parameters for nppiMean functions include:*.

NppStatus **nppiMean_16u_C3CMR_Ctx**(const *Npp16u* *pSrc, int nSrcStep, const *Npp8u* *pMask, int nMaskStep, *NppiSize* oSizeROI, int nCOI, *Npp8u* *pDeviceBuffer, *Npp64f* *pMean, *NppStreamContext* nppStreamCtx)

Masked three-channel 16-bit unsigned image Mean affecting only single channel.

For common parameter descriptions, see *Common parameters for nppiMean functions include:*.

NppStatus **nppiMean_32f_C3CMR_Ctx**(const *Npp32f* *pSrc, int nSrcStep, const *Npp8u* *pMask, int nMaskStep, *NppiSize* oSizeROI, int nCOI, *Npp8u* *pDeviceBuffer, *Npp64f* *pMean, *NppStreamContext* nppStreamCtx)

Masked three-channel 32-bit floating point image Mean affecting only single channel.

For common parameter descriptions, see *Common parameters for nppiMean functions include:*.

MeanGetBufferHostSize

Companion primitives for computing the device buffer size (in bytes) required by the Mean primitives.

1.14.8.3 CommonMeanGetBufferHostSizeParameters

Common parameters for nppiMeanGetBufferHostSize functions include:

param oSizeROI
Region-Of-Interest (ROI).

param hpBufferSize
Required buffer size. Important: hpBufferSize is a *host pointer.* *Scratch Buffer and Host Pointer*.

param nppStreamCtx
Application Managed Stream Context.

return
NPP_NULL_POINTER_ERROR if hpBufferSize is 0 (NULL), *ROI Related Error Codes*.

NppStatus **nppiMeanGetBufferHostSize_8u_C1R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiMean_8u_C1R_Ctx*.

NppStatus **nppiMeanGetBufferHostSize_16u_C1R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiMean_16u_C1R_Ctx*.

For common parameter descriptions, see *CommonMeanGetBufferHostSizeParameters*.

NppStatus **nppiMeanGetBufferHostSize_16s_C1R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiMean_16s_C1R_Ctx*.

For common parameter descriptions, see *CommonMeanGetBufferHostSizeParameters*.

NppStatus **nppiMeanGetBufferHostSize_32f_C1R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiMean_32f_C1R_Ctx*.

For common parameter descriptions, see *CommonMeanGetBufferHostSizeParameters*.

NppStatus **nppiMeanGetBufferHostSize_8u_C3R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiMean_8u_C3R_Ctx*.

For common parameter descriptions, see *CommonMeanGetBufferHostSizeParameters*.

NppStatus **nppiMeanGetBufferHostSize_16u_C3R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiMean_16u_C3R_Ctx*.

For common parameter descriptions, see *CommonMeanGetBufferHostSizeParameters*.

NppStatus **nppiMeanGetBufferHostSize_16s_C3R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiMean_16s_C3R_Ctx*.

For common parameter descriptions, see *CommonMeanGetBufferHostSizeParameters*.

NppStatus **nppiMeanGetBufferHostSize_32f_C3R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiMean_32f_C3R_Ctx*.

For common parameter descriptions, see *CommonMeanGetBufferHostSizeParameters*.

NppStatus **nppiMeanGetBufferHostSize_8u_AC4R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiMean_8u_AC4R_Ctx*.

For common parameter descriptions, see *CommonMeanGetBufferHostSizeParameters*.

NppStatus **nppiMeanGetBufferHostSize_16u_AC4R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiMean_16u_AC4R_Ctx*.

For common parameter descriptions, see *CommonMeanGetBufferHostSizeParameters*.

NppStatus **nppiMeanGetBufferHostSize_16s_AC4R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiMean_16s_AC4R_Ctx*.

For common parameter descriptions, see *CommonMeanGetBufferHostSizeParameters*.

NppStatus **nppiMeanGetBufferHostSize_32f_AC4R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiMean_32f_AC4R_Ctx*.

For common parameter descriptions, see *CommonMeanGetBufferHostSizeParameters*.

NppStatus **nppiMeanGetBufferHostSize_8u_C4R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiMean_8u_C4R_Ctx*.

For common parameter descriptions, see *CommonMeanGetBufferHostSizeParameters*.

NppStatus **nppiMeanGetBufferHostSize_16u_C4R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiMean_16u_C4R_Ctx*.

For common parameter descriptions, see *CommonMeanGetBufferHostSizeParameters*.

NppStatus **nppiMeanGetBufferHostSize_16s_C4R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiMean_16s_C4R_Ctx*.

For common parameter descriptions, see *CommonMeanGetBufferHostSizeParameters*.

NppStatus **nppiMeanGetBufferHostSize_32f_C4R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiMean_32f_C4R_Ctx*.

For common parameter descriptions, see *CommonMeanGetBufferHostSizeParameters*.

NppStatus **nppiMeanGetBufferHostSize_8u_C1MR_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiMean_8u_C1MR_Ctx*.

For common parameter descriptions, see *CommonMeanGetBufferHostSizeParameters*.

NppStatus **nppiMeanGetBufferHostSize_8s_C1MR_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiMean_8s_C1MR_Ctx*.

For common parameter descriptions, see *CommonMeanGetBufferHostSizeParameters*.

NppStatus **nppiMeanGetBufferHostSize_16u_C1MR_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiMean_16u_C1MR_Ctx*.

For common parameter descriptions, see *CommonMeanGetBufferHostSizeParameters*.

NppStatus **nppiMeanGetBufferHostSize_32f_C1MR_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiMean_32f_C1MR_Ctx*.

For common parameter descriptions, see *CommonMeanGetBufferHostSizeParameters*.

NppStatus **nppiMeanGetBufferHostSize_8u_C3CMR_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiMean_8u_C3CMR_Ctx*.

For common parameter descriptions, see *CommonMeanGetBufferHostSizeParameters*.

NppStatus **nppiMeanGetBufferHostSize_8s_C3CMR_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiMean_8s_C3CMR_Ctx*.

For common parameter descriptions, see *CommonMeanGetBufferHostSizeParameters*.

NppStatus **nppiMeanGetBufferHostSize_16u_C3CMR_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiMean_16u_C3CMR_Ctx*.

For common parameter descriptions, see *CommonMeanGetBufferHostSizeParameters*.

NppStatus **nppiMeanGetBufferHostSize_32f_C3CMR_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiMean_32f_C3CMR_Ctx*.

For common parameter descriptions, see *CommonMeanGetBufferHostSizeParameters*.

1.14.9. Image Mean StdDev

1.14.9.1 Mean_StdDev

Primitives for computing both the arithmetic mean and the standard deviation of an image.

Mean_StdDev

Given an image $pSrc$ with width W and height H, the mean and the standard deviation will be computed as

$$Mean = \frac{1}{W \cdot H} \sum_{j=0}^{H-1} \sum_{i=0}^{W-1} pSrc(j,i)$$

$$StdDev = \sqrt{\frac{1}{W \cdot H} \sum_{j=0}^{H-1} \sum_{i=0}^{W-1} (pSrc(j,i) - Mean)^2}$$

The Mean_StdDev primitives require additional scratch buffer for computations.

1.14.9.2 Common parameters for nppiMean_StdDev functions include:

param pSrc
Source-Image Pointer.

param nSrcStep
Source-Image Line Step.

param oSizeROI
Region-Of-Interest (ROI).

param pMask
Mask-Image Pointer.

param nMaskStep
Mask-Image Line Step.

param nCOI
Channel_of_Interest Number.

param pDeviceBuffer
Pointer to the required device memory allocation, *Scratch Buffer and Host Pointer* Use *MeanStdDevGetBufferHostSize* to determine the minimum number of bytes required.

param pMean
Device memory pointer to the computed mean.

param pStdDev
Device memory pointer to the computed standard deviation.

param nppStreamCtx
Application Managed Stream Context.

return
Image Data Related Error Codes, *ROI Related Error Codes*, or NPP_COI_ERROR if an invalid channel of interest is specified.

NppStatus **nppiMean_StdDev_8u_C1R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *NppiSize* oSizeROI, *Npp8u* *pDeviceBuffer, *Npp64f* *pMean, *Npp64f* *pStdDev, *NppStreamContext* nppStreamCtx)

One-channel 8-bit unsigned image Mean_StdDev.

For common parameter descriptions, see *Common parameters for nppiMean_StdDev functions include:*.

NppStatus **nppiMean_StdDev_8s_C1R_Ctx**(const *Npp8s* *pSrc, int nSrcStep, *NppiSize* oSizeROI, *Npp8u* *pDeviceBuffer, *Npp64f* *pMean, *Npp64f* *pStdDev, *NppStreamContext* nppStreamCtx)

One-channel 8-bit signed image Mean_StdDev.

For common parameter descriptions, see *Common parameters for nppiMean_StdDev functions include:*.

NppStatus **nppiMean_StdDev_16u_C1R_Ctx**(const *Npp16u* *pSrc, int nSrcStep, *NppiSize* oSizeROI, *Npp8u* *pDeviceBuffer, *Npp64f* *pMean, *Npp64f* *pStdDev, *NppStreamContext* nppStreamCtx)

One-channel 16-bit unsigned image Mean_StdDev.

For common parameter descriptions, see *Common parameters for nppiMean_StdDev functions include:*.

NppStatus **nppiMean_StdDev_32f_C1R_Ctx**(const *Npp32f* *pSrc, int nSrcStep, *NppiSize* oSizeROI, *Npp8u* *pDeviceBuffer, *Npp64f* *pMean, *Npp64f* *pStdDev, *NppStreamContext* nppStreamCtx)

One-channel 32-bit floating point image Mean_StdDev.

For common parameter descriptions, see *Common parameters for nppiMean_StdDev functions include:*.

NppStatus **nppiMean_StdDev_8u_C1MR_Ctx**(const *Npp8u* *pSrc, int nSrcStep, const *Npp8u* *pMask, int nMaskStep, *NppiSize* oSizeROI, *Npp8u* *pDeviceBuffer, *Npp64f* *pMean, *Npp64f* *pStdDev, *NppStreamContext* nppStreamCtx)

Masked one-channel 8-bit unsigned image Mean_StdDev.

For common parameter descriptions, see *Common parameters for nppiMean_StdDev functions include:*.

NppStatus **nppiMean_StdDev_8s_C1MR_Ctx**(const *Npp8s* *pSrc, int nSrcStep, const *Npp8u* *pMask, int nMaskStep, *NppiSize* oSizeROI, *Npp8u* *pDeviceBuffer, *Npp64f* *pMean, *Npp64f* *pStdDev, *NppStreamContext* nppStreamCtx)

Masked one-channel 8-bit signed image Mean_StdDev.

For common parameter descriptions, see *Common parameters for nppiMean_StdDev functions include:*.

NppStatus **nppiMean_StdDev_16u_C1MR_Ctx**(const *Npp16u* *pSrc, int nSrcStep, const *Npp8u* *pMask, int nMaskStep, *NppiSize* oSizeROI, *Npp8u* *pDeviceBuffer, *Npp64f* *pMean, *Npp64f* *pStdDev, *NppStreamContext* nppStreamCtx)

Masked one-channel 16-bit unsigned image Mean_StdDev.

For common parameter descriptions, see *Common parameters for nppiMean_StdDev functions include:*.

NppStatus **nppiMean_StdDev_32f_C1MR_Ctx**(const *Npp32f* *pSrc, int nSrcStep, const *Npp8u* *pMask, int nMaskStep, *NppiSize* oSizeROI, *Npp8u* *pDeviceBuffer, *Npp64f* *pMean, *Npp64f* *pStdDev, *NppStreamContext* nppStreamCtx)

Masked one-channel 32-bit floating point image Mean_StdDev.

For common parameter descriptions, see *Common parameters for nppiMean_StdDev functions include:*.

Channel Mean_StdDev

See *Channel-of-Interest API*.

NppStatus **nppiMean_StdDev_8u_C3CR_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *NppiSize* oSizeROI, int nCOI, *Npp8u* *pDeviceBuffer, *Npp64f* *pMean, *Npp64f* *pStdDev, *NppStreamContext* nppStreamCtx)

Three-channel 8-bit unsigned image Mean_StdDev affecting only single channel.

For common parameter descriptions, see *Common parameters for nppiMean_StdDev functions include:*.

NppStatus **nppiMean_StdDev_8s_C3CR_Ctx**(const *Npp8s* *pSrc, int nSrcStep, *NppiSize* oSizeROI, int nCOI, *Npp8u* *pDeviceBuffer, *Npp64f* *pMean, *Npp64f* *pStdDev, *NppStreamContext* nppStreamCtx)

Three-channel 8-bit signed image Mean_StdDev affecting only single channel.

For common parameter descriptions, see *Common parameters for nppiMean_StdDev functions include:*.

NppStatus **nppiMean_StdDev_16u_C3CR_Ctx**(const *Npp16u* *pSrc, int nSrcStep, *NppiSize* oSizeROI, int nCOI, *Npp8u* *pDeviceBuffer, *Npp64f* *pMean, *Npp64f* *pStdDev, *NppStreamContext* nppStreamCtx)

Three-channel 16-bit unsigned image Mean_StdDev affecting only single channel.

For common parameter descriptions, see *Common parameters for nppiMean_StdDev functions include:*.

NppStatus **nppiMean_StdDev_32f_C3CR_Ctx**(const *Npp32f* *pSrc, int nSrcStep, *NppiSize* oSizeROI, int nCOI, *Npp8u* *pDeviceBuffer, *Npp64f* *pMean, *Npp64f* *pStdDev, *NppStreamContext* nppStreamCtx)

Three-channel 32-bit floating point image Mean_StdDev affecting only single channel.

For common parameter descriptions, see *Common parameters for nppiMean_StdDev functions include:*.

NppStatus **nppiMean_StdDev_8u_C3CMR_Ctx**(const *Npp8u* *pSrc, int nSrcStep, const *Npp8u* *pMask, int nMaskStep, *NppiSize* oSizeROI, int nCOI, *Npp8u* *pDeviceBuffer, *Npp64f* *pMean, *Npp64f* *pStdDev, *NppStreamContext* nppStreamCtx)

Masked three-channel 8-bit unsigned image Mean_StdDev.

For common parameter descriptions, see *Common parameters for nppiMean_StdDev functions include:*.

NppStatus **nppiMean_StdDev_8s_C3CMR_Ctx**(const *Npp8s* *pSrc, int nSrcStep, const *Npp8u* *pMask, int nMaskStep, *NppiSize* oSizeROI, int nCOI, *Npp8u* *pDeviceBuffer, *Npp64f* *pMean, *Npp64f* *pStdDev, *NppStreamContext* nppStreamCtx)

Masked three-channel 8-bit signed image Mean_StdDev.

For common parameter descriptions, see *Common parameters for nppiMean_StdDev functions include:*.

NppStatus **nppiMean_StdDev_16u_C3CMR_Ctx**(const *Npp16u* *pSrc, int nSrcStep, const *Npp8u* *pMask, int nMaskStep, *NppiSize* oSizeROI, int nCOI, *Npp8u* *pDeviceBuffer, *Npp64f* *pMean, *Npp64f* *pStdDev, *NppStreamContext* nppStreamCtx)

Masked three-channel 16-bit unsigned image Mean_StdDev.

For common parameter descriptions, see *Common parameters for nppiMean_StdDev functions include:*.

NppStatus **nppiMean_StdDev_32f_C3CMR_Ctx**(const *Npp32f* *pSrc, int nSrcStep, const *Npp8u* *pMask, int nMaskStep, *NppiSize* oSizeROI, int nCOI, *Npp8u* *pDeviceBuffer, *Npp64f* *pMean, *Npp64f* *pStdDev, *NppStreamContext* nppStreamCtx)

Masked three-channel 32-bit floating point image Mean_StdDev.

For common parameter descriptions, see *Common parameters for nppiMean_StdDev functions include:*.

Unnamed Group

NppStatus **nppiMeanStdDevGetBufferHostSize_8u_C1R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiMean_StdDev_8u_C1R_Ctx*.

1.14.9.3 MeanStdDevGetBufferHostSize

Companion primitives for computing the device buffer size (in bytes) required by the Mean_StdDev primitives.

1.14.9.4 Common parameters for MeanStdDevGetBufferHostSize functions include:

NppStatus **nppiMeanStdDevGetBufferHostSize_8s_C1R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiMean_StdDev_8s_C1R_Ctx*.

For common parameter descriptions, see *Common parameters for MeanStdDevGetBufferHostSize functions include:*.

NppStatus **nppiMeanStdDevGetBufferHostSize_16u_C1R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiMean_StdDev_16u_C1R_Ctx*.

For common parameter descriptions, see *Common parameters for MeanStdDevGetBufferHostSize functions include:*.

NppStatus **nppiMeanStdDevGetBufferHostSize_32f_C1R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiMean_StdDev_32f_C1R_Ctx*.

For common parameter descriptions, see *Common parameters for MeanStdDevGetBufferHostSize functions include:*.

NppStatus **nppiMeanStdDevGetBufferHostSize_8u_C1MR_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiMean_StdDev_8u_C1MR_Ctx*.

For common parameter descriptions, see *Common parameters for MeanStdDevGetBufferHostSize functions include:*.

NppStatus **nppiMeanStdDevGetBufferHostSize_8s_C1MR_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiMean_StdDev_8s_C1MR_Ctx*.

For common parameter descriptions, see *Common parameters for MeanStdDevGetBufferHostSize functions include:*.

NppStatus **nppiMeanStdDevGetBufferHostSize_16u_C1MR_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiMean_StdDev_16u_C1MR_Ctx*.

For common parameter descriptions, see *Common parameters for MeanStdDevGetBufferHostSize functions include:*.

NppStatus **nppiMeanStdDevGetBufferHostSize_32f_C1MR_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiMean_StdDev_32f_C1MR_Ctx*.

For common parameter descriptions, see *Common parameters for MeanStdDevGetBufferHostSize functions include:*.

NppStatus **nppiMeanStdDevGetBufferHostSize_8u_C3CR_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiMean_StdDev_8u_C3CR_Ctx*.

For common parameter descriptions, see *Common parameters for MeanStdDevGetBufferHostSize functions include:*.

NppStatus **nppiMeanStdDevGetBufferHostSize_8s_C3CR_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiMean_StdDev_8s_C3CR_Ctx*.

For common parameter descriptions, see *Common parameters for MeanStdDevGetBufferHostSize functions include:*.

NppStatus **nppiMeanStdDevGetBufferHostSize_16u_C3CR_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiMean_StdDev_16u_C3CR_Ctx*.

For common parameter descriptions, see *Common parameters for MeanStdDevGetBufferHostSize functions include:*.

NppStatus **nppiMeanStdDevGetBufferHostSize_32f_C3CR_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiMean_StdDev_32f_C3CR_Ctx*.

For common parameter descriptions, see *Common parameters for MeanStdDevGetBufferHostSize functions include:*.

NppStatus **nppiMeanStdDevGetBufferHostSize_8u_C3CMR_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiMean_StdDev_8u_C3CMR_Ctx*.

For common parameter descriptions, see *Common parameters for MeanStdDevGetBufferHostSize functions include:*.

NppStatus **nppiMeanStdDevGetBufferHostSize_8s_C3CMR_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiMean_StdDev_8s_C3CMR_Ctx*.

For common parameter descriptions, see *Common parameters for MeanStdDevGetBufferHostSize functions include:*.

NppStatus **nppiMeanStdDevGetBufferHostSize_16u_C3CMR_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiMean_StdDev_16u_C3CMR_Ctx*.

For common parameter descriptions, see *Common parameters for MeanStdDevGetBufferHostSize functions include:*.

NppStatus **nppiMeanStdDevGetBufferHostSize_32f_C3CMR_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiMean_StdDev_32f_C3CMR_Ctx*.

For common parameter descriptions, see *Common parameters for MeanStdDevGetBufferHostSize functions include:*.

1.14.10. Image Norms

1.14.10.1 Image Norms

Primitives for computing the norms of an image, the norms of difference, and the relative errors of two images. Given an image $pSrc$ with width W and height H,

1. The infinity norm (Norm_Inf) is defined as the largest absolute pixel value of the image.
2. The L1 norm (Norm_L1) is defined as the sum of the absolute pixel value of the image, i.e.,

$$Norm_L1 = \sum_{j=0}^{H-1} \sum_{i=0}^{W-1} |pSrc(j,i)|$$

.

3. The L2 norm (Norm_L2) is defined as the square root of the sum of the squared absolute pixel value of the image, i.e.,

$$Norm_L2 = \sqrt{\sum_{j=0}^{H-1}\sum_{i=0}^{W-1}|pSrc(j,i)|^2}$$

.

Given two images $pSrc1$ and $pSrc2$ both with width W and height H,

1. The infinity norm of differece (NormDiff_Inf) is defined as the largest absolute difference between pixels of two images.
2. The L1 norm of differece (NormDiff_L1) is defined as the sum of the absolute difference between pixels of two images, i.e.,

$$NormDiff_L1 = \sum_{j=0}^{H-1}\sum_{i=0}^{W-1}|pSrc1(j,i) - pSrc2(j,i)|$$

.

3. The L2 norm of differece (NormDiff_L2) is defined as the squared root of the sum of the squared absolute difference between pixels of two images, i.e.,

$$NormDiff_L2 = \sqrt{\sum_{j=0}^{H-1}\sum_{i=0}^{W-1}|pSrc1(j,i) - pSrc2(j,i)|^2}$$

.

Given two images $pSrc1$ and $pSrc2$ both with width W and height H,

1. The relative error for the infinity norm of differece (NormRel_Inf) is defined as NormDiff_Inf divided by the infinity norm of the second image, i.e.,

$$NormRel_Inf = \frac{NormDiff_Inf}{Norm_Inf_{src2}}$$

2. The relative error for the L1 norm of differece (NormRel_L1) is defined as NormDiff_L1 divided by the L1 norm of the second image, i.e.,

$$NormRel_L1 = \frac{NormDiff_L1}{Norm_L1_{src2}}$$

3. The relative error for the L2 norm of differece (NormRel_L2) is defined as NormDiff_L2 divided by the L2 norm of the second image, i.e.,

$$NormRel_L2 = \frac{NormDiff_L2}{Norm_L2_{src2}}$$

The norm functions require the addition device scratch buffer for the computations.

1.14.10.1.1 Common parameters for nppiNorm functions include:

param pSrc1
Source-Image Pointer.

param nSrc1Step
Source-Image Line Step.

param pSrc2
Source-Image Pointer.

param nSrc2Step
Source-Image Line Step.

param oSizeROI
Region-Of-Interest (ROI).

param pMask
Mask-Image Pointer.

param nMaskStep
Mask-Image Line Step.

param nCOI
Channel_of_Interest Number.

param pNorm
Device memory pointer to the norm value.

param pNormDiff
Device memory pointer to the computed norm of differences.

param pNormRel
Device memory pointer to the computed relative error for the infinity norm of two images.

param pDeviceBuffer
Pointer to the required device memory allocation, *Scratch Buffer and Host Pointer*. Use nppiNormInfGetBufferHostSize_XX_XXX to compute the required size (in bytes).

param nppStreamCtx
Application Managed Stream Context.

return
Image Data Related Error Codes, *ROI Related Error Codes*, or NPP_COI_ERROR if an invalid channel of interest is specified, or NPP_NOT_EVEN_STEP_ERROR if an invalid floating-point image is specified.

1.14.10.2 Image Norm Inf

1.14.10.2.1 Norm_Inf

Primitives for computing the infinity norm of an image.

Basic Norm_Inf

NppStatus **nppiNorm_Inf_8u_C1R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *NppiSize* oSizeROI, *Npp64f* *pNorm, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

One-channel 8-bit unsigned image Norm_Inf.

For common parameter descriptions, see *Common parameters for nppiNorm functions include:*.

NppStatus **nppiNorm_Inf_16u_C1R_Ctx**(const *Npp16u* *pSrc, int nSrcStep, *NppiSize* oSizeROI, *Npp64f* *pNorm, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

One-channel 16-bit unsigned image Norm_Inf.

For common parameter descriptions, see *Common parameters for nppiNorm functions include:*.

NppStatus **nppiNorm_Inf_16s_C1R_Ctx**(const *Npp16s* *pSrc, int nSrcStep, *NppiSize* oSizeROI, *Npp64f* *pNorm, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

One-channel 16-bit signed image Norm_Inf.

For common parameter descriptions, see *Common parameters for nppiNorm functions include:*.

NppStatus **nppiNorm_Inf_32s_C1R_Ctx**(const *Npp32s* *pSrc, int nSrcStep, *NppiSize* oSizeROI, *Npp64f* *pNorm, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

One-channel 32-bit signed image Norm_Inf.

For common parameter descriptions, see *Common parameters for nppiNorm functions include:*.

NppStatus **nppiNorm_Inf_32f_C1R_Ctx**(const *Npp32f* *pSrc, int nSrcStep, *NppiSize* oSizeROI, *Npp64f* *pNorm, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

One-channel 32-bit floating point image Norm_Inf.

For common parameter descriptions, see *Common parameters for nppiNorm functions include:*.

NppStatus **nppiNorm_Inf_8u_C3R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *NppiSize* oSizeROI, *Npp64f* aNorm[3], *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Three-channel 8-bit unsigned image Norm_Inf.

For common parameter descriptions, see *Common parameters for nppiNorm functions include:*.

NppStatus **nppiNorm_Inf_16u_C3R_Ctx**(const *Npp16u* *pSrc, int nSrcStep, *NppiSize* oSizeROI, *Npp64f* aNorm[3], *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Three-channel 16-bit unsigned image Norm_Inf.

For common parameter descriptions, see *Common parameters for nppiNorm functions include:*.

NppStatus **nppiNorm_Inf_16s_C3R_Ctx**(const *Npp16s* *pSrc, int nSrcStep, *NppiSize* oSizeROI, *Npp64f* aNorm[3], *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Three-channel 16-bit signed image Norm_Inf.

For common parameter descriptions, see *Common parameters for nppiNorm functions include:*.

NppStatus **nppiNorm_Inf_32f_C3R_Ctx**(const *Npp32f* *pSrc, int nSrcStep, *NppiSize* oSizeROI, *Npp64f* aNorm[3], *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Three-channel 32-bit floating point image Norm_Inf.

For common parameter descriptions, see *Common parameters for nppiNorm functions include:*.

NppStatus **nppiNorm_Inf_8u_AC4R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *NppiSize* oSizeROI, *Npp64f* aNorm[3], *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Four-channel 8-bit unsigned image Norm_Inf ignoring alpha channel.

For common parameter descriptions, see *Common parameters for nppiNorm functions include:*.

NppStatus **nppiNorm_Inf_16u_AC4R_Ctx**(const *Npp16u* *pSrc, int nSrcStep, *NppiSize* oSizeROI, *Npp64f* aNorm[3], *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Four-channel 16-bit unsigned image Norm_Inf ignoring alpha channel.

For common parameter descriptions, see *Common parameters for nppiNorm functions include:*.

NppStatus **nppiNorm_Inf_16s_AC4R_Ctx**(const *Npp16s* *pSrc, int nSrcStep, *NppiSize* oSizeROI, *Npp64f* aNorm[3], *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Four-channel 16-bit signed image Norm_Inf ignoring alpha channel.

For common parameter descriptions, see *Common parameters for nppiNorm functions include:*.

NppStatus **nppiNorm_Inf_32f_AC4R_Ctx**(const *Npp32f* *pSrc, int nSrcStep, *NppiSize* oSizeROI, *Npp64f* aNorm[3], *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Four-channel 32-bit floating point image Norm_Inf ignoring alpha channel.

For common parameter descriptions, see *Common parameters for nppiNorm functions include:*.

NppStatus **nppiNorm_Inf_8u_C4R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *NppiSize* oSizeROI, *Npp64f* aNorm[4], *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Four-channel 8-bit unsigned image Norm_Inf.

For common parameter descriptions, see *Common parameters for nppiNorm functions include:*.

NppStatus **nppiNorm_Inf_16u_C4R_Ctx**(const *Npp16u* *pSrc, int nSrcStep, *NppiSize* oSizeROI, *Npp64f* aNorm[4], *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Four-channel 16-bit unsigned image Norm_Inf.

For common parameter descriptions, see *Common parameters for nppiNorm functions include:*.

NppStatus **nppiNorm_Inf_16s_C4R_Ctx**(const *Npp16s* *pSrc, int nSrcStep, *NppiSize* oSizeROI, *Npp64f* aNorm[4], *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Four-channel 16-bit signed image Norm_Inf.

For common parameter descriptions, see *Common parameters for nppiNorm functions include:*.

NppStatus **nppiNorm_Inf_32f_C4R_Ctx**(const *Npp32f* *pSrc, int nSrcStep, *NppiSize* oSizeROI, *Npp64f* aNorm[4], *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Four-channel 32-bit floating point image Norm_Inf.

For common parameter descriptions, see *Common parameters for nppiNorm functions include:*.

NppStatus **nppiNorm_Inf_8u_C1MR_Ctx**(const *Npp8u* *pSrc, int nSrcStep, const *Npp8u* *pMask, int nMaskStep, *NppiSize* oSizeROI, *Npp64f* *pNorm, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Masked one-channel 8-bit unsigned image Norm_Inf.

For common parameter descriptions, see *Common parameters for nppiNorm functions include:*.

NppStatus **nppiNorm_Inf_8s_C1MR_Ctx**(const *Npp8s* *pSrc, int nSrcStep, const *Npp8u* *pMask, int nMaskStep, *NppiSize* oSizeROI, *Npp64f* *pNorm, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Masked one-channel 8-bit signed image Norm_Inf.

For common parameter descriptions, see *Common parameters for nppiNorm functions include:*.

NppStatus **nppiNorm_Inf_16u_C1MR_Ctx**(const *Npp16u* *pSrc, int nSrcStep, const *Npp8u* *pMask, int nMaskStep, *NppiSize* oSizeROI, *Npp64f* *pNorm, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Masked one-channel 16-bit unsigned image Norm_Inf.

For common parameter descriptions, see *Common parameters for nppiNorm functions include:*.

NppStatus **nppiNorm_Inf_32f_C1MR_Ctx**(const *Npp32f* *pSrc, int nSrcStep, const *Npp8u* *pMask, int nMaskStep, *NppiSize* oSizeROI, *Npp64f* *pNorm, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Masked one-channel 32-bit floating point image Norm_Inf.

For common parameter descriptions, see *Common parameters for nppiNorm functions include:*.

NppStatus **nppiNorm_Inf_8u_C3CMR_Ctx**(const *Npp8u* *pSrc, int nSrcStep, const *Npp8u* *pMask, int nMaskStep, *NppiSize* oSizeROI, int nCOI, *Npp64f* *pNorm, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Masked three-channel 8-bit unsigned image Norm_Inf affecting only single channel.

For common parameter descriptions, see *Common parameters for nppiNorm functions include:*.

NppStatus **nppiNorm_Inf_8s_C3CMR_Ctx**(const *Npp8s* *pSrc, int nSrcStep, const *Npp8u* *pMask, int nMaskStep, *NppiSize* oSizeROI, int nCOI, *Npp64f* *pNorm, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Masked three-channel 8-bit signed image Norm_Inf affecting only single channel.

For common parameter descriptions, see *Common parameters for nppiNorm functions include:*.

NppStatus **nppiNorm_Inf_16u_C3CMR_Ctx**(const *Npp16u* *pSrc, int nSrcStep, const *Npp8u* *pMask, int nMaskStep, *NppiSize* oSizeROI, int nCOI, *Npp64f* *pNorm, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Masked three-channel 16-bit unsigned image Norm_Inf affecting only single channel.

For common parameter descriptions, see *Common parameters for nppiNorm functions include:*.

NppStatus **nppiNorm_Inf_32f_C3CMR_Ctx**(const *Npp32f* *pSrc, int nSrcStep, const *Npp8u* *pMask, int nMaskStep, *NppiSize* oSizeROI, int nCOI, *Npp64f* *pNorm, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Masked three-channel 32-bit floating point image Norm_Inf affecting only single channel.

For common parameter descriptions, see *Common parameters for nppiNorm functions include:*.

NormInfGetBufferHostSize

Companion primitives for computing the device buffer size (in bytes) required by the Norm_Inf primitives.

1.14.10.2.2 CommonNormInfGetBufferHostSizeParameters

Common parameters for nppiNormInfGetBufferHostSize functions include:

param oSizeROI
Region-Of-Interest (ROI).

param hpBufferSize
Required buffer size. Important: hpBufferSize is a *host pointer.* *Scratch Buffer and Host Pointer*.

param nppStreamCtx
Application Managed Stream Context.

return
NPP_NULL_POINTER_ERROR if hpBufferSize is 0 (NULL), *ROI Related Error Codes*.

NppStatus **nppiNormInfGetBufferHostSize_8u_C1R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiNorm_Inf_8u_C1R_Ctx*.

For common parameter descriptions, see *CommonNormInfGetBufferHostSizeParameters*.

NppStatus **nppiNormInfGetBufferHostSize_16u_C1R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiNorm_Inf_16u_C1R_Ctx*.

For common parameter descriptions, see *CommonNormInfGetBufferHostSizeParameters*.

NppStatus **nppiNormInfGetBufferHostSize_16s_C1R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiNorm_Inf_16s_C1R_Ctx*.

For common parameter descriptions, see *CommonNormInfGetBufferHostSizeParameters*.

NppStatus **nppiNormInfGetBufferHostSize_32s_C1R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiNorm_Inf_32s_C1R_Ctx*.

For common parameter descriptions, see *CommonNormInfGetBufferHostSizeParameters*.

NppStatus **nppiNormInfGetBufferHostSize_32f_C1R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiNorm_Inf_32f_C1R_Ctx*.

For common parameter descriptions, see *CommonNormInfGetBufferHostSizeParameters*.

NppStatus **nppiNormInfGetBufferHostSize_8u_C1MR_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiNorm_Inf_8u_C1MR_Ctx*.

For common parameter descriptions, see *CommonNormInfGetBufferHostSizeParameters*.

NppStatus **nppiNormInfGetBufferHostSize_8s_C1MR_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiNorm_Inf_8s_C1MR_Ctx*.

For common parameter descriptions, see *CommonNormInfGetBufferHostSizeParameters*.

NppStatus **nppiNormInfGetBufferHostSize_16u_C1MR_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiNorm_Inf_16u_C1MR_Ctx*.

For common parameter descriptions, see *CommonNormInfGetBufferHostSizeParameters*.

NppStatus **nppiNormInfGetBufferHostSize_32f_C1MR_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiNorm_Inf_32f_C1MR_Ctx*.

For common parameter descriptions, see *CommonNormInfGetBufferHostSizeParameters*.

NppStatus **nppiNormInfGetBufferHostSize_8u_C3R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiNorm_Inf_8u_C3R_Ctx*.

For common parameter descriptions, see *CommonNormInfGetBufferHostSizeParameters*.

NppStatus **nppiNormInfGetBufferHostSize_16u_C3R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiNorm_Inf_16u_C3R_Ctx*.

For common parameter descriptions, see *CommonNormInfGetBufferHostSizeParameters*.

NppStatus **nppiNormInfGetBufferHostSize_16s_C3R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiNorm_Inf_16s_C3R_Ctx*.

For common parameter descriptions, see *CommonNormInfGetBufferHostSizeParameters*.

NppStatus **nppiNormInfGetBufferHostSize_32f_C3R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiNorm_Inf_32f_C3R_Ctx*.

For common parameter descriptions, see *CommonNormInfGetBufferHostSizeParameters*.

NppStatus **nppiNormInfGetBufferHostSize_8u_AC4R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiNorm_Inf_8u_AC4R_Ctx*.

For common parameter descriptions, see *CommonNormInfGetBufferHostSizeParameters*.

NppStatus **nppiNormInfGetBufferHostSize_16u_AC4R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiNorm_Inf_16u_AC4R_Ctx*.

For common parameter descriptions, see *CommonNormInfGetBufferHostSizeParameters*.

NppStatus **nppiNormInfGetBufferHostSize_16s_AC4R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiNorm_Inf_16s_AC4R_Ctx*.

For common parameter descriptions, see *CommonNormInfGetBufferHostSizeParameters*.

NppStatus **nppiNormInfGetBufferHostSize_32f_AC4R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiNorm_Inf_32f_AC4R_Ctx*.

For common parameter descriptions, see *CommonNormInfGetBufferHostSizeParameters*.

NppStatus **nppiNormInfGetBufferHostSize_8u_C4R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiNorm_Inf_8u_C4R_Ctx*.

For common parameter descriptions, see *CommonNormInfGetBufferHostSizeParameters*.

NppStatus **nppiNormInfGetBufferHostSize_16u_C4R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiNorm_Inf_16u_C4R_Ctx*.

For common parameter descriptions, see *CommonNormInfGetBufferHostSizeParameters*.

NppStatus **nppiNormInfGetBufferHostSize_16s_C4R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiNorm_Inf_16s_C4R_Ctx*.

For common parameter descriptions, see *CommonNormInfGetBufferHostSizeParameters*.

NppStatus **nppiNormInfGetBufferHostSize_32f_C4R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiNorm_Inf_32f_C4R_Ctx*.

For common parameter descriptions, see *CommonNormInfGetBufferHostSizeParameters*.

NppStatus **nppiNormInfGetBufferHostSize_8u_C3CMR_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiNorm_Inf_8u_C3CMR_Ctx*.

For common parameter descriptions, see *CommonNormInfGetBufferHostSizeParameters*.

NppStatus **nppiNormInfGetBufferHostSize_8s_C3CMR_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiNorm_Inf_8s_C3CMR_Ctx*.

For common parameter descriptions, see *CommonNormInfGetBufferHostSizeParameters*.

NppStatus **nppiNormInfGetBufferHostSize_16u_C3CMR_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiNorm_Inf_16u_C3CMR_Ctx*.

For common parameter descriptions, see *CommonNormInfGetBufferHostSizeParameters*.

NppStatus **nppiNormInfGetBufferHostSize_32f_C3CMR_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiNorm_Inf_32f_C3CMR_Ctx*.

For common parameter descriptions, see *CommonNormInfGetBufferHostSizeParameters*.

1.14.10.3 Image Norm L1

1.14.10.3.1 Norm_L1

Primitives for computing the L1 norm of an image.

Basic Norm_L1

NppStatus **nppiNorm_L1_8u_C1R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *NppiSize* oSizeROI, *Npp64f* *pNorm, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

One-channel 8-bit unsigned image Norm_L1.

For common parameter descriptions, see *Common parameters for nppiNorm functions include:*.

NppStatus **nppiNorm_L1_16u_C1R_Ctx**(const *Npp16u* *pSrc, int nSrcStep, *NppiSize* oSizeROI, *Npp64f* *pNorm, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

One-channel 16-bit unsigned image Norm_L1.

For common parameter descriptions, see *Common parameters for nppiNorm functions include:*.

NppStatus **nppiNorm_L1_16s_C1R_Ctx**(const *Npp16s* *pSrc, int nSrcStep, *NppiSize* oSizeROI, *Npp64f* *pNorm, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

One-channel 16-bit signed image Norm_L1.

For common parameter descriptions, see *Common parameters for nppiNorm functions include:*.

NppStatus **nppiNorm_L1_32f_C1R_Ctx**(const *Npp32f* *pSrc, int nSrcStep, *NppiSize* oSizeROI, *Npp64f* *pNorm, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

One-channel 32-bit floating point image Norm_L1.

For common parameter descriptions, see *Common parameters for nppiNorm functions include:*.

NppStatus **nppiNorm_L1_8u_C3R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *NppiSize* oSizeROI, *Npp64f* aNorm[3], *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Three-channel 8-bit unsigned image Norm_L1.

For common parameter descriptions, see *Common parameters for nppiNorm functions include:*.

NppStatus **nppiNorm_L1_16u_C3R_Ctx**(const *Npp16u* *pSrc, int nSrcStep, *NppiSize* oSizeROI, *Npp64f* aNorm[3], *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Three-channel 16-bit unsigned image Norm_L1.

For common parameter descriptions, see *Common parameters for nppiNorm functions include:*.

NppStatus **nppiNorm_L1_16s_C3R_Ctx**(const *Npp16s* *pSrc, int nSrcStep, *NppiSize* oSizeROI, *Npp64f* aNorm[3], *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Three-channel 16-bit signed image Norm_L1.

For common parameter descriptions, see *Common parameters for nppiNorm functions include:*.

NppStatus **nppiNorm_L1_32f_C3R_Ctx**(const *Npp32f* *pSrc, int nSrcStep, *NppiSize* oSizeROI, *Npp64f* aNorm[3], *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Three-channel 32-bit floating point image Norm_L1.

For common parameter descriptions, see *Common parameters for nppiNorm functions include:*.

NppStatus **nppiNorm_L1_8u_AC4R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *NppiSize* oSizeROI, *Npp64f* aNorm[3], *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Four-channel 8-bit unsigned image Norm_L1 ignoring alpha channel.

For common parameter descriptions, see *Common parameters for nppiNorm functions include:*.

NppStatus **nppiNorm_L1_16u_AC4R_Ctx**(const *Npp16u* *pSrc, int nSrcStep, *NppiSize* oSizeROI, *Npp64f* aNorm[3], *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Four-channel 16-bit unsigned image Norm_L1 ignoring alpha channel.

For common parameter descriptions, see *Common parameters for nppiNorm functions include:*.

NppStatus **nppiNorm_L1_16s_AC4R_Ctx**(const *Npp16s* *pSrc, int nSrcStep, *NppiSize* oSizeROI, *Npp64f* aNorm[3], *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Four-channel 16-bit signed image Norm_L1 ignoring alpha channel.

For common parameter descriptions, see *Common parameters for nppiNorm functions include:*.

NppStatus **nppiNorm_L1_32f_AC4R_Ctx**(const *Npp32f* *pSrc, int nSrcStep, *NppiSize* oSizeROI, *Npp64f* aNorm[3], *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Four-channel 32-bit floating point image Norm_L1 ignoring alpha channel.

For common parameter descriptions, see *Common parameters for nppiNorm functions include:*.

NppStatus **nppiNorm_L1_8u_C4R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *NppiSize* oSizeROI, *Npp64f* aNorm[4], *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Four-channel 8-bit unsigned image Norm_L1.

For common parameter descriptions, see *Common parameters for nppiNorm functions include:*.

NppStatus **nppiNorm_L1_16u_C4R_Ctx**(const *Npp16u* *pSrc, int nSrcStep, *NppiSize* oSizeROI, *Npp64f* aNorm[4], *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Four-channel 16-bit unsigned image Norm_L1.

For common parameter descriptions, see *Common parameters for nppiNorm functions include:*.

NppStatus **nppiNorm_L1_16s_C4R_Ctx**(const *Npp16s* *pSrc, int nSrcStep, *NppiSize* oSizeROI, *Npp64f* aNorm[4], *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Four-channel 16-bit signed image Norm_L1.

For common parameter descriptions, see *Common parameters for nppiNorm functions include:*.

NppStatus **nppiNorm_L1_32f_C4R_Ctx**(const *Npp32f* *pSrc, int nSrcStep, *NppiSize* oSizeROI, *Npp64f* aNorm[4], *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Four-channel 32-bit floating point image Norm_L1.

For common parameter descriptions, see *Common parameters for nppiNorm functions include:*.

NppStatus **nppiNorm_L1_8u_C1MR_Ctx**(const *Npp8u* *pSrc, int nSrcStep, const *Npp8u* *pMask, int nMaskStep, *NppiSize* oSizeROI, *Npp64f* *pNorm, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Masked one-channel 8-bit unsigned image Norm_L1.

For common parameter descriptions, see *Common parameters for nppiNorm functions include:*.

NppStatus **nppiNorm_L1_8s_C1MR_Ctx**(const *Npp8s* *pSrc, int nSrcStep, const *Npp8u* *pMask, int nMaskStep, *NppiSize* oSizeROI, *Npp64f* *pNorm, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Masked one-channel 8-bit signed image Norm_L1.

For common parameter descriptions, see *Common parameters for nppiNorm functions include:*.

NppStatus **nppiNorm_L1_16u_C1MR_Ctx**(const *Npp16u* *pSrc, int nSrcStep, const *Npp8u* *pMask, int nMaskStep, *NppiSize* oSizeROI, *Npp64f* *pNorm, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Masked one-channel 16-bit unsigned image Norm_L1.

For common parameter descriptions, see *Common parameters for nppiNorm functions include:*.

NppStatus **nppiNorm_L1_32f_C1MR_Ctx**(const *Npp32f* *pSrc, int nSrcStep, const *Npp8u* *pMask, int nMaskStep, *NppiSize* oSizeROI, *Npp64f* *pNorm, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Masked one-channel 32-bit floating point image Norm_L1.

For common parameter descriptions, see *Common parameters for nppiNorm functions include:*.

NppStatus **nppiNorm_L1_8u_C3CMR_Ctx**(const *Npp8u* *pSrc, int nSrcStep, const *Npp8u* *pMask, int nMaskStep, *NppiSize* oSizeROI, int nCOI, *Npp64f* *pNorm, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Masked three-channel 8-bit unsigned image Norm_L1 affecting only single channel.

For common parameter descriptions, see *Common parameters for nppiNorm functions include:*.

NppStatus **nppiNorm_L1_8s_C3CMR_Ctx**(const *Npp8s* *pSrc, int nSrcStep, const *Npp8u* *pMask, int nMaskStep, *NppiSize* oSizeROI, int nCOI, *Npp64f* *pNorm, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Masked three-channel 8-bit signed image Norm_L1 affecting only single channel.

For common parameter descriptions, see *Common parameters for nppiNorm functions include:*.

NppStatus **nppiNorm_L1_16u_C3CMR_Ctx**(const *Npp16u* *pSrc, int nSrcStep, const *Npp8u* *pMask, int nMaskStep, *NppiSize* oSizeROI, int nCOI, *Npp64f* *pNorm, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Masked three-channel 16-bit unsigned image Norm_L1 affecting only single channel.

For common parameter descriptions, see *Common parameters for nppiNorm functions include:*.

NppStatus **nppiNorm_L1_32f_C3CMR_Ctx**(const *Npp32f* *pSrc, int nSrcStep, const *Npp8u* *pMask, int nMaskStep, *NppiSize* oSizeROI, int nCOI, *Npp64f* *pNorm, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Masked three-channel 32-bit floating point image Norm_L1 affecting only single channel.

For common parameter descriptions, see *Common parameters for nppiNorm functions include:*.

NormL1GetBufferHostSize

Companion primitives for computing the device buffer size (in bytes) required by the Norm_L1 primitives.

1.14.10.3.2 CommonNormL1GetBufferHostSizeParameters

Common parameters for nppiNormL1GetBufferHostSize functions include:

param oSizeROI
Region-Of-Interest (ROI).

param hpBufferSize
Required buffer size. Important: hpBufferSize is a *host pointer.* *Scratch Buffer and Host Pointer*.

param nppStreamCtx
Application Managed Stream Context.

return
NPP_NULL_POINTER_ERROR if hpBufferSize is 0 (NULL), *ROI Related Error Codes*.

NppStatus **nppiNormL1GetBufferHostSize_8u_C1R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiNorm_L1_8u_C1R_Ctx*.

For common parameter descriptions, see *CommonNormL1GetBufferHostSizeParameters*.

NppStatus **nppiNormL1GetBufferHostSize_16u_C1R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiNorm_L1_16u_C1R_Ctx*.

For common parameter descriptions, see *CommonNormL1GetBufferHostSizeParameters*.

NppStatus **nppiNormL1GetBufferHostSize_16s_C1R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiNorm_L1_16s_C1R_Ctx*.

For common parameter descriptions, see *CommonNormL1GetBufferHostSizeParameters*.

NppStatus **nppiNormL1GetBufferHostSize_32f_C1R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiNorm_L1_32f_C1R_Ctx*.

For common parameter descriptions, see *CommonNormL1GetBufferHostSizeParameters*.

NppStatus **nppiNormL1GetBufferHostSize_8u_C1MR_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiNorm_L1_8u_C1MR_Ctx*.

For common parameter descriptions, see *CommonNormL1GetBufferHostSizeParameters*.

NppStatus **nppiNormL1GetBufferHostSize_8s_C1MR_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiNorm_L1_8s_C1MR_Ctx*.

For common parameter descriptions, see *CommonNormL1GetBufferHostSizeParameters*.

NppStatus **nppiNormL1GetBufferHostSize_16u_C1MR_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiNorm_L1_16u_C1MR_Ctx*.

For common parameter descriptions, see *CommonNormL1GetBufferHostSizeParameters*.

NppStatus **nppiNormL1GetBufferHostSize_32f_C1MR_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiNorm_L1_32f_C1MR_Ctx*.

For common parameter descriptions, see *CommonNormL1GetBufferHostSizeParameters*.

NppStatus **nppiNormL1GetBufferHostSize_8u_C3R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiNorm_L1_8u_C3R_Ctx*.

For common parameter descriptions, see *CommonNormL1GetBufferHostSizeParameters*.

NppStatus **nppiNormL1GetBufferHostSize_16u_C3R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiNorm_L1_16u_C3R_Ctx*.

For common parameter descriptions, see *CommonNormL1GetBufferHostSizeParameters*.

NppStatus **nppiNormL1GetBufferHostSize_16s_C3R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiNorm_L1_16s_C3R_Ctx*.

For common parameter descriptions, see *CommonNormL1GetBufferHostSizeParameters*.

NppStatus **nppiNormL1GetBufferHostSize_32f_C3R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiNorm_L1_32f_C3R_Ctx*.

For common parameter descriptions, see *CommonNormL1GetBufferHostSizeParameters*.

NppStatus **nppiNormL1GetBufferHostSize_8u_AC4R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiNorm_L1_8u_AC4R_Ctx*.

For common parameter descriptions, see *CommonNormL1GetBufferHostSizeParameters*.

NppStatus **nppiNormL1GetBufferHostSize_16u_AC4R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiNorm_L1_16u_AC4R_Ctx*.

For common parameter descriptions, see *CommonNormL1GetBufferHostSizeParameters*.

NppStatus **nppiNormL1GetBufferHostSize_16s_AC4R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiNorm_L1_16s_AC4R_Ctx*.

For common parameter descriptions, see *CommonNormL1GetBufferHostSizeParameters*.

NppStatus **nppiNormL1GetBufferHostSize_32f_AC4R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiNorm_L1_32f_AC4R_Ctx*.

For common parameter descriptions, see *CommonNormL1GetBufferHostSizeParameters*.

NppStatus **nppiNormL1GetBufferHostSize_8u_C4R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiNorm_L1_8u_C4R_Ctx*.

For common parameter descriptions, see *CommonNormL1GetBufferHostSizeParameters*.

NppStatus **nppiNormL1GetBufferHostSize_16u_C4R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiNorm_L1_16u_C4R_Ctx*.

For common parameter descriptions, see *CommonNormL1GetBufferHostSizeParameters*.

NppStatus **nppiNormL1GetBufferHostSize_16s_C4R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiNorm_L1_16s_C4R_Ctx*.

For common parameter descriptions, see *CommonNormL1GetBufferHostSizeParameters*.

NppStatus **nppiNormL1GetBufferHostSize_32f_C4R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiNorm_L1_32f_C4R_Ctx*.

For common parameter descriptions, see *CommonNormL1GetBufferHostSizeParameters*.

NppStatus **nppiNormL1GetBufferHostSize_8u_C3CMR_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiNorm_L1_8u_C3CMR_Ctx*.

For common parameter descriptions, see *CommonNormL1GetBufferHostSizeParameters*.

NppStatus **nppiNormL1GetBufferHostSize_8s_C3CMR_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiNorm_L1_8s_C3CMR_Ctx*.

For common parameter descriptions, see *CommonNormL1GetBufferHostSizeParameters*.

NppStatus **nppiNormL1GetBufferHostSize_16u_C3CMR_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiNorm_L1_16u_C3CMR_Ctx*.

For common parameter descriptions, see *CommonNormL1GetBufferHostSizeParameters*.

NppStatus **nppiNormL1GetBufferHostSize_32f_C3CMR_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiNorm_L1_32f_C3CMR_Ctx*.

For common parameter descriptions, see *CommonNormL1GetBufferHostSizeParameters*.

1.14.10.4 Image Norm L2

1.14.10.4.1 Norm_L2

Primitives for computing the L2 norm of an image.

Basic Norm_L2

Computes the L2 norm of an image.

NppStatus **nppiNorm_L2_8u_C1R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *NppiSize* oSizeROI, *Npp64f* *pNorm, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

One-channel 8-bit unsigned image Norm_L2.

For common parameter descriptions, see *Common parameters for nppiNorm functions include:*.

NppStatus **nppiNorm_L2_16u_C1R_Ctx**(const *Npp16u* *pSrc, int nSrcStep, *NppiSize* oSizeROI, *Npp64f* *pNorm, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

One-channel 16-bit unsigned image Norm_L2.

For common parameter descriptions, see *Common parameters for nppiNorm functions include:*.

NppStatus **nppiNorm_L2_16s_C1R_Ctx**(const *Npp16s* *pSrc, int nSrcStep, *NppiSize* oSizeROI, *Npp64f* *pNorm, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

One-channel 16-bit signed image Norm_L2.

For common parameter descriptions, see *Common parameters for nppiNorm functions include:*.

NppStatus **nppiNorm_L2_32f_C1R_Ctx**(const *Npp32f* *pSrc, int nSrcStep, *NppiSize* oSizeROI, *Npp64f* *pNorm, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

One-channel 32-bit floating point image Norm_L2.

For common parameter descriptions, see *Common parameters for nppiNorm functions include:*.

NppStatus **nppiNorm_L2_8u_C3R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *NppiSize* oSizeROI, *Npp64f* aNorm[3], *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Three-channel 8-bit unsigned image Norm_L2.

For common parameter descriptions, see *Common parameters for nppiNorm functions include:*.

NppStatus **nppiNorm_L2_16u_C3R_Ctx**(const *Npp16u* *pSrc, int nSrcStep, *NppiSize* oSizeROI, *Npp64f* aNorm[3], *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Three-channel 16-bit unsigned image Norm_L2.

For common parameter descriptions, see *Common parameters for nppiNorm functions include:*.

NppStatus **nppiNorm_L2_16s_C3R_Ctx**(const *Npp16s* *pSrc, int nSrcStep, *NppiSize* oSizeROI, *Npp64f* aNorm[3], *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Three-channel 16-bit signed image Norm_L2.

For common parameter descriptions, see *Common parameters for nppiNorm functions include:*.

NppStatus **nppiNorm_L2_32f_C3R_Ctx**(const *Npp32f* *pSrc, int nSrcStep, *NppiSize* oSizeROI, *Npp64f* aNorm[3], *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Three-channel 32-bit floating point image Norm_L2.

For common parameter descriptions, see *Common parameters for nppiNorm functions include:*.

NppStatus **nppiNorm_L2_8u_AC4R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *NppiSize* oSizeROI, *Npp64f* aNorm[3], *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Four-channel 8-bit unsigned image Norm_L2 ignoring alpha channel.

For common parameter descriptions, see *Common parameters for nppiNorm functions include:*.

NppStatus **nppiNorm_L2_16u_AC4R_Ctx**(const *Npp16u* *pSrc, int nSrcStep, *NppiSize* oSizeROI, *Npp64f* aNorm[3], *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Four-channel 16-bit unsigned image Norm_L2 ignoring alpha channel.

For common parameter descriptions, see *Common parameters for nppiNorm functions include:*.

NppStatus **nppiNorm_L2_16s_AC4R_Ctx**(const *Npp16s* *pSrc, int nSrcStep, *NppiSize* oSizeROI, *Npp64f* aNorm[3], *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Four-channel 16-bit signed image Norm_L2 ignoring alpha channel.

For common parameter descriptions, see *Common parameters for nppiNorm functions include:*.

NppStatus **nppiNorm_L2_32f_AC4R_Ctx**(const *Npp32f* *pSrc, int nSrcStep, *NppiSize* oSizeROI, *Npp64f* aNorm[3], *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Four-channel 32-bit floating point image Norm_L2 ignoring alpha channel.

For common parameter descriptions, see *Common parameters for nppiNorm functions include:*.

NppStatus **nppiNorm_L2_8u_C4R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *NppiSize* oSizeROI, *Npp64f* aNorm[4], *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Four-channel 8-bit unsigned image Norm_L2.

For common parameter descriptions, see *Common parameters for nppiNorm functions include:*.

NppStatus **nppiNorm_L2_16u_C4R_Ctx**(const *Npp16u* *pSrc, int nSrcStep, *NppiSize* oSizeROI, *Npp64f* aNorm[4], *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Four-channel 16-bit unsigned image Norm_L2.

For common parameter descriptions, see *Common parameters for nppiNorm functions include:*.

NppStatus **nppiNorm_L2_16s_C4R_Ctx**(const *Npp16s* *pSrc, int nSrcStep, *NppiSize* oSizeROI, *Npp64f* aNorm[4], *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Four-channel 16-bit signed image Norm_L2.

For common parameter descriptions, see *Common parameters for nppiNorm functions include:*.

NppStatus **nppiNorm_L2_32f_C4R_Ctx**(const *Npp32f* *pSrc, int nSrcStep, *NppiSize* oSizeROI, *Npp64f* aNorm[4], *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Four-channel 32-bit floating point image Norm_L2.

For common parameter descriptions, see *Common parameters for nppiNorm functions include:*.

NppStatus **nppiNorm_L2_8u_C1MR_Ctx**(const *Npp8u* *pSrc, int nSrcStep, const *Npp8u* *pMask, int nMaskStep, *NppiSize* oSizeROI, *Npp64f* *pNorm, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Masked one-channel 8-bit unsigned image Norm_L2.

For common parameter descriptions, see *Common parameters for nppiNorm functions include:*.

NppStatus **nppiNorm_L2_8s_C1MR_Ctx**(const *Npp8s* *pSrc, int nSrcStep, const *Npp8u* *pMask, int nMaskStep, *NppiSize* oSizeROI, *Npp64f* *pNorm, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Masked one-channel 8-bit signed image Norm_L2.

For common parameter descriptions, see *Common parameters for nppiNorm functions include:*.

NppStatus **nppiNorm_L2_16u_C1MR_Ctx**(const *Npp16u* *pSrc, int nSrcStep, const *Npp8u* *pMask, int nMaskStep, *NppiSize* oSizeROI, *Npp64f* *pNorm, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Masked one-channel 16-bit unsigned image Norm_L2.

For common parameter descriptions, see *Common parameters for nppiNorm functions include:*.

NppStatus **nppiNorm_L2_32f_C1MR_Ctx**(const *Npp32f* *pSrc, int nSrcStep, const *Npp8u* *pMask, int nMaskStep, *NppiSize* oSizeROI, *Npp64f* *pNorm, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Masked one-channel 32-bit floating point image Norm_L2.

For common parameter descriptions, see *Common parameters for nppiNorm functions include:*.

NppStatus **nppiNorm_L2_8u_C3CMR_Ctx**(const *Npp8u* *pSrc, int nSrcStep, const *Npp8u* *pMask, int nMaskStep, *NppiSize* oSizeROI, int nCOI, *Npp64f* *pNorm, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Masked three-channel 8-bit unsigned image Norm_L2.

NppStatus **nppiNorm_L2_8s_C3CMR_Ctx**(const *Npp8s* *pSrc, int nSrcStep, const *Npp8u* *pMask, int nMaskStep, *NppiSize* oSizeROI, int nCOI, *Npp64f* *pNorm, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Masked three-channel 8-bit signed image Norm_L2.

For common parameter descriptions, see *Common parameters for nppiNorm functions include:*.

NppStatus **nppiNorm_L2_16u_C3CMR_Ctx**(const *Npp16u* *pSrc, int nSrcStep, const *Npp8u* *pMask, int nMaskStep, *NppiSize* oSizeROI, int nCOI, *Npp64f* *pNorm, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Masked three-channel 16-bit unsigned image Norm_L2.

For common parameter descriptions, see *Common parameters for nppiNorm functions include:*.

NppStatus **nppiNorm_L2_32f_C3CMR_Ctx**(const *Npp32f* *pSrc, int nSrcStep, const *Npp8u* *pMask, int nMaskStep, *NppiSize* oSizeROI, int nCOI, *Npp64f* *pNorm, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Masked three-channel 32-bit floating point image Norm_L2.

For common parameter descriptions, see *Common parameters for nppiNorm functions include:*.

NormL2GetBufferHostSize

Companion primitives for computing the device buffer size (in bytes) required by the Norm_L2 primitives.

1.14.10.4.2 CommonNormL2GetBufferHostSizeParameters

Common parameters for nppiNormL2GetBufferHostSize functions include:

param oSizeROI
Region-Of-Interest (ROI).

param hpBufferSize
Required buffer size. Important: hpBufferSize is a *host pointer.* *Scratch Buffer and Host Pointer*.

param nppStreamCtx
Application Managed Stream Context.

return
NPP_NULL_POINTER_ERROR if hpBufferSize is 0 (NULL), *ROI Related Error Codes*.

NppStatus **nppiNormL2GetBufferHostSize_8u_C1R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiNorm_L2_8u_C1R_Ctx*.

For common parameter descriptions, see *CommonNormL2GetBufferHostSizeParameters*.

NppStatus **nppiNormL2GetBufferHostSize_16u_C1R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiNorm_L2_16u_C1R_Ctx*.

For common parameter descriptions, see *CommonNormL2GetBufferHostSizeParameters*.

NppStatus **nppiNormL2GetBufferHostSize_16s_C1R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiNorm_L2_16s_C1R_Ctx*.

For common parameter descriptions, see *CommonNormL2GetBufferHostSizeParameters*.

NppStatus **nppiNormL2GetBufferHostSize_32f_C1R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiNorm_L2_32f_C1R_Ctx*.

For common parameter descriptions, see *CommonNormL2GetBufferHostSizeParameters*.

NppStatus **nppiNormL2GetBufferHostSize_8u_C1MR_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiNorm_L2_8u_C1MR_Ctx*.

For common parameter descriptions, see *CommonNormL2GetBufferHostSizeParameters*.

NppStatus **nppiNormL2GetBufferHostSize_8s_C1MR_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiNorm_L2_8s_C1MR_Ctx*.

For common parameter descriptions, see *CommonNormL2GetBufferHostSizeParameters*.

NppStatus **nppiNormL2GetBufferHostSize_16u_C1MR_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiNorm_L2_16u_C1MR_Ctx*.

For common parameter descriptions, see *CommonNormL2GetBufferHostSizeParameters*.

NppStatus **nppiNormL2GetBufferHostSize_32f_C1MR_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiNorm_L2_32f_C1MR_Ctx*.

For common parameter descriptions, see *CommonNormL2GetBufferHostSizeParameters*.

NppStatus **nppiNormL2GetBufferHostSize_8u_C3R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiNorm_L2_8u_C3R_Ctx*.

For common parameter descriptions, see *CommonNormL2GetBufferHostSizeParameters*.

NppStatus **nppiNormL2GetBufferHostSize_16u_C3R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiNorm_L2_16u_C3R_Ctx*.

For common parameter descriptions, see *CommonNormL2GetBufferHostSizeParameters*.

NppStatus **nppiNormL2GetBufferHostSize_16s_C3R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiNorm_L2_16s_C3R_Ctx*.

For common parameter descriptions, see *CommonNormL2GetBufferHostSizeParameters*.

NppStatus **nppiNormL2GetBufferHostSize_32f_C3R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiNorm_L2_32f_C3R_Ctx*.

For common parameter descriptions, see *CommonNormL2GetBufferHostSizeParameters*.

NppStatus **nppiNormL2GetBufferHostSize_8u_AC4R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiNorm_L2_8u_AC4R_Ctx*.

For common parameter descriptions, see *CommonNormL2GetBufferHostSizeParameters*.

NppStatus **nppiNormL2GetBufferHostSize_16u_AC4R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiNorm_L2_16u_AC4R_Ctx*.

For common parameter descriptions, see *CommonNormL2GetBufferHostSizeParameters*.

NppStatus **nppiNormL2GetBufferHostSize_16s_AC4R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiNorm_L2_16s_AC4R_Ctx*.

For common parameter descriptions, see *CommonNormL2GetBufferHostSizeParameters*.

NppStatus **nppiNormL2GetBufferHostSize_32f_AC4R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiNorm_L2_32f_AC4R_Ctx*.

For common parameter descriptions, see *CommonNormL2GetBufferHostSizeParameters*.

NppStatus **nppiNormL2GetBufferHostSize_8u_C4R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiNorm_L2_8u_C4R_Ctx*.

For common parameter descriptions, see *CommonNormL2GetBufferHostSizeParameters*.

NppStatus **nppiNormL2GetBufferHostSize_16u_C4R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiNorm_L2_16u_C4R_Ctx*.

For common parameter descriptions, see *CommonNormL2GetBufferHostSizeParameters*.

NppStatus **nppiNormL2GetBufferHostSize_16s_C4R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiNorm_L2_16s_C4R_Ctx*.

For common parameter descriptions, see *CommonNormL2GetBufferHostSizeParameters*.

NppStatus **nppiNormL2GetBufferHostSize_32f_C4R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiNorm_L2_32f_C4R_Ctx*.

For common parameter descriptions, see *CommonNormL2GetBufferHostSizeParameters*.

NppStatus **nppiNormL2GetBufferHostSize_8u_C3CMR_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiNorm_L2_8u_C3CMR_Ctx*.

For common parameter descriptions, see *CommonNormL2GetBufferHostSizeParameters*.

NppStatus **nppiNormL2GetBufferHostSize_8s_C3CMR_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiNorm_L2_8s_C3CMR_Ctx*.

For common parameter descriptions, see *CommonNormL2GetBufferHostSizeParameters*.

NppStatus **nppiNormL2GetBufferHostSize_16u_C3CMR_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiNorm_L2_16u_C3CMR_Ctx*.

For common parameter descriptions, see *CommonNormL2GetBufferHostSizeParameters*.

NppStatus **nppiNormL2GetBufferHostSize_32f_C3CMR_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiNorm_L2_32f_C3CMR_Ctx*.

For common parameter descriptions, see *CommonNormL2GetBufferHostSizeParameters*.

1.14.10.5 Image NormDiff Inf

1.14.10.5.1 NormDiff_Inf

Primitives for computing the infinity norm of difference of pixels between two images.

Basic NormDiff_Inf

NppStatus **nppiNormDiff_Inf_8u_C1R_Ctx**(const *Npp8u* *pSrc1, int nSrc1Step, const *Npp8u* *pSrc2, int nSrc2Step, *NppiSize* oSizeROI, *Npp64f* *pNormDiff, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

One-channel 8-bit unsigned image NormDiff_Inf.

For common parameter descriptions, see *Common parameters for nppiNorm functions include:*.

NppStatus **nppiNormDiff_Inf_16u_C1R_Ctx**(const *Npp16u* *pSrc1, int nSrc1Step, const *Npp16u* *pSrc2, int nSrc2Step, *NppiSize* oSizeROI, *Npp64f* *pNormDiff, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

One-channel 16-bit unsigned image NormDiff_Inf.

For common parameter descriptions, see *Common parameters for nppiNorm functions include:*.

NppStatus **nppiNormDiff_Inf_16s_C1R_Ctx**(const *Npp16s* *pSrc1, int nSrc1Step, const *Npp16s* *pSrc2, int nSrc2Step, *NppiSize* oSizeROI, *Npp64f* *pNormDiff, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

One-channel 16-bit signed image NormDiff_Inf.

For common parameter descriptions, see *Common parameters for nppiNorm functions include:*.

NppStatus **nppiNormDiff_Inf_32f_C1R_Ctx**(const *Npp32f* *pSrc1, int nSrc1Step, const *Npp32f* *pSrc2, int nSrc2Step, *NppiSize* oSizeROI, *Npp64f* *pNormDiff, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

One-channel 32-bit floating point image NormDiff_Inf.

For common parameter descriptions, see *Common parameters for nppiNorm functions include:*.

NppStatus **nppiNormDiff_Inf_8u_C3R_Ctx**(const *Npp8u* *pSrc1, int nSrc1Step, const *Npp8u* *pSrc2, int nSrc2Step, *NppiSize* oSizeROI, *Npp64f* aNormDiff[3], *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Three-channel 8-bit unsigned image NormDiff_Inf.

For common parameter descriptions, see *Common parameters for nppiNorm functions include:*.

NppStatus **nppiNormDiff_Inf_16u_C3R_Ctx**(const *Npp16u* *pSrc1, int nSrc1Step, const *Npp16u* *pSrc2, int nSrc2Step, *NppiSize* oSizeROI, *Npp64f* aNormDiff[3], *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Three-channel 16-bit unsigned image NormDiff_Inf.

For common parameter descriptions, see *Common parameters for nppiNorm functions include:*.

NppStatus **nppiNormDiff_Inf_16s_C3R_Ctx**(const *Npp16s* *pSrc1, int nSrc1Step, const *Npp16s* *pSrc2, int nSrc2Step, *NppiSize* oSizeROI, *Npp64f* aNormDiff[3], *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Three-channel 16-bit signed image NormDiff_Inf.

For common parameter descriptions, see *Common parameters for nppiNorm functions include:*.

NppStatus **nppiNormDiff_Inf_32f_C3R_Ctx**(const *Npp32f* *pSrc1, int nSrc1Step, const *Npp32f* *pSrc2, int nSrc2Step, *NppiSize* oSizeROI, *Npp64f* aNormDiff[3], *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Three-channel 32-bit floating point image NormDiff_Inf.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **pSrc2** – *Source-Image Pointer*.
- **nSrc2Step** – *Source-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **aNormDiff** – Array that contains computed Inf-norm of differences.
- **pDeviceBuffer** – Pointer to the required device memory allocation, *Scratch Buffer and Host Pointer*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*, or NPP_NOT_EVEN_STEP_ERROR if an invalid floating-point image is specified.

NppStatus **nppiNormDiff_Inf_8u_AC4R_Ctx**(const *Npp8u* *pSrc1, int nSrc1Step, const *Npp8u* *pSrc2, int nSrc2Step, *NppiSize* oSizeROI, *Npp64f* aNormDiff[3], *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Four-channel 8-bit unsigned image NormDiff_Inf ignoring alpha channel.

For common parameter descriptions, see *Common parameters for nppiNorm functions include:*.

NppStatus **nppiNormDiff_Inf_16u_AC4R_Ctx**(const *Npp16u* *pSrc1, int nSrc1Step, const *Npp16u* *pSrc2, int nSrc2Step, *NppiSize* oSizeROI, *Npp64f* aNormDiff[3], *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Four-channel 16-bit unsigned image NormDiff_Inf ignoring alpha channel.

For common parameter descriptions, see *Common parameters for nppiNorm functions include:*.

NppStatus **nppiNormDiff_Inf_16s_AC4R_Ctx**(const *Npp16s* *pSrc1, int nSrc1Step, const *Npp16s* *pSrc2, int nSrc2Step, *NppiSize* oSizeROI, *Npp64f* aNormDiff[3], *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Four-channel 16-bit signed image NormDiff_Inf ignoring alpha channel.

For common parameter descriptions, see *Common parameters for nppiNorm functions include:*.

NppStatus **nppiNormDiff_Inf_32f_AC4R_Ctx**(const *Npp32f* *pSrc1, int nSrc1Step, const *Npp32f* *pSrc2, int nSrc2Step, *NppiSize* oSizeROI, *Npp64f* aNormDiff[3], *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Four-channel 32-bit floating point image NormDiff_Inf ignoring alpha channel.

For common parameter descriptions, see *Common parameters for nppiNorm functions include:*.

NppStatus **nppiNormDiff_Inf_8u_C4R_Ctx**(const *Npp8u* *pSrc1, int nSrc1Step, const *Npp8u* *pSrc2, int nSrc2Step, *NppiSize* oSizeROI, *Npp64f* aNormDiff[4], *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Four-channel 8-bit unsigned image NormDiff_Inf.

For common parameter descriptions, see *Common parameters for nppiNorm functions include:*.

NppStatus **nppiNormDiff_Inf_16u_C4R_Ctx**(const *Npp16u* *pSrc1, int nSrc1Step, const *Npp16u* *pSrc2, int nSrc2Step, *NppiSize* oSizeROI, *Npp64f* aNormDiff[4], *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Four-channel 16-bit unsigned image NormDiff_Inf.

For common parameter descriptions, see *Common parameters for nppiNorm functions include:*.

NppStatus **nppiNormDiff_Inf_16s_C4R_Ctx**(const *Npp16s* *pSrc1, int nSrc1Step, const *Npp16s* *pSrc2, int nSrc2Step, *NppiSize* oSizeROI, *Npp64f* aNormDiff[4], *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Four-channel 16-bit signed image NormDiff_Inf.

For common parameter descriptions, see *Common parameters for nppiNorm functions include:*.

NppStatus **nppiNormDiff_Inf_32f_C4R_Ctx**(const *Npp32f* *pSrc1, int nSrc1Step, const *Npp32f* *pSrc2, int nSrc2Step, *NppiSize* oSizeROI, *Npp64f* aNormDiff[4], *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Four-channel 32-bit floating point image NormDiff_Inf.

For common parameter descriptions, see *Common parameters for nppiNorm functions include:*.

NppStatus **nppiNormDiff_Inf_8u_C1MR_Ctx**(const *Npp8u* *pSrc1, int nSrc1Step, const *Npp8u* *pSrc2, int nSrc2Step, const *Npp8u* *pMask, int nMaskStep, *NppiSize* oSizeROI, *Npp64f* *pNormDiff, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Masked one-channel 8-bit unsigned images NormDiff_Inf.

For common parameter descriptions, see *Common parameters for nppiNorm functions include:*.

NppStatus **nppiNormDiff_Inf_8s_C1MR_Ctx**(const *Npp8s* *pSrc1, int nSrc1Step, const *Npp8s* *pSrc2, int nSrc2Step, const *Npp8u* *pMask, int nMaskStep, *NppiSize* oSizeROI, *Npp64f* *pNormDiff, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Masked one-channel 8-bit signed images NormDiff_Inf.

For common parameter descriptions, see *Common parameters for nppiNorm functions include:*.

NppStatus **nppiNormDiff_Inf_16u_C1MR_Ctx**(const *Npp16u* *pSrc1, int nSrc1Step, const *Npp16u* *pSrc2, int nSrc2Step, const *Npp8u* *pMask, int nMaskStep, *NppiSize* oSizeROI, *Npp64f* *pNormDiff, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Masked one-channel 16-bit unsigned images NormDiff_Inf.

For common parameter descriptions, see *Common parameters for nppiNorm functions include:*.

NppStatus **nppiNormDiff_Inf_32f_C1MR_Ctx**(const *Npp32f* *pSrc1, int nSrc1Step, const *Npp32f* *pSrc2, int nSrc2Step, const *Npp8u* *pMask, int nMaskStep, *NppiSize* oSizeROI, *Npp64f* *pNormDiff, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Masked one-channel 32-bit floating point images NormDiff_Inf.

For common parameter descriptions, see *Common parameters for nppiNorm functions include:*.

NppStatus **nppiNormDiff_Inf_8u_C3CMR_Ctx**(const *Npp8u* *pSrc1, int nSrc1Step, const *Npp8u* *pSrc2, int nSrc2Step, const *Npp8u* *pMask, int nMaskStep, *NppiSize* oSizeROI, int nCOI, *Npp64f* *pNormDiff, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Masked three-channel 8-bit unsigned image NormDiff_Inf affecting only single channel.

For common parameter descriptions, see *Common parameters for nppiNorm functions include:*.

NppStatus **nppiNormDiff_Inf_8s_C3CMR_Ctx**(const *Npp8s* *pSrc1, int nSrc1Step, const *Npp8s* *pSrc2, int nSrc2Step, const *Npp8u* *pMask, int nMaskStep, *NppiSize* oSizeROI, int nCOI, *Npp64f* *pNormDiff, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Masked three-channel 8-bit signed image NormDiff_Inf affecting only single channel.

For common parameter descriptions, see *Common parameters for nppiNorm functions include:*.

NppStatus **nppiNormDiff_Inf_16u_C3CMR_Ctx**(const *Npp16u* *pSrc1, int nSrc1Step, const *Npp16u* *pSrc2, int nSrc2Step, const *Npp8u* *pMask, int nMaskStep, *NppiSize* oSizeROI, int nCOI, *Npp64f* *pNormDiff, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Masked three-channel 16-bit unsigned image NormDiff_Inf affecting only single channel.

For common parameter descriptions, see *Common parameters for nppiNorm functions include:*.

NppStatus **nppiNormDiff_Inf_32f_C3CMR_Ctx**(const *Npp32f* *pSrc1, int nSrc1Step, const *Npp32f* *pSrc2, int nSrc2Step, const *Npp8u* *pMask, int nMaskStep, *NppiSize* oSizeROI, int nCOI, *Npp64f* *pNormDiff, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Masked three-channel 32-bit floating point image NormDiff_Inf affecting only single channel.

For common parameter descriptions, see *Common parameters for nppiNorm functions include:*.

NormDiffInfGetBufferHostSize

Companion primitives for computing the device buffer size (in bytes) required by the NormDiff_Inf primitives.

1.14.10.5.2 CommonNormDiffInfGetBufferHostSizeParameters

Common parameters for nppiNormDiffInfGetBufferHostSize functions include:

param oSizeROI
Region-Of-Interest (ROI).

param hpBufferSize
Required buffer size. Important: hpBufferSize is a *host pointer.* *Scratch Buffer and Host Pointer*.

param nppStreamCtx
Application Managed Stream Context.

return
NPP_NULL_POINTER_ERROR if hpBufferSize is 0 (NULL), *ROI Related Error Codes*.

NppStatus **nppiNormDiffInfGetBufferHostSize_8u_C1R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiNormDiff_Inf_8u_C1R_Ctx*.

For common parameter descriptions, see *CommonNormDiffInfGetBufferHostSizeParameters*.

NppStatus **nppiNormDiffInfGetBufferHostSize_16u_C1R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiNormDiff_Inf_16u_C1R_Ctx*.

For common parameter descriptions, see *CommonNormDiffInfGetBufferHostSizeParameters*.

NppStatus **nppiNormDiffInfGetBufferHostSize_16s_C1R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiNormDiff_Inf_16s_C1R_Ctx*.

For common parameter descriptions, see *CommonNormDiffInfGetBufferHostSizeParameters*.

NppStatus **nppiNormDiffInfGetBufferHostSize_32f_C1R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiNormDiff_Inf_32f_C1R_Ctx*.

For common parameter descriptions, see *CommonNormDiffInfGetBufferHostSizeParameters*.

NppStatus **nppiNormDiffInfGetBufferHostSize_8u_C1MR_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiNormDiff_Inf_8u_C1MR_Ctx*.

For common parameter descriptions, see *CommonNormDiffInfGetBufferHostSizeParameters*.

NppStatus **nppiNormDiffInfGetBufferHostSize_8s_C1MR_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiNormDiff_Inf_8s_C1MR_Ctx*.

For common parameter descriptions, see *CommonNormDiffInfGetBufferHostSizeParameters*.

NppStatus **nppiNormDiffInfGetBufferHostSize_16u_C1MR_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiNormDiff_Inf_16u_C1MR_Ctx*.

For common parameter descriptions, see *CommonNormDiffInfGetBufferHostSizeParameters*.

NppStatus **nppiNormDiffInfGetBufferHostSize_32f_C1MR_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiNormDiff_Inf_32f_C1MR_Ctx*.

For common parameter descriptions, see *CommonNormDiffInfGetBufferHostSizeParameters*.

NppStatus **nppiNormDiffInfGetBufferHostSize_8u_C3R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiNormDiff_Inf_8u_C3R_Ctx*.

For common parameter descriptions, see *CommonNormDiffInfGetBufferHostSizeParameters*.

NppStatus **nppiNormDiffInfGetBufferHostSize_16u_C3R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiNormDiff_Inf_16u_C3R_Ctx*.

For common parameter descriptions, see *CommonNormDiffInfGetBufferHostSizeParameters*.

NppStatus **nppiNormDiffInfGetBufferHostSize_16s_C3R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiNormDiff_Inf_16s_C3R_Ctx*.

For common parameter descriptions, see *CommonNormDiffInfGetBufferHostSizeParameters*.

NppStatus **nppiNormDiffInfGetBufferHostSize_32f_C3R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiNormDiff_Inf_32f_C3R_Ctx*.

For common parameter descriptions, see *CommonNormDiffInfGetBufferHostSizeParameters*.

NppStatus **nppiNormDiffInfGetBufferHostSize_8u_C4R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiNormDiff_Inf_8u_C4R_Ctx*.

For common parameter descriptions, see *CommonNormDiffInfGetBufferHostSizeParameters*.

NppStatus **nppiNormDiffInfGetBufferHostSize_16u_C4R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiNormDiff_Inf_16u_C4R_Ctx*.

For common parameter descriptions, see *CommonNormDiffInfGetBufferHostSizeParameters*.

NppStatus **nppiNormDiffInfGetBufferHostSize_16s_C4R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiNormDiff_Inf_16s_C4R_Ctx*.

For common parameter descriptions, see *CommonNormDiffInfGetBufferHostSizeParameters*.

NppStatus **nppiNormDiffInfGetBufferHostSize_32f_C4R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiNormDiff_Inf_32f_C4R_Ctx*.

For common parameter descriptions, see *CommonNormDiffInfGetBufferHostSizeParameters*.

NppStatus **nppiNormDiffInfGetBufferHostSize_8u_AC4R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiNormDiff_Inf_8u_AC4R_Ctx*.

For common parameter descriptions, see *CommonNormDiffInfGetBufferHostSizeParameters*.

NppStatus **nppiNormDiffInfGetBufferHostSize_16u_AC4R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiNormDiff_Inf_16u_AC4R_Ctx*.

For common parameter descriptions, see *CommonNormDiffInfGetBufferHostSizeParameters*.

NppStatus **nppiNormDiffInfGetBufferHostSize_16s_AC4R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiNormDiff_Inf_16s_AC4R_Ctx*.

For common parameter descriptions, see *CommonNormDiffInfGetBufferHostSizeParameters*.

NppStatus **nppiNormDiffInfGetBufferHostSize_32f_AC4R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiNormDiff_Inf_32f_AC4R_Ctx*.

For common parameter descriptions, see *CommonNormDiffInfGetBufferHostSizeParameters*.

NppStatus **nppiNormDiffInfGetBufferHostSize_8u_C3CMR_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiNormDiff_Inf_8u_C3CMR_Ctx*.

For common parameter descriptions, see *CommonNormDiffInfGetBufferHostSizeParameters*.

NppStatus **nppiNormDiffInfGetBufferHostSize_8s_C3CMR_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiNormDiff_Inf_8s_C3CMR_Ctx*.

For common parameter descriptions, see *CommonNormDiffInfGetBufferHostSizeParameters*.

NppStatus **nppiNormDiffInfGetBufferHostSize_16u_C3CMR_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiNormDiff_Inf_16u_C3CMR_Ctx*.

For common parameter descriptions, see *CommonNormDiffInfGetBufferHostSizeParameters*.

NppStatus **nppiNormDiffInfGetBufferHostSize_32f_C3CMR_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiNormDiff_Inf_32f_C3CMR_Ctx*.

For common parameter descriptions, see *CommonNormDiffInfGetBufferHostSizeParameters*.

1.14.10.6 Image NormDiff L1

1.14.10.6.1 NormDiff_L1

Primitives for computing the L1 norm of difference of pixels between two images.

Basic NormDiff_L1

NppStatus **nppiNormDiff_L1_8u_C1R_Ctx**(const *Npp8u* *pSrc1, int nSrc1Step, const *Npp8u* *pSrc2, int nSrc2Step, *NppiSize* oSizeROI, *Npp64f* *pNormDiff, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

One-channel 8-bit unsigned image NormDiff_L1.

For common parameter descriptions, see *Common parameters for nppiNorm functions include:*.

NppStatus **nppiNormDiff_L1_16u_C1R_Ctx**(const *Npp16u* *pSrc1, int nSrc1Step, const *Npp16u* *pSrc2, int nSrc2Step, *NppiSize* oSizeROI, *Npp64f* *pNormDiff, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

One-channel 16-bit unsigned image NormDiff_L1.

For common parameter descriptions, see *Common parameters for nppiNorm functions include:*.

NppStatus **nppiNormDiff_L1_16s_C1R_Ctx**(const *Npp16s* *pSrc1, int nSrc1Step, const *Npp16s* *pSrc2, int nSrc2Step, *NppiSize* oSizeROI, *Npp64f* *pNormDiff, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

One-channel 16-bit signed image NormDiff_L1.

For common parameter descriptions, see *Common parameters for nppiNorm functions include:*.

NppStatus **nppiNormDiff_L1_32f_C1R_Ctx**(const *Npp32f* *pSrc1, int nSrc1Step, const *Npp32f* *pSrc2, int nSrc2Step, *NppiSize* oSizeROI, *Npp64f* *pNormDiff, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

One-channel 32-bit floating point image NormDiff_L1.

For common parameter descriptions, see *Common parameters for nppiNorm functions include:*.

NppStatus **nppiNormDiff_L1_8u_C3R_Ctx**(const *Npp8u* *pSrc1, int nSrc1Step, const *Npp8u* *pSrc2, int nSrc2Step, *NppiSize* oSizeROI, *Npp64f* aNormDiff[3], *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Three-channel 8-bit unsigned image NormDiff_L1.

For common parameter descriptions, see *Common parameters for nppiNorm functions include:*.

NppStatus **nppiNormDiff_L1_16u_C3R_Ctx**(const *Npp16u* *pSrc1, int nSrc1Step, const *Npp16u* *pSrc2, int nSrc2Step, *NppiSize* oSizeROI, *Npp64f* aNormDiff[3], *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Three-channel 16-bit unsigned image NormDiff_L1.

For common parameter descriptions, see *Common parameters for nppiNorm functions include:*.

NppStatus **nppiNormDiff_L1_16s_C3R_Ctx**(const *Npp16s* *pSrc1, int nSrc1Step, const *Npp16s* *pSrc2, int nSrc2Step, *NppiSize* oSizeROI, *Npp64f* aNormDiff[3], *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Three-channel 16-bit signed image NormDiff_L1.

For common parameter descriptions, see *Common parameters for nppiNorm functions include:*.

NppStatus **nppiNormDiff_L1_32f_C3R_Ctx**(const *Npp32f* *pSrc1, int nSrc1Step, const *Npp32f* *pSrc2, int nSrc2Step, *NppiSize* oSizeROI, *Npp64f* aNormDiff[3], *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Three-channel 32-bit floating point image NormDiff_L1.

For common parameter descriptions, see *Common parameters for nppiNorm functions include:*.

NppStatus **nppiNormDiff_L1_8u_AC4R_Ctx**(const *Npp8u* *pSrc1, int nSrc1Step, const *Npp8u* *pSrc2, int nSrc2Step, *NppiSize* oSizeROI, *Npp64f* aNormDiff[3], *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Four-channel 8-bit unsigned image NormDiff_L1 ignoring alpha channel.

For common parameter descriptions, see *Common parameters for nppiNorm functions include:*.

NppStatus **nppiNormDiff_L1_16u_AC4R_Ctx**(const *Npp16u* *pSrc1, int nSrc1Step, const *Npp16u* *pSrc2, int nSrc2Step, *NppiSize* oSizeROI, *Npp64f* aNormDiff[3], *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Four-channel 16-bit unsigned image NormDiff_L1 ignoring alpha channel.

For common parameter descriptions, see *Common parameters for nppiNorm functions include:*.

NppStatus **nppiNormDiff_L1_16s_AC4R_Ctx**(const *Npp16s* *pSrc1, int nSrc1Step, const *Npp16s* *pSrc2, int nSrc2Step, *NppiSize* oSizeROI, *Npp64f* aNormDiff[3], *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Four-channel 16-bit signed image NormDiff_L1 ignoring alpha channel.

For common parameter descriptions, see *Common parameters for nppiNorm functions include:*.

NppStatus **nppiNormDiff_L1_32f_AC4R_Ctx**(const *Npp32f* *pSrc1, int nSrc1Step, const *Npp32f* *pSrc2, int nSrc2Step, *NppiSize* oSizeROI, *Npp64f* aNormDiff[3], *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Four-channel 32-bit floating point image NormDiff_L1 ignoring alpha channel.

For common parameter descriptions, see *Common parameters for nppiNorm functions include:*.

NppStatus **nppiNormDiff_L1_8u_C4R_Ctx**(const *Npp8u* *pSrc1, int nSrc1Step, const *Npp8u* *pSrc2, int nSrc2Step, *NppiSize* oSizeROI, *Npp64f* aNormDiff[4], *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Four-channel 8-bit unsigned image NormDiff_L1.

For common parameter descriptions, see *Common parameters for nppiNorm functions include:*.

NppStatus **nppiNormDiff_L1_16u_C4R_Ctx**(const *Npp16u* *pSrc1, int nSrc1Step, const *Npp16u* *pSrc2, int nSrc2Step, *NppiSize* oSizeROI, *Npp64f* aNormDiff[4], *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Four-channel 16-bit unsigned image NormDiff_L1.

For common parameter descriptions, see *Common parameters for nppiNorm functions include:*.

NppStatus **nppiNormDiff_L1_16s_C4R_Ctx**(const *Npp16s* *pSrc1, int nSrc1Step, const *Npp16s* *pSrc2, int nSrc2Step, *NppiSize* oSizeROI, *Npp64f* aNormDiff[4], *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Four-channel 16-bit signed image NormDiff_L1.

For common parameter descriptions, see *Common parameters for nppiNorm functions include:*.

NppStatus **nppiNormDiff_L1_32f_C4R_Ctx**(const *Npp32f* *pSrc1, int nSrc1Step, const *Npp32f* *pSrc2, int nSrc2Step, *NppiSize* oSizeROI, *Npp64f* aNormDiff[4], *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Four-channel 32-bit floating point image NormDiff_L1.

For common parameter descriptions, see *Common parameters for nppiNorm functions include:*.

NppStatus **nppiNormDiff_L1_8u_C1MR_Ctx**(const *Npp8u* *pSrc1, int nSrc1Step, const *Npp8u* *pSrc2, int nSrc2Step, const *Npp8u* *pMask, int nMaskStep, *NppiSize* oSizeROI, *Npp64f* *pNormDiff, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Masked one-channel 8-bit unsigned image NormDiff_L1.

For common parameter descriptions, see *Common parameters for nppiNorm functions include:*.

NppStatus **nppiNormDiff_L1_8s_C1MR_Ctx**(const *Npp8s* *pSrc1, int nSrc1Step, const *Npp8s* *pSrc2, int nSrc2Step, const *Npp8u* *pMask, int nMaskStep, *NppiSize* oSizeROI, *Npp64f* *pNormDiff, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Masked one-channel 8-bit signed image NormDiff_L1.

For common parameter descriptions, see *Common parameters for nppiNorm functions include:*.

NppStatus **nppiNormDiff_L1_16u_C1MR_Ctx**(const *Npp16u* *pSrc1, int nSrc1Step, const *Npp16u* *pSrc2, int nSrc2Step, const *Npp8u* *pMask, int nMaskStep, *NppiSize* oSizeROI, *Npp64f* *pNormDiff, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Masked one-channel 16-bit unsigned image NormDiff_L1.

For common parameter descriptions, see *Common parameters for nppiNorm functions include:*.

NppStatus **nppiNormDiff_L1_32f_C1MR_Ctx**(const *Npp32f* *pSrc1, int nSrc1Step, const *Npp32f* *pSrc2, int nSrc2Step, const *Npp8u* *pMask, int nMaskStep, *NppiSize* oSizeROI, *Npp64f* *pNormDiff, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Masked one-channel 32-bit floating point image NormDiff_L1.

For common parameter descriptions, see *Common parameters for nppiNorm functions include:*.

NppStatus **nppiNormDiff_L1_8u_C3CMR_Ctx**(const *Npp8u* *pSrc1, int nSrc1Step, const *Npp8u* *pSrc2, int nSrc2Step, const *Npp8u* *pMask, int nMaskStep, *NppiSize* oSizeROI, int nCOI, *Npp64f* *pNormDiff, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Masked three-channel 8-bit unsigned image NormDiff_L1 affecting only single channel.

For common parameter descriptions, see *Common parameters for nppiNorm functions include:*.

NppStatus **nppiNormDiff_L1_8s_C3CMR_Ctx**(const *Npp8s* *pSrc1, int nSrc1Step, const *Npp8s* *pSrc2, int nSrc2Step, const *Npp8u* *pMask, int nMaskStep, *NppiSize* oSizeROI, int nCOI, *Npp64f* *pNormDiff, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Masked three-channel 8-bit signed image NormDiff_L1 affecting only single channel.

For common parameter descriptions, see *Common parameters for nppiNorm functions include:*.

NppStatus **nppiNormDiff_L1_16u_C3CMR_Ctx**(const *Npp16u* *pSrc1, int nSrc1Step, const *Npp16u* *pSrc2, int nSrc2Step, const *Npp8u* *pMask, int nMaskStep, *NppiSize* oSizeROI, int nCOI, *Npp64f* *pNormDiff, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Masked three-channel 16-bit unsigned image NormDiff_L1 affecting only single channel.

For common parameter descriptions, see *Common parameters for nppiNorm functions include:*.

NppStatus **nppiNormDiff_L1_32f_C3CMR_Ctx**(const *Npp32f* *pSrc1, int nSrc1Step, const *Npp32f* *pSrc2, int nSrc2Step, const *Npp8u* *pMask, int nMaskStep, *NppiSize* oSizeROI, int nCOI, *Npp64f* *pNormDiff, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Masked three-channel 32-bit floating point image NormDiff_L1 affecting only single channel.

For common parameter descriptions, see *Common parameters for nppiNorm functions include:*.

NormDiffL1GetBufferHostSize

Companion primitives for computing the device buffer size (in bytes) required by the NormDiff_L1 primitives.

1.14.10.6.2 CommonNormDiffL1GetBufferHostSizeParameters

Common parameters for nppiNormDiffL1GetBufferHostSize functions include:

param oSizeROI
Region-Of-Interest (ROI).

param hpBufferSize
Required buffer size. Important: hpBufferSize is a *host pointer.* *Scratch Buffer and Host Pointer*.

param nppStreamCtx
Application Managed Stream Context.

return
NPP_NULL_POINTER_ERROR if hpBufferSize is 0 (NULL), *ROI Related Error Codes*.

NppStatus **nppiNormDiffL1GetBufferHostSize_8u_C1R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Computes the device scratch buffer size (in bytes) for nppiNormDiff_L1_8u_C1R_Ctx.

For common parameter descriptions, see *CommonNormDiffL1GetBufferHostSizeParameters*.

NppStatus **nppiNormDiffL1GetBufferHostSize_16u_C1R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Computes the device scratch buffer size (in bytes) for nppiNormDiff_L1_16u_C1R_Ctx.

For common parameter descriptions, see *CommonNormDiffL1GetBufferHostSizeParameters*.

NppStatus **nppiNormDiffL1GetBufferHostSize_16s_C1R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Computes the device scratch buffer size (in bytes) for nppiNormDiff_L1_16s_C1R_Ctx.

For common parameter descriptions, see *CommonNormDiffL1GetBufferHostSizeParameters*.

NppStatus **nppiNormDiffL1GetBufferHostSize_32f_C1R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Computes the device scratch buffer size (in bytes) for nppiNormDiff_L1_32f_C1R_Ctx.

For common parameter descriptions, see *CommonNormDiffL1GetBufferHostSizeParameters*.

NppStatus **nppiNormDiffL1GetBufferHostSize_8u_C1MR_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Computes the device scratch buffer size (in bytes) for nppiNormDiff_L1_8u_C1MR_Ctx.

For common parameter descriptions, see *CommonNormDiffL1GetBufferHostSizeParameters*.

NppStatus **nppiNormDiffL1GetBufferHostSize_8s_C1MR_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Computes the device scratch buffer size (in bytes) for nppiNormDiff_L1_8s_C1MR_Ctx.

For common parameter descriptions, see *CommonNormDiffL1GetBufferHostSizeParameters*.

NppStatus **nppiNormDiffL1GetBufferHostSize_16u_C1MR_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Computes the device scratch buffer size (in bytes) for nppiNormDiff_L1_16u_C1MR_Ctx.

For common parameter descriptions, see *CommonNormDiffL1GetBufferHostSizeParameters*.

NppStatus **nppiNormDiffL1GetBufferHostSize_32f_C1MR_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Computes the device scratch buffer size (in bytes) for nppiNormDiff_L1_32f_C1MR_Ctx.

For common parameter descriptions, see *CommonNormDiffL1GetBufferHostSizeParameters*.

NppStatus **nppiNormDiffL1GetBufferHostSize_8u_C3R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Computes the device scratch buffer size (in bytes) for nppiNormDiff_L1_8u_C3R_Ctx.

For common parameter descriptions, see *CommonNormDiffL1GetBufferHostSizeParameters*.

NppStatus **nppiNormDiffL1GetBufferHostSize_16u_C3R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Computes the device scratch buffer size (in bytes) for nppiNormDiff_L1_16u_C3R_Ctx.

For common parameter descriptions, see *CommonNormDiffL1GetBufferHostSizeParameters*.

NppStatus **nppiNormDiffL1GetBufferHostSize_16s_C3R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Computes the device scratch buffer size (in bytes) for nppiNormDiff_L1_16s_C3R_Ctx.

For common parameter descriptions, see *CommonNormDiffL1GetBufferHostSizeParameters*.

NppStatus **nppiNormDiffL1GetBufferHostSize_32f_C3R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Computes the device scratch buffer size (in bytes) for nppiNormDiff_L1_32f_C3R_Ctx.

For common parameter descriptions, see *CommonNormDiffL1GetBufferHostSizeParameters*.

NppStatus **nppiNormDiffL1GetBufferHostSize_8u_C4R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Computes the device scratch buffer size (in bytes) for nppiNormDiff_L1_8u_C4R_Ctx.

For common parameter descriptions, see *CommonNormDiffL1GetBufferHostSizeParameters*.

NppStatus **nppiNormDiffL1GetBufferHostSize_16u_C4R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Computes the device scratch buffer size (in bytes) for nppiNormDiff_L1_16u_C4R_Ctx.

For common parameter descriptions, see *CommonNormDiffL1GetBufferHostSizeParameters*.

NppStatus **nppiNormDiffL1GetBufferHostSize_16s_C4R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Computes the device scratch buffer size (in bytes) for nppiNormDiff_L1_16s_C4R_Ctx.

For common parameter descriptions, see *CommonNormDiffL1GetBufferHostSizeParameters*.

NppStatus **nppiNormDiffL1GetBufferHostSize_32f_C4R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Computes the device scratch buffer size (in bytes) for nppiNormDiff_L1_32f_C4R_Ctx.

For common parameter descriptions, see *CommonNormDiffL1GetBufferHostSizeParameters*.

NppStatus **nppiNormDiffL1GetBufferHostSize_8u_AC4R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Computes the device scratch buffer size (in bytes) for nppiNormDiff_L1_8u_AC4R_Ctx.

For common parameter descriptions, see *CommonNormDiffL1GetBufferHostSizeParameters*.

NppStatus **nppiNormDiffL1GetBufferHostSize_16u_AC4R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Computes the device scratch buffer size (in bytes) for nppiNormDiff_L1_16u_AC4R_Ctx.

For common parameter descriptions, see *CommonNormDiffL1GetBufferHostSizeParameters*.

NppStatus **nppiNormDiffL1GetBufferHostSize_16s_AC4R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Computes the device scratch buffer size (in bytes) for nppiNormDiff_L1_16s_AC4R_Ctx.

For common parameter descriptions, see *CommonNormDiffL1GetBufferHostSizeParameters*.

NppStatus **nppiNormDiffL1GetBufferHostSize_32f_AC4R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Computes the device scratch buffer size (in bytes) for nppiNormDiff_L1_32f_AC4R_Ctx.

For common parameter descriptions, see *CommonNormDiffL1GetBufferHostSizeParameters*.

NppStatus **nppiNormDiffL1GetBufferHostSize_8u_C3CMR_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Computes the device scratch buffer size (in bytes) for nppiNormDiff_L1_8u_C3CMR_Ctx.

For common parameter descriptions, see *CommonNormDiffL1GetBufferHostSizeParameters*.

NppStatus **nppiNormDiffL1GetBufferHostSize_8s_C3CMR_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Computes the device scratch buffer size (in bytes) for nppiNormDiff_L1_8s_C3CMR_Ctx.

For common parameter descriptions, see *CommonNormDiffL1GetBufferHostSizeParameters*.

NppStatus **nppiNormDiffL1GetBufferHostSize_16u_C3CMR_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Computes the device scratch buffer size (in bytes) for nppiNormDiff_L1_16u_C3CMR_Ctx.

For common parameter descriptions, see *CommonNormDiffL1GetBufferHostSizeParameters*.

NppStatus **nppiNormDiffL1GetBufferHostSize_32f_C3CMR_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Computes the device scratch buffer size (in bytes) for nppiNormDiff_L1_32f_C3CMR_Ctx.

For common parameter descriptions, see *CommonNormDiffL1GetBufferHostSizeParameters*.

1.14.10.7 Image NormDiff L2

1.14.10.7.1 NormDiff_L2

Primitives for computing the L2 norm of difference of pixels between two images.

Basic NormDiff_L2

NppStatus **nppiNormDiff_L2_8u_C1R_Ctx**(const *Npp8u* *pSrc1, int nSrc1Step, const *Npp8u* *pSrc2, int nSrc2Step, *NppiSize* oSizeROI, *Npp64f* *pNormDiff, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

One-channel 8-bit unsigned image NormDiff_L2.

For common parameter descriptions, see *Common parameters for nppiNorm functions include:*.

NppStatus **nppiNormDiff_L2_16u_C1R_Ctx**(const *Npp16u* *pSrc1, int nSrc1Step, const *Npp16u* *pSrc2, int nSrc2Step, *NppiSize* oSizeROI, *Npp64f* *pNormDiff, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

One-channel 16-bit unsigned image NormDiff_L2.

For common parameter descriptions, see *Common parameters for nppiNorm functions include:*.

NppStatus **nppiNormDiff_L2_16s_C1R_Ctx**(const *Npp16s* *pSrc1, int nSrc1Step, const *Npp16s* *pSrc2, int nSrc2Step, *NppiSize* oSizeROI, *Npp64f* *pNormDiff, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

One-channel 16-bit signed image NormDiff_L2.

For common parameter descriptions, see *Common parameters for nppiNorm functions include:*.

NppStatus **nppiNormDiff_L2_32f_C1R_Ctx**(const *Npp32f* *pSrc1, int nSrc1Step, const *Npp32f* *pSrc2, int nSrc2Step, *NppiSize* oSizeROI, *Npp64f* *pNormDiff, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

One-channel 32-bit floating point image NormDiff_L2.

For common parameter descriptions, see *Common parameters for nppiNorm functions include:*.

NppStatus **nppiNormDiff_L2_8u_C3R_Ctx**(const *Npp8u* *pSrc1, int nSrc1Step, const *Npp8u* *pSrc2, int nSrc2Step, *NppiSize* oSizeROI, *Npp64f* aNormDiff[3], *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Three-channel 8-bit unsigned image NormDiff_L2.

For common parameter descriptions, see *Common parameters for nppiNorm functions include:*.

NppStatus **nppiNormDiff_L2_16u_C3R_Ctx**(const *Npp16u* *pSrc1, int nSrc1Step, const *Npp16u* *pSrc2, int nSrc2Step, *NppiSize* oSizeROI, *Npp64f* aNormDiff[3], *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Three-channel 16-bit unsigned image NormDiff_L2.

For common parameter descriptions, see *Common parameters for nppiNorm functions include:*.

NppStatus **nppiNormDiff_L2_16s_C3R_Ctx**(const *Npp16s* *pSrc1, int nSrc1Step, const *Npp16s* *pSrc2, int nSrc2Step, *NppiSize* oSizeROI, *Npp64f* aNormDiff[3], *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Three-channel 16-bit signed image NormDiff_L2.

For common parameter descriptions, see *Common parameters for nppiNorm functions include:*.

NppStatus **nppiNormDiff_L2_32f_C3R_Ctx**(const *Npp32f* *pSrc1, int nSrc1Step, const *Npp32f* *pSrc2, int nSrc2Step, *NppiSize* oSizeROI, *Npp64f* aNormDiff[3], *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Three-channel 32-bit floating point image NormDiff_L2.

For common parameter descriptions, see *Common parameters for nppiNorm functions include:*.

NppStatus **nppiNormDiff_L2_8u_AC4R_Ctx**(const *Npp8u* *pSrc1, int nSrc1Step, const *Npp8u* *pSrc2, int nSrc2Step, *NppiSize* oSizeROI, *Npp64f* aNormDiff[3], *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Four-channel 8-bit unsigned image NormDiff_L2 ignoring alpha channel.

For common parameter descriptions, see *Common parameters for nppiNorm functions include:*.

NppStatus **nppiNormDiff_L2_16u_AC4R_Ctx**(const *Npp16u* *pSrc1, int nSrc1Step, const *Npp16u* *pSrc2, int nSrc2Step, *NppiSize* oSizeROI, *Npp64f* aNormDiff[3], *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Four-channel 16-bit unsigned image NormDiff_L2 ignoring alpha channel.

For common parameter descriptions, see *Common parameters for nppiNorm functions include:*.

NppStatus **nppiNormDiff_L2_16s_AC4R_Ctx**(const *Npp16s* *pSrc1, int nSrc1Step, const *Npp16s* *pSrc2, int nSrc2Step, *NppiSize* oSizeROI, *Npp64f* aNormDiff[3], *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Four-channel 16-bit signed image NormDiff_L2 ignoring alpha channel.

For common parameter descriptions, see *Common parameters for nppiNorm functions include:*.

NppStatus **nppiNormDiff_L2_32f_AC4R_Ctx**(const *Npp32f* *pSrc1, int nSrc1Step, const *Npp32f* *pSrc2, int nSrc2Step, *NppiSize* oSizeROI, *Npp64f* aNormDiff[3], *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Four-channel 32-bit floating point image NormDiff_L2 ignoring alpha channel.

For common parameter descriptions, see *Common parameters for nppiNorm functions include:*.

NppStatus **nppiNormDiff_L2_8u_C4R_Ctx**(const *Npp8u* *pSrc1, int nSrc1Step, const *Npp8u* *pSrc2, int nSrc2Step, *NppiSize* oSizeROI, *Npp64f* aNormDiff[4], *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Four-channel 8-bit unsigned image NormDiff_L2.

For common parameter descriptions, see *Common parameters for nppiNorm functions include:*.

NppStatus **nppiNormDiff_L2_16u_C4R_Ctx**(const *Npp16u* *pSrc1, int nSrc1Step, const *Npp16u* *pSrc2, int nSrc2Step, *NppiSize* oSizeROI, *Npp64f* aNormDiff[4], *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Four-channel 16-bit unsigned image NormDiff_L2.

For common parameter descriptions, see *Common parameters for nppiNorm functions include:*.

NppStatus **nppiNormDiff_L2_16s_C4R_Ctx**(const *Npp16s* *pSrc1, int nSrc1Step, const *Npp16s* *pSrc2, int nSrc2Step, *NppiSize* oSizeROI, *Npp64f* aNormDiff[4], *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Four-channel 16-bit signed image NormDiff_L2.

For common parameter descriptions, see *Common parameters for nppiNorm functions include:*.

NppStatus **nppiNormDiff_L2_32f_C4R_Ctx**(const *Npp32f* *pSrc1, int nSrc1Step, const *Npp32f* *pSrc2, int nSrc2Step, *NppiSize* oSizeROI, *Npp64f* aNormDiff[4], *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Four-channel 32-bit floating point image NormDiff_L2.

For common parameter descriptions, see *Common parameters for nppiNorm functions include:*.

NppStatus **nppiNormDiff_L2_8u_C1MR_Ctx**(const *Npp8u* *pSrc1, int nSrc1Step, const *Npp8u* *pSrc2, int nSrc2Step, const *Npp8u* *pMask, int nMaskStep, *NppiSize* oSizeROI, *Npp64f* *pNormDiff, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Masked one-channel 8-bit unsigned image NormDiff_L2.

For common parameter descriptions, see *Common parameters for nppiNorm functions include:*.

NppStatus **nppiNormDiff_L2_8s_C1MR_Ctx**(const *Npp8s* *pSrc1, int nSrc1Step, const *Npp8s* *pSrc2, int nSrc2Step, const *Npp8u* *pMask, int nMaskStep, *NppiSize* oSizeROI, *Npp64f* *pNormDiff, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Masked one-channel 8-bit signed image NormDiff_L2.

For common parameter descriptions, see *Common parameters for nppiNorm functions include:*.

NppStatus **nppiNormDiff_L2_16u_C1MR_Ctx**(const *Npp16u* *pSrc1, int nSrc1Step, const *Npp16u* *pSrc2, int nSrc2Step, const *Npp8u* *pMask, int nMaskStep, *NppiSize* oSizeROI, *Npp64f* *pNormDiff, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Masked one-channel 16-bit unsigned image NormDiff_L2.

For common parameter descriptions, see *Common parameters for nppiNorm functions include:*.

NppStatus **nppiNormDiff_L2_32f_C1MR_Ctx**(const *Npp32f* *pSrc1, int nSrc1Step, const *Npp32f* *pSrc2, int nSrc2Step, const *Npp8u* *pMask, int nMaskStep, *NppiSize* oSizeROI, *Npp64f* *pNormDiff, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Masked one-channel 32-bit floating point image NormDiff_L2.

For common parameter descriptions, see *Common parameters for nppiNorm functions include:*.

NppStatus **nppiNormDiff_L2_8u_C3CMR_Ctx**(const *Npp8u* *pSrc1, int nSrc1Step, const *Npp8u* *pSrc2, int nSrc2Step, const *Npp8u* *pMask, int nMaskStep, *NppiSize* oSizeROI, int nCOI, *Npp64f* *pNormDiff, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Masked three-channel 8-bit unsigned image NormDiff_L2 affecting only single channel.

For common parameter descriptions, see *Common parameters for nppiNorm functions include:*.

NppStatus **nppiNormDiff_L2_8s_C3CMR_Ctx**(const *Npp8s* *pSrc1, int nSrc1Step, const *Npp8s* *pSrc2, int nSrc2Step, const *Npp8u* *pMask, int nMaskStep, *NppiSize* oSizeROI, int nCOI, *Npp64f* *pNormDiff, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Masked three-channel 8-bit signed image NormDiff_L2 affecting only single channel.

For common parameter descriptions, see *Common parameters for nppiNorm functions include:*.

NppStatus **nppiNormDiff_L2_16u_C3CMR_Ctx**(const *Npp16u* *pSrc1, int nSrc1Step, const *Npp16u* *pSrc2, int nSrc2Step, const *Npp8u* *pMask, int nMaskStep, *NppiSize* oSizeROI, int nCOI, *Npp64f* *pNormDiff, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Masked three-channel 16-bit unsigned image NormDiff_L2 affecting only single channel.

For common parameter descriptions, see *Common parameters for nppiNorm functions include:*.

NppStatus **nppiNormDiff_L2_32f_C3CMR_Ctx**(const *Npp32f* *pSrc1, int nSrc1Step, const *Npp32f* *pSrc2, int nSrc2Step, const *Npp8u* *pMask, int nMaskStep, *NppiSize* oSizeROI, int nCOI, *Npp64f* *pNormDiff, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Masked three-channel 32-bit floating point image NormDiff_L2 affecting only single channel.

For common parameter descriptions, see *Common parameters for nppiNorm functions include:*.

NormDiffL2GetBufferHostSize

Companion primitives for computing the device buffer size (in bytes) required by the NormDiff_L2 primitives.

1.14.10.7.2 CommonNormDiffL2GetBufferHostSizeParameters

Common parameters for nppiNormDiffL2GetBufferHostSize functions include:

param oSizeROI
Region-Of-Interest (ROI).

param hpBufferSize
Required buffer size. Important: hpBufferSize is a *host pointer.* *Scratch Buffer and Host Pointer*.

param nppStreamCtx
Application Managed Stream Context.

return
NPP_NULL_POINTER_ERROR if hpBufferSize is 0 (NULL), *ROI Related Error Codes*.

NppStatus **nppiNormDiffL2GetBufferHostSize_8u_C1R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Computes the device scratch buffer size (in bytes) for nppiNormDiff_L2_8u_C1R_Ctx.

For common parameter descriptions, see *CommonNormDiffL2GetBufferHostSizeParameters*.

NppStatus **nppiNormDiffL2GetBufferHostSize_16u_C1R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Computes the device scratch buffer size (in bytes) for nppiNormDiff_L2_16u_C1R_Ctx.

For common parameter descriptions, see *CommonNormDiffL2GetBufferHostSizeParameters*.

NppStatus **nppiNormDiffL2GetBufferHostSize_16s_C1R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Computes the device scratch buffer size (in bytes) for nppiNormDiff_L2_16s_C1R_Ctx.

For common parameter descriptions, see *CommonNormDiffL2GetBufferHostSizeParameters*.

NppStatus **nppiNormDiffL2GetBufferHostSize_32f_C1R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Computes the device scratch buffer size (in bytes) for nppiNormDiff_L2_32f_C1R_Ctx.

For common parameter descriptions, see *CommonNormDiffL2GetBufferHostSizeParameters*.

NppStatus **nppiNormDiffL2GetBufferHostSize_8u_C1MR_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Computes the device scratch buffer size (in bytes) for nppiNormDiff_L2_8u_C1MR_Ctx.

For common parameter descriptions, see *CommonNormDiffL2GetBufferHostSizeParameters*.

NppStatus **nppiNormDiffL2GetBufferHostSize_8s_C1MR_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Computes the device scratch buffer size (in bytes) for nppiNormDiff_L2_8s_C1MR_Ctx.

For common parameter descriptions, see *CommonNormDiffL2GetBufferHostSizeParameters*.

NppStatus **nppiNormDiffL2GetBufferHostSize_16u_C1MR_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Computes the device scratch buffer size (in bytes) for nppiNormDiff_L2_16u_C1MR_Ctx.

For common parameter descriptions, see *CommonNormDiffL2GetBufferHostSizeParameters*.

NppStatus **nppiNormDiffL2GetBufferHostSize_32f_C1MR_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Computes the device scratch buffer size (in bytes) for nppiNormDiff_L2_32f_C1MR_Ctx.

For common parameter descriptions, see *CommonNormDiffL2GetBufferHostSizeParameters*.

NppStatus **nppiNormDiffL2GetBufferHostSize_8u_C3R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Computes the device scratch buffer size (in bytes) for nppiNormDiff_L2_8u_C3R_Ctx.

For common parameter descriptions, see *CommonNormDiffL2GetBufferHostSizeParameters*.

NppStatus **nppiNormDiffL2GetBufferHostSize_16u_C3R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Computes the device scratch buffer size (in bytes) for nppiNormDiff_L2_16u_C3R_Ctx.

For common parameter descriptions, see *CommonNormDiffL2GetBufferHostSizeParameters*.

NppStatus **nppiNormDiffL2GetBufferHostSize_16s_C3R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Computes the device scratch buffer size (in bytes) for nppiNormDiff_L2_16s_C3R_Ctx.

For common parameter descriptions, see *CommonNormDiffL2GetBufferHostSizeParameters*.

NppStatus **nppiNormDiffL2GetBufferHostSize_32f_C3R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Computes the device scratch buffer size (in bytes) for nppiNormDiff_L2_32f_C3R_Ctx.

For common parameter descriptions, see *CommonNormDiffL2GetBufferHostSizeParameters*.

NppStatus **nppiNormDiffL2GetBufferHostSize_8u_C4R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Computes the device scratch buffer size (in bytes) for nppiNormDiff_L2_8u_C4R_Ctx.

For common parameter descriptions, see *CommonNormDiffL2GetBufferHostSizeParameters*.

NppStatus **nppiNormDiffL2GetBufferHostSize_16u_C4R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Computes the device scratch buffer size (in bytes) for nppiNormDiff_L2_16u_C4R_Ctx.

For common parameter descriptions, see *CommonNormDiffL2GetBufferHostSizeParameters*.

NppStatus **nppiNormDiffL2GetBufferHostSize_16s_C4R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Computes the device scratch buffer size (in bytes) for nppiNormDiff_L2_16s_C4R_Ctx.

For common parameter descriptions, see *CommonNormDiffL2GetBufferHostSizeParameters*.

NppStatus **nppiNormDiffL2GetBufferHostSize_32f_C4R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Computes the device scratch buffer size (in bytes) for nppiNormDiff_L2_32f_C4R_Ctx.

For common parameter descriptions, see *CommonNormDiffL2GetBufferHostSizeParameters*.

NppStatus **nppiNormDiffL2GetBufferHostSize_8u_AC4R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Computes the device scratch buffer size (in bytes) for nppiNormDiff_L2_8u_AC4R_Ctx.

For common parameter descriptions, see *CommonNormDiffL2GetBufferHostSizeParameters*.

NppStatus **nppiNormDiffL2GetBufferHostSize_16u_AC4R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Computes the device scratch buffer size (in bytes) for nppiNormDiff_L2_16u_AC4R_Ctx.

For common parameter descriptions, see *CommonNormDiffL2GetBufferHostSizeParameters*.

NppStatus **nppiNormDiffL2GetBufferHostSize_16s_AC4R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Computes the device scratch buffer size (in bytes) for nppiNormDiff_L2_16s_AC4R_Ctx.

For common parameter descriptions, see *CommonNormDiffL2GetBufferHostSizeParameters*.

NppStatus **nppiNormDiffL2GetBufferHostSize_32f_AC4R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Computes the device scratch buffer size (in bytes) for nppiNormDiff_L2_32f_AC4R_Ctx.

For common parameter descriptions, see *CommonNormDiffL2GetBufferHostSizeParameters*.

NppStatus **nppiNormDiffL2GetBufferHostSize_8u_C3CMR_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Computes the device scratch buffer size (in bytes) for nppiNormDiff_L2_8u_C3CMR_Ctx.

For common parameter descriptions, see *CommonNormDiffL2GetBufferHostSizeParameters*.

NppStatus **nppiNormDiffL2GetBufferHostSize_8s_C3CMR_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Computes the device scratch buffer size (in bytes) for nppiNormDiff_L2_8s_C3CMR_Ctx.

For common parameter descriptions, see *CommonNormDiffL2GetBufferHostSizeParameters*.

NppStatus **nppiNormDiffL2GetBufferHostSize_16u_C3CMR_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Computes the device scratch buffer size (in bytes) for nppiNormDiff_L2_16u_C3CMR_Ctx.

For common parameter descriptions, see *CommonNormDiffL2GetBufferHostSizeParameters*.

NppStatus **nppiNormDiffL2GetBufferHostSize_32f_C3CMR_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Computes the device scratch buffer size (in bytes) for nppiNormDiff_L2_32f_C3CMR_Ctx.

For common parameter descriptions, see *CommonNormDiffL2GetBufferHostSizeParameters*.

1.14.10.8 Image NormRel Inf

1.14.10.8.1 NormRel_Inf

Primitives for computing the relative error of infinity norm between two images.

Basic NormRel_Inf

NppStatus **nppiNormRel_Inf_8u_C1R_Ctx**(const *Npp8u* *pSrc1, int nSrc1Step, const *Npp8u* *pSrc2, int nSrc2Step, *NppiSize* oSizeROI, *Npp64f* *pNormRel, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

One-channel 8-bit unsigned image NormRel_Inf.

For common parameter descriptions, see *Common parameters for nppiNorm functions include:*.

NppStatus **nppiNormRel_Inf_16u_C1R_Ctx**(const *Npp16u* *pSrc1, int nSrc1Step, const *Npp16u* *pSrc2, int nSrc2Step, *NppiSize* oSizeROI, *Npp64f* *pNormRel, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

One-channel 16-bit unsigned image NormRel_Inf.

For common parameter descriptions, see *Common parameters for nppiNorm functions include:*.

NppStatus **nppiNormRel_Inf_16s_C1R_Ctx**(const *Npp16s* *pSrc1, int nSrc1Step, const *Npp16s* *pSrc2, int nSrc2Step, *NppiSize* oSizeROI, *Npp64f* *pNormRel, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

One-channel 16-bit signed image NormRel_Inf.

For common parameter descriptions, see *Common parameters for nppiNorm functions include:*.

NppStatus **nppiNormRel_Inf_32f_C1R_Ctx**(const *Npp32f* *pSrc1, int nSrc1Step, const *Npp32f* *pSrc2, int nSrc2Step, *NppiSize* oSizeROI, *Npp64f* *pNormRel, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

One-channel 32-bit floating point image NormRel_Inf.

For common parameter descriptions, see *Common parameters for nppiNorm functions include:*.

NppStatus **nppiNormRel_Inf_8u_C3R_Ctx**(const *Npp8u* *pSrc1, int nSrc1Step, const *Npp8u* *pSrc2, int nSrc2Step, *NppiSize* oSizeROI, *Npp64f* aNormRel[3], *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Three-channel 8-bit unsigned image NormRel_Inf.

For common parameter descriptions, see *Common parameters for nppiNorm functions include:*.

NppStatus **nppiNormRel_Inf_16u_C3R_Ctx**(const *Npp16u* *pSrc1, int nSrc1Step, const *Npp16u* *pSrc2, int nSrc2Step, *NppiSize* oSizeROI, *Npp64f* aNormRel[3], *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Three-channel 16-bit unsigned image NormRel_Inf.

For common parameter descriptions, see *Common parameters for nppiNorm functions include:*.

NppStatus **nppiNormRel_Inf_16s_C3R_Ctx**(const *Npp16s* *pSrc1, int nSrc1Step, const *Npp16s* *pSrc2, int nSrc2Step, *NppiSize* oSizeROI, *Npp64f* aNormRel[3], *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Three-channel 16-bit signed image NormRel_Inf.

For common parameter descriptions, see *Common parameters for nppiNorm functions include:*.

NppStatus **nppiNormRel_Inf_32f_C3R_Ctx**(const *Npp32f* *pSrc1, int nSrc1Step, const *Npp32f* *pSrc2, int nSrc2Step, *NppiSize* oSizeROI, *Npp64f* aNormRel[3], *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Three-channel 32-bit floating point image NormRel_Inf.

For common parameter descriptions, see *Common parameters for nppiNorm functions include:*.

NppStatus **nppiNormRel_Inf_8u_AC4R_Ctx**(const *Npp8u* *pSrc1, int nSrc1Step, const *Npp8u* *pSrc2, int nSrc2Step, *NppiSize* oSizeROI, *Npp64f* aNormRel[3], *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Four-channel 8-bit unsigned image NormRel_Inf ignoring alpha channel.

For common parameter descriptions, see *Common parameters for nppiNorm functions include:*.

NppStatus **nppiNormRel_Inf_16u_AC4R_Ctx**(const *Npp16u* *pSrc1, int nSrc1Step, const *Npp16u* *pSrc2, int nSrc2Step, *NppiSize* oSizeROI, *Npp64f* aNormRel[3], *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Four-channel 16-bit unsigned image NormRel_Inf ignoring alpha channel.

For common parameter descriptions, see *Common parameters for nppiNorm functions include:*.

NppStatus **nppiNormRel_Inf_16s_AC4R_Ctx**(const *Npp16s* *pSrc1, int nSrc1Step, const *Npp16s* *pSrc2, int nSrc2Step, *NppiSize* oSizeROI, *Npp64f* aNormRel[3], *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Four-channel 16-bit signed image NormRel_Inf ignoring alpha channel.

For common parameter descriptions, see *Common parameters for nppiNorm functions include:*.

NppStatus **nppiNormRel_Inf_32f_AC4R_Ctx**(const *Npp32f* *pSrc1, int nSrc1Step, const *Npp32f* *pSrc2, int nSrc2Step, *NppiSize* oSizeROI, *Npp64f* aNormRel[3], *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Four-channel 32-bit floating point image NormRel_Inf ignoring alpha channel.

For common parameter descriptions, see *Common parameters for nppiNorm functions include:*.

NppStatus **nppiNormRel_Inf_8u_C4R_Ctx**(const *Npp8u* *pSrc1, int nSrc1Step, const *Npp8u* *pSrc2, int nSrc2Step, *NppiSize* oSizeROI, *Npp64f* aNormRel[4], *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Four-channel 8-bit unsigned image NormRel_Inf.

For common parameter descriptions, see *Common parameters for nppiNorm functions include:*.

NppStatus **nppiNormRel_Inf_16u_C4R_Ctx**(const *Npp16u* *pSrc1, int nSrc1Step, const *Npp16u* *pSrc2, int nSrc2Step, *NppiSize* oSizeROI, *Npp64f* aNormRel[4], *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Four-channel 16-bit unsigned image NormRel_Inf.

For common parameter descriptions, see *Common parameters for nppiNorm functions include:*.

NppStatus **nppiNormRel_Inf_16s_C4R_Ctx**(const *Npp16s* *pSrc1, int nSrc1Step, const *Npp16s* *pSrc2, int nSrc2Step, *NppiSize* oSizeROI, *Npp64f* aNormRel[4], *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Four-channel 16-bit signed image NormRel_Inf.

For common parameter descriptions, see *Common parameters for nppiNorm functions include:*.

NppStatus **nppiNormRel_Inf_32f_C4R_Ctx**(const *Npp32f* *pSrc1, int nSrc1Step, const *Npp32f* *pSrc2, int nSrc2Step, *NppiSize* oSizeROI, *Npp64f* aNormRel[4], *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Four-channel 32-bit floating point image NormRel_Inf.

For common parameter descriptions, see *Common parameters for nppiNorm functions include:*.

NppStatus **nppiNormRel_Inf_8u_C1MR_Ctx**(const *Npp8u* *pSrc1, int nSrc1Step, const *Npp8u* *pSrc2, int nSrc2Step, const *Npp8u* *pMask, int nMaskStep, *NppiSize* oSizeROI, *Npp64f* *pNormRel, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Masked one-channel 8-bit unsigned image NormRel_Inf.

For common parameter descriptions, see *Common parameters for nppiNorm functions include:*.

NppStatus **nppiNormRel_Inf_8s_C1MR_Ctx**(const *Npp8s* *pSrc1, int nSrc1Step, const *Npp8s* *pSrc2, int nSrc2Step, const *Npp8u* *pMask, int nMaskStep, *NppiSize* oSizeROI, *Npp64f* *pNormRel, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Masked one-channel 8-bit signed image NormRel_Inf.

For common parameter descriptions, see *Common parameters for nppiNorm functions include:*.

NppStatus **nppiNormRel_Inf_16u_C1MR_Ctx**(const *Npp16u* *pSrc1, int nSrc1Step, const *Npp16u* *pSrc2, int nSrc2Step, const *Npp8u* *pMask, int nMaskStep, *NppiSize* oSizeROI, *Npp64f* *pNormRel, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Masked one-channel 16-bit unsigned image NormRel_Inf.

For common parameter descriptions, see *Common parameters for nppiNorm functions include:*.

NppStatus **nppiNormRel_Inf_32f_C1MR_Ctx**(const *Npp32f* *pSrc1, int nSrc1Step, const *Npp32f* *pSrc2, int nSrc2Step, const *Npp8u* *pMask, int nMaskStep, *NppiSize* oSizeROI, *Npp64f* *pNormRel, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Masked one-channel 32-bit floating point image NormRel_Inf.

For common parameter descriptions, see *Common parameters for nppiNorm functions include:*.

NppStatus **nppiNormRel_Inf_8u_C3CMR_Ctx**(const *Npp8u* *pSrc1, int nSrc1Step, const *Npp8u* *pSrc2, int nSrc2Step, const *Npp8u* *pMask, int nMaskStep, *NppiSize* oSizeROI, int nCOI, *Npp64f* *pNormRel, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Masked three-channel 8-bit unsigned image NormRel_Inf affecting only signle channel.

For common parameter descriptions, see *Common parameters for nppiNorm functions include:*.

NppStatus **nppiNormRel_Inf_8s_C3CMR_Ctx**(const *Npp8s* *pSrc1, int nSrc1Step, const *Npp8s* *pSrc2, int nSrc2Step, const *Npp8u* *pMask, int nMaskStep, *NppiSize* oSizeROI, int nCOI, *Npp64f* *pNormRel, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Masked three-channel 8-bit signed image NormRel_Inf affecting only signle channel.

For common parameter descriptions, see *Common parameters for nppiNorm functions include:*.

NppStatus **nppiNormRel_Inf_16u_C3CMR_Ctx**(const *Npp16u* *pSrc1, int nSrc1Step, const *Npp16u* *pSrc2, int nSrc2Step, const *Npp8u* *pMask, int nMaskStep, *NppiSize* oSizeROI, int nCOI, *Npp64f* *pNormRel, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Masked three-channel 16-bit unsigned image NormRel_Inf affecting only signle channel.

For common parameter descriptions, see *Common parameters for nppiNorm functions include:*.

NppStatus **nppiNormRel_Inf_32f_C3CMR_Ctx**(const *Npp32f* *pSrc1, int nSrc1Step, const *Npp32f* *pSrc2, int nSrc2Step, const *Npp8u* *pMask, int nMaskStep, *NppiSize* oSizeROI, int nCOI, *Npp64f* *pNormRel, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Masked three-channel 32-bit floating point image NormRel_Inf affecting only signle channel.

For common parameter descriptions, see *Common parameters for nppiNorm functions include:*.

NormRelInfGetBufferHostSize

Companion primitives for computing the device buffer size (in bytes) required by the NormRel_Inf primitives.

1.14.10.8.2 CommonNormRelInfGetBufferHostSizeParameters

Common parameters for nppiNormRelInfGetBufferHostSize functions include:

param oSizeROI
Region-Of-Interest (ROI).

param hpBufferSize
Required buffer size. Important: hpBufferSize is a *host pointer.* *Scratch Buffer and Host Pointer*.

param nppStreamCtx
Application Managed Stream Context.

return
NPP_NULL_POINTER_ERROR if hpBufferSize is 0 (NULL), *ROI Related Error Codes*.

NppStatus **nppiNormRelInfGetBufferHostSize_8u_C1R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Computes the device scratch buffer size (in bytes) for nppiNormRel_Inf_8u_C1R_Ctx.

For common parameter descriptions, see *CommonNormRelInfGetBufferHostSizeParameters*.

NppStatus **nppiNormRelInfGetBufferHostSize_16u_C1R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Computes the device scratch buffer size (in bytes) for nppiNormRel_Inf_16u_C1R_Ctx.

For common parameter descriptions, see *CommonNormRelInfGetBufferHostSizeParameters*.

NppStatus **nppiNormRelInfGetBufferHostSize_16s_C1R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Computes the device scratch buffer size (in bytes) for nppiNormRel_Inf_16s_C1R_Ctx.

For common parameter descriptions, see *CommonNormRelInfGetBufferHostSizeParameters*.

NppStatus **nppiNormRelInfGetBufferHostSize_32f_C1R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Computes the device scratch buffer size (in bytes) for nppiNormRel_Inf_32f_C1R_Ctx.

For common parameter descriptions, see *CommonNormRelInfGetBufferHostSizeParameters*.

NppStatus **nppiNormRelInfGetBufferHostSize_8u_C1MR_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Computes the device scratch buffer size (in bytes) for nppiNormRel_Inf_8u_C1MR_Ctx.

For common parameter descriptions, see *CommonNormRelInfGetBufferHostSizeParameters*.

NppStatus **nppiNormRelInfGetBufferHostSize_8s_C1MR_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Computes the device scratch buffer size (in bytes) for nppiNormRel_Inf_8s_C1MR_Ctx.

For common parameter descriptions, see *CommonNormRelInfGetBufferHostSizeParameters*.

NppStatus **nppiNormRelInfGetBufferHostSize_16u_C1MR_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Computes the device scratch buffer size (in bytes) for nppiNormRel_Inf_16u_C1MR_Ctx.

For common parameter descriptions, see *CommonNormRelInfGetBufferHostSizeParameters*.

NppStatus **nppiNormRelInfGetBufferHostSize_32f_C1MR_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Computes the device scratch buffer size (in bytes) for nppiNormRel_Inf_32f_C1MR_Ctx.

For common parameter descriptions, see *CommonNormRelInfGetBufferHostSizeParameters*.

NppStatus **nppiNormRelInfGetBufferHostSize_8u_C3R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Computes the device scratch buffer size (in bytes) for nppiNormRel_Inf_8u_C3R_Ctx.

For common parameter descriptions, see *CommonNormRelInfGetBufferHostSizeParameters*.

NppStatus **nppiNormRelInfGetBufferHostSize_16u_C3R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Computes the device scratch buffer size (in bytes) for nppiNormRel_Inf_16u_C3R_Ctx.

For common parameter descriptions, see *CommonNormRelInfGetBufferHostSizeParameters*.

NppStatus **nppiNormRelInfGetBufferHostSize_16s_C3R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Computes the device scratch buffer size (in bytes) for nppiNormRel_Inf_16s_C3R_Ctx.

For common parameter descriptions, see *CommonNormRelInfGetBufferHostSizeParameters*.

NppStatus **nppiNormRelInfGetBufferHostSize_32f_C3R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Computes the device scratch buffer size (in bytes) for nppiNormRel_Inf_32f_C3R_Ctx.

For common parameter descriptions, see *CommonNormRelInfGetBufferHostSizeParameters*.

NppStatus **nppiNormRelInfGetBufferHostSize_8u_C4R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Computes the device scratch buffer size (in bytes) for nppiNormRel_Inf_8u_C4R_Ctx.

For common parameter descriptions, see *CommonNormRelInfGetBufferHostSizeParameters*.

NppStatus **nppiNormRelInfGetBufferHostSize_16u_C4R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Computes the device scratch buffer size (in bytes) for nppiNormRel_Inf_16u_C4R_Ctx.

For common parameter descriptions, see *CommonNormRelInfGetBufferHostSizeParameters*.

NppStatus **nppiNormRelInfGetBufferHostSize_16s_C4R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Computes the device scratch buffer size (in bytes) for nppiNormRel_Inf_16s_C4R_Ctx.

For common parameter descriptions, see *CommonNormRelInfGetBufferHostSizeParameters*.

NppStatus **nppiNormRelInfGetBufferHostSize_32f_C4R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Computes the device scratch buffer size (in bytes) for nppiNormRel_Inf_32f_C4R_Ctx.

For common parameter descriptions, see *CommonNormRelInfGetBufferHostSizeParameters*.

NppStatus **nppiNormRelInfGetBufferHostSize_8u_AC4R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Computes the device scratch buffer size (in bytes) for nppiNormRel_Inf_8u_AC4R_Ctx.

For common parameter descriptions, see *CommonNormRelInfGetBufferHostSizeParameters*.

NppStatus **nppiNormRelInfGetBufferHostSize_16u_AC4R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Computes the device scratch buffer size (in bytes) for nppiNormRel_Inf_16u_AC4R_Ctx.

For common parameter descriptions, see *CommonNormRelInfGetBufferHostSizeParameters*.

NppStatus **nppiNormRelInfGetBufferHostSize_16s_AC4R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Computes the device scratch buffer size (in bytes) for nppiNormRel_Inf_16s_AC4R_Ctx.

For common parameter descriptions, see *CommonNormRelInfGetBufferHostSizeParameters*.

NppStatus **nppiNormRelInfGetBufferHostSize_32f_AC4R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Computes the device scratch buffer size (in bytes) for nppiNormRel_Inf_32f_AC4R_Ctx.

For common parameter descriptions, see *CommonNormRelInfGetBufferHostSizeParameters*.

NppStatus **nppiNormRelInfGetBufferHostSize_8u_C3CMR_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Computes the device scratch buffer size (in bytes) for nppiNormRel_Inf_8u_C3CMR_Ctx.

For common parameter descriptions, see *CommonNormRelInfGetBufferHostSizeParameters*.

NppStatus **nppiNormRelInfGetBufferHostSize_8s_C3CMR_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Computes the device scratch buffer size (in bytes) for nppiNormRel_Inf_8s_C3CMR_Ctx.

For common parameter descriptions, see *CommonNormRelInfGetBufferHostSizeParameters*.

NppStatus **nppiNormRelInfGetBufferHostSize_16u_C3CMR_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Computes the device scratch buffer size (in bytes) for nppiNormRel_Inf_16u_C3CMR_Ctx.

For common parameter descriptions, see *CommonNormRelInfGetBufferHostSizeParameters*.

NppStatus **nppiNormRelInfGetBufferHostSize_32f_C3CMR_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Computes the device scratch buffer size (in bytes) for nppiNormRel_Inf_32f_C3CMR_Ctx.

For common parameter descriptions, see *CommonNormRelInfGetBufferHostSizeParameters*.

1.14.10.9 Image NormRel L1

1.14.10.9.1 NormRel_L1

Primitives for computing the relative error of L1 norm between two images.

Basic NormRel_L1

NppStatus **nppiNormRel_L1_8u_C1R_Ctx**(const *Npp8u* *pSrc1, int nSrc1Step, const *Npp8u* *pSrc2, int nSrc2Step, *NppiSize* oSizeROI, *Npp64f* *pNormRel, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

One-channel 8-bit unsigned image NormRel_L1.

For common parameter descriptions, see *Common parameters for nppiNorm functions include:*.

NppStatus **nppiNormRel_L1_16u_C1R_Ctx**(const *Npp16u* *pSrc1, int nSrc1Step, const *Npp16u* *pSrc2, int nSrc2Step, *NppiSize* oSizeROI, *Npp64f* *pNormRel, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

One-channel 16-bit unsigned image NormRel_L1.

For common parameter descriptions, see *Common parameters for nppiNorm functions include:*.

NppStatus **nppiNormRel_L1_16s_C1R_Ctx**(const *Npp16s* *pSrc1, int nSrc1Step, const *Npp16s* *pSrc2, int nSrc2Step, *NppiSize* oSizeROI, *Npp64f* *pNormRel, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

One-channel 16-bit signed image NormRel_L1.

For common parameter descriptions, see *Common parameters for nppiNorm functions include:*.

NppStatus **nppiNormRel_L1_32f_C1R_Ctx**(const *Npp32f* *pSrc1, int nSrc1Step, const *Npp32f* *pSrc2, int nSrc2Step, *NppiSize* oSizeROI, *Npp64f* *pNormRel, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

One-channel 32-bit floating point image NormRel_L1.

For common parameter descriptions, see *Common parameters for nppiNorm functions include:*.

NppStatus **nppiNormRel_L1_8u_C3R_Ctx**(const *Npp8u* *pSrc1, int nSrc1Step, const *Npp8u* *pSrc2, int nSrc2Step, *NppiSize* oSizeROI, *Npp64f* aNormRel[3], *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Three-channel 8-bit unsigned image NormRel_L1.

For common parameter descriptions, see *Common parameters for nppiNorm functions include:*.

NppStatus **nppiNormRel_L1_16u_C3R_Ctx**(const *Npp16u* *pSrc1, int nSrc1Step, const *Npp16u* *pSrc2, int nSrc2Step, *NppiSize* oSizeROI, *Npp64f* aNormRel[3], *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Three-channel 16-bit unsigned image NormRel_L1.

For common parameter descriptions, see *Common parameters for nppiNorm functions include:*.

NppStatus **nppiNormRel_L1_16s_C3R_Ctx**(const *Npp16s* *pSrc1, int nSrc1Step, const *Npp16s* *pSrc2, int nSrc2Step, *NppiSize* oSizeROI, *Npp64f* aNormRel[3], *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Three-channel 16-bit signed image NormRel_L1.

For common parameter descriptions, see *Common parameters for nppiNorm functions include:*.

NppStatus **nppiNormRel_L1_32f_C3R_Ctx**(const *Npp32f* *pSrc1, int nSrc1Step, const *Npp32f* *pSrc2, int nSrc2Step, *NppiSize* oSizeROI, *Npp64f* aNormRel[3], *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Three-channel 32-bit floating point image NormRel_L1.

For common parameter descriptions, see *Common parameters for nppiNorm functions include:*.

NppStatus **nppiNormRel_L1_8u_AC4R_Ctx**(const *Npp8u* *pSrc1, int nSrc1Step, const *Npp8u* *pSrc2, int nSrc2Step, *NppiSize* oSizeROI, *Npp64f* aNormRel[3], *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Four-channel 8-bit signed image NormRel_L1 ignoring alpha channel.

For common parameter descriptions, see *Common parameters for nppiNorm functions include:*.

NppStatus **nppiNormRel_L1_16u_AC4R_Ctx**(const *Npp16u* *pSrc1, int nSrc1Step, const *Npp16u* *pSrc2, int nSrc2Step, *NppiSize* oSizeROI, *Npp64f* aNormRel[3], *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Four-channel 16-bit unsigned image NormRel_L1 ignoring alpha channel.

For common parameter descriptions, see *Common parameters for nppiNorm functions include:*.

NppStatus **nppiNormRel_L1_16s_AC4R_Ctx**(const *Npp16s* *pSrc1, int nSrc1Step, const *Npp16s* *pSrc2, int nSrc2Step, *NppiSize* oSizeROI, *Npp64f* aNormRel[3], *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Four-channel 16-bit signed image NormRel_L1 ignoring alpha channel.

For common parameter descriptions, see *Common parameters for nppiNorm functions include:*.

NppStatus **nppiNormRel_L1_32f_AC4R_Ctx**(const *Npp32f* *pSrc1, int nSrc1Step, const *Npp32f* *pSrc2, int nSrc2Step, *NppiSize* oSizeROI, *Npp64f* aNormRel[3], *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Four-channel 32-bit floating point image NormRel_L1 ignoring alpha channel.

For common parameter descriptions, see *Common parameters for nppiNorm functions include:*.

NppStatus **nppiNormRel_L1_8u_C4R_Ctx**(const *Npp8u* *pSrc1, int nSrc1Step, const *Npp8u* *pSrc2, int nSrc2Step, *NppiSize* oSizeROI, *Npp64f* aNormRel[4], *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Four-channel 8-bit unsigned image NormRel_L1.

For common parameter descriptions, see *Common parameters for nppiNorm functions include:*.

NppStatus **nppiNormRel_L1_16u_C4R_Ctx**(const *Npp16u* *pSrc1, int nSrc1Step, const *Npp16u* *pSrc2, int nSrc2Step, *NppiSize* oSizeROI, *Npp64f* aNormRel[4], *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Four-channel 16-bit unsigned image NormRel_L1.

For common parameter descriptions, see *Common parameters for nppiNorm functions include:*.

NppStatus **nppiNormRel_L1_16s_C4R_Ctx**(const *Npp16s* *pSrc1, int nSrc1Step, const *Npp16s* *pSrc2, int nSrc2Step, *NppiSize* oSizeROI, *Npp64f* aNormRel[4], *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Four-channel 16-bit signed image NormRel_L1.

For common parameter descriptions, see *Common parameters for nppiNorm functions include:*.

NppStatus **nppiNormRel_L1_32f_C4R_Ctx**(const *Npp32f* *pSrc1, int nSrc1Step, const *Npp32f* *pSrc2, int nSrc2Step, *NppiSize* oSizeROI, *Npp64f* aNormRel[4], *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Four-channel 32-bit floating point image NormRel_L1.

For common parameter descriptions, see *Common parameters for nppiNorm functions include:*.

NppStatus **nppiNormRel_L1_8u_C1MR_Ctx**(const *Npp8u* *pSrc1, int nSrc1Step, const *Npp8u* *pSrc2, int nSrc2Step, const *Npp8u* *pMask, int nMaskStep, *NppiSize* oSizeROI, *Npp64f* *pNormRel, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

One-channel 8-bit unsigned image NormRel_L1.

For common parameter descriptions, see *Common parameters for nppiNorm functions include:*.

NppStatus **nppiNormRel_L1_8s_C1MR_Ctx**(const *Npp8s* *pSrc1, int nSrc1Step, const *Npp8s* *pSrc2, int nSrc2Step, const *Npp8u* *pMask, int nMaskStep, *NppiSize* oSizeROI, *Npp64f* *pNormRel, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

One-channel 8-bit signed image NormRel_L1.

For common parameter descriptions, see *Common parameters for nppiNorm functions include:*.

NppStatus **nppiNormRel_L1_16u_C1MR_Ctx**(const *Npp16u* *pSrc1, int nSrc1Step, const *Npp16u* *pSrc2, int nSrc2Step, const *Npp8u* *pMask, int nMaskStep, *NppiSize* oSizeROI, *Npp64f* *pNormRel, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

One-channel 16-bit unsigned image NormRel_L1.

For common parameter descriptions, see *Common parameters for nppiNorm functions include:*.

NppStatus **nppiNormRel_L1_32f_C1MR_Ctx**(const *Npp32f* *pSrc1, int nSrc1Step, const *Npp32f* *pSrc2, int nSrc2Step, const *Npp8u* *pMask, int nMaskStep, *NppiSize* oSizeROI, *Npp64f* *pNormRel, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

One-channel 32-bit floating point image NormRel_L1.

For common parameter descriptions, see *Common parameters for nppiNorm functions include:*.

NppStatus **nppiNormRel_L1_8u_C3CMR_Ctx**(const *Npp8u* *pSrc1, int nSrc1Step, const *Npp8u* *pSrc2, int nSrc2Step, const *Npp8u* *pMask, int nMaskStep, *NppiSize* oSizeROI, int nCOI, *Npp64f* *pNormRel, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Masked three-channel 8-bit unsigned image NormRel_L1 affecting only single channel.

For common parameter descriptions, see *Common parameters for nppiNorm functions include:*.

NppStatus **nppiNormRel_L1_8s_C3CMR_Ctx**(const *Npp8s* *pSrc1, int nSrc1Step, const *Npp8s* *pSrc2, int nSrc2Step, const *Npp8u* *pMask, int nMaskStep, *NppiSize* oSizeROI, int nCOI, *Npp64f* *pNormRel, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Masked three-channel 8-bit signed image NormRel_L1 affecting only single channel.

For common parameter descriptions, see *Common parameters for nppiNorm functions include:*.

NppStatus **nppiNormRel_L1_16u_C3CMR_Ctx**(const *Npp16u* *pSrc1, int nSrc1Step, const *Npp16u* *pSrc2, int nSrc2Step, const *Npp8u* *pMask, int nMaskStep, *NppiSize* oSizeROI, int nCOI, *Npp64f* *pNormRel, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Masked three-channel 16-bit unsigned image NormRel_L1 affecting only single channel.

For common parameter descriptions, see *Common parameters for nppiNorm functions include:*.

NppStatus **nppiNormRel_L1_32f_C3CMR_Ctx**(const *Npp32f* *pSrc1, int nSrc1Step, const *Npp32f* *pSrc2, int nSrc2Step, const *Npp8u* *pMask, int nMaskStep, *NppiSize* oSizeROI, int nCOI, *Npp64f* *pNormRel, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Masked three-channel 32-bit floating point image NormRel_L1 affecting only single channel.

For common parameter descriptions, see *Common parameters for nppiNorm functions include:*.

NormRelL1GetBufferHostSize

Companion primitives for computing the device buffer size (in bytes) required by the NormRel_L1 primitives.

1.14.10.9.2 CommonNormRelL1GetBufferHostSizeParameters

Common parameters for nppiNormRelL1GetBufferHostSize functions include:

param oSizeROI
Region-Of-Interest (ROI).

param hpBufferSize
Required buffer size. Important: hpBufferSize is a *host pointer.* *Scratch Buffer and Host Pointer*.

param nppStreamCtx
Application Managed Stream Context.

return
NPP_NULL_POINTER_ERROR if hpBufferSize is 0 (NULL), *ROI Related Error Codes*.

NppStatus **nppiNormRelL1GetBufferHostSize_8u_C1R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Computes the device scratch buffer size (in bytes) for nppiNormRel_L1_8u_C1R_Ctx.

For common parameter descriptions, see *CommonNormRelL1GetBufferHostSizeParameters*.

NppStatus **nppiNormRelL1GetBufferHostSize_16u_C1R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Computes the device scratch buffer size (in bytes) for nppiNormRel_L1_16u_C1R_Ctx.

For common parameter descriptions, see *CommonNormRelL1GetBufferHostSizeParameters*.

NppStatus **nppiNormRelL1GetBufferHostSize_16s_C1R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Computes the device scratch buffer size (in bytes) for nppiNormRel_L1_16s_C1R_Ctx.

For common parameter descriptions, see *CommonNormRelL1GetBufferHostSizeParameters*.

NppStatus **nppiNormRelL1GetBufferHostSize_32f_C1R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Computes the device scratch buffer size (in bytes) for nppiNormRel_L1_32f_C1R_Ctx.

For common parameter descriptions, see *CommonNormRelL1GetBufferHostSizeParameters*.

NppStatus **nppiNormRelL1GetBufferHostSize_8u_C1MR_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Computes the device scratch buffer size (in bytes) for nppiNormRel_L1_8u_C1MR_Ctx.

For common parameter descriptions, see *CommonNormRelL1GetBufferHostSizeParameters*.

NppStatus **nppiNormRelL1GetBufferHostSize_8s_C1MR_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Computes the device scratch buffer size (in bytes) for nppiNormRel_L1_8s_C1MR_Ctx.

For common parameter descriptions, see *CommonNormRelL1GetBufferHostSizeParameters*.

NppStatus **nppiNormRelL1GetBufferHostSize_16u_C1MR_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Computes the device scratch buffer size (in bytes) for nppiNormRel_L1_16u_C1MR_Ctx.

For common parameter descriptions, see *CommonNormRelL1GetBufferHostSizeParameters*.

NppStatus **nppiNormRelL1GetBufferHostSize_32f_C1MR_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Computes the device scratch buffer size (in bytes) for nppiNormRel_L1_32f_C1MR_Ctx.

For common parameter descriptions, see *CommonNormRelL1GetBufferHostSizeParameters*.

NppStatus **nppiNormRelL1GetBufferHostSize_8u_C3R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Computes the device scratch buffer size (in bytes) for nppiNormRel_L1_8u_C3R_Ctx.

For common parameter descriptions, see *CommonNormRelL1GetBufferHostSizeParameters*.

NppStatus **nppiNormRelL1GetBufferHostSize_16u_C3R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Computes the device scratch buffer size (in bytes) for nppiNormRel_L1_16u_C3R_Ctx.

For common parameter descriptions, see *CommonNormRelL1GetBufferHostSizeParameters*.

NppStatus **nppiNormRelL1GetBufferHostSize_16s_C3R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Computes the device scratch buffer size (in bytes) for nppiNormRel_L1_16s_C3R_Ctx.

For common parameter descriptions, see *CommonNormRelL1GetBufferHostSizeParameters*.

NppStatus **nppiNormRelL1GetBufferHostSize_32f_C3R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Computes the device scratch buffer size (in bytes) for nppiNormRel_L1_32f_C3R_Ctx.

For common parameter descriptions, see *CommonNormRelL1GetBufferHostSizeParameters*.

NppStatus **nppiNormRelL1GetBufferHostSize_8u_C4R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Computes the device scratch buffer size (in bytes) for nppiNormRel_L1_8u_C4R_Ctx.

For common parameter descriptions, see *CommonNormRelL1GetBufferHostSizeParameters*.

NppStatus **nppiNormRelL1GetBufferHostSize_16u_C4R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Computes the device scratch buffer size (in bytes) for nppiNormRel_L1_16u_C4R_Ctx.

For common parameter descriptions, see *CommonNormRelL1GetBufferHostSizeParameters*.

NppStatus **nppiNormRelL1GetBufferHostSize_16s_C4R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Computes the device scratch buffer size (in bytes) for nppiNormRel_L1_16s_C4R_Ctx.

For common parameter descriptions, see *CommonNormRelL1GetBufferHostSizeParameters*.

NppStatus **nppiNormRelL1GetBufferHostSize_32f_C4R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Computes the device scratch buffer size (in bytes) for nppiNormRel_L1_32f_C4R_Ctx.

For common parameter descriptions, see *CommonNormRelL1GetBufferHostSizeParameters*.

NppStatus **nppiNormRelL1GetBufferHostSize_8u_AC4R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Computes the device scratch buffer size (in bytes) for nppiNormRel_L1_8u_AC4R_Ctx.

For common parameter descriptions, see *CommonNormRelL1GetBufferHostSizeParameters*.

NppStatus **nppiNormRelL1GetBufferHostSize_16u_AC4R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Computes the device scratch buffer size (in bytes) for nppiNormRel_L1_16u_AC4R_Ctx.

For common parameter descriptions, see *CommonNormRelL1GetBufferHostSizeParameters*.

NppStatus **nppiNormRelL1GetBufferHostSize_16s_AC4R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Computes the device scratch buffer size (in bytes) for nppiNormRel_L1_16s_AC4R_Ctx.

For common parameter descriptions, see *CommonNormRelL1GetBufferHostSizeParameters*.

NppStatus **nppiNormRelL1GetBufferHostSize_32f_AC4R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Computes the device scratch buffer size (in bytes) for nppiNormRel_L1_32f_AC4R_Ctx.

For common parameter descriptions, see *CommonNormRelL1GetBufferHostSizeParameters*.

NppStatus **nppiNormRelL1GetBufferHostSize_8u_C3CMR_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Computes the device scratch buffer size (in bytes) for nppiNormRel_L1_8u_C3CMR_Ctx.

For common parameter descriptions, see *CommonNormRelL1GetBufferHostSizeParameters*.

NppStatus **nppiNormRelL1GetBufferHostSize_8s_C3CMR_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Computes the device scratch buffer size (in bytes) for nppiNormRel_L1_8s_C3CMR_Ctx.

For common parameter descriptions, see *CommonNormRelL1GetBufferHostSizeParameters*.

NppStatus **nppiNormRelL1GetBufferHostSize_16u_C3CMR_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Computes the device scratch buffer size (in bytes) for nppiNormRel_L1_16u_C3CMR_Ctx.

For common parameter descriptions, see *CommonNormRelL1GetBufferHostSizeParameters*.

NppStatus **nppiNormRelL1GetBufferHostSize_32f_C3CMR_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Computes the device scratch buffer size (in bytes) for nppiNormRel_L1_32f_C3CMR_Ctx.

For common parameter descriptions, see *CommonNormRelL1GetBufferHostSizeParameters*.

1.14.10.10 Image NormRel L2

1.14.10.10.1 NormRel_L2

Primitives for computing the relative error of L2 norm between two images.

Basic NormRel_L2

NppStatus **nppiNormRel_L2_8u_C1R_Ctx**(const *Npp8u* *pSrc1, int nSrc1Step, const *Npp8u* *pSrc2, int nSrc2Step, *NppiSize* oSizeROI, *Npp64f* *pNormRel, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

One-channel 8-bit unsigned image NormRel_L2.

For common parameter descriptions, see *Common parameters for nppiNorm functions include:*.

NppStatus **nppiNormRel_L2_16u_C1R_Ctx**(const *Npp16u* *pSrc1, int nSrc1Step, const *Npp16u* *pSrc2, int nSrc2Step, *NppiSize* oSizeROI, *Npp64f* *pNormRel, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

One-channel 16-bit unsigned image NormRel_L2.

For common parameter descriptions, see *Common parameters for nppiNorm functions include:*.

NppStatus **nppiNormRel_L2_16s_C1R_Ctx**(const *Npp16s* *pSrc1, int nSrc1Step, const *Npp16s* *pSrc2, int nSrc2Step, *NppiSize* oSizeROI, *Npp64f* *pNormRel, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

One-channel 16-bit signed image NormRel_L2.

For common parameter descriptions, see *Common parameters for nppiNorm functions include:*.

NppStatus **nppiNormRel_L2_32f_C1R_Ctx**(const *Npp32f* *pSrc1, int nSrc1Step, const *Npp32f* *pSrc2, int nSrc2Step, *NppiSize* oSizeROI, *Npp64f* *pNormRel, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

One-channel 32-bit floating point image NormRel_L2.

For common parameter descriptions, see *Common parameters for nppiNorm functions include:*.

NppStatus **nppiNormRel_L2_8u_C3R_Ctx**(const *Npp8u* *pSrc1, int nSrc1Step, const *Npp8u* *pSrc2, int nSrc2Step, *NppiSize* oSizeROI, *Npp64f* aNormRel[3], *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Three-channel 8-bit unsigned image NormRel_L2.

For common parameter descriptions, see *Common parameters for nppiNorm functions include:*.

NppStatus **nppiNormRel_L2_16u_C3R_Ctx**(const *Npp16u* *pSrc1, int nSrc1Step, const *Npp16u* *pSrc2, int nSrc2Step, *NppiSize* oSizeROI, *Npp64f* aNormRel[3], *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Three-channel 16-bit unsigned image NormRel_L2.

For common parameter descriptions, see *Common parameters for nppiNorm functions include:*.

NppStatus **nppiNormRel_L2_16s_C3R_Ctx**(const *Npp16s* *pSrc1, int nSrc1Step, const *Npp16s* *pSrc2, int nSrc2Step, *NppiSize* oSizeROI, *Npp64f* aNormRel[3], *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Three-channel 16-bit signed image NormRel_L2.

For common parameter descriptions, see *Common parameters for nppiNorm functions include:*.

NppStatus **nppiNormRel_L2_32f_C3R_Ctx**(const *Npp32f* *pSrc1, int nSrc1Step, const *Npp32f* *pSrc2, int nSrc2Step, *NppiSize* oSizeROI, *Npp64f* aNormRel[3], *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Three-channel 32-bit floating point image NormRel_L2.

For common parameter descriptions, see *Common parameters for nppiNorm functions include:*.

NppStatus **nppiNormRel_L2_8u_AC4R_Ctx**(const *Npp8u* *pSrc1, int nSrc1Step, const *Npp8u* *pSrc2, int nSrc2Step, *NppiSize* oSizeROI, *Npp64f* aNormRel[3], *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Four-channel 8-bit unsigned image NormRel_L2 ignoring alpha channel.

For common parameter descriptions, see *Common parameters for nppiNorm functions include:*.

NppStatus **nppiNormRel_L2_16u_AC4R_Ctx**(const *Npp16u* *pSrc1, int nSrc1Step, const *Npp16u* *pSrc2, int nSrc2Step, *NppiSize* oSizeROI, *Npp64f* aNormRel[3], *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Four-channel 16-bit unsigned image NormRel_L2 ignoring alpha channel.

For common parameter descriptions, see *Common parameters for nppiNorm functions include:*.

NppStatus **nppiNormRel_L2_16s_AC4R_Ctx**(const *Npp16s* *pSrc1, int nSrc1Step, const *Npp16s* *pSrc2, int nSrc2Step, *NppiSize* oSizeROI, *Npp64f* aNormRel[3], *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Four-channel 16-bit signed image NormRel_L2 ignoring alpha channel.

For common parameter descriptions, see *Common parameters for nppiNorm functions include:*.

NppStatus **nppiNormRel_L2_32f_AC4R_Ctx**(const *Npp32f* *pSrc1, int nSrc1Step, const *Npp32f* *pSrc2, int nSrc2Step, *NppiSize* oSizeROI, *Npp64f* aNormRel[3], *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Four-channel 32-bit floating point image NormRel_L2 ignoring alpha channel.

For common parameter descriptions, see *Common parameters for nppiNorm functions include:*.

NppStatus **nppiNormRel_L2_8u_C4R_Ctx**(const *Npp8u* *pSrc1, int nSrc1Step, const *Npp8u* *pSrc2, int nSrc2Step, *NppiSize* oSizeROI, *Npp64f* aNormRel[4], *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Four-channel 8-bit unsigned image NormRel_L2.

For common parameter descriptions, see *Common parameters for nppiNorm functions include:*.

NppStatus **nppiNormRel_L2_16u_C4R_Ctx**(const *Npp16u* *pSrc1, int nSrc1Step, const *Npp16u* *pSrc2, int nSrc2Step, *NppiSize* oSizeROI, *Npp64f* aNormRel[4], *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Four-channel 16-bit unsigned image NormRel_L2.

For common parameter descriptions, see *Common parameters for nppiNorm functions include:*.

NppStatus **nppiNormRel_L2_16s_C4R_Ctx**(const *Npp16s* *pSrc1, int nSrc1Step, const *Npp16s* *pSrc2, int nSrc2Step, *NppiSize* oSizeROI, *Npp64f* aNormRel[4], *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Four-channel 16-bit signed image NormRel_L2.

For common parameter descriptions, see *Common parameters for nppiNorm functions include:*.

NppStatus **nppiNormRel_L2_32f_C4R_Ctx**(const *Npp32f* *pSrc1, int nSrc1Step, const *Npp32f* *pSrc2, int nSrc2Step, *NppiSize* oSizeROI, *Npp64f* aNormRel[4], *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Four-channel 32-bit floating point image NormRel_L2.

For common parameter descriptions, see *Common parameters for nppiNorm functions include:*.

NppStatus **nppiNormRel_L2_8u_C1MR_Ctx**(const *Npp8u* *pSrc1, int nSrc1Step, const *Npp8u* *pSrc2, int nSrc2Step, const *Npp8u* *pMask, int nMaskStep, *NppiSize* oSizeROI, *Npp64f* *pNormRel, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Masked one-channel 8-bit unsigned image NormRel_L2.

For common parameter descriptions, see *Common parameters for nppiNorm functions include:*.

NppStatus **nppiNormRel_L2_8s_C1MR_Ctx**(const *Npp8s* *pSrc1, int nSrc1Step, const *Npp8s* *pSrc2, int nSrc2Step, const *Npp8u* *pMask, int nMaskStep, *NppiSize* oSizeROI, *Npp64f* *pNormRel, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Masked one-channel 8-bit signed image NormRel_L2.

For common parameter descriptions, see *Common parameters for nppiNorm functions include:*.

NppStatus **nppiNormRel_L2_16u_C1MR_Ctx**(const *Npp16u* *pSrc1, int nSrc1Step, const *Npp16u* *pSrc2, int nSrc2Step, const *Npp8u* *pMask, int nMaskStep, *NppiSize* oSizeROI, *Npp64f* *pNormRel, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Masked one-channel 16-bit unsigned image NormRel_L2.

For common parameter descriptions, see *Common parameters for nppiNorm functions include:*.

NppStatus **nppiNormRel_L2_32f_C1MR_Ctx**(const *Npp32f* *pSrc1, int nSrc1Step, const *Npp32f* *pSrc2, int nSrc2Step, const *Npp8u* *pMask, int nMaskStep, *NppiSize* oSizeROI, *Npp64f* *pNormRel, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Masked one-channel 32-bit floating point image NormRel_L2.

For common parameter descriptions, see *Common parameters for nppiNorm functions include:* .

NppStatus **nppiNormRel_L2_8u_C3CMR_Ctx**(const *Npp8u* *pSrc1, int nSrc1Step, const *Npp8u* *pSrc2, int nSrc2Step, const *Npp8u* *pMask, int nMaskStep, *NppiSize* oSizeROI, int nCOI, *Npp64f* *pNormRel, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Masked three-channel 8-bit unsigned image NormRel_L2 affecting only single channel.

For common parameter descriptions, see *Common parameters for nppiNorm functions include:*.

NppStatus **nppiNormRel_L2_8s_C3CMR_Ctx**(const *Npp8s* *pSrc1, int nSrc1Step, const *Npp8s* *pSrc2, int nSrc2Step, const *Npp8u* *pMask, int nMaskStep, *NppiSize* oSizeROI, int nCOI, *Npp64f* *pNormRel, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Masked three-channel 8-bit signed image NormRel_L2 affecting only single channel.

For common parameter descriptions, see *Common parameters for nppiNorm functions include:*.

NppStatus **nppiNormRel_L2_16u_C3CMR_Ctx**(const *Npp16u* *pSrc1, int nSrc1Step, const *Npp16u* *pSrc2, int nSrc2Step, const *Npp8u* *pMask, int nMaskStep, *NppiSize* oSizeROI, int nCOI, *Npp64f* *pNormRel, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Masked three-channel 16-bit unsigned image NormRel_L2 affecting only single channel.

For common parameter descriptions, see *Common parameters for nppiNorm functions include:*.

NppStatus **nppiNormRel_L2_32f_C3CMR_Ctx**(const *Npp32f* *pSrc1, int nSrc1Step, const *Npp32f* *pSrc2, int nSrc2Step, const *Npp8u* *pMask, int nMaskStep, *NppiSize* oSizeROI, int nCOI, *Npp64f* *pNormRel, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Masked three-channel 32-bit floating point image NormRel_L2 affecting only single channel.

For common parameter descriptions, see *Common parameters for nppiNorm functions include:*.

NormRelL2GetBufferHostSize

Companion primitives for computing the device buffer size (in bytes) required by the NormRel_L2 primitives.

1.14.10.10.2 CommonNormRelL2GetBufferHostSizeParameters

Common parameters for nppiNormRelL2GetBufferHostSize functions include:

param oSizeROI
Region-Of-Interest (ROI).

param hpBufferSize
Required buffer size. Important: hpBufferSize is a *host pointer.* *Scratch Buffer and Host Pointer*.

param nppStreamCtx
Application Managed Stream Context.

return
NPP_NULL_POINTER_ERROR if hpBufferSize is 0 (NULL), *ROI Related Error Codes*.

NppStatus **nppiNormRelL2GetBufferHostSize_8u_C1R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Computes the device scratch buffer size (in bytes) for nppiNormRel_L2_8u_C1R_Ctx.

For common parameter descriptions, see *CommonNormRelL2GetBufferHostSizeParameters*.

NppStatus **nppiNormRelL2GetBufferHostSize_16u_C1R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Computes the device scratch buffer size (in bytes) for nppiNormRel_L2_16u_C1R_Ctx.

For common parameter descriptions, see *CommonNormRelL2GetBufferHostSizeParameters*.

NppStatus **nppiNormRelL2GetBufferHostSize_16s_C1R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Computes the device scratch buffer size (in bytes) for nppiNormRel_L2_16s_C1R_Ctx.

For common parameter descriptions, see *CommonNormRelL2GetBufferHostSizeParameters*.

NppStatus **nppiNormRelL2GetBufferHostSize_32f_C1R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Computes the device scratch buffer size (in bytes) for nppiNormRel_L2_32f_C1R_Ctx.

For common parameter descriptions, see *CommonNormRelL2GetBufferHostSizeParameters*.

NppStatus **nppiNormRelL2GetBufferHostSize_8u_C1MR_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Computes the device scratch buffer size (in bytes) for nppiNormRel_L2_8u_C1MR_Ctx.

For common parameter descriptions, see *CommonNormRelL2GetBufferHostSizeParameters*.

NppStatus **nppiNormRelL2GetBufferHostSize_8s_C1MR_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Computes the device scratch buffer size (in bytes) for nppiNormRel_L2_8s_C1MR_Ctx.

For common parameter descriptions, see *CommonNormRelL2GetBufferHostSizeParameters*.

NppStatus **nppiNormRelL2GetBufferHostSize_16u_C1MR_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Computes the device scratch buffer size (in bytes) for nppiNormRel_L2_16u_C1MR_Ctx.

For common parameter descriptions, see *CommonNormRelL2GetBufferHostSizeParameters*.

NppStatus **nppiNormRelL2GetBufferHostSize_32f_C1MR_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Computes the device scratch buffer size (in bytes) for nppiNormRel_L2_32f_C1MR_Ctx.

For common parameter descriptions, see *CommonNormRelL2GetBufferHostSizeParameters*.

NppStatus **nppiNormRelL2GetBufferHostSize_8u_C3R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Computes the device scratch buffer size (in bytes) for nppiNormRel_L2_8u_C3R_Ctx.

For common parameter descriptions, see *CommonNormRelL2GetBufferHostSizeParameters*.

NppStatus **nppiNormRelL2GetBufferHostSize_16u_C3R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Computes the device scratch buffer size (in bytes) for nppiNormRel_L2_16u_C3R_Ctx.

For common parameter descriptions, see *CommonNormRelL2GetBufferHostSizeParameters*.

NppStatus **nppiNormRelL2GetBufferHostSize_16s_C3R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Computes the device scratch buffer size (in bytes) for nppiNormRel_L2_16s_C3R_Ctx.

For common parameter descriptions, see *CommonNormRelL2GetBufferHostSizeParameters*.

NppStatus **nppiNormRelL2GetBufferHostSize_32f_C3R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Computes the device scratch buffer size (in bytes) for nppiNormRel_L2_32f_C3R_Ctx.

For common parameter descriptions, see *CommonNormRelL2GetBufferHostSizeParameters*.

NppStatus **nppiNormRelL2GetBufferHostSize_8u_C4R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Computes the device scratch buffer size (in bytes) for nppiNormRel_L2_8u_C4R_Ctx.

For common parameter descriptions, see *CommonNormRelL2GetBufferHostSizeParameters*.

NppStatus **nppiNormRelL2GetBufferHostSize_16u_C4R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Computes the device scratch buffer size (in bytes) for nppiNormRel_L2_16u_C4R_Ctx.

For common parameter descriptions, see *CommonNormRelL2GetBufferHostSizeParameters*.

NppStatus **nppiNormRelL2GetBufferHostSize_16s_C4R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Computes the device scratch buffer size (in bytes) for nppiNormRel_L2_16s_C4R_Ctx.

For common parameter descriptions, see *CommonNormRelL2GetBufferHostSizeParameters*.

NppStatus **nppiNormRelL2GetBufferHostSize_32f_C4R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Computes the device scratch buffer size (in bytes) for nppiNormRel_L2_32f_C4R_Ctx.

For common parameter descriptions, see *CommonNormRelL2GetBufferHostSizeParameters*.

NppStatus **nppiNormRelL2GetBufferHostSize_8u_AC4R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Computes the device scratch buffer size (in bytes) for nppiNormRel_L2_8u_AC4R_Ctx.

For common parameter descriptions, see *CommonNormRelL2GetBufferHostSizeParameters*.

NppStatus **nppiNormRelL2GetBufferHostSize_16u_AC4R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Computes the device scratch buffer size (in bytes) for nppiNormRel_L2_16u_AC4R_Ctx.

For common parameter descriptions, see *CommonNormRelL2GetBufferHostSizeParameters*.

NppStatus **nppiNormRelL2GetBufferHostSize_16s_AC4R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Computes the device scratch buffer size (in bytes) for nppiNormRel_L2_16s_AC4R_Ctx.

For common parameter descriptions, see *CommonNormRelL2GetBufferHostSizeParameters*.

NppStatus **nppiNormRelL2GetBufferHostSize_32f_AC4R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Computes the device scratch buffer size (in bytes) for nppiNormRel_L2_32f_AC4R_Ctx.

For common parameter descriptions, see *CommonNormRelL2GetBufferHostSizeParameters*.

NppStatus **nppiNormRelL2GetBufferHostSize_8u_C3CMR_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Computes the device scratch buffer size (in bytes) for nppiNormRel_L2_8u_C3CMR_Ctx.

For common parameter descriptions, see *CommonNormRelL2GetBufferHostSizeParameters*.

NppStatus **nppiNormRelL2GetBufferHostSize_8s_C3CMR_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Computes the device scratch buffer size (in bytes) for nppiNormRel_L2_8s_C3CMR_Ctx.

For common parameter descriptions, see *CommonNormRelL2GetBufferHostSizeParameters*.

NppStatus **nppiNormRelL2GetBufferHostSize_16u_C3CMR_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Computes the device scratch buffer size (in bytes) for nppiNormRel_L2_16u_C3CMR_Ctx.

For common parameter descriptions, see *CommonNormRelL2GetBufferHostSizeParameters*.

NppStatus **nppiNormRelL2GetBufferHostSize_32f_C3CMR_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Computes the device scratch buffer size (in bytes) for nppiNormRel_L2_32f_C3CMR_Ctx.

For common parameter descriptions, see *CommonNormRelL2GetBufferHostSizeParameters*.

1.14.11. Image DotProd

1.14.11.1 DotProd

Primitives for computing the dot product of two images.

DotProd

Given two images $pSrc1$ and $pSrc2$ both with width W and height H, the dot product will be computed as

$$DotProd = \sum_{j=0}^{H-1} \sum_{i=0}^{W-1} [pSrc1(j,i) \cdot pSrc2(j,i)]$$

The functions require additional scratch buffer for computations.

1.14.11.2 Common parameters for nppiDotProd functions include:

param pSrc1
Source-Image Pointer.

param nSrc1Step
Source-Image Line Step.

param pSrc2
Source-Image Pointer.

param nSrc2Step
Source-Image Line Step.

param oSizeROI
Region-Of-Interest (ROI).

param pDp
Device memory pointer to the computed dot product of the two images.

param pDeviceBuffer
Pointer to the required device memory allocation, *Scratch Buffer and Host Pointer*.

param nppStreamCtx
Application Managed Stream Context.

return
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiDotProd_8u64f_C1R_Ctx**(const *Npp8u* *pSrc1, int nSrc1Step, const *Npp8u* *pSrc2, int nSrc2Step, *NppiSize* oSizeROI, *Npp64f* *pDp, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

One-channel 8-bit unsigned image DotProd.

For common parameter descriptions, see *Common parameters for nppiDotProd functions include:*.

NppStatus **nppiDotProd_8s64f_C1R_Ctx**(const *Npp8s* *pSrc1, int nSrc1Step, const *Npp8s* *pSrc2, int nSrc2Step, *NppiSize* oSizeROI, *Npp64f* *pDp, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

One-channel 8-bit signed image DotProd.

For common parameter descriptions, see *Common parameters for nppiDotProd functions include:*.

NppStatus **nppiDotProd_16u64f_C1R_Ctx**(const *Npp16u* *pSrc1, int nSrc1Step, const *Npp16u* *pSrc2, int nSrc2Step, *NppiSize* oSizeROI, *Npp64f* *pDp, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

One-channel 16-bit unsigned image DotProd.

For common parameter descriptions, see *Common parameters for nppiDotProd functions include:*.

NppStatus **nppiDotProd_16s64f_C1R_Ctx**(const *Npp16s* *pSrc1, int nSrc1Step, const *Npp16s* *pSrc2, int nSrc2Step, *NppiSize* oSizeROI, *Npp64f* *pDp, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

One-channel 16-bit signed image DotProd.

For common parameter descriptions, see *Common parameters for nppiDotProd functions include:*.

NppStatus **nppiDotProd_32u64f_C1R_Ctx**(const *Npp32u* *pSrc1, int nSrc1Step, const *Npp32u* *pSrc2, int nSrc2Step, *NppiSize* oSizeROI, *Npp64f* *pDp, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

One-channel 32-bit unsigned image DotProd.

For common parameter descriptions, see *Common parameters for nppiDotProd functions include:*.

NppStatus **nppiDotProd_32s64f_C1R_Ctx**(const *Npp32s* *pSrc1, int nSrc1Step, const *Npp32s* *pSrc2, int nSrc2Step, *NppiSize* oSizeROI, *Npp64f* *pDp, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

One-channel 32-bit signed image DotProd.

For common parameter descriptions, see *Common parameters for nppiDotProd functions include:*.

NppStatus **nppiDotProd_32f64f_C1R_Ctx**(const *Npp32f* *pSrc1, int nSrc1Step, const *Npp32f* *pSrc2, int nSrc2Step, *NppiSize* oSizeROI, *Npp64f* *pDp, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

One-channel 32-bit floating point image DotProd.

For common parameter descriptions, see *Common parameters for nppiDotProd functions include:*.

NppStatus **nppiDotProd_8u64f_C3R_Ctx**(const *Npp8u* *pSrc1, int nSrc1Step, const *Npp8u* *pSrc2, int nSrc2Step, *NppiSize* oSizeROI, *Npp64f* aDp[3], *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Three-channel 8-bit unsigned image DotProd.

For common parameter descriptions, see *Common parameters for nppiDotProd functions include:*.

NppStatus **nppiDotProd_8s64f_C3R_Ctx**(const *Npp8s* *pSrc1, int nSrc1Step, const *Npp8s* *pSrc2, int nSrc2Step, *NppiSize* oSizeROI, *Npp64f* aDp[3], *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Three-channel 8-bit signed image DotProd.

For common parameter descriptions, see *Common parameters for nppiDotProd functions include:*.

NppStatus **nppiDotProd_16u64f_C3R_Ctx**(const *Npp16u* *pSrc1, int nSrc1Step, const *Npp16u* *pSrc2, int nSrc2Step, *NppiSize* oSizeROI, *Npp64f* aDp[3], *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Three-channel 16-bit unsigned image DotProd.

For common parameter descriptions, see *Common parameters for nppiDotProd functions include:*.

NppStatus **nppiDotProd_16s64f_C3R_Ctx**(const *Npp16s* *pSrc1, int nSrc1Step, const *Npp16s* *pSrc2, int nSrc2Step, *NppiSize* oSizeROI, *Npp64f* aDp[3], *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Three-channel 16-bit signed image DotProd.

For common parameter descriptions, see *Common parameters for nppiDotProd functions include:*.

NppStatus **nppiDotProd_32u64f_C3R_Ctx**(const *Npp32u* *pSrc1, int nSrc1Step, const *Npp32u* *pSrc2, int nSrc2Step, *NppiSize* oSizeROI, *Npp64f* aDp[3], *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Three-channel 32-bit unsigned image DotProd.

For common parameter descriptions, see *Common parameters for nppiDotProd functions include:*.

NppStatus **nppiDotProd_32s64f_C3R_Ctx**(const *Npp32s* *pSrc1, int nSrc1Step, const *Npp32s* *pSrc2, int nSrc2Step, *NppiSize* oSizeROI, *Npp64f* aDp[3], *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Three-channel 32-bit signed image DotProd.

For common parameter descriptions, see *Common parameters for nppiDotProd functions include:*.

NppStatus **nppiDotProd_32f64f_C3R_Ctx**(const *Npp32f* *pSrc1, int nSrc1Step, const *Npp32f* *pSrc2, int nSrc2Step, *NppiSize* oSizeROI, *Npp64f* aDp[3], *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Three-channel 32-bit floating point image DotProd.

For common parameter descriptions, see *Common parameters for nppiDotProd functions include:*.

NppStatus **nppiDotProd_8u64f_C4R_Ctx**(const *Npp8u* *pSrc1, int nSrc1Step, const *Npp8u* *pSrc2, int nSrc2Step, *NppiSize* oSizeROI, *Npp64f* aDp[4], *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Four-channel 8-bit unsigned image DotProd.

For common parameter descriptions, see *Common parameters for nppiDotProd functions include:*.

NppStatus **nppiDotProd_8s64f_C4R_Ctx**(const *Npp8s* *pSrc1, int nSrc1Step, const *Npp8s* *pSrc2, int nSrc2Step, *NppiSize* oSizeROI, *Npp64f* aDp[4], *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Four-channel 8-bit signed image DotProd.

For common parameter descriptions, see *Common parameters for nppiDotProd functions include:*.

NppStatus **nppiDotProd_16u64f_C4R_Ctx**(const *Npp16u* *pSrc1, int nSrc1Step, const *Npp16u* *pSrc2, int nSrc2Step, *NppiSize* oSizeROI, *Npp64f* aDp[4], *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Four-channel 16-bit unsigned image DotProd.

For common parameter descriptions, see *Common parameters for nppiDotProd functions include:*.

NppStatus **nppiDotProd_16s64f_C4R_Ctx**(const *Npp16s* *pSrc1, int nSrc1Step, const *Npp16s* *pSrc2, int nSrc2Step, *NppiSize* oSizeROI, *Npp64f* aDp[4], *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Four-channel 16-bit signed image DotProd.

For common parameter descriptions, see *Common parameters for nppiDotProd functions include:*.

NppStatus **nppiDotProd_32u64f_C4R_Ctx**(const *Npp32u* *pSrc1, int nSrc1Step, const *Npp32u* *pSrc2, int nSrc2Step, *NppiSize* oSizeROI, *Npp64f* aDp[4], *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Four-channel 32-bit unsigned image DotProd.

For common parameter descriptions, see *Common parameters for nppiDotProd functions include:*.

NppStatus **nppiDotProd_32s64f_C4R_Ctx**(const *Npp32s* *pSrc1, int nSrc1Step, const *Npp32s* *pSrc2, int nSrc2Step, *NppiSize* oSizeROI, *Npp64f* aDp[4], *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Four-channel 32-bit signed image DotProd.

For common parameter descriptions, see *Common parameters for nppiDotProd functions include:*.

NppStatus **nppiDotProd_32f64f_C4R_Ctx**(const *Npp32f* *pSrc1, int nSrc1Step, const *Npp32f* *pSrc2, int nSrc2Step, *NppiSize* oSizeROI, *Npp64f* aDp[4], *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Four-channel 32-bit floating point image DotProd.

For common parameter descriptions, see *Common parameters for nppiDotProd functions include:*.

NppStatus **nppiDotProd_8u64f_AC4R_Ctx**(const *Npp8u* *pSrc1, int nSrc1Step, const *Npp8u* *pSrc2, int nSrc2Step, *NppiSize* oSizeROI, *Npp64f* aDp[3], *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Four-channel 8-bit unsigned image DotProd ignoring alpha channel.

For common parameter descriptions, see *Common parameters for nppiDotProd functions include:*.

NppStatus **nppiDotProd_8s64f_AC4R_Ctx**(const *Npp8s* *pSrc1, int nSrc1Step, const *Npp8s* *pSrc2, int nSrc2Step, *NppiSize* oSizeROI, *Npp64f* aDp[3], *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Four-channel 8-bit signed image DotProd ignoring alpha channel.

For common parameter descriptions, see *Common parameters for nppiDotProd functions include:*.

NppStatus **nppiDotProd_16u64f_AC4R_Ctx**(const *Npp16u* *pSrc1, int nSrc1Step, const *Npp16u* *pSrc2, int nSrc2Step, *NppiSize* oSizeROI, *Npp64f* aDp[3], *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Four-channel 16-bit unsigned image DotProd ignoring alpha channel.

For common parameter descriptions, see *Common parameters for nppiDotProd functions include:*.

NppStatus **nppiDotProd_16s64f_AC4R_Ctx**(const *Npp16s* *pSrc1, int nSrc1Step, const *Npp16s* *pSrc2, int nSrc2Step, *NppiSize* oSizeROI, *Npp64f* aDp[3], *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Four-channel 16-bit signed image DotProd ignoring alpha channel.

For common parameter descriptions, see *Common parameters for nppiDotProd functions include:*.

NppStatus **nppiDotProd_32u64f_AC4R_Ctx**(const *Npp32u* *pSrc1, int nSrc1Step, const *Npp32u* *pSrc2, int nSrc2Step, *NppiSize* oSizeROI, *Npp64f* aDp[3], *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Four-channel 32-bit unsigned image DotProd ignoring alpha channel.

For common parameter descriptions, see *Common parameters for nppiDotProd functions include:*.

NppStatus **nppiDotProd_32s64f_AC4R_Ctx**(const *Npp32s* *pSrc1, int nSrc1Step, const *Npp32s* *pSrc2, int nSrc2Step, *NppiSize* oSizeROI, *Npp64f* aDp[3], *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Four-channel 32-bit signed image DotProd ignoring alpha channel.

For common parameter descriptions, see *Common parameters for nppiDotProd functions include:*.

NppStatus **nppiDotProd_32f64f_AC4R_Ctx**(const *Npp32f* *pSrc1, int nSrc1Step, const *Npp32f* *pSrc2, int nSrc2Step, *NppiSize* oSizeROI, *Npp64f* aDp[3], *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Four-channel 32-bit floating point image DotProd ignoring alpha channel.

For common parameter descriptions, see *Common parameters for nppiDotProd functions include:*.

DotProdGetBufferHostSize

Companion primitives for computing the device buffer size (in bytes) required by the Mean_StdDev primitives.

1.14.11.3 CommonDotProdGetBufferHostSizeParameters

Common parameters for nppiDotProdGetBufferHostSize functions include:

param oSizeROI
Region-Of-Interest (ROI).

param hpBufferSize
Required buffer size. Important: hpBufferSize is a *host pointer.* *Scratch Buffer and Host Pointer*.

param nppStreamCtx
Application Managed Stream Context.

return
NPP_NULL_POINTER_ERROR if hpBufferSize is 0 (NULL), *ROI Related Error Codes*.

NppStatus **nppiDotProdGetBufferHostSize_8u64f_C1R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Device scratch buffer size (in bytes) for nppiDotProd_8u64f_C1R_Ctx.

For common parameter descriptions, see *CommonDotProdGetBufferHostSizeParameters*.

NppStatus **nppiDotProdGetBufferHostSize_8s64f_C1R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Device scratch buffer size (in bytes) for nppiDotProd_8s64f_C1R_Ctx.

For common parameter descriptions, see *CommonDotProdGetBufferHostSizeParameters*.

NppStatus **nppiDotProdGetBufferHostSize_16u64f_C1R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Device scratch buffer size (in bytes) for nppiDotProd_16u64f_C1R_Ctx.

For common parameter descriptions, see *CommonDotProdGetBufferHostSizeParameters*.

NppStatus **nppiDotProdGetBufferHostSize_16s64f_C1R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Device scratch buffer size (in bytes) for nppiDotProd_16s64f_C1R_Ctx.

For common parameter descriptions, see *CommonDotProdGetBufferHostSizeParameters*.

NppStatus **nppiDotProdGetBufferHostSize_32u64f_C1R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Device scratch buffer size (in bytes) for nppiDotProd_32u64f_C1R_Ctx.

For common parameter descriptions, see *CommonDotProdGetBufferHostSizeParameters*.

NppStatus **nppiDotProdGetBufferHostSize_32s64f_C1R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Device scratch buffer size (in bytes) for nppiDotProd_32s64f_C1R_Ctx.

For common parameter descriptions, see *CommonDotProdGetBufferHostSizeParameters*.

NppStatus **nppiDotProdGetBufferHostSize_32f64f_C1R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Device scratch buffer size (in bytes) for nppiDotProd_32f64f_C1R_Ctx.

For common parameter descriptions, see *CommonDotProdGetBufferHostSizeParameters*.

NppStatus **nppiDotProdGetBufferHostSize_8u64f_C3R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Device scratch buffer size (in bytes) for nppiDotProd_8u64f_C3R_Ctx.

For common parameter descriptions, see *CommonDotProdGetBufferHostSizeParameters*.

NppStatus **nppiDotProdGetBufferHostSize_8s64f_C3R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Device scratch buffer size (in bytes) for nppiDotProd_8s64f_C3R_Ctx.

For common parameter descriptions, see *CommonDotProdGetBufferHostSizeParameters*.

NppStatus **nppiDotProdGetBufferHostSize_16u64f_C3R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Device scratch buffer size (in bytes) for nppiDotProd_16u64f_C3R_Ctx.

For common parameter descriptions, see *CommonDotProdGetBufferHostSizeParameters*.

NppStatus **nppiDotProdGetBufferHostSize_16s64f_C3R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Device scratch buffer size (in bytes) for nppiDotProd_16s64f_C3R_Ctx.

For common parameter descriptions, see *CommonDotProdGetBufferHostSizeParameters*.

NppStatus **nppiDotProdGetBufferHostSize_32u64f_C3R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Device scratch buffer size (in bytes) for nppiDotProd_32u64f_C3R_Ctx.

For common parameter descriptions, see *CommonDotProdGetBufferHostSizeParameters*.

NppStatus **nppiDotProdGetBufferHostSize_32s64f_C3R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Device scratch buffer size (in bytes) for nppiDotProd_32s64f_C3R_Ctx.

For common parameter descriptions, see *CommonDotProdGetBufferHostSizeParameters*.

NppStatus **nppiDotProdGetBufferHostSize_32f64f_C3R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Device scratch buffer size (in bytes) for nppiDotProd_32f64f_C3R_Ctx.

For common parameter descriptions, see *CommonDotProdGetBufferHostSizeParameters*.

NppStatus **nppiDotProdGetBufferHostSize_8u64f_C4R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Device scratch buffer size (in bytes) for nppiDotProd_8u64f_C4R_Ctx.

For common parameter descriptions, see *CommonDotProdGetBufferHostSizeParameters*.

NppStatus **nppiDotProdGetBufferHostSize_8s64f_C4R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Device scratch buffer size (in bytes) for nppiDotProd_8s64f_C4R_Ctx.

For common parameter descriptions, see *CommonDotProdGetBufferHostSizeParameters*.

NppStatus **nppiDotProdGetBufferHostSize_16u64f_C4R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Device scratch buffer size (in bytes) for nppiDotProd_16u64f_C4R_Ctx.

For common parameter descriptions, see *CommonDotProdGetBufferHostSizeParameters*.

NppStatus **nppiDotProdGetBufferHostSize_16s64f_C4R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Device scratch buffer size (in bytes) for nppiDotProd_16s64f_C4R_Ctx.

For common parameter descriptions, see *CommonDotProdGetBufferHostSizeParameters*.

NppStatus **nppiDotProdGetBufferHostSize_32u64f_C4R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Device scratch buffer size (in bytes) for nppiDotProd_32u64f_C4R_Ctx.

For common parameter descriptions, see *CommonDotProdGetBufferHostSizeParameters*.

NppStatus **nppiDotProdGetBufferHostSize_32s64f_C4R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Device scratch buffer size (in bytes) for nppiDotProd_32s64f_C4R_Ctx.

For common parameter descriptions, see *CommonDotProdGetBufferHostSizeParameters*.

NppStatus **nppiDotProdGetBufferHostSize_32f64f_C4R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Device scratch buffer size (in bytes) for nppiDotProd_32f64f_C4R_Ctx.

For common parameter descriptions, see *CommonDotProdGetBufferHostSizeParameters*.

NppStatus **nppiDotProdGetBufferHostSize_8u64f_AC4R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Device scratch buffer size (in bytes) for nppiDotProd_8u64f_AC4R_Ctx.

For common parameter descriptions, see *CommonDotProdGetBufferHostSizeParameters*.

NppStatus **nppiDotProdGetBufferHostSize_8s64f_AC4R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Device scratch buffer size (in bytes) for nppiDotProd_8s64f_AC4R_Ctx.

For common parameter descriptions, see *CommonDotProdGetBufferHostSizeParameters*.

NppStatus **nppiDotProdGetBufferHostSize_16u64f_AC4R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Device scratch buffer size (in bytes) for nppiDotProd_16u64f_AC4R_Ctx.

For common parameter descriptions, see *CommonDotProdGetBufferHostSizeParameters*.

NppStatus **nppiDotProdGetBufferHostSize_16s64f_AC4R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Device scratch buffer size (in bytes) for nppiDotProd_16s64f_AC4R_Ctx.

For common parameter descriptions, see *CommonDotProdGetBufferHostSizeParameters*.

NppStatus **nppiDotProdGetBufferHostSize_32u64f_AC4R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Device scratch buffer size (in bytes) for nppiDotProd_32u64f_AC4R_Ctx.

For common parameter descriptions, see *CommonDotProdGetBufferHostSizeParameters*.

NppStatus **nppiDotProdGetBufferHostSize_32s64f_AC4R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Device scratch buffer size (in bytes) for nppiDotProd_32s64f_AC4R_Ctx.

For common parameter descriptions, see *CommonDotProdGetBufferHostSizeParameters*.

NppStatus **nppiDotProdGetBufferHostSize_32f64f_AC4R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Device scratch buffer size (in bytes) for nppiDotProd_32f64f_AC4R_Ctx.

For common parameter descriptions, see *CommonDotProdGetBufferHostSizeParameters*.

1.14.12. Image Count In Range

1.14.12.1 CountInRange.

Primitives for computing the amount of pixels that fall into the specified intensity range.

CountInRange

The lower bound and the upper bound are inclusive.

The functions require additional scratch buffer for computations.

1.14.12.2 Common parameters for nppiCountInRange functions include:

param pSrc
Source-Image Pointer.

param nSrcStep
Source-Image Line Step.

param oSizeROI
Region-Of-Interest (ROI).

param pCounts
Device memory pointer to the number of pixels that fall into the specified range.

param nLowerBound
Lower bound of the specified range.

param nUpperBound
Upper bound of the specified range.

param pDeviceBuffer
Pointer to the required device memory allocation, *Scratch Buffer and Host Pointer*.

param nppStreamCtx
Application Managed Stream Context.

return
Image Data Related Error Codes, *ROI Related Error Codes*, or NPP_RANGE_ERROR if the lower bound is larger than the upper bound.

NppStatus **nppiCountInRange_8u_C1R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *NppiSize* oSizeROI, int *pCounts, *Npp8u* nLowerBound, *Npp8u* nUpperBound, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

One-channel 8-bit unsigned image CountInRange.

For common parameter descriptions, see *Common parameters for nppiCountInRange functions include:*.

NppStatus **nppiCountInRange_32f_C1R_Ctx**(const *Npp32f* *pSrc, int nSrcStep, *NppiSize* oSizeROI, int *pCounts, *Npp32f* nLowerBound, *Npp32f* nUpperBound, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

One-channel 32-bit floating point image CountInRange.

For common parameter descriptions, see *Common parameters for nppiCountInRange functions include:*.

NppStatus **nppiCountInRange_8u_C3R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *NppiSize* oSizeROI, int aCounts[3], *Npp8u* aLowerBound[3], *Npp8u* aUpperBound[3], *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Three-channel 8-bit unsigned image CountInRange.

For common parameter descriptions, see *Common parameters for nppiCountInRange functions include:*.

NppStatus **nppiCountInRange_32f_C3R_Ctx**(const *Npp32f* *pSrc, int nSrcStep, *NppiSize* oSizeROI, int aCounts[3], *Npp32f* aLowerBound[3], *Npp32f* aUpperBound[3], *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Three-channel 32-bit floating point image CountInRange.

For common parameter descriptions, see *Common parameters for nppiCountInRange functions include:*.

NppStatus **nppiCountInRange_8u_AC4R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *NppiSize* oSizeROI, int aCounts[3], *Npp8u* aLowerBound[3], *Npp8u* aUpperBound[3], *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Four-channel 8-bit unsigned image CountInRange ignoring alpha channel.

For common parameter descriptions, see *Common parameters for nppiCountInRange functions include:*.

NppStatus **nppiCountInRange_32f_AC4R_Ctx**(const *Npp32f* *pSrc, int nSrcStep, *NppiSize* oSizeROI, int aCounts[3], *Npp32f* aLowerBound[3], *Npp32f* aUpperBound[3], *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Four-channel 32-bit floating point image CountInRange ignoring alpha channel.

For common parameter descriptions, see *Common parameters for nppiCountInRange functions include:*.

CountInRangeGetBufferHostSize

Companion primitives for computing the device buffer size (in bytes) required by the CountInRange primitives.

1.14.12.3 CommonCountInRangeGetBufferHostSizeParameters

Common parameters for nppiCountInRangeGetBufferHostSize functions include:

param oSizeROI
Region-Of-Interest (ROI).

param hpBufferSize
Required buffer size. Important: hpBufferSize is a *host pointer.* *Scratch Buffer and Host Pointer*.

param nppStreamCtx
Application Managed Stream Context.

return
NPP_NULL_POINTER_ERROR if hpBufferSize is 0 (NULL), *ROI Related Error Codes*.

NppStatus **nppiCountInRangeGetBufferHostSize_8u_C1R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Device scratch buffer size (in bytes) for nppiCountInRange_8u_C1R_Ctx.

For common parameter descriptions, see *CommonCountInRangeGetBufferHostSizeParameters*.

NppStatus **nppiCountInRangeGetBufferHostSize_32f_C1R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Device scratch buffer size (in bytes) for nppiCountInRange_32f_C1R_Ctx.

For common parameter descriptions, see *CommonCountInRangeGetBufferHostSizeParameters*.

NppStatus **nppiCountInRangeGetBufferHostSize_8u_C3R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Device scratch buffer size (in bytes) for nppiCountInRange_8u_C3R_Ctx.

For common parameter descriptions, see *CommonCountInRangeGetBufferHostSizeParameters*.

NppStatus **nppiCountInRangeGetBufferHostSize_32f_C3R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Device scratch buffer size (in bytes) for nppiCountInRange_32f_C3R_Ctx.

For common parameter descriptions, see *CommonCountInRangeGetBufferHostSizeParameters*.

NppStatus **nppiCountInRangeGetBufferHostSize_8u_AC4R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Device scratch buffer size (in bytes) for nppiCountInRange_8u_AC4R_Ctx.

For common parameter descriptions, see *CommonCountInRangeGetBufferHostSizeParameters*.

NppStatus **nppiCountInRangeGetBufferHostSize_32f_AC4R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Device scratch buffer size (in bytes) for nppiCountInRange_32f_AC4R_Ctx.

For common parameter descriptions, see *CommonCountInRangeGetBufferHostSizeParameters*.

1.14.13. Image MaxEvery

1.14.13.1 MaxEvery

Primitives for computing the maximal value of the pixel pair from two images.

MaxEvery

The maximum is stored into the second image.

1.14.13.2 Common parameters for nppiMaxEvery functions include:

param pSrc
Source-Image Pointer.

param nSrcStep
Source-Image Line Step.

param pSrcDst
In-Place Image Pointer.

param nSrcDstStep
Source-Image Line Step.

param oSizeROI
Region-Of-Interest (ROI).

param nppStreamCtx
Application Managed Stream Context.

return
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiMaxEvery_8u_C1IR_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *Npp8u* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

One-channel 8-bit unsigned image MaxEvery.

For common parameter descriptions, see *Common parameters for nppiMaxEvery functions include:*.

NppStatus **nppiMaxEvery_16u_C1IR_Ctx**(const *Npp16u* *pSrc, int nSrcStep, *Npp16u* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

One-channel 16-bit unsigned image MaxEvery.

For common parameter descriptions, see *Common parameters for nppiMaxEvery functions include:*.

NppStatus **nppiMaxEvery_16s_C1IR_Ctx**(const *Npp16s* *pSrc, int nSrcStep, *Npp16s* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

One-channel 16-bit signed image MaxEvery.

For common parameter descriptions, see *Common parameters for nppiMaxEvery functions include:*.

NppStatus **nppiMaxEvery_32f_C1IR_Ctx**(const *Npp32f* *pSrc, int nSrcStep, *Npp32f* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

One-channel 32-bit floating point image MaxEvery.

For common parameter descriptions, see *Common parameters for nppiMaxEvery functions include:*.

NppStatus **nppiMaxEvery_8u_C3IR_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *Npp8u* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Three-channel 8-bit unsigned image MaxEvery.

For common parameter descriptions, see *Common parameters for nppiMaxEvery functions include:*.

NppStatus **nppiMaxEvery_16u_C3IR_Ctx**(const *Npp16u* *pSrc, int nSrcStep, *Npp16u* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Three-channel 16-bit unsigned image MaxEvery.

For common parameter descriptions, see *Common parameters for nppiMaxEvery functions include:*.

NppStatus **nppiMaxEvery_16s_C3IR_Ctx**(const *Npp16s* *pSrc, int nSrcStep, *Npp16s* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Three-channel 16-bit signed image MaxEvery.

For common parameter descriptions, see *Common parameters for nppiMaxEvery functions include:*.

NppStatus **nppiMaxEvery_32f_C3IR_Ctx**(const *Npp32f* *pSrc, int nSrcStep, *Npp32f* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Three-channel 32-bit floating point image MaxEvery.

For common parameter descriptions, see *Common parameters for nppiMaxEvery functions include:*.

NppStatus **nppiMaxEvery_8u_C4IR_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *Npp8u* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four-channel 8-bit unsigned image MaxEvery.

For common parameter descriptions, see *Common parameters for nppiMaxEvery functions include:*.

NppStatus **nppiMaxEvery_16u_C4IR_Ctx**(const *Npp16u* *pSrc, int nSrcStep, *Npp16u* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four-channel 16-bit unsigned image MaxEvery.

For common parameter descriptions, see *Common parameters for nppiMaxEvery functions include:*.

NppStatus **nppiMaxEvery_16s_C4IR_Ctx**(const *Npp16s* *pSrc, int nSrcStep, *Npp16s* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four-channel 16-bit signed image MaxEvery.

For common parameter descriptions, see *Common parameters for nppiMaxEvery functions include:*.

NppStatus **nppiMaxEvery_32f_C4IR_Ctx**(const *Npp32f* *pSrc, int nSrcStep, *Npp32f* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four-channel 32-bit floating point image MaxEvery.

For common parameter descriptions, see *Common parameters for nppiMaxEvery functions include:*.

NppStatus **nppiMaxEvery_8u_AC4IR_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *Npp8u* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four-channel 8-bit unsigned image MaxEvery ignoring alpha channel.

For common parameter descriptions, see *Common parameters for nppiMaxEvery functions include:*.

NppStatus **nppiMaxEvery_16u_AC4IR_Ctx**(const *Npp16u* *pSrc, int nSrcStep, *Npp16u* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four-channel 16-bit unsigned image MaxEvery ignoring alpha channel.

For common parameter descriptions, see *Common parameters for nppiMaxEvery functions include:*.

NppStatus **nppiMaxEvery_16s_AC4IR_Ctx**(const *Npp16s* *pSrc, int nSrcStep, *Npp16s* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four-channel 16-bit signed image MaxEvery ignoring alpha channel.

For common parameter descriptions, see *Common parameters for nppiMaxEvery functions include:*.

NppStatus **nppiMaxEvery_32f_AC4IR_Ctx**(const *Npp32f* *pSrc, int nSrcStep, *Npp32f* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four-channel 32-bit floating point image MaxEvery ignoring alpha channel.

For common parameter descriptions, see *Common parameters for nppiMaxEvery functions include:*.

1.14.14. Image MinEvery

1.14.14.1 MinEvery

Primitives for computing the minimal value of the pixel pair from two images.

MinEvery

The minimum is stored into the second image.

1.14.14.2 Common parameters for nppiMinEvery functions include:

param pSrc
Source-Image Pointer.

param nSrcStep
Source-Image Line Step.

param pSrcDst
In-Place Image Pointer.

param nSrcDstStep
Source-Image Line Step.

param oSizeROI
Region-Of-Interest (ROI).

param nppStreamCtx
Application Managed Stream Context.

return
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiMinEvery_8u_C1IR_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *Npp8u* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

One-channel 8-bit unsigned image MinEvery.

For common parameter descriptions, see *Common parameters for nppiMinEvery functions include:*.

NppStatus **nppiMinEvery_16u_C1IR_Ctx**(const *Npp16u* *pSrc, int nSrcStep, *Npp16u* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

One-channel 16-bit unsigned image MinEvery.

For common parameter descriptions, see *Common parameters for nppiMinEvery functions include:*.

NppStatus **nppiMinEvery_16s_C1IR_Ctx**(const *Npp16s* *pSrc, int nSrcStep, *Npp16s* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

One-channel 16-bit signed image MinEvery.

For common parameter descriptions, see *Common parameters for nppiMinEvery functions include:*.

NppStatus **nppiMinEvery_32f_C1IR_Ctx**(const *Npp32f* *pSrc, int nSrcStep, *Npp32f* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

One-channel 32-bit floating point image MinEvery.

For common parameter descriptions, see *Common parameters for nppiMinEvery functions include:*.

NppStatus **nppiMinEvery_8u_C3IR_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *Npp8u* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Three-channel 8-bit unsigned image MinEvery.

For common parameter descriptions, see *Common parameters for nppiMinEvery functions include:*.

NppStatus **nppiMinEvery_16u_C3IR_Ctx**(const *Npp16u* *pSrc, int nSrcStep, *Npp16u* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Three-channel 16-bit unsigned image MinEvery.

For common parameter descriptions, see *Common parameters for nppiMinEvery functions include:*.

NppStatus **nppiMinEvery_16s_C3IR_Ctx**(const *Npp16s* *pSrc, int nSrcStep, *Npp16s* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Three-channel 16-bit signed image MinEvery.

For common parameter descriptions, see *Common parameters for nppiMinEvery functions include:*.

NppStatus **nppiMinEvery_32f_C3IR_Ctx**(const *Npp32f* *pSrc, int nSrcStep, *Npp32f* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Three-channel 32-bit floating point image MinEvery.

For common parameter descriptions, see *Common parameters for nppiMinEvery functions include:*.

NppStatus **nppiMinEvery_8u_C4IR_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *Npp8u* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four-channel 8-bit unsigned image MinEvery.

For common parameter descriptions, see *Common parameters for nppiMinEvery functions include:*.

NppStatus **nppiMinEvery_16u_C4IR_Ctx**(const *Npp16u* *pSrc, int nSrcStep, *Npp16u* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four-channel 16-bit unsigned image MinEvery.

For common parameter descriptions, see *Common parameters for nppiMinEvery functions include:*.

NppStatus **nppiMinEvery_16s_C4IR_Ctx**(const *Npp16s* *pSrc, int nSrcStep, *Npp16s* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four-channel 16-bit signed image MinEvery.

For common parameter descriptions, see *Common parameters for nppiMinEvery functions include:*.

NppStatus **nppiMinEvery_32f_C4IR_Ctx**(const *Npp32f* *pSrc, int nSrcStep, *Npp32f* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four-channel 32-bit floating point image MinEvery.

For common parameter descriptions, see *Common parameters for nppiMinEvery functions include:*.

NppStatus **nppiMinEvery_8u_AC4IR_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *Npp8u* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four-channel 8-bit unsigned image MinEvery ignoring alpha channel.

For common parameter descriptions, see *Common parameters for nppiMinEvery functions include:*.

NppStatus **nppiMinEvery_16u_AC4IR_Ctx**(const *Npp16u* *pSrc, int nSrcStep, *Npp16u* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four-channel 16-bit unsigned image MinEvery ignoring alpha channel.

For common parameter descriptions, see *Common parameters for nppiMinEvery functions include:*.

NppStatus **nppiMinEvery_16s_AC4IR_Ctx**(const *Npp16s* *pSrc, int nSrcStep, *Npp16s* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four-channel 16-bit signed image MinEvery ignoring alpha channel.

For common parameter descriptions, see *Common parameters for nppiMinEvery functions include:*.

NppStatus **nppiMinEvery_32f_AC4IR_Ctx**(const *Npp32f* *pSrc, int nSrcStep, *Npp32f* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, *NppStreamContext* nppStreamCtx)

Four-channel 32-bit floating point image MinEvery ignoring alpha channel.

For common parameter descriptions, see *Common parameters for nppiMinEvery functions include:*.

1.14.15. Image Integral

1.14.15.1 Integral

Primitives for computing the integral image of a given image.

Integral

Given an input image $pSrc$ and the specified value $nVal$, the pixel value of the integral image $pDst$ at coordinate (i, j) will be computed as

$$pDst(j,i) = nVal + \sum_{l=0}^{j-1}\sum_{k=0}^{i-1} pSrc(l,k)$$

If the size of the input image is $W \times H$, the size of the integral image will be $(W+1) \times (H+1)$.

NppStatus **nppiIntegral_8u32s_C1R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *Npp32s* *pDst, int nDstStep, *NppiSize* oROI, *Npp32s* nVal, *NppStreamContext* nppStreamCtx)

One-channel 8-bit unsigned image Integral with 32-bit signed output.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oROI** – *Region-Of-Interest (ROI)*.
- **nVal** – The value to add to pDst image pixels
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiIntegral_8u32f_C1R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *Npp32f* *pDst, int nDstStep, *NppiSize* oROI, *Npp32f* nVal, *NppStreamContext* nppStreamCtx)

One-channel 8-bit unsigned image Integral with 32-bit floating point output.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oROI** – *Region-Of-Interest (ROI)*.

- **nVal** – The value to add to pDst image pixels
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

1.14.16. Image Square Integral

1.14.16.1 SqrIntegral

Primitives for computing both the integral and the squared integral images of a given image.

SqrIntegral

Given an input image $pSrc$ and the specified value $nVal$, the pixel value of the integral image $pDst$ at coordinate (i, j) will be computed as

$$pDst(j,i) = nVal + \sum_{l=0}^{j-1}\sum_{k=0}^{i-1} pSrc(l,k)$$

Given an input image $pSrc$ and the specified value $nValSqr$, the pixel value of the squared integral image $pSqr$ at coordinate (i, j) will be computed as

$$pSqr(j,i) = nValSqr + \sum_{l=0}^{j-1}\sum_{k=0}^{i-1} pSrc(l,k)^2$$

If the size of the input image is $W \times H$, the size of the squared integral image will be $(W+1) \times (H+1)$.

NppStatus **nppiSqrIntegral_8u32s_C1R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *Npp32s* *pDst, int nDstStep, *Npp32s* *pSqr, int nSqrStep, *NppiSize* oSrcROI, *Npp32s* nVal, *Npp32s* nValSqr, *NppStreamContext* nppStreamCtx)

One-channel 8-bit unsigned image SqrIntegral.

Destination integral image and square integral image are 32-bit signed int.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **pSqr** – *Destination-Image Pointer*.
- **nSqrStep** – *Destination-Image Line Step*.
- **oSrcROI** – *Region-Of-Interest (ROI)*.

- **nVal** – The value to add to pDst image pixels
- **nValSqr** – The value to add to pSqr image pixels
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiSqrIntegral_8u32s64f_C1R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *Npp32s* *pDst, int nDstStep, *Npp64f* *pSqr, int nSqrStep, *NppiSize* oSrcROI, *Npp32s* nVal, *Npp64f* nValSqr, *NppStreamContext* nppStreamCtx)

One-channel 8-bit unsigned image SqrIntegral.

Destination integral image is 32-bit signed int. Destination square integral image is 64-bit double floating point.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **pSqr** – *Destination-Image Pointer*.
- **nSqrStep** – *Destination-Image Line Step*.
- **oSrcROI** – *Region-Of-Interest (ROI)*.
- **nVal** – The value to add to pDst image pixels
- **nValSqr** – The value to add to pSqr image pixels
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiSqrIntegral_8u32f64f_C1R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *Npp32f* *pDst, int nDstStep, *Npp64f* *pSqr, int nSqrStep, *NppiSize* oSrcROI, *Npp32f* nVal, *Npp64f* nValSqr, *NppStreamContext* nppStreamCtx)

One-channel 8-bit unsigned image SqrIntegral.

Destination integral image is 32-bit floating point. Destination square integral image is 64-bit double floating point.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **pSqr** – *Destination-Image Pointer*.

- **nSqrStep** – *Destination-Image Line Step*.
- **oSrcROI** – *Region-Of-Interest (ROI)*.
- **nVal** – The value to add to pDst image pixels
- **nValSqr** – The value to add to pSqr image pixels
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

1.14.17. Image RectStdDev

1.14.17.1 RectStdDev

Primitives for computing the standard deviation of the integral images. The function computes the standard deviation of the pixel in the rectangular window with the integral image $pSrc$ and the squared integral image $pSqr$, which can be obtained by calling *Integral* and *SqrIntegral*.

The standard deviation of the pixel (j, i) can be computed using the formula:

$$pDst(j,i) = \sqrt{max(0, \frac{\sum(SqrIntegral) \cdot N - (\sum(Integral))^2}{N^2})}$$

where $\sum(SqrIntegral) = pSqr[j+oRect.y+oRect.height, i+oRect.x+oRect.width] - pSqr[j+oRect.y, i+oRect.x + oRect.width] - pSqr[j + oRect.y + oRect.height, i + oRect.x] + pSqr[j + oRect.y, i + oRect.x]$, $\sum(Integral) = pSrc[j+oRect.y+oRect.height, i+oRect.x+oRect.width] - pSrc[j+oRect.y, i+oRect.x+oRect.width] - pSrc[j+oRect.y+oRect.height, i+oRect.x] + pSrc[j+oRect.y, i+oRect.x]$, $N = oRect.width \cdot oRect.height$.

The size of the $pSrc$ and $pSqr$ should be $(oSizeROI.width + oRect.x + oRect.width, oSizeROI.height + oRect.y + oRect.height)$.

RectStdDev

NppStatus **nppiRectStdDev_32f_C1R_Ctx**(const *Npp32f* *pSrc, int nSrcStep, const *Npp64f* *pSqr, int nSqrStep, *Npp32f* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppiRect* oRect, *NppStreamContext* nppStreamCtx)

One-channel 32-bit floating point image RectStdDev.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pSqr** – *Destination-Image Pointer*.
- **nSqrStep** – *Destination-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.

- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **oRect** – rectangular window
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiRectStdDev_32s_C1RSfs_Ctx**(const *Npp32s* *pSrc, int nSrcStep, const *Npp32s* *pSqr, int nSqrStep, *Npp32s* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppiRect* oRect, int nScaleFactor, *NppStreamContext* nppStreamCtx)

One-channel 32-bit signed image RectStdDev, scaled by $2^{(} - nScaleFactor)$.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pSqr** – *Destination-Image Pointer*.
- **nSqrStep** – *Destination-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **oRect** – rectangular window
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiRectStdDev_32s32f_C1R_Ctx**(const *Npp32s* *pSrc, int nSrcStep, const *Npp64f* *pSqr, int nSqrStep, *Npp32f* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppiRect* oRect, *NppStreamContext* nppStreamCtx)

One-channel 32-bit signed image RectStdDev.

Parameters

- **pSrc** – *Source-Image Pointer*.
- **nSrcStep** – *Source-Image Line Step*.
- **pSqr** – *Destination-Image Pointer*.
- **nSqrStep** – *Destination-Image Line Step*.
- **pDst** – *Destination-Image Pointer*.
- **nDstStep** – *Destination-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **oRect** – rectangular window
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Image Data Related Error Codes, *ROI Related Error Codes*

1.14.18. Image Histogram Even

1.14.18.1 HistogramEven

Primitives for computing the histogram of an image with evenly distributed bins.

HistogramEven

The $nLowerLevel$ (inclusive) and $nUpperLevel$ (exclusive) define the boundaries of the range, which are evenly segmented into $nLevel - 1$ bins.

The computed histogram is stored in $pHist$. The levels are calculated by another primitive *nppiEvenLevelsHost_32s* and are stored in a host pointer $hpLevels$. The number of levels is also $nLevel - 1$. The histogram $pHist[k]$ is defined as the total number of pixels that fall into the range: $hpLevels[k] <= pSrc(j, i) < hpLevels[k + 1]$. The functions require additional scratch buffer for computations.

1.14.18.2 Common parameters for nppiHistogramEven functions include:

param pSrc
Source-Image Pointer.

param nSrcStep
Source-Image Line Step.

param oSizeROI
Region-Of-Interest (ROI).

param pHist
Device memory pointer to array that receives the computed histogram. The array must be of size nLevels-1.

param nLevels
Number of levels.

param nLowerLevel
Lower boundary of lowest level bin.

param nUpperLevel
Upper boundary of highest level bin.

param pBuffer
Device memory pointer to appropriately sized scratch buffer.

param nppStreamCtx
Application Managed Stream Context.

return
Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiEvenLevelsHost_32s**(*Npp32s* *hpLevels, int nLevels, *Npp32s* nLowerLevel, *Npp32s* nUpperLevel)

Compute levels with even distribution.

Parameters

- **hpLevels** – A host pointer to array which receives the levels being computed. The array needs to be of size nLevels.
- **nLevels** – The number of levels being computed. nLevels must be at least 2.
- **nLowerLevel** – Lower boundary value of the lowest level.
- **nUpperLevel** – Upper boundary value of the greatest level.

Returns

image_data_error_codes, or NPP_HISTO_NUMBER_OF_LEVELS_ERROR if an invalid nLevels is specified.

NppStatus **nppiHistogramEven_8u_C1R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *NppiSize* oSizeROI, *Npp32s* *pHist, int nLevels, *Npp32s* nLowerLevel, *Npp32s* nUpperLevel, *Npp8u* *pBuffer, *NppStreamContext* nppStreamCtx)

One-channel 8-bit unsigned HistogramEven.

For common parameter descriptions, see *Common parameters for nppiHistogramEven functions include:*.

NppStatus **nppiHistogramEven_8u_C3R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *NppiSize* oSizeROI, *Npp32s* *pHist[3], int nLevels[3], *Npp32s* nLowerLevel[3], *Npp32s* nUpperLevel[3], *Npp8u* *pBuffer, *NppStreamContext* nppStreamCtx)

Three-channel 8-bit unsigned HistogramEven.

For common parameter descriptions, see *Common parameters for nppiHistogramEven functions include:*.

NppStatus **nppiHistogramEven_8u_C4R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *NppiSize* oSizeROI, *Npp32s* *pHist[4], int nLevels[4], *Npp32s* nLowerLevel[4], *Npp32s* nUpperLevel[4], *Npp8u* *pBuffer, *NppStreamContext* nppStreamCtx)

Four-channel 8-bit unsigned HistogramEven.

For common parameter descriptions, see *Common parameters for nppiHistogramEven functions include:*.

NppStatus **nppiHistogramEven_8u_AC4R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *NppiSize* oSizeROI, *Npp32s* *pHist[3], int nLevels[3], *Npp32s* nLowerLevel[3], *Npp32s* nUpperLevel[3], *Npp8u* *pBuffer, *NppStreamContext* nppStreamCtx)

Four-channel 8-bit unsigned HistogramEven ignoring alpha channel.

For common parameter descriptions, see *Common parameters for nppiHistogramEven functions include:*.

NppStatus **nppiHistogramEven_16u_C1R_Ctx**(const *Npp16u* *pSrc, int nSrcStep, *NppiSize* oSizeROI, *Npp32s* *pHist, int nLevels, *Npp32s* nLowerLevel, *Npp32s* nUpperLevel, *Npp8u* *pBuffer, *NppStreamContext* nppStreamCtx)

One-channel 16-bit unsigned HistogramEven.

For common parameter descriptions, see *Common parameters for nppiHistogramEven functions include:*.

NppStatus **nppiHistogramEven_16u_C3R_Ctx**(const *Npp16u* *pSrc, int nSrcStep, *NppiSize* oSizeROI, *Npp32s* *pHist[3], int nLevels[3], *Npp32s* nLowerLevel[3], *Npp32s* nUpperLevel[3], *Npp8u* *pBuffer, *NppStreamContext* nppStreamCtx)

Three-channel 16-bit unsigned HistogramEven.

For common parameter descriptions, see *Common parameters for nppiHistogramEven functions include:*.

NppStatus **nppiHistogramEven_16u_C4R_Ctx**(const *Npp16u* *pSrc, int nSrcStep, *NppiSize* oSizeROI, *Npp32s* *pHist[4], int nLevels[4], *Npp32s* nLowerLevel[4], *Npp32s* nUpperLevel[4], *Npp8u* *pBuffer, *NppStreamContext* nppStreamCtx)

Four-channel 16-bit unsigned HistogramEven.

For common parameter descriptions, see *Common parameters for nppiHistogramEven functions include:*.

NppStatus **nppiHistogramEven_16u_AC4R_Ctx**(const *Npp16u* *pSrc, int nSrcStep, *NppiSize* oSizeROI, *Npp32s* *pHist[3], int nLevels[3], *Npp32s* nLowerLevel[3], *Npp32s* nUpperLevel[3], *Npp8u* *pBuffer, *NppStreamContext* nppStreamCtx)

Four-channel 16-bit unsigned HistogramEven ignoring alpha channel.

For common parameter descriptions, see *Common parameters for nppiHistogramEven functions include:*.

NppStatus **nppiHistogramEven_16s_C1R_Ctx**(const *Npp16s* *pSrc, int nSrcStep, *NppiSize* oSizeROI, *Npp32s* *pHist, int nLevels, *Npp32s* nLowerLevel, *Npp32s* nUpperLevel, *Npp8u* *pBuffer, *NppStreamContext* nppStreamCtx)

One-channel 16-bit signed HistogramEven.

For common parameter descriptions, see *Common parameters for nppiHistogramEven functions include:*.

NppStatus **nppiHistogramEven_16s_C3R_Ctx**(const *Npp16s* *pSrc, int nSrcStep, *NppiSize* oSizeROI, *Npp32s* *pHist[3], int nLevels[3], *Npp32s* nLowerLevel[3], *Npp32s* nUpperLevel[3], *Npp8u* *pBuffer, *NppStreamContext* nppStreamCtx)

Three-channel 16-bit signed HistogramEven.

For common parameter descriptions, see *Common parameters for nppiHistogramEven functions include:*.

NppStatus **nppiHistogramEven_16s_C4R_Ctx**(const *Npp16s* *pSrc, int nSrcStep, *NppiSize* oSizeROI, *Npp32s* *pHist[4], int nLevels[4], *Npp32s* nLowerLevel[4], *Npp32s* nUpperLevel[4], *Npp8u* *pBuffer, *NppStreamContext* nppStreamCtx)

Four-channel 16-bit signed HistogramEven.

For common parameter descriptions, see *Common parameters for nppiHistogramEven functions include:*.

NppStatus **nppiHistogramEven_16s_AC4R_Ctx**(const *Npp16s* *pSrc, int nSrcStep, *NppiSize* oSizeROI, *Npp32s* *pHist[3], int nLevels[3], *Npp32s* nLowerLevel[3], *Npp32s* nUpperLevel[3], *Npp8u* *pBuffer, *NppStreamContext* nppStreamCtx)

Four-channel 16-bit signed HistogramEven ignoring alpha channel.

For common parameter descriptions, see *Common parameters for nppiHistogramEven functions include:*.

HistogramEvenGetBufferSize

Companion primitives for computing the device buffer size (in bytes) required by the HistogramEven primitives.

1.14.18.3 Common parameters for nppiHistogramEvenGetBufferSize functions include:

param oSizeROI
Region-Of-Interest (ROI).

param nLevels
Number of levels in the histogram.

param hpBufferSize
Required buffer size. Important: hpBufferSize is a *host pointer.* *Scratch Buffer and Host Pointer*.

param nppStreamCtx
Application Managed Stream Context.

return
NPP_NULL_POINTER_ERROR if hpBufferSize is 0 (NULL), *ROI Related Error Codes*..

NppStatus **nppiHistogramEvenGetBufferSize_8u_C1R_Ctx**(*NppiSize* oSizeROI, int nLevels, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiHistogramEven_8u_C1R_Ctx*.

For common parameter descriptions, see *Common parameters for nppiHistogramEvenGetBufferSize functions include:*.

NppStatus **nppiHistogramEvenGetBufferSize_8u_C3R_Ctx**(*NppiSize* oSizeROI, int nLevels[3], size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiHistogramEven_8u_C3R_Ctx*.

For common parameter descriptions, see *Common parameters for nppiHistogramEvenGetBufferSize functions include:*.

NppStatus **nppiHistogramEvenGetBufferSize_8u_C4R_Ctx**(*NppiSize* oSizeROI, int nLevels[4], size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiHistogramEven_8u_C4R_Ctx*.

For common parameter descriptions, see *Common parameters for nppiHistogramEvenGetBufferSize functions include:*.

NppStatus **nppiHistogramEvenGetBufferSize_8u_AC4R_Ctx**(*NppiSize* oSizeROI, int nLevels[3], size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiHistogramEven_8u_AC4R_Ctx*.

For common parameter descriptions, see *Common parameters for nppiHistogramEvenGetBufferSize functions include:*.

NppStatus **nppiHistogramEvenGetBufferSize_16u_C1R_Ctx**(*NppiSize* oSizeROI, int nLevels, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiHistogramEven_16u_C1R_Ctx*.

For common parameter descriptions, see *Common parameters for nppiHistogramEvenGetBufferSize functions include:*.

NppStatus **nppiHistogramEvenGetBufferSize_16u_C3R_Ctx**(*NppiSize* oSizeROI, int nLevels[3], size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiHistogramEven_16u_C3R_Ctx*.

For common parameter descriptions, see *Common parameters for nppiHistogramEvenGetBufferSize functions include:*.

NppStatus **nppiHistogramEvenGetBufferSize_16u_C4R_Ctx**(*NppiSize* oSizeROI, int nLevels[4], size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiHistogramEven_16u_C4R_Ctx*.

For common parameter descriptions, see *Common parameters for nppiHistogramEvenGetBufferSize functions include:*.

NppStatus **nppiHistogramEvenGetBufferSize_16u_AC4R_Ctx**(*NppiSize* oSizeROI, int nLevels[3], size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiHistogramEven_16u_AC4R_Ctx*.

For common parameter descriptions, see *Common parameters for nppiHistogramEvenGetBufferSize functions include:*.

NppStatus **nppiHistogramEvenGetBufferSize_16s_C1R_Ctx**(*NppiSize* oSizeROI, int nLevels, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiHistogramEven_16s_C1R_Ctx*.

For common parameter descriptions, see *Common parameters for nppiHistogramEvenGetBufferSize functions include:*.

NppStatus **nppiHistogramEvenGetBufferSize_16s_C3R_Ctx**(*NppiSize* oSizeROI, int nLevels[3], size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiHistogramEven_16s_C3R_Ctx*.

For common parameter descriptions, see *Common parameters for nppiHistogramEvenGetBufferSize functions include:*.

NppStatus **nppiHistogramEvenGetBufferSize_16s_C4R_Ctx**(*NppiSize* oSizeROI, int nLevels[4], size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiHistogramEven_16s_C4R_Ctx*.

For common parameter descriptions, see *Common parameters for nppiHistogramEvenGetBufferSize functions include:*.

NppStatus **nppiHistogramEvenGetBufferSize_16s_AC4R_Ctx**(*NppiSize* oSizeROI, int nLevels[3], size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiHistogramEven_16s_AC4R_Ctx*.

For common parameter descriptions, see *Common parameters for nppiHistogramEvenGetBufferSize functions include:*.

1.14.19. Image Histogram Range

1.14.19.1 HistogramRange

Primitives for computing the histogram of an image within specified ranges.

HistogramRange

The histogram is computed according to the ranges provided in $pLevels$.

The histogram $pHist[k]$ is defined as the total number of pixels that fall into the range: $pLevels[k] <= pSrc(j,i) < pLevels[k+1]$. The number of the histogram bins is $nLevel - 1$. The functions require additional scratch buffer for computations.

1.14.19.2 Common parameters for nppiHistogramRange functions include:

param pSrc
Source-Image Pointer.

param nSrcStep
Source-Image Line Step.

param oSizeROI
Region-Of-Interest (ROI).

param pHist
Device memory pointer to array that receives the computed histogram. The array must be of size nLevels-1.

param pLevels
Device memory pointer to array containing the level sizes of the bins. The array must be of size nLevels.

param nLevels
Number of levels in histogram.

param pBuffer
Pointer to appropriately sized (nppiHistogramRangeGetBufferSize_XX_XXX) scratch buffer.

param nppStreamCtx
Application Managed Stream Context.

return
Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiHistogramRange_8u_C1R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *NppiSize* oSizeROI, *Npp32s* *pHist, const *Npp32s* *pLevels, int nLevels, *Npp8u* *pBuffer, *NppStreamContext* nppStreamCtx)

One-channel 8-bit unsigned HistogramRange.

For common parameter descriptions, see *Common parameters for nppiHistogramEven functions include:*.

NppStatus **nppiHistogramRange_8u_C3R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *NppiSize* oSizeROI, *Npp32s* *pHist[3], const *Npp32s* *pLevels[3], int nLevels[3], *Npp8u* *pBuffer, *NppStreamContext* nppStreamCtx)

Three-channel 8-bit unsigned HistogramRange.

For common parameter descriptions, see *Common parameters for nppiHistogramEven functions include:*.

NppStatus **nppiHistogramRange_8u_C4R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *NppiSize* oSizeROI, *Npp32s* *pHist[4], const *Npp32s* *pLevels[4], int nLevels[4], *Npp8u* *pBuffer, *NppStreamContext* nppStreamCtx)

Four-channel 8-bit unsigned HistogramRange.

For common parameter descriptions, see *Common parameters for nppiHistogramEven functions include:*.

NppStatus **nppiHistogramRange_8u_AC4R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *NppiSize* oSizeROI, *Npp32s* *pHist[3], const *Npp32s* *pLevels[3], int nLevels[3], *Npp8u* *pBuffer, *NppStreamContext* nppStreamCtx)

Four-channel 8-bit unsigned HistogramRange ignoring alpha channel.

For common parameter descriptions, see *Common parameters for nppiHistogramEven functions include:*.

NppStatus **nppiHistogramRange_16u_C1R_Ctx**(const *Npp16u* *pSrc, int nSrcStep, *NppiSize* oSizeROI, *Npp32s* *pHist, const *Npp32s* *pLevels, int nLevels, *Npp8u* *pBuffer, *NppStreamContext* nppStreamCtx)

One-channel 16-bit unsigned HistogramRange.

For common parameter descriptions, see *Common parameters for nppiHistogramEven functions include:*.

NppStatus **nppiHistogramRange_16u_C3R_Ctx**(const *Npp16u* *pSrc, int nSrcStep, *NppiSize* oSizeROI, *Npp32s* *pHist[3], const *Npp32s* *pLevels[3], int nLevels[3], *Npp8u* *pBuffer, *NppStreamContext* nppStreamCtx)

Three-channel 16-bit unsigned HistogramRange.

For common parameter descriptions, see *Common parameters for nppiHistogramEven functions include:*.

NppStatus **nppiHistogramRange_16u_C4R_Ctx**(const *Npp16u* *pSrc, int nSrcStep, *NppiSize* oSizeROI, *Npp32s* *pHist[4], const *Npp32s* *pLevels[4], int nLevels[4], *Npp8u* *pBuffer, *NppStreamContext* nppStreamCtx)

Four-channel 16-bit unsigned HistogramRange.

For common parameter descriptions, see *Common parameters for nppiHistogramEven functions include:*.

NppStatus **nppiHistogramRange_16u_AC4R_Ctx**(const *Npp16u* *pSrc, int nSrcStep, *NppiSize* oSizeROI, *Npp32s* *pHist[3], const *Npp32s* *pLevels[3], int nLevels[3], *Npp8u* *pBuffer, *NppStreamContext* nppStreamCtx)

Four-channel 16-bit unsigned HistogramRange ignoring alpha channel.

For common parameter descriptions, see *Common parameters for nppiHistogramEven functions include:*.

NppStatus **nppiHistogramRange_16s_C1R_Ctx**(const *Npp16s* *pSrc, int nSrcStep, *NppiSize* oSizeROI, *Npp32s* *pHist, const *Npp32s* *pLevels, int nLevels, *Npp8u* *pBuffer, *NppStreamContext* nppStreamCtx)

One-channel 16-bit signed HistogramRange.

For common parameter descriptions, see *Common parameters for nppiHistogramEven functions include:*.

NppStatus **nppiHistogramRange_16s_C3R_Ctx**(const *Npp16s* *pSrc, int nSrcStep, *NppiSize* oSizeROI, *Npp32s* *pHist[3], const *Npp32s* *pLevels[3], int nLevels[3], *Npp8u* *pBuffer, *NppStreamContext* nppStreamCtx)

Three-channel 16-bit signed HistogramRange.

For common parameter descriptions, see *Common parameters for nppiHistogramEven functions include:*.

NppStatus **nppiHistogramRange_16s_C4R_Ctx**(const *Npp16s* *pSrc, int nSrcStep, *NppiSize* oSizeROI, *Npp32s* *pHist[4], const *Npp32s* *pLevels[4], int nLevels[4], *Npp8u* *pBuffer, *NppStreamContext* nppStreamCtx)

Four-channel 16-bit signed HistogramRange.

For common parameter descriptions, see *Common parameters for nppiHistogramEven functions include:*.

NppStatus **nppiHistogramRange_16s_AC4R_Ctx**(const *Npp16s* *pSrc, int nSrcStep, *NppiSize* oSizeROI, *Npp32s* *pHist[3], const *Npp32s* *pLevels[3], int nLevels[3], *Npp8u* *pBuffer, *NppStreamContext* nppStreamCtx)

Four-channel 16-bit signed HistogramRange.

For common parameter descriptions, see *Common parameters for nppiHistogramEven functions include:*.

NppStatus **nppiHistogramRange_32f_C1R_Ctx**(const *Npp32f* *pSrc, int nSrcStep, *NppiSize* oSizeROI, *Npp32s* *pHist, const *Npp32f* *pLevels, int nLevels, *Npp8u* *pBuffer, *NppStreamContext* nppStreamCtx)

One-channel 32-bit floating point HistogramRange.

For common parameter descriptions, see *Common parameters for nppiHistogramEven functions include:*.

NppStatus **nppiHistogramRange_32f_C3R_Ctx**(const *Npp32f* *pSrc, int nSrcStep, *NppiSize* oSizeROI, *Npp32s* *pHist[3], const *Npp32f* *pLevels[3], int nLevels[3], *Npp8u* *pBuffer, *NppStreamContext* nppStreamCtx)

Three-channel 32-bit floating point HistogramRange.

For common parameter descriptions, see *Common parameters for nppiHistogramEven functions include:*.

NppStatus **nppiHistogramRange_32f_C4R_Ctx**(const *Npp32f* *pSrc, int nSrcStep, *NppiSize* oSizeROI, *Npp32s* *pHist[4], const *Npp32f* *pLevels[4], int nLevels[4], *Npp8u* *pBuffer, *NppStreamContext* nppStreamCtx)

Four-channel 32-bit floating point HistogramRange.

For common parameter descriptions, see *Common parameters for nppiHistogramEven functions include:*.

NppStatus **nppiHistogramRange_32f_AC4R_Ctx**(const *Npp32f* *pSrc, int nSrcStep, *NppiSize* oSizeROI, *Npp32s* *pHist[3], const *Npp32f* *pLevels[3], int nLevels[3], *Npp8u* *pBuffer, *NppStreamContext* nppStreamCtx)

Four-channel 32-bit floating point HistogramRange ignoring alpha channel.

For common parameter descriptions, see *Common parameters for nppiHistogramEven functions include:*.

HistogramRangeGetBufferSize

Companion primitives for computing the device buffer size (in bytes) required by the HistogramRange primitives.

NppStatus **nppiHistogramRangeGetBufferSize_8u_C1R_Ctx**(*NppiSize* oSizeROI, int nLevels, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Scratch-buffer size for nppiHistogramRange_8u_C1R_Ctx.

For common parameter descriptions, see *Common parameters for nppiHistogramEvenGetBufferSize functions include:*.

NppStatus **nppiHistogramRangeGetBufferSize_8u_C3R_Ctx**(*NppiSize* oSizeROI, int nLevels[3], size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Scratch-buffer size for nppiHistogramRange_8u_C3R_Ctx.

For common parameter descriptions, see *Common parameters for nppiHistogramEvenGetBufferSize functions include:*.

NppStatus **nppiHistogramRangeGetBufferSize_8u_C4R_Ctx**(*NppiSize* oSizeROI, int nLevels[4], size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Scratch-buffer size for nppiHistogramRange_8u_C4R_Ctx.

For common parameter descriptions, see *Common parameters for nppiHistogramEvenGetBufferSize functions include:*.

NppStatus **nppiHistogramRangeGetBufferSize_8u_AC4R_Ctx**(*NppiSize* oSizeROI, int nLevels[3], size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Scratch-buffer size for nppiHistogramRange_8u_AC4R_Ctx.

For common parameter descriptions, see *Common parameters for nppiHistogramEvenGetBufferSize functions include:*.

NppStatus **nppiHistogramRangeGetBufferSize_16u_C1R_Ctx**(*NppiSize* oSizeROI, int nLevels, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Scratch-buffer size for nppiHistogramRange_16u_C1R_Ctx.

For common parameter descriptions, see *Common parameters for nppiHistogramEvenGetBufferSize functions include:*.

NppStatus **nppiHistogramRangeGetBufferSize_16u_C3R_Ctx**(*NppiSize* oSizeROI, int nLevels[3], size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Scratch-buffer size for nppiHistogramRange_16u_C3R_Ctx.

For common parameter descriptions, see *Common parameters for nppiHistogramEvenGetBufferSize functions include:*.

NppStatus **nppiHistogramRangeGetBufferSize_16u_C4R_Ctx**(*NppiSize* oSizeROI, int nLevels[4], size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Scratch-buffer size for nppiHistogramRange_16u_C4R_Ctx.

For common parameter descriptions, see *Common parameters for nppiHistogramEvenGetBufferSize functions include:*.

NppStatus **nppiHistogramRangeGetBufferSize_16u_AC4R_Ctx**(*NppiSize* oSizeROI, int nLevels[3], size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Scratch-buffer size for nppiHistogramRange_16u_AC4R_Ctx.

For common parameter descriptions, see *Common parameters for nppiHistogramEvenGetBufferSize functions include:*.

NppStatus **nppiHistogramRangeGetBufferSize_16s_C1R_Ctx**(*NppiSize* oSizeROI, int nLevels, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Scratch-buffer size for nppiHistogramRange_16s_C1R_Ctx.

For common parameter descriptions, see *Common parameters for nppiHistogramEvenGetBufferSize functions include:*.

NppStatus **nppiHistogramRangeGetBufferSize_16s_C3R_Ctx**(*NppiSize* oSizeROI, int nLevels[3], size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Scratch-buffer size for nppiHistogramRange_16s_C3R_Ctx.

For common parameter descriptions, see *Common parameters for nppiHistogramEvenGetBufferSize functions include:*.

NppStatus **nppiHistogramRangeGetBufferSize_16s_C4R_Ctx**(*NppiSize* oSizeROI, int nLevels[4], size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Scratch-buffer size for nppiHistogramRange_16s_C4R_Ctx.

For common parameter descriptions, see *Common parameters for nppiHistogramEvenGetBufferSize functions include:*.

NppStatus **nppiHistogramRangeGetBufferSize_16s_AC4R_Ctx**(*NppiSize* oSizeROI, int nLevels[3], size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Scratch-buffer size for nppiHistogramRange_16s_AC4R_Ctx.

For common parameter descriptions, see *Common parameters for nppiHistogramEvenGetBufferSize functions include:*.

NppStatus **nppiHistogramRangeGetBufferSize_32f_C1R_Ctx**(*NppiSize* oSizeROI, int nLevels, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Scratch-buffer size for nppiHistogramRange_32f_C1R_Ctx.

For common parameter descriptions, see *Common parameters for nppiHistogramEvenGetBufferSize functions include:*.

NppStatus **nppiHistogramRangeGetBufferSize_32f_C3R_Ctx**(*NppiSize* oSizeROI, int nLevels[3], size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Scratch-buffer size for nppiHistogramRange_32f_C3R_Ctx.

For common parameter descriptions, see *Common parameters for nppiHistogramEvenGetBufferSize functions include:*.

NppStatus **nppiHistogramRangeGetBufferSize_32f_C4R_Ctx**(*NppiSize* oSizeROI, int nLevels[4], size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Scratch-buffer size for nppiHistogramRange_32f_C4R_Ctx.

For common parameter descriptions, see *Common parameters for nppiHistogramEvenGetBufferSize functions include:*.

NppStatus **nppiHistogramRangeGetBufferSize_32f_AC4R_Ctx**(*NppiSize* oSizeROI, int nLevels[3], size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Scratch-buffer size for nppiHistogramRange_32f_AC4R_Ctx.

For common parameter descriptions, see *Common parameters for nppiHistogramEvenGetBufferSize functions include:*.

1.14.20. Image Proximity

1.14.20.1 Image Proximity

Primitives for computing the proximity measure between a source image and a template image.

1.14.20.1.1 General Introduction

There are basically two approaches to compute the proximity measure for template matching, Euclidean distance and the cross correlation.

1.

Euclidean distance computes the sum of the squared distance (SSD) between the corresponding pixels of the source image and the template image. The smaller the distance is, the more similar the source image and the template image is around the pixel. The anchor of the template

image is used during the computations, which always lies in the geometric center of the image. Given a source image $pSrc$ ($W_s \times H_s$) and a template image $pTpl$ ($W_t \times H_t$), the Euclidean distance $D_{st}(c,r)$ between two images at pixel in row r and column c is computed as (s stands for source image and t for template image for short):

$$D_{st}(c,r) = \sum_{j=0}^{H_t-1} \sum_{i=0}^{W_t-1} [pTpl(j,i) - pSrc(j+c-\frac{H_t}{2}, i+r-\frac{W_t}{2})]^2$$

2. Cross correlation computes the sum of the product between the corresponding pixels of the source image and the template image. The cross correlation $R_{st}(c,r)$ is calculated as:

$$R_{st}(c,r) = \sum_{j=0}^{H_t-1} \sum_{i=0}^{W_t-1} [pTpl(j,i) \cdot pSrc(j+c-\frac{H_t}{2}, i+r-\frac{W_t}{2})]$$

The larger the cross correlation value is, the more similar the source image and the template image is around the pixel.

3. The cross correlation $R_{st}(c,r)$ is affected by the brightness of the images which may vary due to the lighting and exposure conditions. Therefore, NPP computes the cross correlation coefficient to circumvent this dependence. This is typically done at every step by subtracting the mean from every pixel value, i.e.,

$$\tilde{R}_{st}(c,r) = \sum_{j=0}^{H_t-1}\sum_{i=0}^{W_t-1}[pTpl(j,i) - Mean_t]\cdot[pSrc(j+c-\frac{H_t}{2}, i+r-\frac{W_t}{2}) - Mean_s]$$

NPP computes the normalized values of Euclidean distance, cross correlation and the cross correlation coefficient.

1. The normalized Euclidean distance $\sigma_{st}(c,r)$ is defined as:

$$\sigma_{st}(c,r) = \frac{D_{st}(c,r)}{\sqrt{R_{ss}(c,r)\cdot R_{tt}(\frac{H_t}{2},\frac{W_t}{2})}}$$

2. The normalized cross correlation $\rho_{st}(c,r)$ is defined as:

$$\rho_{st}(c,r) = \frac{R_{st}(c,r)}{\sqrt{R_{ss}(c,r)\cdot R_{tt}(\frac{H_t}{2},\frac{W_t}{2})}}$$

The $R_{ss}(c,r)$ and $R_{tt}(\frac{H_t}{2},\frac{W_t}{2}$ denote the auto correlation of the source image and the template image individually. They are defined as:

$$R_{ss}(c,r) = \sum_{j=c-\frac{H_t}{2}}^{c+\frac{H_t}{2}}\sum_{i=r-\frac{W_t}{2}}^{r+\frac{W_t}{2}} pSrc(j,i)$$

$$R_{tt}(\frac{H_t}{2},\frac{W_t}{2}) = \sum_{j=0}^{H_t-1}\sum_{i=0}^{W_t-1} pTpl(j,i)$$

3. Similarly, the normalized cross correlation coefficient $\gamma_{st}(c,r)$ is calculated as:

$$\gamma_{st}(c,r) = \frac{\tilde{R}_{st}(c,r)}{\sqrt{\tilde{R}_{ss}(c,r)\cdot \tilde{R}_{tt}(\frac{H_t}{2},\frac{W_t}{2})}}$$

The $\tilde{R}_{ss}(c,r)$ and $\tilde{R}_{tt}(\frac{H_t}{2},\frac{W_t}{2}$ are defined as:

$$\tilde{R}_{ss}(c,r) = \sum_{j=c-\frac{H_t}{2}}^{c+\frac{H_t}{2}}\sum_{i=r-\frac{W_t}{2}}^{r+\frac{W_t}{2}}[pSrc(j,i) - Mean_s]$$

$$\tilde{R}_{tt}(\frac{H_t}{2},\frac{W_t}{2}) = \sum_{j=0}^{H_t-1}\sum_{i=0}^{W_t-1}[pTpl(j,i) - Mean_t]$$

where $Mean_t$ is the template mean minus the mean of the image in the region just under the template.

1.14.20.1.2 Categorizations

The Euclidean distance and the cross correlation are categorized into three types, full, same, and valid.

1. Full mode indicates that the anchor of the template image starts from the outside of the source image, assuming the out-of-boundary pixels are zeor-padded. The size of the destination image is $(W_s + W_t - 1) \times (H_s + H_t - 1)$.
2. Same mode means that the anchor of the template image starts from the top left pixel of the source image. All the out-of-boundary pixels are also zero-padded. The size of the destination image is the same as the source one, i.e., $W_s \times H_s$.
3. Valid mode indicates that there are no out-of-boudnary readings from the source image. The anchor of the template image starts from the inside of the source image. The size of the destination image is $(W_s - W_t + 1) \times (H_s - H_t + 1)$.

1.14.21. Image Square Distance Full Norm

1.14.21.1 SqrDistanceFull_Norm

Primitives for computing the normalized Euclidean distance between two images with full mode.

SqrDistanceFull_Norm

The functions compute the $\sigma_{st}(c, r)$ in *General Introduction* with full mode (see *Categorizations*).

1.14.21.2 Common parameters for nppiSqrDistanceFull functions include:

param pSrc
Source-Image Pointer.

param nSrcStep
Source-Image Line Step.

param oSrcRoiSize
Region-Of-Interest (ROI).

param pTpl
Pointer to the template image.

param nTplStep
Number of bytes between successive rows in the template image.

param oTplRoiSize
Region-Of-Interest (ROI).

param pDst
Destination-Image Pointer.

param nDstStep
Destination-Image Line Step.

param nScaleFactor
Integer Result Scaling.

param nppStreamCtx
Application Managed Stream Context.

return
Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiSqrDistanceFull_Norm_8u_C1RSfs_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *NppiSize* oSrcRoiSize, const *Npp8u* *pTpl, int nTplStep, *NppiSize* oTplRoiSize, *Npp8u* *pDst, int nDstStep, int nScaleFactor, *NppStreamContext* nppStreamCtx)

One-channel 8-bit unsigned image SqrDistanceFull_Norm, scaled by $2^{(} - nScaleFactor)$.

For common parameter descriptions, see *Common parameters for nppiSqrDistanceFull functions include:*.

NppStatus **nppiSqrDistanceFull_Norm_8u_C3RSfs_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *NppiSize* oSrcRoiSize, const *Npp8u* *pTpl, int nTplStep, *NppiSize* oTplRoiSize, *Npp8u* *pDst, int nDstStep, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Three-channel 8-bit unsigned image SqrDistanceFull_Norm, scaled by $2^{(} - nScaleFactor)$.

For common parameter descriptions, see *Common parameters for nppiSqrDistanceFull functions include:*.

NppStatus **nppiSqrDistanceFull_Norm_8u_C4RSfs_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *NppiSize* oSrcRoiSize, const *Npp8u* *pTpl, int nTplStep, *NppiSize* oTplRoiSize, *Npp8u* *pDst, int nDstStep, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Four-channel 8-bit unsigned image SqrDistanceFull_Norm, scaled by $2^{(} - nScaleFactor)$.

For common parameter descriptions, see *Common parameters for nppiSqrDistanceFull functions include:*.

NppStatus **nppiSqrDistanceFull_Norm_8u_AC4RSfs_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *NppiSize* oSrcRoiSize, const *Npp8u* *pTpl, int nTplStep, *NppiSize* oTplRoiSize, *Npp8u* *pDst, int nDstStep, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Four-channel 8-bit unsigned image SqrDistanceFull_Norm ignoring alpha channel, scaled by $2^{(} - nScaleFactor)$.

For common parameter descriptions, see *Common parameters for nppiSqrDistanceFull functions include:*.

NppStatus **nppiSqrDistanceFull_Norm_32f_C1R_Ctx**(const *Npp32f* *pSrc, int nSrcStep, *NppiSize* oSrcRoiSize, const *Npp32f* *pTpl, int nTplStep, *NppiSize* oTplRoiSize, *Npp32f* *pDst, int nDstStep, *NppStreamContext* nppStreamCtx)

One-channel 32-bit floating point image SqrDistanceFull_Norm.

For common parameter descriptions, see *Common parameters for nppiSqrDistanceFull functions include:*.

NppStatus **nppiSqrDistanceFull_Norm_32f_C3R_Ctx**(const *Npp32f* *pSrc, int nSrcStep, *NppiSize* oSrcRoiSize, const *Npp32f* *pTpl, int nTplStep, *NppiSize* oTplRoiSize, *Npp32f* *pDst, int nDstStep, *NppStreamContext* nppStreamCtx)

Three-channel 32-bit floating point image SqrDistanceFull_Norm.

For common parameter descriptions, see *Common parameters for nppiSqrDistanceFull functions include:*.

NppStatus **nppiSqrDistanceFull_Norm_32f_C4R_Ctx**(const *Npp32f* *pSrc, int nSrcStep, *NppiSize* oSrcRoiSize, const *Npp32f* *pTpl, int nTplStep, *NppiSize* oTplRoiSize, *Npp32f* *pDst, int nDstStep, *NppStreamContext* nppStreamCtx)

Four-channel 32-bit floating point image SqrDistanceFull_Norm.

For common parameter descriptions, see *Common parameters for nppiSqrDistanceFull functions include:*.

NppStatus **nppiSqrDistanceFull_Norm_32f_AC4R_Ctx**(const *Npp32f* *pSrc, int nSrcStep, *NppiSize* oSrcRoiSize, const *Npp32f* *pTpl, int nTplStep, *NppiSize* oTplRoiSize, *Npp32f* *pDst, int nDstStep, *NppStreamContext* nppStreamCtx)

Four-channel 32-bit floating point image SqrDistanceFull_Norm ignoring alpha channel.

For common parameter descriptions, see *Common parameters for nppiSqrDistanceFull functions include:*.

NppStatus **nppiSqrDistanceFull_Norm_8u32f_C1R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *NppiSize* oSrcRoiSize, const *Npp8u* *pTpl, int nTplStep, *NppiSize* oTplRoiSize, *Npp32f* *pDst, int nDstStep, *NppStreamContext* nppStreamCtx)

One-channel 8-bit unsigned image SqrDistanceFull_Norm.

For common parameter descriptions, see *Common parameters for nppiSqrDistanceFull functions include:*.

NppStatus **nppiSqrDistanceFull_Norm_8u32f_C3R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *NppiSize* oSrcRoiSize, const *Npp8u* *pTpl, int nTplStep, *NppiSize* oTplRoiSize, *Npp32f* *pDst, int nDstStep, *NppStreamContext* nppStreamCtx)

Three-channel 8-bit unsigned image SqrDistanceFull_Norm.

For common parameter descriptions, see *Common parameters for nppiSqrDistanceFull functions include:*.

NppStatus **nppiSqrDistanceFull_Norm_8u32f_C4R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *NppiSize* oSrcRoiSize, const *Npp8u* *pTpl, int nTplStep, *NppiSize* oTplRoiSize, *Npp32f* *pDst, int nDstStep, *NppStreamContext* nppStreamCtx)

Four-channel 8-bit unsigned image SqrDistanceFull_Norm.

For common parameter descriptions, see *Common parameters for nppiSqrDistanceFull functions include:*.

NppStatus **nppiSqrDistanceFull_Norm_8u32f_AC4R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *NppiSize* oSrcRoiSize, const *Npp8u* *pTpl, int nTplStep, *NppiSize* oTplRoiSize, *Npp32f* *pDst, int nDstStep, *NppStreamContext* nppStreamCtx)

Four-channel 8-bit unsigned image SqrDistanceFull_Norm ignoring alpha channel.

For common parameter descriptions, see *Common parameters for nppiSqrDistanceFull functions include:*.

NppStatus **nppiSqrDistanceFull_Norm_8s32f_C1R_Ctx**(const *Npp8s* *pSrc, int nSrcStep, *NppiSize* oSrcRoiSize, const *Npp8s* *pTpl, int nTplStep, *NppiSize* oTplRoiSize, *Npp32f* *pDst, int nDstStep, *NppStreamContext* nppStreamCtx)

One-channel 8-bit signed image SqrDistanceFull_Norm.

For common parameter descriptions, see *Common parameters for nppiSqrDistanceFull functions include:*.

NppStatus **nppiSqrDistanceFull_Norm_8s32f_C3R_Ctx**(const *Npp8s* *pSrc, int nSrcStep, *NppiSize* oSrcRoiSize, const *Npp8s* *pTpl, int nTplStep, *NppiSize* oTplRoiSize, *Npp32f* *pDst, int nDstStep, *NppStreamContext* nppStreamCtx)

Three-channel 8-bit signed image SqrDistanceFull_Norm.

For common parameter descriptions, see *Common parameters for nppiSqrDistanceFull functions include:*.

NppStatus **nppiSqrDistanceFull_Norm_8s32f_C4R_Ctx**(const *Npp8s* *pSrc, int nSrcStep, *NppiSize* oSrcRoiSize, const *Npp8s* *pTpl, int nTplStep, *NppiSize* oTplRoiSize, *Npp32f* *pDst, int nDstStep, *NppStreamContext* nppStreamCtx)

Four-channel 8-bit signed image SqrDistanceFull_Norm.

For common parameter descriptions, see *Common parameters for nppiSqrDistanceFull functions include:*.

NppStatus **nppiSqrDistanceFull_Norm_8s32f_AC4R_Ctx**(const *Npp8s* *pSrc, int nSrcStep, *NppiSize* oSrcRoiSize, const *Npp8s* *pTpl, int nTplStep, *NppiSize* oTplRoiSize, *Npp32f* *pDst, int nDstStep, *NppStreamContext* nppStreamCtx)

Four-channel 8-bit signed image SqrDistanceFull_Norm ignoring alpha channel.

For common parameter descriptions, see *Common parameters for nppiSqrDistanceFull functions include:*.

NppStatus **nppiSqrDistanceFull_Norm_16u32f_C1R_Ctx**(const *Npp16u* *pSrc, int nSrcStep, *NppiSize* oSrcRoiSize, const *Npp16u* *pTpl, int nTplStep, *NppiSize* oTplRoiSize, *Npp32f* *pDst, int nDstStep, *NppStreamContext* nppStreamCtx)

One-channel 16-bit unsigned image SqrDistanceFull_Norm.

For common parameter descriptions, see *Common parameters for nppiSqrDistanceFull functions include:*.

NppStatus **nppiSqrDistanceFull_Norm_16u32f_C3R_Ctx**(const *Npp16u* *pSrc, int nSrcStep, *NppiSize* oSrcRoiSize, const *Npp16u* *pTpl, int nTplStep, *NppiSize* oTplRoiSize, *Npp32f* *pDst, int nDstStep, *NppStreamContext* nppStreamCtx)

Three-channel 16-bit unsigned image SqrDistanceFull_Norm.

For common parameter descriptions, see *Common parameters for nppiSqrDistanceFull functions include:*.

NppStatus **nppiSqrDistanceFull_Norm_16u32f_C4R_Ctx**(const *Npp16u* *pSrc, int nSrcStep, *NppiSize* oSrcRoiSize, const *Npp16u* *pTpl, int nTplStep, *NppiSize* oTplRoiSize, *Npp32f* *pDst, int nDstStep, *NppStreamContext* nppStreamCtx)

Four-channel 16-bit unsigned image SqrDistanceFull_Norm.

For common parameter descriptions, see *Common parameters for nppiSqrDistanceFull functions include:*.

NppStatus **nppiSqrDistanceFull_Norm_16u32f_AC4R_Ctx**(const *Npp16u* *pSrc, int nSrcStep, *NppiSize* oSrcRoiSize, const *Npp16u* *pTpl, int nTplStep, *NppiSize* oTplRoiSize, *Npp32f* *pDst, int nDstStep, *NppStreamContext* nppStreamCtx)

Four-channel 16-bit unsigned image SqrDistanceFull_Norm ignoring alpha channel.

For common parameter descriptions, see *Common parameters for nppiSqrDistanceFull functions include:*.

1.14.22. Image Square Distance Same Norm

1.14.22.1 SqrDistanceSame_Norm

Primitives for computing the normalized Euclidean distance between two images with same mode.

SqrDistanceSame_Norm

The functions compute the $\sigma_{st}(c, r)$ in *General Introduction* with same mode (see *Categorizations*).

NppStatus **nppiSqrDistanceSame_Norm_8u_C1RSfs_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *NppiSize* oSrcRoiSize, const *Npp8u* *pTpl, int nTplStep, *NppiSize* oTplRoiSize, *Npp8u* *pDst, int nDstStep, int nScaleFactor, *NppStreamContext* nppStreamCtx)

One-channel 8-bit unsigned image SqrDistanceSame_Norm, scaled by $2^{(} - nScaleFactor)$.

For common parameter descriptions, see *Common parameters for nppiSqrDistanceFull functions include:*.

NppStatus **nppiSqrDistanceSame_Norm_8u_C3RSfs_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *NppiSize* oSrcRoiSize, const *Npp8u* *pTpl, int nTplStep, *NppiSize* oTplRoiSize, *Npp8u* *pDst, int nDstStep, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Three-channel 8-bit unsigned image SqrDistanceSame_Norm, scaled by $2^{(} - nScaleFactor)$.

For common parameter descriptions, see *Common parameters for nppiSqrDistanceFull functions include:*.

NppStatus **nppiSqrDistanceSame_Norm_8u_C4RSfs_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *NppiSize* oSrcRoiSize, const *Npp8u* *pTpl, int nTplStep, *NppiSize* oTplRoiSize, *Npp8u* *pDst, int nDstStep, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Four-channel 8-bit unsigned image SqrDistanceSame_Norm, scaled by $2^{(} - nScaleFactor)$.

For common parameter descriptions, see *Common parameters for nppiSqrDistanceFull functions include:*.

NppStatus **nppiSqrDistanceSame_Norm_8u_AC4RSfs_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *NppiSize* oSrcRoiSize, const *Npp8u* *pTpl, int nTplStep, *NppiSize* oTplRoiSize, *Npp8u* *pDst, int nDstStep, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Four-channel 8-bit unsigned image SqrDistanceSame_Norm ignoring alpha channel, scaled by $2^{(} - nScaleFactor)$.

For common parameter descriptions, see *Common parameters for nppiSqrDistanceFull functions include:*.

NppStatus **nppiSqrDistanceSame_Norm_32f_C1R_Ctx**(const *Npp32f* *pSrc, int nSrcStep, *NppiSize* oSrcRoiSize, const *Npp32f* *pTpl, int nTplStep, *NppiSize* oTplRoiSize, *Npp32f* *pDst, int nDstStep, *NppStreamContext* nppStreamCtx)

One-channel 32-bit floating point image SqrDistanceSame_Norm.

For common parameter descriptions, see *Common parameters for nppiSqrDistanceFull functions include:*.

NppStatus **nppiSqrDistanceSame_Norm_32f_C3R_Ctx**(const *Npp32f* *pSrc, int nSrcStep, *NppiSize* oSrcRoiSize, const *Npp32f* *pTpl, int nTplStep, *NppiSize* oTplRoiSize, *Npp32f* *pDst, int nDstStep, *NppStreamContext* nppStreamCtx)

Three-channel 32-bit floating point image SqrDistanceSame_Norm.

For common parameter descriptions, see *Common parameters for nppiSqrDistanceFull functions include:*.

NppStatus **nppiSqrDistanceSame_Norm_32f_C4R_Ctx**(const *Npp32f* *pSrc, int nSrcStep, *NppiSize* oSrcRoiSize, const *Npp32f* *pTpl, int nTplStep, *NppiSize* oTplRoiSize, *Npp32f* *pDst, int nDstStep, *NppStreamContext* nppStreamCtx)

Four-channel 32-bit floating point image SqrDistanceSame_Norm.

For common parameter descriptions, see *Common parameters for nppiSqrDistanceFull functions include:*.

NppStatus **nppiSqrDistanceSame_Norm_32f_AC4R_Ctx**(const *Npp32f* *pSrc, int nSrcStep, *NppiSize* oSrcRoiSize, const *Npp32f* *pTpl, int nTplStep, *NppiSize* oTplRoiSize, *Npp32f* *pDst, int nDstStep, *NppStreamContext* nppStreamCtx)

Four-channel 32-bit floating point image SqrDistanceSame_Norm ignoring alpha channel.

For common parameter descriptions, see *Common parameters for nppiSqrDistanceFull functions include:*.

NppStatus **nppiSqrDistanceSame_Norm_8u32f_C1R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *NppiSize* oSrcRoiSize, const *Npp8u* *pTpl, int nTplStep, *NppiSize* oTplRoiSize, *Npp32f* *pDst, int nDstStep, *NppStreamContext* nppStreamCtx)

One-channel 8-bit unsigned image SqrDistanceSame_Norm.

For common parameter descriptions, see *Common parameters for nppiSqrDistanceFull functions include:*.

NppStatus **nppiSqrDistanceSame_Norm_8u32f_C3R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *NppiSize* oSrcRoiSize, const *Npp8u* *pTpl, int nTplStep, *NppiSize* oTplRoiSize, *Npp32f* *pDst, int nDstStep, *NppStreamContext* nppStreamCtx)

Three-channel 8-bit unsigned image SqrDistanceSame_Norm.

For common parameter descriptions, see *Common parameters for nppiSqrDistanceFull functions include:*.

NppStatus **nppiSqrDistanceSame_Norm_8u32f_C4R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *NppiSize* oSrcRoiSize, const *Npp8u* *pTpl, int nTplStep, *NppiSize* oTplRoiSize, *Npp32f* *pDst, int nDstStep, *NppStreamContext* nppStreamCtx)

Four-channel 8-bit unsigned image SqrDistanceSame_Norm.

For common parameter descriptions, see *Common parameters for nppiSqrDistanceFull functions include:*.

NppStatus **nppiSqrDistanceSame_Norm_8u32f_AC4R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *NppiSize* oSrcRoiSize, const *Npp8u* *pTpl, int nTplStep, *NppiSize* oTplRoiSize, *Npp32f* *pDst, int nDstStep, *NppStreamContext* nppStreamCtx)

Four-channel 8-bit unsigned image SqrDistanceSame_Norm ignoring alpha channel.

For common parameter descriptions, see *Common parameters for nppiSqrDistanceFull functions include:*.

NppStatus **nppiSqrDistanceSame_Norm_8s32f_C1R_Ctx**(const *Npp8s* *pSrc, int nSrcStep, *NppiSize* oSrcRoiSize, const *Npp8s* *pTpl, int nTplStep, *NppiSize* oTplRoiSize, *Npp32f* *pDst, int nDstStep, *NppStreamContext* nppStreamCtx)

One-channel 8-bit signed image SqrDistanceSame_Norm.

For common parameter descriptions, see *Common parameters for nppiSqrDistanceFull functions include:*.

NppStatus **nppiSqrDistanceSame_Norm_8s32f_C3R_Ctx**(const *Npp8s* *pSrc, int nSrcStep, *NppiSize* oSrcRoiSize, const *Npp8s* *pTpl, int nTplStep, *NppiSize* oTplRoiSize, *Npp32f* *pDst, int nDstStep, *NppStreamContext* nppStreamCtx)

Three-channel 8-bit signed image SqrDistanceSame_Norm.

For common parameter descriptions, see *Common parameters for nppiSqrDistanceFull functions include:*.

NppStatus **nppiSqrDistanceSame_Norm_8s32f_C4R_Ctx**(const *Npp8s* *pSrc, int nSrcStep, *NppiSize* oSrcRoiSize, const *Npp8s* *pTpl, int nTplStep, *NppiSize* oTplRoiSize, *Npp32f* *pDst, int nDstStep, *NppStreamContext* nppStreamCtx)

Four-channel 8-bit signed image SqrDistanceSame_Norm.

For common parameter descriptions, see *Common parameters for nppiSqrDistanceFull functions include:*.

NppStatus **nppiSqrDistanceSame_Norm_8s32f_AC4R_Ctx**(const *Npp8s* *pSrc, int nSrcStep, *NppiSize* oSrcRoiSize, const *Npp8s* *pTpl, int nTplStep, *NppiSize* oTplRoiSize, *Npp32f* *pDst, int nDstStep, *NppStreamContext* nppStreamCtx)

Four-channel 8-bit signed image SqrDistanceSame_Norm ignoring alpha channel.

For common parameter descriptions, see *Common parameters for nppiSqrDistanceFull functions include:*.

NppStatus **nppiSqrDistanceSame_Norm_16u32f_C1R_Ctx**(const *Npp16u* *pSrc, int nSrcStep, *NppiSize* oSrcRoiSize, const *Npp16u* *pTpl, int nTplStep, *NppiSize* oTplRoiSize, *Npp32f* *pDst, int nDstStep, *NppStreamContext* nppStreamCtx)

One-channel 16-bit unsigned image SqrDistanceSame_Norm.

For common parameter descriptions, see *Common parameters for nppiSqrDistanceFull functions include:*.

NppStatus **nppiSqrDistanceSame_Norm_16u32f_C3R_Ctx**(const *Npp16u* *pSrc, int nSrcStep, *NppiSize* oSrcRoiSize, const *Npp16u* *pTpl, int nTplStep, *NppiSize* oTplRoiSize, *Npp32f* *pDst, int nDstStep, *NppStreamContext* nppStreamCtx)

Three-channel 16-bit unsigned image SqrDistanceSame_Norm.

For common parameter descriptions, see *Common parameters for nppiSqrDistanceFull functions include:*.

NppStatus **nppiSqrDistanceSame_Norm_16u32f_C4R_Ctx**(const *Npp16u* *pSrc, int nSrcStep, *NppiSize* oSrcRoiSize, const *Npp16u* *pTpl, int nTplStep, *NppiSize* oTplRoiSize, *Npp32f* *pDst, int nDstStep, *NppStreamContext* nppStreamCtx)

Four-channel 16-bit unsigned image SqrDistanceSame_Norm.

For common parameter descriptions, see *Common parameters for nppiSqrDistanceFull functions include:*.

NppStatus **nppiSqrDistanceSame_Norm_16u32f_AC4R_Ctx**(const *Npp16u* *pSrc, int nSrcStep, *NppiSize* oSrcRoiSize, const *Npp16u* *pTpl, int nTplStep, *NppiSize* oTplRoiSize, *Npp32f* *pDst, int nDstStep, *NppStreamContext* nppStreamCtx)

Four-channel 16-bit unsigned image SqrDistanceSame_Norm ignoring alpha channel.

For common parameter descriptions, see *Common parameters for nppiSqrDistanceFull functions include:*.

NppStatus **nppiSqrDistanceSame_Norm_16u32f_AC4R**(const *Npp16u* *pSrc, int nSrcStep, *NppiSize* oSrcRoiSize, const *Npp16u* *pTpl, int nTplStep, *NppiSize* oTplRoiSize, *Npp32f* *pDst, int nDstStep)

Four-channel 16-bit unsigned image SqrDistanceSame_Norm ignoring alpha channel.

For common parameter descriptions, see *Common parameters for nppiSqrDistanceFull functions include:*.

1.14.23. Image Square Distance Valid Norm

1.14.23.1 SqrDistanceValid_Norm

Primitives for computing the normalized Euclidean distance between two images with valid mode.

SqrDistanceValid_Norm

The functions compute the $\sigma_{st}(c,r)$ in *General Introduction* with valid mode (see *Categorizations*).

NppStatus **nppiSqrDistanceValid_Norm_8u_C1RSfs_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *NppiSize* oSrcRoiSize, const *Npp8u* *pTpl, int nTplStep, *NppiSize* oTplRoiSize, *Npp8u* *pDst, int nDstStep, int nScaleFactor, *NppStreamContext* nppStreamCtx)

One-channel 8-bit unsigned image SqrDistanceValid_Norm, scaled by $2^(- nScaleFactor)$.

For common parameter descriptions, see *Common parameters for nppiSqrDistanceFull functions include:*.

NppStatus **nppiSqrDistanceValid_Norm_8u_C3RSfs_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *NppiSize* oSrcRoiSize, const *Npp8u* *pTpl, int nTplStep, *NppiSize* oTplRoiSize, *Npp8u* *pDst, int nDstStep, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Three-channel 8-bit unsigned image SqrDistanceValid_Norm, scaled by $2^(- nScaleFactor)$.

For common parameter descriptions, see *Common parameters for nppiSqrDistanceFull functions include:*.

NppStatus **nppiSqrDistanceValid_Norm_8u_C4RSfs_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *NppiSize* oSrcRoiSize, const *Npp8u* *pTpl, int nTplStep, *NppiSize* oTplRoiSize, *Npp8u* *pDst, int nDstStep, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Four-channel 8-bit unsigned image SqrDistanceValid_Norm, scaled by $2^(- nScaleFactor)$.

For common parameter descriptions, see *Common parameters for nppiSqrDistanceFull functions include:*.

NppStatus **nppiSqrDistanceValid_Norm_8u_AC4RSfs_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *NppiSize* oSrcRoiSize, const *Npp8u* *pTpl, int nTplStep, *NppiSize* oTplRoiSize, *Npp8u* *pDst, int nDstStep, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Four-channel 8-bit unsigned image SqrDistanceValid_Norm ignoring alpha channel, scaled by $2^{(-nScaleFactor)}$.

For common parameter descriptions, see *Common parameters for nppiSqrDistanceFull functions include:*.

NppStatus **nppiSqrDistanceValid_Norm_32f_C1R_Ctx**(const *Npp32f* *pSrc, int nSrcStep, *NppiSize* oSrcRoiSize, const *Npp32f* *pTpl, int nTplStep, *NppiSize* oTplRoiSize, *Npp32f* *pDst, int nDstStep, *NppStreamContext* nppStreamCtx)

One-channel 32-bit floating point image SqrDistanceValid_Norm.

For common parameter descriptions, see *Common parameters for nppiSqrDistanceFull functions include:*.

NppStatus **nppiSqrDistanceValid_Norm_32f_C3R_Ctx**(const *Npp32f* *pSrc, int nSrcStep, *NppiSize* oSrcRoiSize, const *Npp32f* *pTpl, int nTplStep, *NppiSize* oTplRoiSize, *Npp32f* *pDst, int nDstStep, *NppStreamContext* nppStreamCtx)

Three-channel 32-bit floating point image SqrDistanceValid_Norm.

For common parameter descriptions, see *Common parameters for nppiSqrDistanceFull functions include:*.

NppStatus **nppiSqrDistanceValid_Norm_32f_C4R_Ctx**(const *Npp32f* *pSrc, int nSrcStep, *NppiSize* oSrcRoiSize, const *Npp32f* *pTpl, int nTplStep, *NppiSize* oTplRoiSize, *Npp32f* *pDst, int nDstStep, *NppStreamContext* nppStreamCtx)

Four-channel 32-bit floating point image SqrDistanceValid_Norm.

For common parameter descriptions, see *Common parameters for nppiSqrDistanceFull functions include:*.

NppStatus **nppiSqrDistanceValid_Norm_32f_AC4R_Ctx**(const *Npp32f* *pSrc, int nSrcStep, *NppiSize* oSrcRoiSize, const *Npp32f* *pTpl, int nTplStep, *NppiSize* oTplRoiSize, *Npp32f* *pDst, int nDstStep, *NppStreamContext* nppStreamCtx)

Four-channel 32-bit floating point image SqrDistanceValid_Norm ignoring alpha channel.

For common parameter descriptions, see *Common parameters for nppiSqrDistanceFull functions include:*.

NppStatus **nppiSqrDistanceValid_Norm_8u32f_C1R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *NppiSize* oSrcRoiSize, const *Npp8u* *pTpl, int nTplStep, *NppiSize* oTplRoiSize, *Npp32f* *pDst, int nDstStep, *NppStreamContext* nppStreamCtx)

One-channel 8-bit unsigned image SqrDistanceValid_Norm.

For common parameter descriptions, see *Common parameters for nppiSqrDistanceFull functions include:*.

NppStatus **nppiSqrDistanceValid_Norm_8u32f_C3R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *NppiSize* oSrcRoiSize, const *Npp8u* *pTpl, int nTplStep, *NppiSize* oTplRoiSize, *Npp32f* *pDst, int nDstStep, *NppStreamContext* nppStreamCtx)

Three-channel 8-bit unsigned image SqrDistanceValid_Norm.

For common parameter descriptions, see *Common parameters for nppiSqrDistanceFull functions include:*.

NppStatus **nppiSqrDistanceValid_Norm_8u32f_C4R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *NppiSize* oSrcRoiSize, const *Npp8u* *pTpl, int nTplStep, *NppiSize* oTplRoiSize, *Npp32f* *pDst, int nDstStep, *NppStreamContext* nppStreamCtx)

Four-channel 8-bit unsigned image SqrDistanceValid_Norm.

For common parameter descriptions, see *Common parameters for nppiSqrDistanceFull functions include:*.

NppStatus **nppiSqrDistanceValid_Norm_8u32f_AC4R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *NppiSize* oSrcRoiSize, const *Npp8u* *pTpl, int nTplStep, *NppiSize* oTplRoiSize, *Npp32f* *pDst, int nDstStep, *NppStreamContext* nppStreamCtx)

Four-channel 8-bit unsigned image SqrDistanceValid_Norm ignoring alpha channel.

For common parameter descriptions, see *Common parameters for nppiSqrDistanceFull functions include:*.

NppStatus **nppiSqrDistanceValid_Norm_8s32f_C1R_Ctx**(const *Npp8s* *pSrc, int nSrcStep, *NppiSize* oSrcRoiSize, const *Npp8s* *pTpl, int nTplStep, *NppiSize* oTplRoiSize, *Npp32f* *pDst, int nDstStep, *NppStreamContext* nppStreamCtx)

One-channel 8-bit signed image SqrDistanceValid_Norm.

For common parameter descriptions, see *Common parameters for nppiSqrDistanceFull functions include:*.

NppStatus **nppiSqrDistanceValid_Norm_8s32f_C3R_Ctx**(const *Npp8s* *pSrc, int nSrcStep, *NppiSize* oSrcRoiSize, const *Npp8s* *pTpl, int nTplStep, *NppiSize* oTplRoiSize, *Npp32f* *pDst, int nDstStep, *NppStreamContext* nppStreamCtx)

Three-channel 8-bit signed image SqrDistanceValid_Norm.

For common parameter descriptions, see *Common parameters for nppiSqrDistanceFull functions include:*.

NppStatus **nppiSqrDistanceValid_Norm_8s32f_C4R_Ctx**(const *Npp8s* *pSrc, int nSrcStep, *NppiSize* oSrcRoiSize, const *Npp8s* *pTpl, int nTplStep, *NppiSize* oTplRoiSize, *Npp32f* *pDst, int nDstStep, *NppStreamContext* nppStreamCtx)

Four-channel 8-bit signed image SqrDistanceValid_Norm.

For common parameter descriptions, see *Common parameters for nppiSqrDistanceFull functions include:*.

NppStatus **nppiSqrDistanceValid_Norm_8s32f_AC4R_Ctx**(const *Npp8s* *pSrc, int nSrcStep, *NppiSize* oSrcRoiSize, const *Npp8s* *pTpl, int nTplStep, *NppiSize* oTplRoiSize, *Npp32f* *pDst, int nDstStep, *NppStreamContext* nppStreamCtx)

Four-channel 8-bit signed image SqrDistanceValid_Norm ignoring alpha channel.

For common parameter descriptions, see *Common parameters for nppiSqrDistanceFull functions include:*.

NppStatus **nppiSqrDistanceValid_Norm_16u32f_C1R_Ctx**(const *Npp16u* *pSrc, int nSrcStep, *NppiSize* oSrcRoiSize, const *Npp16u* *pTpl, int nTplStep, *NppiSize* oTplRoiSize, *Npp32f* *pDst, int nDstStep, *NppStreamContext* nppStreamCtx)

One-channel 16-bit unsigned image SqrDistanceValid_Norm.

For common parameter descriptions, see *Common parameters for nppiSqrDistanceFull functions include:*.

NppStatus **nppiSqrDistanceValid_Norm_16u32f_C3R_Ctx**(const *Npp16u* *pSrc, int nSrcStep, *NppiSize* oSrcRoiSize, const *Npp16u* *pTpl, int nTplStep, *NppiSize* oTplRoiSize, *Npp32f* *pDst, int nDstStep, *NppStreamContext* nppStreamCtx)

Three-channel 16-bit unsigned image SqrDistanceValid_Norm.

For common parameter descriptions, see *Common parameters for nppiSqrDistanceFull functions include:*.

NppStatus **nppiSqrDistanceValid_Norm_16u32f_C4R_Ctx**(const *Npp16u* *pSrc, int nSrcStep, *NppiSize* oSrcRoiSize, const *Npp16u* *pTpl, int nTplStep, *NppiSize* oTplRoiSize, *Npp32f* *pDst, int nDstStep, *NppStreamContext* nppStreamCtx)

Four-channel 16-bit unsigned image SqrDistanceValid_Norm.

For common parameter descriptions, see *Common parameters for nppiSqrDistanceFull functions include:*.

NppStatus **nppiSqrDistanceValid_Norm_16u32f_AC4R_Ctx**(const *Npp16u* *pSrc, int nSrcStep, *NppiSize* oSrcRoiSize, const *Npp16u* *pTpl, int nTplStep, *NppiSize* oTplRoiSize, *Npp32f* *pDst, int nDstStep, *NppStreamContext* nppStreamCtx)

Four-channel 16-bit unsigned image SqrDistanceValid_Norm ignoring alpha channel.

For common parameter descriptions, see *Common parameters for nppiSqrDistanceFull functions include:*.

1.14.24. Image Cross Correlation Full Norm

1.14.24.1 CrossCorrFull_Norm

Primitives for computing the normalized cross correlation between two images with full mode.

CrossCorrFull_Norm

The functions compute the $\rho_{st}(c,r)$ in *General Introduction* with full mode (see *Categorizations*).

NppStatus **nppiCrossCorrFull_Norm_8u_C1RSfs_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *NppiSize* oSrcRoiSize, const *Npp8u* *pTpl, int nTplStep, *NppiSize* oTplRoiSize, *Npp8u* *pDst, int nDstStep, int nScaleFactor, *NppStreamContext* nppStreamCtx)

One-channel 8-bit unsigned image CrossCorrFull_Norm, scaled by $2^{(} - nScaleFactor)$.

For common parameter descriptions, see *Common parameters for nppiSqrDistanceFull functions include:*.

NppStatus **nppiCrossCorrFull_Norm_8u_C3RSfs_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *NppiSize* oSrcRoiSize, const *Npp8u* *pTpl, int nTplStep, *NppiSize* oTplRoiSize, *Npp8u* *pDst, int nDstStep, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Three-channel 8-bit unsigned image CrossCorrFull_Norm, scaled by $2^{(} - nScaleFactor)$.

For common parameter descriptions, see *Common parameters for nppiSqrDistanceFull functions include:*.

NppStatus **nppiCrossCorrFull_Norm_8u_C4RSfs_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *NppiSize* oSrcRoiSize, const *Npp8u* *pTpl, int nTplStep, *NppiSize* oTplRoiSize, *Npp8u* *pDst, int nDstStep, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Four-channel 8-bit unsigned image CrossCorrFull_Norm, scaled by $2^{(} - nScaleFactor)$.

For common parameter descriptions, see *Common parameters for nppiSqrDistanceFull functions include:*.

NppStatus **nppiCrossCorrFull_Norm_8u_AC4RSfs_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *NppiSize* oSrcRoiSize, const *Npp8u* *pTpl, int nTplStep, *NppiSize* oTplRoiSize, *Npp8u* *pDst, int nDstStep, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Four-channel 8-bit unsigned image CrossCorrFull_Norm ignoring alpha channel, scaled by $2^{(} - nScaleFactor)$.

For common parameter descriptions, see *Common parameters for nppiSqrDistanceFull functions include:*.

NppStatus **nppiCrossCorrFull_Norm_32f_C1R_Ctx**(const *Npp32f* *pSrc, int nSrcStep, *NppiSize* oSrcRoiSize, const *Npp32f* *pTpl, int nTplStep, *NppiSize* oTplRoiSize, *Npp32f* *pDst, int nDstStep, *NppStreamContext* nppStreamCtx)

One-channel 32-bit floating point image CrossCorrFull_Norm.

For common parameter descriptions, see *Common parameters for nppiSqrDistanceFull functions include:*.

NppStatus **nppiCrossCorrFull_Norm_32f_C3R_Ctx**(const *Npp32f* *pSrc, int nSrcStep, *NppiSize* oSrcRoiSize, const *Npp32f* *pTpl, int nTplStep, *NppiSize* oTplRoiSize, *Npp32f* *pDst, int nDstStep, *NppStreamContext* nppStreamCtx)

Three-channel 32-bit floating point image CrossCorrFull_Norm.

For common parameter descriptions, see *Common parameters for nppiSqrDistanceFull functions include:*.

NppStatus **nppiCrossCorrFull_Norm_32f_C4R_Ctx**(const *Npp32f* *pSrc, int nSrcStep, *NppiSize* oSrcRoiSize, const *Npp32f* *pTpl, int nTplStep, *NppiSize* oTplRoiSize, *Npp32f* *pDst, int nDstStep, *NppStreamContext* nppStreamCtx)

Four-channel 32-bit floating point image CrossCorrFull_Norm.

For common parameter descriptions, see *Common parameters for nppiSqrDistanceFull functions include:*.

NppStatus **nppiCrossCorrFull_Norm_32f_AC4R_Ctx**(const *Npp32f* *pSrc, int nSrcStep, *NppiSize* oSrcRoiSize, const *Npp32f* *pTpl, int nTplStep, *NppiSize* oTplRoiSize, *Npp32f* *pDst, int nDstStep, *NppStreamContext* nppStreamCtx)

Four-channel 32-bit floating point image CrossCorrFull_Norm ignoring alpha channel.

For common parameter descriptions, see *Common parameters for nppiSqrDistanceFull functions include:*.

NppStatus **nppiCrossCorrFull_Norm_64f_C1R_Ctx**(const *Npp64f* *pSrc, int nSrcStep, *NppiSize* oSrcRoiSize, const *Npp64f* *pTpl, int nTplStep, *NppiSize* oTplRoiSize, *Npp64f* *pDst, int nDstStep, *NppStreamContext* nppStreamCtx)

One-channel 64-bit floating point image CrossCorrFull_Norm.

For common parameter descriptions, see *Common parameters for nppiSqrDistanceFull functions include:*.

NppStatus **nppiCrossCorrFull_Norm_64f_C3R_Ctx**(const *Npp64f* *pSrc, int nSrcStep, *NppiSize* oSrcRoiSize, const *Npp64f* *pTpl, int nTplStep, *NppiSize* oTplRoiSize, *Npp64f* *pDst, int nDstStep, *NppStreamContext* nppStreamCtx)

Three-channel 64-bit floating point image CrossCorrFull_Norm.

For common parameter descriptions, see *Common parameters for nppiSqrDistanceFull functions include:*.

NppStatus **nppiCrossCorrFull_Norm_64f_C4R_Ctx**(const *Npp64f* *pSrc, int nSrcStep, *NppiSize* oSrcRoiSize, const *Npp64f* *pTpl, int nTplStep, *NppiSize* oTplRoiSize, *Npp64f* *pDst, int nDstStep, *NppStreamContext* nppStreamCtx)

Four-channel 64-bit floating point image CrossCorrFull_Norm.

For common parameter descriptions, see *Common parameters for nppiSqrDistanceFull functions include:*.

NppStatus **nppiCrossCorrFull_Norm_64f_AC4R_Ctx**(const *Npp64f* *pSrc, int nSrcStep, *NppiSize* oSrcRoiSize, const *Npp64f* *pTpl, int nTplStep, *NppiSize* oTplRoiSize, *Npp64f* *pDst, int nDstStep, *NppStreamContext* nppStreamCtx)

Four-channel 64-bit floating point image CrossCorrFull_Norm ignoring alpha channel.

For common parameter descriptions, see *Common parameters for nppiSqrDistanceFull functions include:*.

NppStatus **nppiCrossCorrFull_Norm_8u32f_C1R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *NppiSize* oSrcRoiSize, const *Npp8u* *pTpl, int nTplStep, *NppiSize* oTplRoiSize, *Npp32f* *pDst, int nDstStep, *NppStreamContext* nppStreamCtx)

One-channel 8-bit unsigned image CrossCorrFull_Norm.

For common parameter descriptions, see *Common parameters for nppiSqrDistanceFull functions include:*.

NppStatus **nppiCrossCorrFull_Norm_8u32f_C3R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *NppiSize* oSrcRoiSize, const *Npp8u* *pTpl, int nTplStep, *NppiSize* oTplRoiSize, *Npp32f* *pDst, int nDstStep, *NppStreamContext* nppStreamCtx)

Three-channel 8-bit unsigned image CrossCorrFull_Norm.

For common parameter descriptions, see *Common parameters for nppiSqrDistanceFull functions include:*.

NppStatus **nppiCrossCorrFull_Norm_8u32f_C4R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *NppiSize* oSrcRoiSize, const *Npp8u* *pTpl, int nTplStep, *NppiSize* oTplRoiSize, *Npp32f* *pDst, int nDstStep, *NppStreamContext* nppStreamCtx)

Four-channel 8-bit unsigned image CrossCorrFull_Norm.

For common parameter descriptions, see *Common parameters for nppiSqrDistanceFull functions include:*.

NppStatus **nppiCrossCorrFull_Norm_8u32f_AC4R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *NppiSize* oSrcRoiSize, const *Npp8u* *pTpl, int nTplStep, *NppiSize* oTplRoiSize, *Npp32f* *pDst, int nDstStep, *NppStreamContext* nppStreamCtx)

Four-channel 8-bit unsigned image CrossCorrFull_Norm ignoring alpha channel.

For common parameter descriptions, see *Common parameters for nppiSqrDistanceFull functions include:*.

NppStatus **nppiCrossCorrFull_Norm_8s32f_C1R_Ctx**(const *Npp8s* *pSrc, int nSrcStep, *NppiSize* oSrcRoiSize, const *Npp8s* *pTpl, int nTplStep, *NppiSize* oTplRoiSize, *Npp32f* *pDst, int nDstStep, *NppStreamContext* nppStreamCtx)

One-channel 8-bit signed image CrossCorrFull_Norm.

For common parameter descriptions, see *Common parameters for nppiSqrDistanceFull functions include:*.

NppStatus **nppiCrossCorrFull_Norm_8s32f_C3R_Ctx**(const *Npp8s* *pSrc, int nSrcStep, *NppiSize* oSrcRoiSize, const *Npp8s* *pTpl, int nTplStep, *NppiSize* oTplRoiSize, *Npp32f* *pDst, int nDstStep, *NppStreamContext* nppStreamCtx)

Three-channel 8-bit signed image CrossCorrFull_Norm.

For common parameter descriptions, see *Common parameters for nppiSqrDistanceFull functions include:*.

NppStatus **nppiCrossCorrFull_Norm_8s32f_C4R_Ctx**(const *Npp8s* *pSrc, int nSrcStep, *NppiSize* oSrcRoiSize, const *Npp8s* *pTpl, int nTplStep, *NppiSize* oTplRoiSize, *Npp32f* *pDst, int nDstStep, *NppStreamContext* nppStreamCtx)

Four-channel 8-bit signed image CrossCorrFull_Norm.

For common parameter descriptions, see *Common parameters for nppiSqrDistanceFull functions include:*.

NppStatus **nppiCrossCorrFull_Norm_8s32f_AC4R_Ctx**(const *Npp8s* *pSrc, int nSrcStep, *NppiSize* oSrcRoiSize, const *Npp8s* *pTpl, int nTplStep, *NppiSize* oTplRoiSize, *Npp32f* *pDst, int nDstStep, *NppStreamContext* nppStreamCtx)

Four-channel 8-bit signed image CrossCorrFull_Norm ignoring alpha channel.

For common parameter descriptions, see *Common parameters for nppiSqrDistanceFull functions include:*.

NppStatus **nppiCrossCorrFull_Norm_16u32f_C1R_Ctx**(const *Npp16u* *pSrc, int nSrcStep, *NppiSize* oSrcRoiSize, const *Npp16u* *pTpl, int nTplStep, *NppiSize* oTplRoiSize, *Npp32f* *pDst, int nDstStep, *NppStreamContext* nppStreamCtx)

One-channel 16-bit unsigned image CrossCorrFull_Norm.

For common parameter descriptions, see *Common parameters for nppiSqrDistanceFull functions include:*.

NppStatus **nppiCrossCorrFull_Norm_16u32f_C3R_Ctx**(const *Npp16u* *pSrc, int nSrcStep, *NppiSize* oSrcRoiSize, const *Npp16u* *pTpl, int nTplStep, *NppiSize* oTplRoiSize, *Npp32f* *pDst, int nDstStep, *NppStreamContext* nppStreamCtx)

Three-channel 16-bit unsigned image CrossCorrFull_Norm.

For common parameter descriptions, see *Common parameters for nppiSqrDistanceFull functions include:*.

NppStatus **nppiCrossCorrFull_Norm_16u32f_C4R_Ctx**(const *Npp16u* *pSrc, int nSrcStep, *NppiSize* oSrcRoiSize, const *Npp16u* *pTpl, int nTplStep, *NppiSize* oTplRoiSize, *Npp32f* *pDst, int nDstStep, *NppStreamContext* nppStreamCtx)

Four-channel 16-bit unsigned image CrossCorrFull_Norm.

For common parameter descriptions, see *Common parameters for nppiSqrDistanceFull functions include:*.

NppStatus **nppiCrossCorrFull_Norm_16u32f_AC4R_Ctx**(const *Npp16u* *pSrc, int nSrcStep, *NppiSize* oSrcRoiSize, const *Npp16u* *pTpl, int nTplStep, *NppiSize* oTplRoiSize, *Npp32f* *pDst, int nDstStep, *NppStreamContext* nppStreamCtx)

Four-channel 16-bit unsigned image CrossCorrFull_Norm ignoring alpha channel.

For common parameter descriptions, see *Common parameters for nppiSqrDistanceFull functions include:*.

1.14.25. Image Cross Correlation Same Norm

1.14.25.1 CrossCorrSame_Norm

Primitives for computing the normalized cross correlation between two images with same mode.

CrossCorrSame_Norm

The functions compute the $\rho_{st}(c, r)$ in *General Introduction* with same mode (see *Categorizations*).

NppStatus **nppiCrossCorrSame_Norm_8u_C1RSfs_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *NppiSize* oSrcRoiSize, const *Npp8u* *pTpl, int nTplStep, *NppiSize* oTplRoiSize, *Npp8u* *pDst, int nDstStep, int nScaleFactor, *NppStreamContext* nppStreamCtx)

One-channel 8-bit unsigned image CrossCorrSame_Norm, scaled by $2^{(} - nScaleFactor)$.

For common parameter descriptions, see *Common parameters for nppiSqrDistanceFull functions include:*.

NppStatus **nppiCrossCorrSame_Norm_8u_C3RSfs_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *NppiSize* oSrcRoiSize, const *Npp8u* *pTpl, int nTplStep, *NppiSize* oTplRoiSize, *Npp8u* *pDst, int nDstStep, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Three-channel 8-bit unsigned image CrossCorrSame_Norm, scaled by $2^{(} - nScaleFactor)$.

For common parameter descriptions, see *Common parameters for nppiSqrDistanceFull functions include:*.

NppStatus **nppiCrossCorrSame_Norm_8u_C4RSfs_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *NppiSize* oSrcRoiSize, const *Npp8u* *pTpl, int nTplStep, *NppiSize* oTplRoiSize, *Npp8u* *pDst, int nDstStep, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Four-channel 8-bit unsigned image CrossCorrSame_Norm, scaled by $2^{(} - nScaleFactor)$.

For common parameter descriptions, see *Common parameters for nppiSqrDistanceFull functions include:*.

NppStatus **nppiCrossCorrSame_Norm_8u_AC4RSfs_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *NppiSize* oSrcRoiSize, const *Npp8u* *pTpl, int nTplStep, *NppiSize* oTplRoiSize, *Npp8u* *pDst, int nDstStep, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Four-channel 8-bit unsigned image CrossCorrSame_Norm ignoring alpha channel, scaled by $2^{(} - nScaleFactor)$.

For common parameter descriptions, see *Common parameters for nppiSqrDistanceFull functions include:*.

NppStatus **nppiCrossCorrSame_Norm_32f_C1R_Ctx**(const *Npp32f* *pSrc, int nSrcStep, *NppiSize* oSrcRoiSize, const *Npp32f* *pTpl, int nTplStep, *NppiSize* oTplRoiSize, *Npp32f* *pDst, int nDstStep, *NppStreamContext* nppStreamCtx)

One-channel 32-bit floating point image CrossCorrSame_Norm.

For common parameter descriptions, see *Common parameters for nppiSqrDistanceFull functions include:*.

NppStatus **nppiCrossCorrSame_Norm_32f_C3R_Ctx**(const *Npp32f* *pSrc, int nSrcStep, *NppiSize* oSrcRoiSize, const *Npp32f* *pTpl, int nTplStep, *NppiSize* oTplRoiSize, *Npp32f* *pDst, int nDstStep, *NppStreamContext* nppStreamCtx)

Three-channel 32-bit floating point image CrossCorrSame_Norm.

For common parameter descriptions, see *Common parameters for nppiSqrDistanceFull functions include:*.

NppStatus **nppiCrossCorrSame_Norm_32f_C4R_Ctx**(const *Npp32f* *pSrc, int nSrcStep, *NppiSize* oSrcRoiSize, const *Npp32f* *pTpl, int nTplStep, *NppiSize* oTplRoiSize, *Npp32f* *pDst, int nDstStep, *NppStreamContext* nppStreamCtx)

Four-channel 32-bit floating point image CrossCorrSame_Norm.

For common parameter descriptions, see *Common parameters for nppiSqrDistanceFull functions include:*.

NppStatus **nppiCrossCorrSame_Norm_32f_AC4R_Ctx**(const *Npp32f* *pSrc, int nSrcStep, *NppiSize* oSrcRoiSize, const *Npp32f* *pTpl, int nTplStep, *NppiSize* oTplRoiSize, *Npp32f* *pDst, int nDstStep, *NppStreamContext* nppStreamCtx)

Four-channel 32-bit floating point image CrossCorrSame_Norm ignoring alpha channel.

For common parameter descriptions, see *Common parameters for nppiSqrDistanceFull functions include:*.

NppStatus **nppiCrossCorrSame_Norm_64f_C1R_Ctx**(const *Npp64f* *pSrc, int nSrcStep, *NppiSize* oSrcRoiSize, const *Npp64f* *pTpl, int nTplStep, *NppiSize* oTplRoiSize, *Npp64f* *pDst, int nDstStep, *NppStreamContext* nppStreamCtx)

One-channel 64-bit floating point image CrossCorrSame_Norm.

For common parameter descriptions, see *Common parameters for nppiSqrDistanceFull functions include:*.

NppStatus **nppiCrossCorrSame_Norm_64f_C3R_Ctx**(const *Npp64f* *pSrc, int nSrcStep, *NppiSize* oSrcRoiSize, const *Npp64f* *pTpl, int nTplStep, *NppiSize* oTplRoiSize, *Npp64f* *pDst, int nDstStep, *NppStreamContext* nppStreamCtx)

Three-channel 64-bit floating point image CrossCorrSame_Norm.

For common parameter descriptions, see *Common parameters for nppiSqrDistanceFull functions include:*.

NppStatus **nppiCrossCorrSame_Norm_64f_C4R_Ctx**(const *Npp64f* *pSrc, int nSrcStep, *NppiSize* oSrcRoiSize, const *Npp64f* *pTpl, int nTplStep, *NppiSize* oTplRoiSize, *Npp64f* *pDst, int nDstStep, *NppStreamContext* nppStreamCtx)

Four-channel 64-bit floating point image CrossCorrSame_Norm.

For common parameter descriptions, see *Common parameters for nppiSqrDistanceFull functions include:*.

NppStatus **nppiCrossCorrSame_Norm_64f_AC4R_Ctx**(const *Npp64f* *pSrc, int nSrcStep, *NppiSize* oSrcRoiSize, const *Npp64f* *pTpl, int nTplStep, *NppiSize* oTplRoiSize, *Npp64f* *pDst, int nDstStep, *NppStreamContext* nppStreamCtx)

Four-channel 64-bit floating point image CrossCorrSame_Norm ignoring alpha channel.

For common parameter descriptions, see *Common parameters for nppiSqrDistanceFull functions include:*.

NppStatus **nppiCrossCorrSame_Norm_8u32f_C1R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *NppiSize* oSrcRoiSize, const *Npp8u* *pTpl, int nTplStep, *NppiSize* oTplRoiSize, *Npp32f* *pDst, int nDstStep, *NppStreamContext* nppStreamCtx)

One-channel 8-bit unsigned image CrossCorrSame_Norm.

For common parameter descriptions, see *Common parameters for nppiSqrDistanceFull functions include:*.

NppStatus **nppiCrossCorrSame_Norm_8u32f_C3R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *NppiSize* oSrcRoiSize, const *Npp8u* *pTpl, int nTplStep, *NppiSize* oTplRoiSize, *Npp32f* *pDst, int nDstStep, *NppStreamContext* nppStreamCtx)

Three-channel 8-bit unsigned image CrossCorrSame_Norm.

For common parameter descriptions, see *Common parameters for nppiSqrDistanceFull functions include:*.

NppStatus **nppiCrossCorrSame_Norm_8u32f_C4R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *NppiSize* oSrcRoiSize, const *Npp8u* *pTpl, int nTplStep, *NppiSize* oTplRoiSize, *Npp32f* *pDst, int nDstStep, *NppStreamContext* nppStreamCtx)

Four-channel 8-bit unsigned image CrossCorrSame_Norm.

For common parameter descriptions, see *Common parameters for nppiSqrDistanceFull functions include:*.

NppStatus **nppiCrossCorrSame_Norm_8u32f_AC4R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *NppiSize* oSrcRoiSize, const *Npp8u* *pTpl, int nTplStep, *NppiSize* oTplRoiSize, *Npp32f* *pDst, int nDstStep, *NppStreamContext* nppStreamCtx)

Four-channel 8-bit unsigned image CrossCorrSame_Norm ignoring alpha channel.

For common parameter descriptions, see *Common parameters for nppiSqrDistanceFull functions include:*.

NppStatus **nppiCrossCorrSame_Norm_8s32f_C1R_Ctx**(const *Npp8s* *pSrc, int nSrcStep, *NppiSize* oSrcRoiSize, const *Npp8s* *pTpl, int nTplStep, *NppiSize* oTplRoiSize, *Npp32f* *pDst, int nDstStep, *NppStreamContext* nppStreamCtx)

One-channel 8-bit signed image CrossCorrSame_Norm.

For common parameter descriptions, see *Common parameters for nppiSqrDistanceFull functions include:*.

NppStatus **nppiCrossCorrSame_Norm_8s32f_C3R_Ctx**(const *Npp8s* *pSrc, int nSrcStep, *NppiSize* oSrcRoiSize, const *Npp8s* *pTpl, int nTplStep, *NppiSize* oTplRoiSize, *Npp32f* *pDst, int nDstStep, *NppStreamContext* nppStreamCtx)

Three-channel 8-bit signed image CrossCorrSame_Norm.

For common parameter descriptions, see *Common parameters for nppiSqrDistanceFull functions include:*.

NppStatus **nppiCrossCorrSame_Norm_8s32f_C4R_Ctx**(const *Npp8s* *pSrc, int nSrcStep, *NppiSize* oSrcRoiSize, const *Npp8s* *pTpl, int nTplStep, *NppiSize* oTplRoiSize, *Npp32f* *pDst, int nDstStep, *NppStreamContext* nppStreamCtx)

Four-channel 8-bit signed image CrossCorrSame_Norm.

For common parameter descriptions, see *Common parameters for nppiSqrDistanceFull functions include:*.

NppStatus **nppiCrossCorrSame_Norm_8s32f_AC4R_Ctx**(const *Npp8s* *pSrc, int nSrcStep, *NppiSize* oSrcRoiSize, const *Npp8s* *pTpl, int nTplStep, *NppiSize* oTplRoiSize, *Npp32f* *pDst, int nDstStep, *NppStreamContext* nppStreamCtx)

Four-channel 8-bit signed image CrossCorrSame_Norm ignoring alpha channel.

For common parameter descriptions, see *Common parameters for nppiSqrDistanceFull functions include:*.

NppStatus **nppiCrossCorrSame_Norm_16u32f_C1R_Ctx**(const *Npp16u* *pSrc, int nSrcStep, *NppiSize* oSrcRoiSize, const *Npp16u* *pTpl, int nTplStep, *NppiSize* oTplRoiSize, *Npp32f* *pDst, int nDstStep, *NppStreamContext* nppStreamCtx)

One-channel 16-bit unsigned image CrossCorrSame_Norm.

For common parameter descriptions, see *Common parameters for nppiSqrDistanceFull functions include:*.

NppStatus **nppiCrossCorrSame_Norm_16u32f_C3R_Ctx**(const *Npp16u* *pSrc, int nSrcStep, *NppiSize* oSrcRoiSize, const *Npp16u* *pTpl, int nTplStep, *NppiSize* oTplRoiSize, *Npp32f* *pDst, int nDstStep, *NppStreamContext* nppStreamCtx)

Three-channel 16-bit unsigned image CrossCorrSame_Norm.

For common parameter descriptions, see *Common parameters for nppiSqrDistanceFull functions include:*.

NppStatus **nppiCrossCorrSame_Norm_16u32f_C4R_Ctx**(const *Npp16u* *pSrc, int nSrcStep, *NppiSize* oSrcRoiSize, const *Npp16u* *pTpl, int nTplStep, *NppiSize* oTplRoiSize, *Npp32f* *pDst, int nDstStep, *NppStreamContext* nppStreamCtx)

Four-channel 16-bit unsigned image CrossCorrSame_Norm.

For common parameter descriptions, see *Common parameters for nppiSqrDistanceFull functions include:*.

NppStatus **nppiCrossCorrSame_Norm_16u32f_AC4R_Ctx**(const *Npp16u* *pSrc, int nSrcStep, *NppiSize* oSrcRoiSize, const *Npp16u* *pTpl, int nTplStep, *NppiSize* oTplRoiSize, *Npp32f* *pDst, int nDstStep, *NppStreamContext* nppStreamCtx)

Four-channel 16-bit unsigned image CrossCorrSame_Norm ignoring alpha channel.

For common parameter descriptions, see *Common parameters for nppiSqrDistanceFull functions include:*.

1.14.26. Image Cross Correlation Valid Norm

1.14.26.1 CrossCorrValid_Norm

Primitives for computing the normalized cross correlation between two images with valid mode.

CrossCorrValid_Norm

The functions compute the $\rho_{st}(c,r)$ in *General Introduction* with valid mode (see *Categorizations*).

NppStatus **nppiCrossCorrValid_Norm_8u_C1RSfs_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *NppiSize* oSrcRoiSize, const *Npp8u* *pTpl, int nTplStep, *NppiSize* oTplRoiSize, *Npp8u* *pDst, int nDstStep, int nScaleFactor, *NppStreamContext* nppStreamCtx)

One-channel 8-bit unsigned image CrossCorrValid_Norm, scaled by $2^{(}-nScaleFactor)$.

For common parameter descriptions, see *Common parameters for nppiSqrDistanceFull functions include:*.

NppStatus **nppiCrossCorrValid_Norm_8u_C3RSfs_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *NppiSize* oSrcRoiSize, const *Npp8u* *pTpl, int nTplStep, *NppiSize* oTplRoiSize, *Npp8u* *pDst, int nDstStep, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Three-channel 8-bit unsigned image CrossCorrValid_Norm, scaled by $2^{(} - nScaleFactor)$.

For common parameter descriptions, see *Common parameters for nppiSqrDistanceFull functions include:*.

NppStatus **nppiCrossCorrValid_Norm_8u_C4RSfs_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *NppiSize* oSrcRoiSize, const *Npp8u* *pTpl, int nTplStep, *NppiSize* oTplRoiSize, *Npp8u* *pDst, int nDstStep, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Four-channel 8-bit unsigned image CrossCorrValid_Norm, scaled by $2^{(} - nScaleFactor)$.

For common parameter descriptions, see *Common parameters for nppiSqrDistanceFull functions include:*.

NppStatus **nppiCrossCorrValid_Norm_8u_AC4RSfs_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *NppiSize* oSrcRoiSize, const *Npp8u* *pTpl, int nTplStep, *NppiSize* oTplRoiSize, *Npp8u* *pDst, int nDstStep, int nScaleFactor, *NppStreamContext* nppStreamCtx)

Four-channel 8-bit unsigned image CrossCorrValid_Norm ignoring alpha channel, scaled by $2^{(} - nScaleFactor)$.

For common parameter descriptions, see *Common parameters for nppiSqrDistanceFull functions include:*.

NppStatus **nppiCrossCorrValid_Norm_32f_C1R_Ctx**(const *Npp32f* *pSrc, int nSrcStep, *NppiSize* oSrcRoiSize, const *Npp32f* *pTpl, int nTplStep, *NppiSize* oTplRoiSize, *Npp32f* *pDst, int nDstStep, *NppStreamContext* nppStreamCtx)

One-channel 32-bit floating point image CrossCorrValid_Norm.

For common parameter descriptions, see *Common parameters for nppiSqrDistanceFull functions include:*.

NppStatus **nppiCrossCorrValid_Norm_32f_C3R_Ctx**(const *Npp32f* *pSrc, int nSrcStep, *NppiSize* oSrcRoiSize, const *Npp32f* *pTpl, int nTplStep, *NppiSize* oTplRoiSize, *Npp32f* *pDst, int nDstStep, *NppStreamContext* nppStreamCtx)

Three-channel 32-bit floating point image CrossCorrValid_Norm.

For common parameter descriptions, see *Common parameters for nppiSqrDistanceFull functions include:*.

NppStatus **nppiCrossCorrValid_Norm_32f_C4R_Ctx**(const *Npp32f* *pSrc, int nSrcStep, *NppiSize* oSrcRoiSize, const *Npp32f* *pTpl, int nTplStep, *NppiSize* oTplRoiSize, *Npp32f* *pDst, int nDstStep, *NppStreamContext* nppStreamCtx)

Four-channel 32-bit floating point image CrossCorrValid_Norm.

For common parameter descriptions, see *Common parameters for nppiSqrDistanceFull functions include:*.

NppStatus **nppiCrossCorrValid_Norm_32f_AC4R_Ctx**(const *Npp32f* *pSrc, int nSrcStep, *NppiSize* oSrcRoiSize, const *Npp32f* *pTpl, int nTplStep, *NppiSize* oTplRoiSize, *Npp32f* *pDst, int nDstStep, *NppStreamContext* nppStreamCtx)

Four-channel 32-bit floating point image CrossCorrValid_Norm ignoring alpha channel.

For common parameter descriptions, see *Common parameters for nppiSqrDistanceFull functions include:*.

NppStatus **nppiCrossCorrValid_Norm_64f_C1R_Ctx**(const *Npp64f* *pSrc, int nSrcStep, *NppiSize* oSrcRoiSize, const *Npp64f* *pTpl, int nTplStep, *NppiSize* oTplRoiSize, *Npp64f* *pDst, int nDstStep, *NppStreamContext* nppStreamCtx)

One-channel 64-bit floating point image CrossCorrValid_Norm.

For common parameter descriptions, see *Common parameters for nppiSqrDistanceFull functions include:*.

NppStatus **nppiCrossCorrValid_Norm_64f_C3R_Ctx**(const *Npp64f* *pSrc, int nSrcStep, *NppiSize* oSrcRoiSize, const *Npp64f* *pTpl, int nTplStep, *NppiSize* oTplRoiSize, *Npp64f* *pDst, int nDstStep, *NppStreamContext* nppStreamCtx)

Three-channel 64-bit floating point image CrossCorrValid_Norm.

For common parameter descriptions, see *Common parameters for nppiSqrDistanceFull functions include:*.

NppStatus **nppiCrossCorrValid_Norm_64f_C4R_Ctx**(const *Npp64f* *pSrc, int nSrcStep, *NppiSize* oSrcRoiSize, const *Npp64f* *pTpl, int nTplStep, *NppiSize* oTplRoiSize, *Npp64f* *pDst, int nDstStep, *NppStreamContext* nppStreamCtx)

Four-channel 64-bit floating point image CrossCorrValid_Norm.

For common parameter descriptions, see *Common parameters for nppiSqrDistanceFull functions include:*.

NppStatus **nppiCrossCorrValid_Norm_64f_AC4R_Ctx**(const *Npp64f* *pSrc, int nSrcStep, *NppiSize* oSrcRoiSize, const *Npp64f* *pTpl, int nTplStep, *NppiSize* oTplRoiSize, *Npp64f* *pDst, int nDstStep, *NppStreamContext* nppStreamCtx)

Four-channel 64-bit floating point image CrossCorrValid_Norm ignoring alpha channel.

For common parameter descriptions, see *Common parameters for nppiSqrDistanceFull functions include:*.

NppStatus **nppiCrossCorrValid_Norm_8u32f_C1R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *NppiSize* oSrcRoiSize, const *Npp8u* *pTpl, int nTplStep, *NppiSize* oTplRoiSize, *Npp32f* *pDst, int nDstStep, *NppStreamContext* nppStreamCtx)

One-channel 8-bit unsigned image CrossCorrValid_Norm.

For common parameter descriptions, see *Common parameters for nppiSqrDistanceFull functions include:*.

NppStatus **nppiCrossCorrValid_Norm_8u32f_C3R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *NppiSize* oSrcRoiSize, const *Npp8u* *pTpl, int nTplStep, *NppiSize* oTplRoiSize, *Npp32f* *pDst, int nDstStep, *NppStreamContext* nppStreamCtx)

Three-channel 8-bit unsigned image CrossCorrValid_Norm.

For common parameter descriptions, see *Common parameters for nppiSqrDistanceFull functions include:*.

NppStatus **nppiCrossCorrValid_Norm_8u32f_C4R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *NppiSize* oSrcRoiSize, const *Npp8u* *pTpl, int nTplStep, *NppiSize* oTplRoiSize, *Npp32f* *pDst, int nDstStep, *NppStreamContext* nppStreamCtx)

Four-channel 8-bit unsigned image CrossCorrValid_Norm.

For common parameter descriptions, see *Common parameters for nppiSqrDistanceFull functions include:*.

NppStatus **nppiCrossCorrValid_Norm_8u32f_AC4R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *NppiSize* oSrcRoiSize, const *Npp8u* *pTpl, int nTplStep, *NppiSize* oTplRoiSize, *Npp32f* *pDst, int nDstStep, *NppStreamContext* nppStreamCtx)

Four-channel 8-bit unsigned image CrossCorrValid_Norm ignoring alpha channel.

For common parameter descriptions, see *Common parameters for nppiSqrDistanceFull functions include:*.

NppStatus **nppiCrossCorrValid_Norm_8s32f_C1R_Ctx**(const *Npp8s* *pSrc, int nSrcStep, *NppiSize* oSrcRoiSize, const *Npp8s* *pTpl, int nTplStep, *NppiSize* oTplRoiSize, *Npp32f* *pDst, int nDstStep, *NppStreamContext* nppStreamCtx)

One-channel 8-bit signed image CrossCorrValid_Norm.

For common parameter descriptions, see *Common parameters for nppiSqrDistanceFull functions include:*.

NppStatus **nppiCrossCorrValid_Norm_8s32f_C3R_Ctx**(const *Npp8s* *pSrc, int nSrcStep, *NppiSize* oSrcRoiSize, const *Npp8s* *pTpl, int nTplStep, *NppiSize* oTplRoiSize, *Npp32f* *pDst, int nDstStep, *NppStreamContext* nppStreamCtx)

Three-channel 8-bit signed image CrossCorrValid_Norm.

For common parameter descriptions, see *Common parameters for nppiSqrDistanceFull functions include:*.

NppStatus **nppiCrossCorrValid_Norm_8s32f_C4R_Ctx**(const *Npp8s* *pSrc, int nSrcStep, *NppiSize* oSrcRoiSize, const *Npp8s* *pTpl, int nTplStep, *NppiSize* oTplRoiSize, *Npp32f* *pDst, int nDstStep, *NppStreamContext* nppStreamCtx)

Four-channel 8-bit signed image CrossCorrValid_Norm.

For common parameter descriptions, see *Common parameters for nppiSqrDistanceFull functions include:*.

NppStatus **nppiCrossCorrValid_Norm_8s32f_AC4R_Ctx**(const *Npp8s* *pSrc, int nSrcStep, *NppiSize* oSrcRoiSize, const *Npp8s* *pTpl, int nTplStep, *NppiSize* oTplRoiSize, *Npp32f* *pDst, int nDstStep, *NppStreamContext* nppStreamCtx)

Four-channel 8-bit signed image CrossCorrValid_Norm ignoring alpha channel.

For common parameter descriptions, see *Common parameters for nppiSqrDistanceFull functions include:*.

NppStatus **nppiCrossCorrValid_Norm_16u32f_C1R_Ctx**(const *Npp16u* *pSrc, int nSrcStep, *NppiSize* oSrcRoiSize, const *Npp16u* *pTpl, int nTplStep, *NppiSize* oTplRoiSize, *Npp32f* *pDst, int nDstStep, *NppStreamContext* nppStreamCtx)

One-channel 16-bit unsigned image CrossCorrValid_Norm.

For common parameter descriptions, see *Common parameters for nppiSqrDistanceFull functions include:*.

NppStatus **nppiCrossCorrValid_Norm_16u32f_C3R_Ctx**(const *Npp16u* *pSrc, int nSrcStep, *NppiSize* oSrcRoiSize, const *Npp16u* *pTpl, int nTplStep, *NppiSize* oTplRoiSize, *Npp32f* *pDst, int nDstStep, *NppStreamContext* nppStreamCtx)

Three-channel 16-bit unsigned image CrossCorrValid_Norm.

For common parameter descriptions, see *Common parameters for nppiSqrDistanceFull functions include:*.

NppStatus **nppiCrossCorrValid_Norm_16u32f_C4R_Ctx**(const *Npp16u* *pSrc, int nSrcStep, *NppiSize* oSrcRoiSize, const *Npp16u* *pTpl, int nTplStep, *NppiSize* oTplRoiSize, *Npp32f* *pDst, int nDstStep, *NppStreamContext* nppStreamCtx)

Four-channel 16-bit unsigned image CrossCorrValid_Norm.

For common parameter descriptions, see *Common parameters for nppiSqrDistanceFull functions include:*.

NppStatus **nppiCrossCorrValid_Norm_16u32f_AC4R_Ctx**(const *Npp16u* *pSrc, int nSrcStep, *NppiSize* oSrcRoiSize, const *Npp16u* *pTpl, int nTplStep, *NppiSize* oTplRoiSize, *Npp32f* *pDst, int nDstStep, *NppStreamContext* nppStreamCtx)

Four-channel 16-bit unsigned image CrossCorrValid_Norm ignoring alpha channel.

For common parameter descriptions, see *Common parameters for nppiSqrDistanceFull functions include:*.

1.14.27. Image Cross Correlation Valid

1.14.27.1 CrossCorrValid

Primitives for computing the cross correlation between two images with valid mode.

CrossCorrValid

The functions compute the $R_{st}(c,r)$ in *General Introduction* with valid mode (see *Categorizations*).

NppStatus **nppiCrossCorrValid_32f_C1R_Ctx**(const *Npp32f* *pSrc, int nSrcStep, *NppiSize* oSrcRoiSize, const *Npp32f* *pTpl, int nTplStep, *NppiSize* oTplRoiSize, *Npp32f* *pDst, int nDstStep, *NppStreamContext* nppStreamCtx)

One-channel 32-bit floating point images CrossCorrValid.

For common parameter descriptions, see *Common parameters for nppiSqrDistanceFull functions include:*.

NppStatus **nppiCrossCorrValid_64f_C1R_Ctx**(const *Npp64f* *pSrc, int nSrcStep, *NppiSize* oSrcRoiSize, const *Npp64f* *pTpl, int nTplStep, *NppiSize* oTplRoiSize, *Npp64f* *pDst, int nDstStep, *NppStreamContext* nppStreamCtx)

One-channel 64-bit floating point images CrossCorrValid.

For common parameter descriptions, see *Common parameters for nppiSqrDistanceFull functions include:*.

NppStatus **nppiCrossCorrValid_8u32f_C1R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *NppiSize* oSrcRoiSize, const *Npp8u* *pTpl, int nTplStep, *NppiSize* oTplRoiSize, *Npp32f* *pDst, int nDstStep, *NppStreamContext* nppStreamCtx)

One-channel 8-bit unsigned images CrossCorrValid.

For common parameter descriptions, see *Common parameters for nppiSqrDistanceFull functions include:*.

NppStatus **nppiCrossCorrValid_8s32f_C1R_Ctx**(const *Npp8s* *pSrc, int nSrcStep, *NppiSize* oSrcRoiSize, const *Npp8s* *pTpl, int nTplStep, *NppiSize* oTplRoiSize, *Npp32f* *pDst, int nDstStep, *NppStreamContext* nppStreamCtx)

One-channel 8-bit signed images CrossCorrValid.

For common parameter descriptions, see *Common parameters for nppiSqrDistanceFull functions include:*.

NppStatus **nppiCrossCorrValid_16u32f_C1R_Ctx**(const *Npp16u* *pSrc, int nSrcStep, *NppiSize* oSrcRoiSize, const *Npp16u* *pTpl, int nTplStep, *NppiSize* oTplRoiSize, *Npp32f* *pDst, int nDstStep, *NppStreamContext* nppStreamCtx)

One-channel 16-bit unsigned images CrossCorrValid.

For common parameter descriptions, see *Common parameters for nppiSqrDistanceFull functions include:*.

1.14.28. Image Cross Correlation Full Norm Level

1.14.28.1 CrossCorrFull_NormLevel

Primitives for computing the normalized cross correlation coefficient between two images with full mode.

CrossCorrFull_NormLevel

The functions compute the $\gamma_{st}(c, r)$ in *General Introduction* with full mode (see *Categorizations*).

The functions require additional scratch buffer for computations.

Note: For maximum performance oSrcRoiSize.width + oTplRoiSize.width - 1 MUST be an integer multiple of 4.

NppStatus **nppiCrossCorrFull_NormLevel_8u_C1RSfs_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *NppiSize* oSrcRoiSize, const *Npp8u* *pTpl, int nTplStep, *NppiSize* oTplRoiSize, *Npp8u* *pDst, int nDstStep, int nScaleFactor, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

One-channel 8-bit unsigned image CrossCorrFull_NormLevel.

For common parameter descriptions, see *Common parameters for nppiSqrDistanceFull functions include:*.

NppStatus **nppiCrossCorrFull_NormLevel_8u_C3RSfs_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *NppiSize* oSrcRoiSize, const *Npp8u* *pTpl, int nTplStep, *NppiSize* oTplRoiSize, *Npp8u* *pDst, int nDstStep, int nScaleFactor, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Three-channel 8-bit unsigned image CrossCorrFull_NormLevel.

For common parameter descriptions, see *Common parameters for nppiSqrDistanceFull functions include:*.

NppStatus **nppiCrossCorrFull_NormLevel_8u_C4RSfs_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *NppiSize* oSrcRoiSize, const *Npp8u* *pTpl, int nTplStep, *NppiSize* oTplRoiSize, *Npp8u* *pDst, int nDstStep, int nScaleFactor, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Four-channel 8-bit unsigned image CrossCorrFull_NormLevel.

For common parameter descriptions, see *Common parameters for nppiSqrDistanceFull functions include:*.

NppStatus **nppiCrossCorrFull_NormLevel_8u_AC4RSfs_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *NppiSize* oSrcRoiSize, const *Npp8u* *pTpl, int nTplStep, *NppiSize* oTplRoiSize, *Npp8u* *pDst, int nDstStep, int nScaleFactor, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Four-channel 8-bit unsigned image CrossCorrFull_NormLevel ignoring alpha channel.

For common parameter descriptions, see *Common parameters for nppiSqrDistanceFull functions include:*.

NppStatus **nppiCrossCorrFull_NormLevel_32f_C1R_Ctx**(const *Npp32f* *pSrc, int nSrcStep, *NppiSize* oSrcRoiSize, const *Npp32f* *pTpl, int nTplStep, *NppiSize* oTplRoiSize, *Npp32f* *pDst, int nDstStep, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

One-channel 32-bit floating point image CrossCorrFull_NormLevel.

For common parameter descriptions, see *Common parameters for nppiSqrDistanceFull functions include:*.

NppStatus **nppiCrossCorrFull_NormLevel_32f_C3R_Ctx**(const *Npp32f* *pSrc, int nSrcStep, *NppiSize* oSrcRoiSize, const *Npp32f* *pTpl, int nTplStep, *NppiSize* oTplRoiSize, *Npp32f* *pDst, int nDstStep, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Three-channel 32-bit floating point image CrossCorrFull_NormLevel.

For common parameter descriptions, see *Common parameters for nppiSqrDistanceFull functions include:*.

NppStatus **nppiCrossCorrFull_NormLevel_32f_C4R_Ctx**(const *Npp32f* *pSrc, int nSrcStep, *NppiSize* oSrcRoiSize, const *Npp32f* *pTpl, int nTplStep, *NppiSize* oTplRoiSize, *Npp32f* *pDst, int nDstStep, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Four-channel 32-bit floating point image CrossCorrFull_NormLevel.

For common parameter descriptions, see *Common parameters for nppiSqrDistanceFull functions include:*.

NppStatus **nppiCrossCorrFull_NormLevel_32f_AC4R_Ctx**(const *Npp32f* *pSrc, int nSrcStep, *NppiSize* oSrcRoiSize, const *Npp32f* *pTpl, int nTplStep, *NppiSize* oTplRoiSize, *Npp32f* *pDst, int nDstStep, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Four-channel 32-bit floating point image CrossCorrFull_NormLevel ignoring alpha channel.

For common parameter descriptions, see *Common parameters for nppiSqrDistanceFull functions include:*.

NppStatus **nppiCrossCorrFull_NormLevel_64f_C1R_Ctx**(const *Npp64f* *pSrc, int nSrcStep, *NppiSize* oSrcRoiSize, const *Npp64f* *pTpl, int nTplStep, *NppiSize* oTplRoiSize, *Npp64f* *pDst, int nDstStep, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

One-channel 64-bit floating point image CrossCorrFull_NormLevel.

For common parameter descriptions, see *Common parameters for nppiSqrDistanceFull functions include:*.

NppStatus **nppiCrossCorrFull_NormLevel_64f_C3R_Ctx**(const *Npp64f* *pSrc, int nSrcStep, *NppiSize* oSrcRoiSize, const *Npp64f* *pTpl, int nTplStep, *NppiSize* oTplRoiSize, *Npp64f* *pDst, int nDstStep, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Three-channel 64-bit floating point image CrossCorrFull_NormLevel.

For common parameter descriptions, see *Common parameters for nppiSqrDistanceFull functions include:*.

NppStatus **nppiCrossCorrFull_NormLevel_64f_C4R_Ctx**(const *Npp64f* *pSrc, int nSrcStep, *NppiSize* oSrcRoiSize, const *Npp64f* *pTpl, int nTplStep, *NppiSize* oTplRoiSize, *Npp64f* *pDst, int nDstStep, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Four-channel 64-bit floating point image CrossCorrFull_NormLevel.

For common parameter descriptions, see *Common parameters for nppiSqrDistanceFull functions include:*.

NppStatus **nppiCrossCorrFull_NormLevel_64f_AC4R_Ctx**(const *Npp64f* *pSrc, int nSrcStep, *NppiSize* oSrcRoiSize, const *Npp64f* *pTpl, int nTplStep, *NppiSize* oTplRoiSize, *Npp64f* *pDst, int nDstStep, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Four-channel 64-bit floating point image CrossCorrFull_NormLevel ignoring alpha channel.

For common parameter descriptions, see *Common parameters for nppiSqrDistanceFull functions include:*.

NppStatus **nppiCrossCorrFull_NormLevel_8u32f_C1R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *NppiSize* oSrcRoiSize, const *Npp8u* *pTpl, int nTplStep, *NppiSize* oTplRoiSize, *Npp32f* *pDst, int nDstStep, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

One-channel 8-bit unsigned image CrossCorrFull_NormLevel.

For common parameter descriptions, see *Common parameters for nppiSqrDistanceFull functions include:*.

NppStatus **nppiCrossCorrFull_NormLevel_8u32f_C3R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *NppiSize* oSrcRoiSize, const *Npp8u* *pTpl, int nTplStep, *NppiSize* oTplRoiSize, *Npp32f* *pDst, int nDstStep, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Three-channel 8-bit unsigned image CrossCorrFull_NormLevel.

For common parameter descriptions, see *Common parameters for nppiSqrDistanceFull functions include:*.

NppStatus **nppiCrossCorrFull_NormLevel_8u32f_C4R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *NppiSize* oSrcRoiSize, const *Npp8u* *pTpl, int nTplStep, *NppiSize* oTplRoiSize, *Npp32f* *pDst, int nDstStep, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Four-channel 8-bit unsigned image CrossCorrFull_NormLevel.

For common parameter descriptions, see *Common parameters for nppiSqrDistanceFull functions include:*.

NppStatus **nppiCrossCorrFull_NormLevel_8u32f_AC4R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *NppiSize* oSrcRoiSize, const *Npp8u* *pTpl, int nTplStep, *NppiSize* oTplRoiSize, *Npp32f* *pDst, int nDstStep, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Four-channel 8-bit unsigned image CrossCorrFull_NormLevel ignoring alpha channel.

For common parameter descriptions, see *Common parameters for nppiSqrDistanceFull functions include:*.

NppStatus **nppiCrossCorrFull_NormLevel_8s32f_C1R_Ctx**(const *Npp8s* *pSrc, int nSrcStep, *NppiSize* oSrcRoiSize, const *Npp8s* *pTpl, int nTplStep, *NppiSize* oTplRoiSize, *Npp32f* *pDst, int nDstStep, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

One-channel 8-bit signed image CrossCorrFull_NormLevel.

For common parameter descriptions, see *Common parameters for nppiSqrDistanceFull functions include:*.

NppStatus **nppiCrossCorrFull_NormLevel_8s32f_C3R_Ctx**(const *Npp8s* *pSrc, int nSrcStep, *NppiSize* oSrcRoiSize, const *Npp8s* *pTpl, int nTplStep, *NppiSize* oTplRoiSize, *Npp32f* *pDst, int nDstStep, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Three-channel 8-bit signed image CrossCorrFull_NormLevel.

For common parameter descriptions, see *Common parameters for nppiSqrDistanceFull functions include:*.

NppStatus **nppiCrossCorrFull_NormLevel_8s32f_C4R_Ctx**(const *Npp8s* *pSrc, int nSrcStep, *NppiSize* oSrcRoiSize, const *Npp8s* *pTpl, int nTplStep, *NppiSize* oTplRoiSize, *Npp32f* *pDst, int nDstStep, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Four-channel 8-bit signed image CrossCorrFull_NormLevel.

For common parameter descriptions, see *Common parameters for nppiSqrDistanceFull functions include:*.

NppStatus **nppiCrossCorrFull_NormLevel_8s32f_AC4R_Ctx**(const *Npp8s* *pSrc, int nSrcStep, *NppiSize* oSrcRoiSize, const *Npp8s* *pTpl, int nTplStep, *NppiSize* oTplRoiSize, *Npp32f* *pDst, int nDstStep, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Four-channel 8-bit signed image CrossCorrFull_NormLevel ignoring alpha channel.

For common parameter descriptions, see *Common parameters for nppiSqrDistanceFull functions include:*.

NppStatus **nppiCrossCorrFull_NormLevel_16u32f_C1R_Ctx**(const *Npp16u* *pSrc, int nSrcStep, *NppiSize* oSrcRoiSize, const *Npp16u* *pTpl, int nTplStep, *NppiSize* oTplRoiSize, *Npp32f* *pDst, int nDstStep, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

One-channel 16-bit unsigned image CrossCorrFull_NormLevel.

For common parameter descriptions, see *Common parameters for nppiSqrDistanceFull functions include:*.

NppStatus **nppiCrossCorrFull_NormLevel_16u32f_C3R_Ctx**(const *Npp16u* *pSrc, int nSrcStep, *NppiSize* oSrcRoiSize, const *Npp16u* *pTpl, int nTplStep, *NppiSize* oTplRoiSize, *Npp32f* *pDst, int nDstStep, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Three-channel 16-bit unsigned image CrossCorrFull_NormLevel.

For common parameter descriptions, see *Common parameters for nppiSqrDistanceFull functions include:*.

NppStatus **nppiCrossCorrFull_NormLevel_16u32f_C4R_Ctx**(const *Npp16u* *pSrc, int nSrcStep, *NppiSize* oSrcRoiSize, const *Npp16u* *pTpl, int nTplStep, *NppiSize* oTplRoiSize, *Npp32f* *pDst, int nDstStep, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Four-channel 16-bit unsigned image CrossCorrFull_NormLevel.

For common parameter descriptions, see *Common parameters for nppiSqrDistanceFull functions include:*.

NppStatus **nppiCrossCorrFull_NormLevel_16u32f_AC4R_Ctx**(const *Npp16u* *pSrc, int nSrcStep, *NppiSize* oSrcRoiSize, const *Npp16u* *pTpl, int nTplStep, *NppiSize* oTplRoiSize, *Npp32f* *pDst, int nDstStep, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Four-channel 16-bit unsigned image CrossCorrFull_NormLevel ignoring alpha channel.

For common parameter descriptions, see *Common parameters for nppiSqrDistanceFull functions include:*.

FullNormLevelGetBufferHostSize

Companion primitives for computing the device buffer size (in bytes) required by the CrossCorrFull_NormLevel primitives.

1.14.28.2 CommonFullNormLevelGetBufferHostSizeParameters

Common parameters for nppiFullNormLevelGetBufferHostSize functions include:

param oSizeROI
Region-Of-Interest (ROI).

param hpBufferSize
Required buffer size. Important: hpBufferSize is a *host pointer. Scratch Buffer and Host Pointer*.

param nppStreamCtx
Application Managed Stream Context.

return
NPP_NULL_POINTER_ERROR if hpBufferSize is 0 (NULL), *ROI Related Error Codes*.

NppStatus **nppiFullNormLevelGetBufferHostSize_8u_C1RSfs_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size (in bytes) for nppiCrossCorrFull_NormLevel_8u_C1RSfs_Ctx.

For common parameter descriptions, see *CommonFullNormLevelGetBufferHostSizeParameters*.

NppStatus **nppiFullNormLevelGetBufferHostSize_8u_C3RSfs_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size (in bytes) for *nppiCrossCorrFull_NormLevel_8u_C3RSfs_Ctx*.

For common parameter descriptions, see *CommonFullNormLevelGetBufferHostSizeParameters*.

NppStatus **nppiFullNormLevelGetBufferHostSize_8u_C4RSfs_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size (in bytes) for *nppiCrossCorrFull_NormLevel_8u_C4RSfs_Ctx*.

For common parameter descriptions, see *CommonFullNormLevelGetBufferHostSizeParameters*.

NppStatus **nppiFullNormLevelGetBufferHostSize_8u_AC4RSfs_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size (in bytes) for *nppiCrossCorrFull_NormLevel_8u_AC4RSfs_Ctx*.

For common parameter descriptions, see *CommonFullNormLevelGetBufferHostSizeParameters*.

NppStatus **nppiFullNormLevelGetBufferHostSize_32f_C1R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size (in bytes) for *nppiCrossCorrFull_NormLevel_32f_C1R_Ctx*.

For common parameter descriptions, see *CommonFullNormLevelGetBufferHostSizeParameters*.

NppStatus **nppiFullNormLevelGetBufferHostSize_32f_C3R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size (in bytes) for *nppiCrossCorrFull_NormLevel_32f_C3R_Ctx*.

For common parameter descriptions, see *CommonFullNormLevelGetBufferHostSizeParameters*.

NppStatus **nppiFullNormLevelGetBufferHostSize_32f_C4R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size (in bytes) for *nppiCrossCorrFull_NormLevel_32f_C4R_Ctx*.

For common parameter descriptions, see *CommonFullNormLevelGetBufferHostSizeParameters*.

NppStatus **nppiFullNormLevelGetBufferHostSize_32f_AC4R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size (in bytes) for *nppiCrossCorrFull_NormLevel_32f_AC4R_Ctx*.

For common parameter descriptions, see *CommonFullNormLevelGetBufferHostSizeParameters*.

NppStatus **nppiFullNormLevelGetBufferHostSize_64f_C1R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size (in bytes) for *nppiCrossCorrFull_NormLevel_64f_C1R_Ctx*.

For common parameter descriptions, see *CommonFullNormLevelGetBufferHostSizeParameters*.

NppStatus **nppiFullNormLevelGetBufferHostSize_64f_C3R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size (in bytes) for *nppiCrossCorrFull_NormLevel_64f_C3R_Ctx*.

For common parameter descriptions, see *CommonFullNormLevelGetBufferHostSizeParameters*.

NppStatus **nppiFullNormLevelGetBufferHostSize_64f_C4R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size (in bytes) for *nppiCrossCorrFull_NormLevel_64f_C4R_Ctx*.

For common parameter descriptions, see *CommonFullNormLevelGetBufferHostSizeParameters*.

NppStatus **nppiFullNormLevelGetBufferHostSize_64f_AC4R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size (in bytes) for *nppiCrossCorrFull_NormLevel_64f_AC4R_Ctx*.

For common parameter descriptions, see *CommonFullNormLevelGetBufferHostSizeParameters*.

NppStatus **nppiFullNormLevelGetBufferHostSize_8u32f_C1R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size (in bytes) for *nppiCrossCorrFull_NormLevel_8u32f_C1R_Ctx*.

For common parameter descriptions, see *CommonFullNormLevelGetBufferHostSizeParameters*.

NppStatus **nppiFullNormLevelGetBufferHostSize_8u32f_C3R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size (in bytes) for *nppiCrossCorrFull_NormLevel_8u32f_C3R_Ctx*.

For common parameter descriptions, see *CommonFullNormLevelGetBufferHostSizeParameters*.

NppStatus **nppiFullNormLevelGetBufferHostSize_8u32f_C4R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size (in bytes) for *nppiCrossCorrFull_NormLevel_8u32f_C4R_Ctx*.

For common parameter descriptions, see *CommonFullNormLevelGetBufferHostSizeParameters*.

NppStatus **nppiFullNormLevelGetBufferHostSize_8u32f_AC4R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size (in bytes) for *nppiCrossCorrFull_NormLevel_8u32f_AC4R_Ctx*.

For common parameter descriptions, see *CommonFullNormLevelGetBufferHostSizeParameters*.

NppStatus **nppiFullNormLevelGetBufferHostSize_8s32f_C1R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size (in bytes) for *nppiCrossCorrFull_NormLevel_8s32f_C1R_Ctx*.

For common parameter descriptions, see *CommonFullNormLevelGetBufferHostSizeParameters*.

NppStatus **nppiFullNormLevelGetBufferHostSize_8s32f_C3R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size (in bytes) for *nppiCrossCorrFull_NormLevel_8s32f_C3R_Ctx*.

For common parameter descriptions, see *CommonFullNormLevelGetBufferHostSizeParameters*.

NppStatus **nppiFullNormLevelGetBufferHostSize_8s32f_C4R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size (in bytes) for *nppiCrossCorrFull_NormLevel_8s32f_C4R_Ctx*.

For common parameter descriptions, see *CommonFullNormLevelGetBufferHostSizeParameters*.

NppStatus **nppiFullNormLevelGetBufferHostSize_8s32f_AC4R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size (in bytes) for *nppiCrossCorrFull_NormLevel_8s32f_AC4R_Ctx*.

For common parameter descriptions, see *CommonFullNormLevelGetBufferHostSizeParameters*.

NppStatus **nppiFullNormLevelGetBufferHostSize_16u32f_C1R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size (in bytes) for *nppiCrossCorrFull_NormLevel_16u32f_C1R_Ctx*.

For common parameter descriptions, see *CommonFullNormLevelGetBufferHostSizeParameters*.

NppStatus **nppiFullNormLevelGetBufferHostSize_16u32f_C3R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size (in bytes) for *nppiCrossCorrFull_NormLevel_16u32f_C3R_Ctx*.

For common parameter descriptions, see *CommonFullNormLevelGetBufferHostSizeParameters*.

NppStatus **nppiFullNormLevelGetBufferHostSize_16u32f_C4R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size (in bytes) for *nppiCrossCorrFull_NormLevel_16u32f_C4R_Ctx*.

For common parameter descriptions, see *CommonFullNormLevelGetBufferHostSizeParameters*.

NppStatus **nppiFullNormLevelGetBufferHostSize_16u32f_AC4R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size (in bytes) for *nppiCrossCorrFull_NormLevel_16u32f_AC4R_Ctx*.

For common parameter descriptions, see *CommonFullNormLevelGetBufferHostSizeParameters*.

1.14.29. Image Cross Correlation Same Norm Level

1.14.29.1 CrossCorrSame_NormLevel

Primitives for computing the normalized cross correlation coefficient between two images with same mode.

CrossCorrSame_NormLevel

The functions compute the $\gamma_{st}(c, r)$ in *General Introduction* with same mode (see *Categorizations*).

The functions require additional scratch buffer for computations.

Note: For maximum performance oSrcRoiSize.width MUST be an integer multiple of 4.

NppStatus **nppiCrossCorrSame_NormLevel_8u_C1RSfs_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *NppiSize* oSrcRoiSize, const *Npp8u* *pTpl, int nTplStep, *NppiSize* oTplRoiSize, *Npp8u* *pDst, int nDstStep, int nScaleFactor, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

One-channel 8-bit unsigned image CrossCorrSame_NormLevel.

For common parameter descriptions, see *Common parameters for nppiSqrDistanceFull functions include:*.

NppStatus **nppiCrossCorrSame_NormLevel_8u_C3RSfs_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *NppiSize* oSrcRoiSize, const *Npp8u* *pTpl, int nTplStep, *NppiSize* oTplRoiSize, *Npp8u* *pDst, int nDstStep, int nScaleFactor, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Three-channel 8-bit unsigned image CrossCorrSame_NormLevel.

For common parameter descriptions, see *Common parameters for nppiSqrDistanceFull functions include:*.

NppStatus **nppiCrossCorrSame_NormLevel_8u_C4RSfs_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *NppiSize* oSrcRoiSize, const *Npp8u* *pTpl, int nTplStep, *NppiSize* oTplRoiSize, *Npp8u* *pDst, int nDstStep, int nScaleFactor, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Four-channel 8-bit unsigned image CrossCorrSame_NormLevel.

For common parameter descriptions, see *Common parameters for nppiSqrDistanceFull functions include:*.

NppStatus **nppiCrossCorrSame_NormLevel_8u_AC4RSfs_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *NppiSize* oSrcRoiSize, const *Npp8u* *pTpl, int nTplStep, *NppiSize* oTplRoiSize, *Npp8u* *pDst, int nDstStep, int nScaleFactor, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Four-channel 8-bit unsigned image CrossCorrSame_NormLevel ignoring alpha channel.

For common parameter descriptions, see *Common parameters for nppiSqrDistanceFull functions include:*.

NppStatus **nppiCrossCorrSame_NormLevel_32f_C1R_Ctx**(const *Npp32f* *pSrc, int nSrcStep, *NppiSize* oSrcRoiSize, const *Npp32f* *pTpl, int nTplStep, *NppiSize* oTplRoiSize, *Npp32f* *pDst, int nDstStep, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

One-channel 32-bit floating point image CrossCorrSame_NormLevel.

For common parameter descriptions, see *Common parameters for nppiSqrDistanceFull functions include:*.

NppStatus **nppiCrossCorrSame_NormLevel_32f_C3R_Ctx**(const *Npp32f* *pSrc, int nSrcStep, *NppiSize* oSrcRoiSize, const *Npp32f* *pTpl, int nTplStep, *NppiSize* oTplRoiSize, *Npp32f* *pDst, int nDstStep, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Three-channel 32-bit floating point image CrossCorrSame_NormLevel.

For common parameter descriptions, see *Common parameters for nppiSqrDistanceFull functions include:*.

NppStatus **nppiCrossCorrSame_NormLevel_32f_C4R_Ctx**(const *Npp32f* *pSrc, int nSrcStep, *NppiSize* oSrcRoiSize, const *Npp32f* *pTpl, int nTplStep, *NppiSize* oTplRoiSize, *Npp32f* *pDst, int nDstStep, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Four-channel 32-bit floating point image CrossCorrSame_NormLevel.

For common parameter descriptions, see *Common parameters for nppiSqrDistanceFull functions include:*.

NppStatus **nppiCrossCorrSame_NormLevel_32f_AC4R_Ctx**(const *Npp32f* *pSrc, int nSrcStep, *NppiSize* oSrcRoiSize, const *Npp32f* *pTpl, int nTplStep, *NppiSize* oTplRoiSize, *Npp32f* *pDst, int nDstStep, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Four-channel 32-bit floating point image CrossCorrSame_NormLevel ignoring alpha channel.

For common parameter descriptions, see *Common parameters for nppiSqrDistanceFull functions include:*.

NppStatus **nppiCrossCorrSame_NormLevel_64f_C1R_Ctx**(const *Npp64f* *pSrc, int nSrcStep, *NppiSize* oSrcRoiSize, const *Npp64f* *pTpl, int nTplStep, *NppiSize* oTplRoiSize, *Npp64f* *pDst, int nDstStep, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

One-channel 64-bit floating point image CrossCorrSame_NormLevel.

For common parameter descriptions, see *Common parameters for nppiSqrDistanceFull functions include:*.

NppStatus **nppiCrossCorrSame_NormLevel_64f_C3R_Ctx**(const *Npp64f* *pSrc, int nSrcStep, *NppiSize* oSrcRoiSize, const *Npp64f* *pTpl, int nTplStep, *NppiSize* oTplRoiSize, *Npp64f* *pDst, int nDstStep, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Three-channel 64-bit floating point image CrossCorrSame_NormLevel.

For common parameter descriptions, see *Common parameters for nppiSqrDistanceFull functions include:*.

NppStatus **nppiCrossCorrSame_NormLevel_64f_C4R_Ctx**(const *Npp64f* *pSrc, int nSrcStep, *NppiSize* oSrcRoiSize, const *Npp64f* *pTpl, int nTplStep, *NppiSize* oTplRoiSize, *Npp64f* *pDst, int nDstStep, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Four-channel 64-bit floating point image CrossCorrSame_NormLevel.

For common parameter descriptions, see *Common parameters for nppiSqrDistanceFull functions include:*.

NppStatus **nppiCrossCorrSame_NormLevel_64f_AC4R_Ctx**(const *Npp64f* *pSrc, int nSrcStep, *NppiSize* oSrcRoiSize, const *Npp64f* *pTpl, int nTplStep, *NppiSize* oTplRoiSize, *Npp64f* *pDst, int nDstStep, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Four-channel 64-bit floating point image CrossCorrSame_NormLevel ignoring alpha channel.

For common parameter descriptions, see *Common parameters for nppiSqrDistanceFull functions include:*.

NppStatus **nppiCrossCorrSame_NormLevel_8u32f_C1R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *NppiSize* oSrcRoiSize, const *Npp8u* *pTpl, int nTplStep, *NppiSize* oTplRoiSize, *Npp32f* *pDst, int nDstStep, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

One-channel 8-bit unsigned image CrossCorrSame_NormLevel.

For common parameter descriptions, see *Common parameters for nppiSqrDistanceFull functions include:*.

NppStatus **nppiCrossCorrSame_NormLevel_8u32f_C3R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *NppiSize* oSrcRoiSize, const *Npp8u* *pTpl, int nTplStep, *NppiSize* oTplRoiSize, *Npp32f* *pDst, int nDstStep, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Three-channel 8-bit unsigned image CrossCorrSame_NormLevel.

For common parameter descriptions, see *Common parameters for nppiSqrDistanceFull functions include:*.

NppStatus **nppiCrossCorrSame_NormLevel_8u32f_C4R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *NppiSize* oSrcRoiSize, const *Npp8u* *pTpl, int nTplStep, *NppiSize* oTplRoiSize, *Npp32f* *pDst, int nDstStep, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Four-channel 8-bit unsigned image CrossCorrSame_NormLevel.

For common parameter descriptions, see *Common parameters for nppiSqrDistanceFull functions include:*.

NppStatus **nppiCrossCorrSame_NormLevel_8u32f_AC4R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *NppiSize* oSrcRoiSize, const *Npp8u* *pTpl, int nTplStep, *NppiSize* oTplRoiSize, *Npp32f* *pDst, int nDstStep, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Four-channel 8-bit unsigned image CrossCorrSame_NormLevel ignoring alpha channel.

For common parameter descriptions, see *Common parameters for nppiSqrDistanceFull functions include:*.

NppStatus **nppiCrossCorrSame_NormLevel_8s32f_C1R_Ctx**(const *Npp8s* *pSrc, int nSrcStep, *NppiSize* oSrcRoiSize, const *Npp8s* *pTpl, int nTplStep, *NppiSize* oTplRoiSize, *Npp32f* *pDst, int nDstStep, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

One-channel 8-bit signed image CrossCorrSame_NormLevel.

For common parameter descriptions, see *Common parameters for nppiSqrDistanceFull functions include:*.

NppStatus **nppiCrossCorrSame_NormLevel_8s32f_C3R_Ctx**(const *Npp8s* *pSrc, int nSrcStep, *NppiSize* oSrcRoiSize, const *Npp8s* *pTpl, int nTplStep, *NppiSize* oTplRoiSize, *Npp32f* *pDst, int nDstStep, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Three-channel 8-bit signed image CrossCorrSame_NormLevel.

For common parameter descriptions, see *Common parameters for nppiSqrDistanceFull functions include:*.

NppStatus **nppiCrossCorrSame_NormLevel_8s32f_C4R_Ctx**(const *Npp8s* *pSrc, int nSrcStep, *NppiSize* oSrcRoiSize, const *Npp8s* *pTpl, int nTplStep, *NppiSize* oTplRoiSize, *Npp32f* *pDst, int nDstStep, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Four-channel 8-bit signed image CrossCorrSame_NormLevel.

For common parameter descriptions, see *Common parameters for nppiSqrDistanceFull functions include:*.

NppStatus **nppiCrossCorrSame_NormLevel_8s32f_AC4R_Ctx**(const *Npp8s* *pSrc, int nSrcStep, *NppiSize* oSrcRoiSize, const *Npp8s* *pTpl, int nTplStep, *NppiSize* oTplRoiSize, *Npp32f* *pDst, int nDstStep, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Four-channel 8-bit signed image CrossCorrSame_NormLevel ignoring alpha channel.

For common parameter descriptions, see *Common parameters for nppiSqrDistanceFull functions include:*.

NppStatus **nppiCrossCorrSame_NormLevel_16u32f_C1R_Ctx**(const *Npp16u* *pSrc, int nSrcStep, *NppiSize* oSrcRoiSize, const *Npp16u* *pTpl, int nTplStep, *NppiSize* oTplRoiSize, *Npp32f* *pDst, int nDstStep, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

One-channel 16-bit unsigned image CrossCorrSame_NormLevel.

For common parameter descriptions, see *Common parameters for nppiSqrDistanceFull functions include:*.

NppStatus **nppiCrossCorrSame_NormLevel_16u32f_C3R_Ctx**(const *Npp16u* *pSrc, int nSrcStep, *NppiSize* oSrcRoiSize, const *Npp16u* *pTpl, int nTplStep, *NppiSize* oTplRoiSize, *Npp32f* *pDst, int nDstStep, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Three-channel 16-bit unsigned image CrossCorrSame_NormLevel.

For common parameter descriptions, see *Common parameters for nppiSqrDistanceFull functions include:*.

NppStatus **nppiCrossCorrSame_NormLevel_16u32f_C4R_Ctx**(const *Npp16u* *pSrc, int nSrcStep, *NppiSize* oSrcRoiSize, const *Npp16u* *pTpl, int nTplStep, *NppiSize* oTplRoiSize, *Npp32f* *pDst, int nDstStep, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Four-channel 16-bit unsigned image CrossCorrSame_NormLevel.

For common parameter descriptions, see *Common parameters for nppiSqrDistanceFull functions include:*.

NppStatus **nppiCrossCorrSame_NormLevel_16u32f_AC4R_Ctx**(const *Npp16u* *pSrc, int nSrcStep, *NppiSize* oSrcRoiSize, const *Npp16u* *pTpl, int nTplStep, *NppiSize* oTplRoiSize, *Npp32f* *pDst, int nDstStep, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Four-channel 16-bit unsigned image CrossCorrSame_NormLevel ignoring alpha channel.

For common parameter descriptions, see *Common parameters for nppiSqrDistanceFull functions include:*.

SameNormLevelGetBufferHostSize

Companion primitives for computing the device buffer size (in bytes) required by the CrossCorrSame_NormLevel primitives.

1.14.29.2 CommonSameNormLevelGetBufferHostSizeParameters

Common parameters for nppiSameNormLevelGetBufferHostSize functions include:

param oSizeROI
Region-Of-Interest (ROI).

param hpBufferSize
Required buffer size. Important: hpBufferSize is a *host pointer.* *Scratch Buffer and Host Pointer*.

param nppStreamCtx
Application Managed Stream Context.

return
NPP_NULL_POINTER_ERROR if hpBufferSize is 0 (NULL), *ROI Related Error Codes*.

NppStatus **nppiSameNormLevelGetBufferHostSize_8u_C1RSfs_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size (in bytes) for nppiCrossCorrSame_NormLevel_8u_C1RSfs.

For common parameter descriptions, see *CommonSameNormLevelGetBufferHostSizeParameters*.

NppStatus **nppiSameNormLevelGetBufferHostSize_8u_C3RSfs_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size (in bytes) for *nppiCrossCorrSame_NormLevel_8u_C3RSfs_Ctx*.

For common parameter descriptions, see *CommonSameNormLevelGetBufferHostSizeParameters*.

NppStatus **nppiSameNormLevelGetBufferHostSize_8u_C4RSfs_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size (in bytes) for *nppiCrossCorrSame_NormLevel_8u_C4RSfs_Ctx*.

For common parameter descriptions, see *CommonSameNormLevelGetBufferHostSizeParameters*.

NppStatus **nppiSameNormLevelGetBufferHostSize_8u_AC4RSfs_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size (in bytes) for *nppiCrossCorrSame_NormLevel_8u_AC4RSfs_Ctx*.

For common parameter descriptions, see *CommonSameNormLevelGetBufferHostSizeParameters*.

NppStatus **nppiSameNormLevelGetBufferHostSize_32f_C1R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size (in bytes) for *nppiCrossCorrSame_NormLevel_32f_C1R_Ctx*.

For common parameter descriptions, see *CommonSameNormLevelGetBufferHostSizeParameters*.

NppStatus **nppiSameNormLevelGetBufferHostSize_32f_C3R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size (in bytes) for *nppiCrossCorrSame_NormLevel_32f_C3R_Ctx*.

For common parameter descriptions, see *CommonSameNormLevelGetBufferHostSizeParameters*.

NppStatus **nppiSameNormLevelGetBufferHostSize_32f_C4R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size (in bytes) for *nppiCrossCorrSame_NormLevel_32f_C4R_Ctx*.

For common parameter descriptions, see *CommonSameNormLevelGetBufferHostSizeParameters*.

NppStatus **nppiSameNormLevelGetBufferHostSize_32f_AC4R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size (in bytes) for *nppiCrossCorrSame_NormLevel_32f_AC4R_Ctx*.

For common parameter descriptions, see *CommonSameNormLevelGetBufferHostSizeParameters*.

NppStatus **nppiSameNormLevelGetBufferHostSize_64f_C1R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size (in bytes) for *nppiCrossCorrSame_NormLevel_64f_C1R_Ctx*.

For common parameter descriptions, see *CommonSameNormLevelGetBufferHostSizeParameters*.

NppStatus **nppiSameNormLevelGetBufferHostSize_64f_C3R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size (in bytes) for *nppiCrossCorrSame_NormLevel_64f_C3R_Ctx*.

For common parameter descriptions, see *CommonSameNormLevelGetBufferHostSizeParameters*.

NppStatus **nppiSameNormLevelGetBufferHostSize_64f_C4R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size (in bytes) for *nppiCrossCorrSame_NormLevel_64f_C4R_Ctx*.

For common parameter descriptions, see *CommonSameNormLevelGetBufferHostSizeParameters*.

NppStatus **nppiSameNormLevelGetBufferHostSize_64f_AC4R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size (in bytes) for *nppiCrossCorrSame_NormLevel_64f_AC4R_Ctx*.

For common parameter descriptions, see *CommonSameNormLevelGetBufferHostSizeParameters*.

NppStatus **nppiSameNormLevelGetBufferHostSize_8u32f_C1R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size (in bytes) for *nppiCrossCorrSame_NormLevel_8u32f_C1R_Ctx*.

For common parameter descriptions, see *CommonSameNormLevelGetBufferHostSizeParameters*.

NppStatus **nppiSameNormLevelGetBufferHostSize_8u32f_C3R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size (in bytes) for *nppiCrossCorrSame_NormLevel_8u32f_C3R_Ctx*.

For common parameter descriptions, see *CommonSameNormLevelGetBufferHostSizeParameters*.

NppStatus **nppiSameNormLevelGetBufferHostSize_8u32f_C4R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size (in bytes) for *nppiCrossCorrSame_NormLevel_8u32f_C4R_Ctx*.

For common parameter descriptions, see *CommonSameNormLevelGetBufferHostSizeParameters*.

NppStatus **nppiSameNormLevelGetBufferHostSize_8u32f_AC4R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size (in bytes) for *nppiCrossCorrSame_NormLevel_8u32f_AC4R_Ctx*.

For common parameter descriptions, see *CommonSameNormLevelGetBufferHostSizeParameters*.

NppStatus **nppiSameNormLevelGetBufferHostSize_8s32f_C1R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size (in bytes) for *nppiCrossCorrSame_NormLevel_8s32f_C1R_Ctx*.

For common parameter descriptions, see *CommonSameNormLevelGetBufferHostSizeParameters*.

NppStatus **nppiSameNormLevelGetBufferHostSize_8s32f_C3R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size (in bytes) for *nppiCrossCorrSame_NormLevel_8s32f_C3R_Ctx*.

For common parameter descriptions, see *CommonSameNormLevelGetBufferHostSizeParameters*.

NppStatus **nppiSameNormLevelGetBufferHostSize_8s32f_C4R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size (in bytes) for *nppiCrossCorrSame_NormLevel_8s32f_C4R_Ctx*.

For common parameter descriptions, see *CommonSameNormLevelGetBufferHostSizeParameters*.

NppStatus **nppiSameNormLevelGetBufferHostSize_8s32f_AC4R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size (in bytes) for *nppiCrossCorrSame_NormLevel_8s32f_AC4R_Ctx*.

For common parameter descriptions, see *CommonSameNormLevelGetBufferHostSizeParameters*.

NppStatus **nppiSameNormLevelGetBufferHostSize_16u32f_C1R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size (in bytes) for *nppiCrossCorrSame_NormLevel_16u32f_C1R_Ctx*.

For common parameter descriptions, see *CommonSameNormLevelGetBufferHostSizeParameters*.

NppStatus **nppiSameNormLevelGetBufferHostSize_16u32f_C3R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size (in bytes) for *nppiCrossCorrSame_NormLevel_16u32f_C3R_Ctx*.

For common parameter descriptions, see *CommonSameNormLevelGetBufferHostSizeParameters*.

NppStatus **nppiSameNormLevelGetBufferHostSize_16u32f_C4R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size (in bytes) for *nppiCrossCorrSame_NormLevel_16u32f_C4R_Ctx*.

For common parameter descriptions, see *CommonSameNormLevelGetBufferHostSizeParameters*.

NppStatus **nppiSameNormLevelGetBufferHostSize_16u32f_AC4R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size (in bytes) for *nppiCrossCorrSame_NormLevel_16u32f_AC4R_Ctx*.

For common parameter descriptions, see *CommonSameNormLevelGetBufferHostSizeParameters*.

1.14.30. Image Cross Correlation Valid Norm Level

1.14.30.1 CrossCorrValid_NormLevel

Primitives for computing the normalized cross correlation coefficient between two images with valid mode.

CrossCorrValid_NormLevel

The functions compute the $\gamma_{st}(c, r)$ in *General Introduction* with valid mode (see *Categorizations*).

The functions require additional scratch buffer for computations.

Note: For maximum performance oSrcRoiSize.width - oTplRoiSize + 1 MUST be an integer multiple of 4.

NppStatus **nppiCrossCorrValid_NormLevel_8u_C1RSfs_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *NppiSize* oSrcRoiSize, const *Npp8u* *pTpl, int nTplStep, *NppiSize* oTplRoiSize, *Npp8u* *pDst, int nDstStep, int nScaleFactor, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

One-channel 8-bit unsigned image CrossCorrValid_NormLevel.

For common parameter descriptions, see *Common parameters for nppiSqrDistanceFull functions include:*.

NppStatus **nppiCrossCorrValid_NormLevel_8u_C3RSfs_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *NppiSize* oSrcRoiSize, const *Npp8u* *pTpl, int nTplStep, *NppiSize* oTplRoiSize, *Npp8u* *pDst, int nDstStep, int nScaleFactor, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Three-channel 8-bit unsigned image CrossCorrValid_NormLevel.

For common parameter descriptions, see *Common parameters for nppiSqrDistanceFull functions include:*.

NppStatus **nppiCrossCorrValid_NormLevel_8u_C4RSfs_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *NppiSize* oSrcRoiSize, const *Npp8u* *pTpl, int nTplStep, *NppiSize* oTplRoiSize, *Npp8u* *pDst, int nDstStep, int nScaleFactor, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Four-channel 8-bit unsigned image CrossCorrValid_NormLevel.

For common parameter descriptions, see *Common parameters for nppiSqrDistanceFull functions include:*.

NppStatus **nppiCrossCorrValid_NormLevel_8u_AC4RSfs_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *NppiSize* oSrcRoiSize, const *Npp8u* *pTpl, int nTplStep, *NppiSize* oTplRoiSize, *Npp8u* *pDst, int nDstStep, int nScaleFactor, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Four-channel 8-bit unsigned image CrossCorrValid_NormLevel ignoring alpha channel.

For common parameter descriptions, see *Common parameters for nppiSqrDistanceFull functions include:*.

NppStatus **nppiCrossCorrValid_NormLevel_32f_C1R_Ctx**(const *Npp32f* *pSrc, int nSrcStep, *NppiSize* oSrcRoiSize, const *Npp32f* *pTpl, int nTplStep, *NppiSize* oTplRoiSize, *Npp32f* *pDst, int nDstStep, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

One-channel 32-bit floating point image CrossCorrValid_NormLevel.

For common parameter descriptions, see *Common parameters for nppiSqrDistanceFull functions include:*.

NppStatus **nppiCrossCorrValid_NormLevel_32f_C3R_Ctx**(const *Npp32f* *pSrc, int nSrcStep, *NppiSize* oSrcRoiSize, const *Npp32f* *pTpl, int nTplStep, *NppiSize* oTplRoiSize, *Npp32f* *pDst, int nDstStep, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Three-channel 32-bit floating point image CrossCorrValid_NormLevel.

For common parameter descriptions, see *Common parameters for nppiSqrDistanceFull functions include:*.

NppStatus **nppiCrossCorrValid_NormLevel_32f_C4R_Ctx**(const *Npp32f* *pSrc, int nSrcStep, *NppiSize* oSrcRoiSize, const *Npp32f* *pTpl, int nTplStep, *NppiSize* oTplRoiSize, *Npp32f* *pDst, int nDstStep, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Four-channel 32-bit floating point image CrossCorrValid_NormLevel.

For common parameter descriptions, see *Common parameters for nppiSqrDistanceFull functions include:*.

NppStatus **nppiCrossCorrValid_NormLevel_32f_AC4R_Ctx**(const *Npp32f* *pSrc, int nSrcStep, *NppiSize* oSrcRoiSize, const *Npp32f* *pTpl, int nTplStep, *NppiSize* oTplRoiSize, *Npp32f* *pDst, int nDstStep, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Four-channel 32-bit floating point image CrossCorrValid_NormLevel ignoring alpha channel.

For common parameter descriptions, see *Common parameters for nppiSqrDistanceFull functions include:*.

NppStatus **nppiCrossCorrValid_NormLevel_64f_C1R_Ctx**(const *Npp64f* *pSrc, int nSrcStep, *NppiSize* oSrcRoiSize, const *Npp64f* *pTpl, int nTplStep, *NppiSize* oTplRoiSize, *Npp64f* *pDst, int nDstStep, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

One-channel 64-bit floating point image CrossCorrValid_NormLevel.

For common parameter descriptions, see *Common parameters for nppiSqrDistanceFull functions include:*.

NppStatus **nppiCrossCorrValid_NormLevel_64f_C3R_Ctx**(const *Npp64f* *pSrc, int nSrcStep, *NppiSize* oSrcRoiSize, const *Npp64f* *pTpl, int nTplStep, *NppiSize* oTplRoiSize, *Npp64f* *pDst, int nDstStep, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Three-channel 64-bit floating point image CrossCorrValid_NormLevel.

For common parameter descriptions, see *Common parameters for nppiSqrDistanceFull functions include:*.

NppStatus **nppiCrossCorrValid_NormLevel_64f_C4R_Ctx**(const *Npp64f* *pSrc, int nSrcStep, *NppiSize* oSrcRoiSize, const *Npp64f* *pTpl, int nTplStep, *NppiSize* oTplRoiSize, *Npp64f* *pDst, int nDstStep, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Four-channel 64-bit floating point image CrossCorrValid_NormLevel.

For common parameter descriptions, see *Common parameters for nppiSqrDistanceFull functions include:*.

NppStatus **nppiCrossCorrValid_NormLevel_64f_AC4R_Ctx**(const *Npp64f* *pSrc, int nSrcStep, *NppiSize* oSrcRoiSize, const *Npp64f* *pTpl, int nTplStep, *NppiSize* oTplRoiSize, *Npp64f* *pDst, int nDstStep, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Four-channel 64-bit floating point image CrossCorrValid_NormLevel ignoring alpha channel.

For common parameter descriptions, see *Common parameters for nppiSqrDistanceFull functions include:*.

NppStatus **nppiCrossCorrValid_NormLevel_8u32f_C1R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *NppiSize* oSrcRoiSize, const *Npp8u* *pTpl, int nTplStep, *NppiSize* oTplRoiSize, *Npp32f* *pDst, int nDstStep, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

One-channel 8-bit unsigned image CrossCorrValid_NormLevel.

For common parameter descriptions, see *Common parameters for nppiSqrDistanceFull functions include:*.

NppStatus **nppiCrossCorrValid_NormLevel_8u32f_C3R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *NppiSize* oSrcRoiSize, const *Npp8u* *pTpl, int nTplStep, *NppiSize* oTplRoiSize, *Npp32f* *pDst, int nDstStep, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Three-channel 8-bit unsigned image CrossCorrValid_NormLevel.

For common parameter descriptions, see *Common parameters for nppiSqrDistanceFull functions include:*.

NppStatus **nppiCrossCorrValid_NormLevel_8u32f_C4R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *NppiSize* oSrcRoiSize, const *Npp8u* *pTpl, int nTplStep, *NppiSize* oTplRoiSize, *Npp32f* *pDst, int nDstStep, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Four-channel 8-bit unsigned image CrossCorrValid_NormLevel.

For common parameter descriptions, see *Common parameters for nppiSqrDistanceFull functions include:*.

NppStatus **nppiCrossCorrValid_NormLevel_8u32f_AC4R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *NppiSize* oSrcRoiSize, const *Npp8u* *pTpl, int nTplStep, *NppiSize* oTplRoiSize, *Npp32f* *pDst, int nDstStep, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Four-channel 8-bit unsigned image CrossCorrValid_NormLevel ignoring alpha channel.

For common parameter descriptions, see *Common parameters for nppiSqrDistanceFull functions include:*.

NppStatus **nppiCrossCorrValid_NormLevel_8s32f_C1R_Ctx**(const *Npp8s* *pSrc, int nSrcStep, *NppiSize* oSrcRoiSize, const *Npp8s* *pTpl, int nTplStep, *NppiSize* oTplRoiSize, *Npp32f* *pDst, int nDstStep, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

One-channel 8-bit signed image CrossCorrValid_NormLevel.

For common parameter descriptions, see *Common parameters for nppiSqrDistanceFull functions include:*.

NppStatus **nppiCrossCorrValid_NormLevel_8s32f_C3R_Ctx**(const *Npp8s* *pSrc, int nSrcStep, *NppiSize* oSrcRoiSize, const *Npp8s* *pTpl, int nTplStep, *NppiSize* oTplRoiSize, *Npp32f* *pDst, int nDstStep, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Three-channel 8-bit signed image CrossCorrValid_NormLevel.

For common parameter descriptions, see *Common parameters for nppiSqrDistanceFull functions include:*.

NppStatus **nppiCrossCorrValid_NormLevel_8s32f_C4R_Ctx**(const *Npp8s* *pSrc, int nSrcStep, *NppiSize* oSrcRoiSize, const *Npp8s* *pTpl, int nTplStep, *NppiSize* oTplRoiSize, *Npp32f* *pDst, int nDstStep, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Four-channel 8-bit signed image CrossCorrValid_NormLevel.

For common parameter descriptions, see *Common parameters for nppiSqrDistanceFull functions include:*.

NppStatus **nppiCrossCorrValid_NormLevel_8s32f_AC4R_Ctx**(const *Npp8s* *pSrc, int nSrcStep, *NppiSize* oSrcRoiSize, const *Npp8s* *pTpl, int nTplStep, *NppiSize* oTplRoiSize, *Npp32f* *pDst, int nDstStep, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Four-channel 8-bit signed image CrossCorrValid_NormLevel ignoring alpha channel.

For common parameter descriptions, see *Common parameters for nppiSqrDistanceFull functions include:*.

NppStatus **nppiCrossCorrValid_NormLevel_16u32f_C1R_Ctx**(const *Npp16u* *pSrc, int nSrcStep, *NppiSize* oSrcRoiSize, const *Npp16u* *pTpl, int nTplStep, *NppiSize* oTplRoiSize, *Npp32f* *pDst, int nDstStep, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

One-channel 16-bit unsigned image CrossCorrValid_NormLevel.

For common parameter descriptions, see *Common parameters for nppiSqrDistanceFull functions include:*.

NppStatus **nppiCrossCorrValid_NormLevel_16u32f_C3R_Ctx**(const *Npp16u* *pSrc, int nSrcStep, *NppiSize* oSrcRoiSize, const *Npp16u* *pTpl, int nTplStep, *NppiSize* oTplRoiSize, *Npp32f* *pDst, int nDstStep, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Three-channel 16-bit unsigned image CrossCorrValid_NormLevel.

For common parameter descriptions, see *Common parameters for nppiSqrDistanceFull functions include:*.

NppStatus **nppiCrossCorrValid_NormLevel_16u32f_C4R_Ctx**(const *Npp16u* *pSrc, int nSrcStep, *NppiSize* oSrcRoiSize, const *Npp16u* *pTpl, int nTplStep, *NppiSize* oTplRoiSize, *Npp32f* *pDst, int nDstStep, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Four-channel 16-bit unsigned image CrossCorrValid_NormLevel.

For common parameter descriptions, see *Common parameters for nppiSqrDistanceFull functions include:*.

NppStatus **nppiCrossCorrValid_NormLevel_16u32f_AC4R_Ctx**(const *Npp16u* *pSrc, int nSrcStep, *NppiSize* oSrcRoiSize, const *Npp16u* *pTpl, int nTplStep, *NppiSize* oTplRoiSize, *Npp32f* *pDst, int nDstStep, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Four-channel 16-bit unsigned image CrossCorrValid_NormLevel ignoring alpha channel.

For common parameter descriptions, see *Common parameters for nppiSqrDistanceFull functions include:*.

ValidNormLevelGetBufferHostSize

Companion primitives for computing the device buffer size (in bytes) required by the CrossCorrValid_NormLevel primitives.

1.14.30.2 CommonValidNormLevelGetBufferHostSizeParameters

Common parameters for nppiValidNormLevelGetBufferHostSize functions include:

param oSizeROI
Region-Of-Interest (ROI).

param hpBufferSize
Required buffer size. Important: hpBufferSize is a *host pointer.* *Scratch Buffer and Host Pointer*.

param nppStreamCtx
Application Managed Stream Context.

return
NPP_NULL_POINTER_ERROR if hpBufferSize is 0 (NULL), *ROI Related Error Codes*.

NppStatus **nppiValidNormLevelGetBufferHostSize_8u_C1RSfs_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size (in bytes) for nppiCrossCorrValid_NormLevel_8u_C1RSfs_Ctx.

For common parameter descriptions, see *CommonValidNormLevelGetBufferHostSizeParameters*.

NppStatus **nppiValidNormLevelGetBufferHostSize_8u_C3RSfs_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size (in bytes) for nppiCrossCorrValid_NormLevel_8u_C1RSfs_Ctx.

For common parameter descriptions, see *CommonValidNormLevelGetBufferHostSizeParameters*.

NppStatus **nppiValidNormLevelGetBufferHostSize_8u_C4RSfs_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size (in bytes) for *nppiCrossCorrValid_NormLevel_8u_C4RSfs_Ctx*.

For common parameter descriptions, see *CommonValidNormLevelGetBufferHostSizeParameters*.

NppStatus **nppiValidNormLevelGetBufferHostSize_8u_AC4RSfs_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size (in bytes) for *nppiCrossCorrValid_NormLevel_8u_AC4RSfs_Ctx*.

For common parameter descriptions, see *CommonValidNormLevelGetBufferHostSizeParameters*.

NppStatus **nppiValidNormLevelGetBufferHostSize_32f_C1R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size (in bytes) for *nppiCrossCorrValid_NormLevel_32f_C1R_Ctx*.

For common parameter descriptions, see *CommonValidNormLevelGetBufferHostSizeParameters*.

NppStatus **nppiValidNormLevelGetBufferHostSize_32f_C3R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size (in bytes) for *nppiCrossCorrValid_NormLevel_32f_C3R_Ctx*.

For common parameter descriptions, see *CommonValidNormLevelGetBufferHostSizeParameters*.

NppStatus **nppiValidNormLevelGetBufferHostSize_32f_C4R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size (in bytes) for *nppiCrossCorrValid_NormLevel_32f_C4R_Ctx*.

For common parameter descriptions, see *CommonValidNormLevelGetBufferHostSizeParameters*.

NppStatus **nppiValidNormLevelGetBufferHostSize_32f_AC4R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size (in bytes) for *nppiCrossCorrValid_NormLevel_32f_AC4R_Ctx*.

For common parameter descriptions, see *CommonValidNormLevelGetBufferHostSizeParameters*.

NppStatus **nppiValidNormLevelGetBufferHostSize_64f_C1R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size (in bytes) for *nppiCrossCorrValid_NormLevel_64f_C1R_Ctx*.

For common parameter descriptions, see *CommonValidNormLevelGetBufferHostSizeParameters*.

NppStatus **nppiValidNormLevelGetBufferHostSize_64f_C3R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size (in bytes) for *nppiCrossCorrValid_NormLevel_64f_C3R_Ctx*.

For common parameter descriptions, see *CommonValidNormLevelGetBufferHostSizeParameters*.

NppStatus **nppiValidNormLevelGetBufferHostSize_64f_C4R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size (in bytes) for *nppiCrossCorrValid_NormLevel_64f_C4R_Ctx*.

For common parameter descriptions, see *CommonValidNormLevelGetBufferHostSizeParameters*.

NppStatus **nppiValidNormLevelGetBufferHostSize_64f_AC4R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size (in bytes) for *nppiCrossCorrValid_NormLevel_64f_AC4R_Ctx*.

For common parameter descriptions, see *CommonValidNormLevelGetBufferHostSizeParameters*.

NppStatus **nppiValidNormLevelGetBufferHostSize_8u32f_C1R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size (in bytes) for *nppiCrossCorrValid_NormLevel_8u32f_C1R_Ctx*.

For common parameter descriptions, see *CommonValidNormLevelGetBufferHostSizeParameters*.

NppStatus **nppiValidNormLevelGetBufferHostSize_8u32f_C3R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size (in bytes) for *nppiCrossCorrValid_NormLevel_8u32f_C3R_Ctx*.

For common parameter descriptions, see *CommonValidNormLevelGetBufferHostSizeParameters*.

NppStatus **nppiValidNormLevelGetBufferHostSize_8u32f_C4R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size (in bytes) for *nppiCrossCorrValid_NormLevel_8u32f_C4R_Ctx*.

For common parameter descriptions, see *CommonValidNormLevelGetBufferHostSizeParameters*.

NppStatus **nppiValidNormLevelGetBufferHostSize_8u32f_AC4R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size (in bytes) for *nppiCrossCorrValid_NormLevel_8u32f_AC4R_Ctx*.

For common parameter descriptions, see *CommonValidNormLevelGetBufferHostSizeParameters*.

NppStatus **nppiValidNormLevelGetBufferHostSize_8s32f_C1R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size (in bytes) for *nppiCrossCorrValid_NormLevel_8s32f_C1R_Ctx*.

For common parameter descriptions, see *CommonValidNormLevelGetBufferHostSizeParameters*.

NppStatus **nppiValidNormLevelGetBufferHostSize_8s32f_C3R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size (in bytes) for *nppiCrossCorrValid_NormLevel_8s32f_C3R_Ctx*.

For common parameter descriptions, see *CommonValidNormLevelGetBufferHostSizeParameters*.

NppStatus **nppiValidNormLevelGetBufferHostSize_8s32f_C4R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size (in bytes) for *nppiCrossCorrValid_NormLevel_8s32f_C4R_Ctx*.

For common parameter descriptions, see *CommonValidNormLevelGetBufferHostSizeParameters*.

NppStatus **nppiValidNormLevelGetBufferHostSize_8s32f_AC4R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size (in bytes) for *nppiCrossCorrValid_NormLevel_8s32f_AC4R_Ctx*.

For common parameter descriptions, see *CommonValidNormLevelGetBufferHostSizeParameters*.

NppStatus **nppiValidNormLevelGetBufferHostSize_16u32f_C1R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size (in bytes) for *nppiCrossCorrValid_NormLevel_16u32f_C1R_Ctx*.

For common parameter descriptions, see *CommonValidNormLevelGetBufferHostSizeParameters*.

NppStatus **nppiValidNormLevelGetBufferHostSize_16u32f_C3R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size (in bytes) for *nppiCrossCorrValid_NormLevel_16u32f_C3R_Ctx*.

For common parameter descriptions, see *CommonValidNormLevelGetBufferHostSizeParameters*.

NppStatus **nppiValidNormLevelGetBufferHostSize_16u32f_C4R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size (in bytes) for *nppiCrossCorrValid_NormLevel_16u32f_C4R_Ctx*.

For common parameter descriptions, see *CommonValidNormLevelGetBufferHostSizeParameters*.

NppStatus **nppiValidNormLevelGetBufferHostSize_16u32f_AC4R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size (in bytes) for *nppiCrossCorrValid_NormLevel_16u32f_AC4R_Ctx*.

For common parameter descriptions, see *CommonValidNormLevelGetBufferHostSizeParameters*.

1.14.31. Image Cross Correlation Full Norm Level Advanced

1.14.31.1 CrossCorrFull_NormLevelAdvanced

Primitives for computing the normalized cross correlation coefficient between two images with full mode with large image template sizes.

CrossCorrFull_NormLevelAdvanced

The functions compute the $\gamma_{st}(c, r)$ in *General Introduction* with full mode (see *Categorizations*).

The functions require an additional scratch buffer and advanced scratch buffer for computations.

Note: For maximum performance oSrcRoiSize.width + oTplRoiSize.width - 1 MUST be an integer multiple of 4.

NppStatus **nppiCrossCorrFull_NormLevelAdvanced_32f_C1R_Ctx**(const *Npp32f* *pSrc, int nSrcStep, *NppiSize* oSrcRoiSize, const *Npp32f* *pTpl, int nTplStep, *NppiSize* oTplRoiSize, *Npp32f* *pDst, int nDstStep, *Npp8u* *pDeviceBuffer, *Npp8u* *pAdvancedScratchBuffer, *NppStreamContext* nppStreamCtx)

One-channel 32-bit floating point image CrossCorrFull_NormLevelAdvanced.

For common parameter descriptions, see *Common parameters for nppiSqrDistanceFull functions include:*.

NppStatus **nppiCrossCorrFull_NormLevelAdvanced_32f_C3R_Ctx**(const *Npp32f* *pSrc, int nSrcStep, *NppiSize* oSrcRoiSize, const *Npp32f* *pTpl, int nTplStep, *NppiSize* oTplRoiSize, *Npp32f* *pDst, int nDstStep, *Npp8u* *pDeviceBuffer, *Npp8u* *pAdvancedScratchBuffer, *NppStreamContext* nppStreamCtx)

Three-channel 32-bit floating point image CrossCorrFull_NormLevelAdvanced.

For common parameter descriptions, see *Common parameters for nppiSqrDistanceFull functions include:*.

NppStatus **nppiCrossCorrFull_NormLevelAdvanced_32f_C4R_Ctx**(const *Npp32f* *pSrc, int nSrcStep, *NppiSize* oSrcRoiSize, const *Npp32f* *pTpl, int nTplStep, *NppiSize* oTplRoiSize, *Npp32f* *pDst, int nDstStep, *Npp8u* *pDeviceBuffer, *Npp8u* *pAdvancedScratchBuffer, *NppStreamContext* nppStreamCtx)

Four-channel 32-bit floating point image CrossCorrFull_NormLevelAdvanced.

For common parameter descriptions, see *Common parameters for nppiSqrDistanceFull functions include:*.

NppStatus **nppiCrossCorrFull_NormLevelAdvanced_64f_C1R_Ctx**(const *Npp64f* *pSrc, int nSrcStep, *NppiSize* oSrcRoiSize, const *Npp64f* *pTpl, int nTplStep, *NppiSize* oTplRoiSize, *Npp64f* *pDst, int nDstStep, *Npp8u* *pDeviceBuffer, *Npp8u* *pAdvancedScratchBuffer, *NppStreamContext* nppStreamCtx)

One-channel 64-bit floating point image CrossCorrFull_NormLevelAdvanced.

For common parameter descriptions, see *Common parameters for nppiSqrDistanceFull functions include:*.

NppStatus **nppiCrossCorrFull_NormLevelAdvanced_64f_C3R_Ctx**(const *Npp64f* *pSrc, int nSrcStep, *NppiSize* oSrcRoiSize, const *Npp64f* *pTpl, int nTplStep, *NppiSize* oTplRoiSize, *Npp64f* *pDst, int nDstStep, *Npp8u* *pDeviceBuffer, *Npp8u* *pAdvancedScratchBuffer, *NppStreamContext* nppStreamCtx)

Three-channel 64-bit floating point image CrossCorrFull_NormLevelAdvanced.

For common parameter descriptions, see *Common parameters for nppiSqrDistanceFull functions include:*.

NppStatus **nppiCrossCorrFull_NormLevelAdvanced_64f_C4R_Ctx**(const *Npp64f* *pSrc, int nSrcStep, *NppiSize* oSrcRoiSize, const *Npp64f* *pTpl, int nTplStep, *NppiSize* oTplRoiSize, *Npp64f* *pDst, int nDstStep, *Npp8u* *pDeviceBuffer, *Npp8u* *pAdvancedScratchBuffer, *NppStreamContext* nppStreamCtx)

Four-channel 64-bit floating point image CrossCorrFull_NormLevelAdvanced.

For common parameter descriptions, see *Common parameters for nppiSqrDistanceFull functions include:*.

NppStatus **nppiCrossCorrFull_NormLevelAdvanced_8u32f_C1R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *NppiSize* oSrcRoiSize, const *Npp8u* *pTpl, int nTplStep, *NppiSize* oTplRoiSize, *Npp32f* *pDst, int nDstStep, *Npp8u* *pDeviceBuffer, *Npp8u* *pAdvanced-ScratchBuffer, *NppStreamContext* nppStreamCtx)

One-channel 8-bit unsigned image CrossCorrFull_NormLevelAdvanced.

For common parameter descriptions, see *Common parameters for nppiSqrDistanceFull functions include:*.

NppStatus **nppiCrossCorrFull_NormLevelAdvanced_8u32f_C3R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *NppiSize* oSrcRoiSize, const *Npp8u* *pTpl, int nTplStep, *NppiSize* oTplRoiSize, *Npp32f* *pDst, int nDstStep, *Npp8u* *pDeviceBuffer, *Npp8u* *pAdvanced-ScratchBuffer, *NppStreamContext* nppStreamCtx)

Three-channel 8-bit unsigned image CrossCorrFull_NormLevelAdvanced.

For common parameter descriptions, see *Common parameters for nppiSqrDistanceFull functions include:*.

NppStatus **nppiCrossCorrFull_NormLevelAdvanced_8u32f_C4R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *NppiSize* oSrcRoiSize, const *Npp8u* *pTpl, int nTplStep, *NppiSize* oTplRoiSize, *Npp32f* *pDst, int nDstStep, *Npp8u* *pDeviceBuffer, *Npp8u* *pAdvanced-ScratchBuffer, *NppStreamContext* nppStreamCtx)

Four-channel 8-bit unsigned image CrossCorrFull_NormLevelAdvanced.

For common parameter descriptions, see *Common parameters for nppiSqrDistanceFull functions include:*.

NppStatus **nppiCrossCorrFull_NormLevelAdvanced_8s32f_C1R_Ctx**(const *Npp8s* *pSrc, int nSrcStep, *NppiSize* oSrcRoiSize, const *Npp8s* *pTpl, int nTplStep, *NppiSize* oTplRoiSize, *Npp32f* *pDst, int nDstStep, *Npp8u* *pDeviceBuffer, *Npp8u* *pAdvancedScratch-Buffer, *NppStreamContext* nppStreamCtx)

One-channel 8-bit signed image CrossCorrFull_NormLevelAdvanced.

For common parameter descriptions, see *Common parameters for nppiSqrDistanceFull functions include:*.

NppStatus **nppiCrossCorrFull_NormLevelAdvanced_8s32f_C3R_Ctx**(const *Npp8s* *pSrc, int nSrcStep, *NppiSize* oSrcRoiSize, const *Npp8s* *pTpl, int nTplStep, *NppiSize* oTplRoiSize, *Npp32f* *pDst, int nDstStep, *Npp8u* *pDeviceBuffer, *Npp8u* *pAdvancedScratchBuffer, *NppStreamContext* nppStreamCtx)

Three-channel 8-bit signed image CrossCorrFull_NormLevelAdvanced.

For common parameter descriptions, see *Common parameters for nppiSqrDistanceFull functions include:*.

NppStatus **nppiCrossCorrFull_NormLevelAdvanced_8s32f_C4R_Ctx**(const *Npp8s* *pSrc, int nSrcStep, *NppiSize* oSrcRoiSize, const *Npp8s* *pTpl, int nTplStep, *NppiSize* oTplRoiSize, *Npp32f* *pDst, int nDstStep, *Npp8u* *pDeviceBuffer, *Npp8u* *pAdvancedScratchBuffer, *NppStreamContext* nppStreamCtx)

Four-channel 8-bit signed image CrossCorrFull_NormLevelAdvanced.

For common parameter descriptions, see *Common parameters for nppiSqrDistanceFull functions include:*.

NppStatus **nppiCrossCorrFull_NormLevelAdvanced_16u32f_C1R_Ctx**(const *Npp16u* *pSrc, int nSrcStep, *NppiSize* oSrcRoiSize, const *Npp16u* *pTpl, int nTplStep, *NppiSize* oTplRoiSize, *Npp32f* *pDst, int nDstStep, *Npp8u* *pDeviceBuffer, *Npp8u* *pAdvancedScratchBuffer, *NppStreamContext* nppStreamCtx)

One-channel 16-bit unsigned image CrossCorrFull_NormLevelAdvanced.

For common parameter descriptions, see *Common parameters for nppiSqrDistanceFull functions include:*.

NppStatus **nppiCrossCorrFull_NormLevelAdvanced_16u32f_C3R_Ctx**(const *Npp16u* *pSrc, int nSrcStep, *NppiSize* oSrcRoiSize, const *Npp16u* *pTpl, int nTplStep, *NppiSize* oTplRoiSize, *Npp32f* *pDst, int nDstStep, *Npp8u* *pDeviceBuffer, *Npp8u* *pAdvancedScratchBuffer, *NppStreamContext* nppStreamCtx)

Three-channel 16-bit unsigned image CrossCorrFull_NormLevelAdvanced.

For common parameter descriptions, see *Common parameters for nppiSqrDistanceFull functions include:*.

NppStatus **nppiCrossCorrFull_NormLevelAdvanced_16u32f_C4R_Ctx**(const *Npp16u* *pSrc, int nSrcStep, *NppiSize* oSrcRoiSize, const *Npp16u* *pTpl, int nTplStep, *NppiSize* oTplRoiSize, *Npp32f* *pDst, int nDstStep, *Npp8u* *pDeviceBuffer, *Npp8u* *pAdvancedScratchBuffer, *NppStreamContext* nppStreamCtx)

Four-channel 16-bit unsigned image CrossCorrFull_NormLevelAdvanced.

For common parameter descriptions, see *Common parameters for nppiSqrDistanceFull functions include:*.

FullNormLevelGetAdvancedScratchBufferHostSize

Companion primitives for computing the device buffer size (in bytes) required by the CrossCorrFull_NormLevelAdvanced primitives.

NppStatus **nppiCrossCorrFull_NormLevel_GetAdvancedScratchBufferSize**(*NppiSize* oSrcRoiSize, *NppiSize* oTplRoiSize, int nSizeofDstData, int nSrcChannels, size_t *hpBufferSize)

Buffer size (in bytes) for nppiCrossCorrFull_NormLevelAdvanced functions.

Parameters

- **oSrcRoiSize** – *Region-Of-Interest (ROI)*.
- **oTplRoiSize** – *Region-Of-Interest (ROI)*.

- **nSizeofDstData** – sizeof(destination data type (usually Npp32f)).
- **nSrcChannels** – number of source image color channels.
- **hpBufferSize** – Required buffer size. Important: hpBufferSize is a *host pointer. Scratch Buffer and Host Pointer*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

1.14.32. Image Cross Correlation Same Norm Level Advanced

1.14.32.1 CrossCorrSame_NormLevelAdvanced

Primitives for computing the normalized cross correlation coefficient between two images with same mode with large image template sizes.

CrossCorrSame_NormLevelAdvanced

The functions compute the $\gamma_{st}(c, r)$ in *General Introduction* with same mode (see *Categorizations*).

The functions require and additional scratch buffer and advanced scratch buffer for computations.

Note: For maximum performance oSrcRoiSize.width MUST be an integer multiple of 4.

NppStatus **nppiCrossCorrSame_NormLevelAdvanced_32f_C1R_Ctx**(const *Npp32f* *pSrc, int nSrcStep, *NppiSize* oSrcRoiSize, const *Npp32f* *pTpl, int nTplStep, *NppiSize* oTplRoiSize, *Npp32f* *pDst, int nDstStep, *Npp8u* *pDeviceBuffer, *Npp8u* *pAdvancedScratchBuffer, *NppStreamContext* nppStreamCtx)

One-channel 32-bit floating point image CrossCorrSame_NormLevelAdvanced.

For common parameter descriptions, see *Common parameters for nppiSqrDistanceFull functions include:*.

NppStatus **nppiCrossCorrSame_NormLevelAdvanced_32f_C3R_Ctx**(const *Npp32f* *pSrc, int nSrcStep, *NppiSize* oSrcRoiSize, const *Npp32f* *pTpl, int nTplStep, *NppiSize* oTplRoiSize, *Npp32f* *pDst, int nDstStep, *Npp8u* *pDeviceBuffer, *Npp8u* *pAdvancedScratchBuffer, *NppStreamContext* nppStreamCtx)

Three-channel 32-bit floating point image CrossCorrSame_NormLevelAdvanced.

For common parameter descriptions, see *Common parameters for nppiSqrDistanceFull functions include:*.

NppStatus **nppiCrossCorrSame_NormLevelAdvanced_32f_C4R_Ctx**(const *Npp32f* *pSrc, int nSrcStep, *NppiSize* oSrcRoiSize, const *Npp32f* *pTpl, int nTplStep, *NppiSize* oTplRoiSize, *Npp32f* *pDst, int nDstStep, *Npp8u* *pDeviceBuffer, *Npp8u* *pAdvancedScratchBuffer, *NppStreamContext* nppStreamCtx)

Four-channel 32-bit floating point image CrossCorrSame_NormLevelAdvanced.

For common parameter descriptions, see *Common parameters for nppiSqrDistanceFull functions include:*.

NppStatus **nppiCrossCorrSame_NormLevelAdvanced_64f_C1R_Ctx**(const *Npp64f* *pSrc, int nSrcStep, *NppiSize* oSrcRoiSize, const *Npp64f* *pTpl, int nTplStep, *NppiSize* oTplRoiSize, *Npp64f* *pDst, int nDstStep, *Npp8u* *pDeviceBuffer, *Npp8u* *pAdvancedScratchBuffer, *NppStreamContext* nppStreamCtx)

One-channel 64-bit floating point image CrossCorrSame_NormLevelAdvanced.

For common parameter descriptions, see *Common parameters for nppiSqrDistanceFull functions include:*.

NppStatus **nppiCrossCorrSame_NormLevelAdvanced_64f_C3R_Ctx**(const *Npp64f* *pSrc, int nSrcStep, *NppiSize* oSrcRoiSize, const *Npp64f* *pTpl, int nTplStep, *NppiSize* oTplRoiSize, *Npp64f* *pDst, int nDstStep, *Npp8u* *pDeviceBuffer, *Npp8u* *pAdvancedScratchBuffer, *NppStreamContext* nppStreamCtx)

Three-channel 64-bit floating point image CrossCorrSame_NormLevelAdvanced.

For common parameter descriptions, see *Common parameters for nppiSqrDistanceFull functions include:*.

NppStatus **nppiCrossCorrSame_NormLevelAdvanced_64f_C4R_Ctx**(const *Npp64f* *pSrc, int nSrcStep, *NppiSize* oSrcRoiSize, const *Npp64f* *pTpl, int nTplStep, *NppiSize* oTplRoiSize, *Npp64f* *pDst, int nDstStep, *Npp8u* *pDeviceBuffer, *Npp8u* *pAdvancedScratchBuffer, *NppStreamContext* nppStreamCtx)

Four-channel 64-bit floating point image CrossCorrSame_NormLevelAdvanced.

For common parameter descriptions, see *Common parameters for nppiSqrDistanceFull functions include:*.

NppStatus **nppiCrossCorrSame_NormLevelAdvanced_8u32f_C1R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *NppiSize* oSrcRoiSize, const *Npp8u* *pTpl, int nTplStep, *NppiSize* oTplRoiSize, *Npp32f* *pDst, int nDstStep, *Npp8u* *pDeviceBuffer, *Npp8u* *pAdvanced-ScratchBuffer, *NppStreamContext* nppStreamCtx)

One-channel 8-bit unsigned image CrossCorrSame_NormLevelAdvanced.

For common parameter descriptions, see *Common parameters for nppiSqrDistanceFull functions include:*.

NppStatus **nppiCrossCorrSame_NormLevelAdvanced_8u32f_C3R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *NppiSize* oSrcRoiSize, const *Npp8u* *pTpl, int nTplStep, *NppiSize* oTplRoiSize, *Npp32f* *pDst, int nDstStep, *Npp8u* *pDeviceBuffer, *Npp8u* *pAdvanced-ScratchBuffer, *NppStreamContext* nppStreamCtx)

Three-channel 8-bit unsigned image CrossCorrSame_NormLevelAdvanced.

For common parameter descriptions, see *Common parameters for nppiSqrDistanceFull functions include:*.

NppStatus **nppiCrossCorrSame_NormLevelAdvanced_8u32f_C4R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *NppiSize* oSrcRoiSize, const *Npp8u* *pTpl, int nTplStep, *NppiSize* oTplRoiSize, *Npp32f* *pDst, int nDstStep, *Npp8u* *pDeviceBuffer, *Npp8u* *pAdvanced-ScratchBuffer, *NppStreamContext* nppStreamCtx)

Four-channel 8-bit unsigned image CrossCorrSame_NormLevelAdvanced.

For common parameter descriptions, see *Common parameters for nppiSqrDistanceFull functions include:*.

NppStatus **nppiCrossCorrSame_NormLevelAdvanced_8s32f_C1R_Ctx**(const *Npp8s* *pSrc, int nSrcStep, *NppiSize* oSrcRoiSize, const *Npp8s* *pTpl, int nTplStep, *NppiSize* oTplRoiSize, *Npp32f* *pDst, int nDstStep, *Npp8u* *pDeviceBuffer, *Npp8u* *pAdvancedScratch-Buffer, *NppStreamContext* nppStreamCtx)

One-channel 8-bit signed image CrossCorrSame_NormLevelAdvanced.

For common parameter descriptions, see *Common parameters for nppiSqrDistanceFull functions include:*.

NppStatus **nppiCrossCorrSame_NormLevelAdvanced_8s32f_C3R_Ctx**(const *Npp8s* *pSrc, int nSrcStep, *NppiSize* oSrcRoiSize, const *Npp8s* *pTpl, int nTplStep, *NppiSize* oTplRoiSize, *Npp32f* *pDst, int nDstStep, *Npp8u* *pDeviceBuffer, *Npp8u* *pAdvancedScratch-Buffer, *NppStreamContext* nppStreamCtx)

Three-channel 8-bit signed image CrossCorrSame_NormLevelAdvanced.

For common parameter descriptions, see *Common parameters for nppiSqrDistanceFull functions include:*.

NppStatus **nppiCrossCorrSame_NormLevelAdvanced_8s32f_C4R_Ctx**(const *Npp8s* *pSrc, int nSrcStep, *NppiSize* oSrcRoiSize, const *Npp8s* *pTpl, int nTplStep, *NppiSize* oTplRoiSize, *Npp32f* *pDst, int nDstStep, *Npp8u* *pDeviceBuffer, *Npp8u* *pAdvancedScratchBuffer, *NppStreamContext* nppStreamCtx)

Four-channel 8-bit signed image CrossCorrSame_NormLevelAdvanced.

For common parameter descriptions, see *Common parameters for nppiSqrDistanceFull functions include:*.

NppStatus **nppiCrossCorrSame_NormLevelAdvanced_16u32f_C1R_Ctx**(const *Npp16u* *pSrc, int nSrcStep, *NppiSize* oSrcRoiSize, const *Npp16u* *pTpl, int nTplStep, *NppiSize* oTplRoiSize, *Npp32f* *pDst, int nDstStep, *Npp8u* *pDeviceBuffer, *Npp8u* *pAdvancedScratchBuffer, *NppStreamContext* nppStreamCtx)

One-channel 16-bit unsigned image CrossCorrSame_NormLevelAdvanced.

For common parameter descriptions, see *Common parameters for nppiSqrDistanceFull functions include:*.

NppStatus **nppiCrossCorrSame_NormLevelAdvanced_16u32f_C3R_Ctx**(const *Npp16u* *pSrc, int nSrcStep, *NppiSize* oSrcRoiSize, const *Npp16u* *pTpl, int nTplStep, *NppiSize* oTplRoiSize, *Npp32f* *pDst, int nDstStep, *Npp8u* *pDeviceBuffer, *Npp8u* *pAdvancedScratchBuffer, *NppStreamContext* nppStreamCtx)

Three-channel 16-bit unsigned image CrossCorrSame_NormLevelAdvanced.

For common parameter descriptions, see *Common parameters for nppiSqrDistanceFull functions include:*.

NppStatus **nppiCrossCorrSame_NormLevelAdvanced_16u32f_C4R_Ctx**(const *Npp16u* *pSrc, int nSrcStep, *NppiSize* oSrcRoiSize, const *Npp16u* *pTpl, int nTplStep, *NppiSize* oTplRoiSize, *Npp32f* *pDst, int nDstStep, *Npp8u* *pDeviceBuffer, *Npp8u* *pAdvancedScratchBuffer, *NppStreamContext* nppStreamCtx)

Four-channel 16-bit unsigned image CrossCorrSame_NormLevelAdvanced.

For common parameter descriptions, see *Common parameters for nppiSqrDistanceFull functions include:*.

SameNormLevelGetAdvancedScratchBufferHostSize

Companion primitives for computing the device buffer size (in bytes) required by the CrossCorrSame_NormLevelAdvanced primitives.

NppStatus **nppiCrossCorrSame_NormLevel_GetAdvancedScratchBufferSize**(*NppiSize* oSrcRoiSize, *NppiSize* oTplRoiSize, int nSizeofDstData, int nSrcChannels, size_t *hpBufferSize)

Buffer size (in bytes) for nppiCrossCorrSame_NormLevelAdvanced functions.

Parameters

- **oSrcRoiSize** – *Region-Of-Interest (ROI)*.
- **oTplRoiSize** – *Region-Of-Interest (ROI)*.
- **nSizeofDstData** – sizeof(destination data type (usually Npp32f)).
- **nSrcChannels** – number of source image color channels.
- **hpBufferSize** – Required buffer size. Important: hpBufferSize is a *host pointer. Scratch Buffer and Host Pointer*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

1.14.33. Image Cross Correlation Valid Norm Level Advanced

1.14.33.1 CrossCorrValid_NormLevelAdvanced

Primitives for computing the normalized cross correlation coefficient between two images with valid mode with large template sizes.

CrossCorrValid_NormLevelAdvanced

The functions compute the $\gamma_{st}(c, r)$ in *General Introduction* with valid mode (see *Categorizations*).

The functions require an additional scratch buffer and advanced scratch buffer for computations.

Note: For maximum performance oSrcRoiSize.width - oTplRoiSize + 1 MUST be an integer multiple of 4.

NppStatus **nppiCrossCorrValid_NormLevelAdvanced_32f_C1R_Ctx**(const *Npp32f* *pSrc, int nSrcStep, *NppiSize* oSrcRoiSize, const *Npp32f* *pTpl, int nTplStep, *NppiSize* oTplRoiSize, *Npp32f* *pDst, int nDstStep, *Npp8u* *pDeviceBuffer, *Npp8u* *pAdvancedScratchBuffer, *NppStreamContext* nppStreamCtx)

One-channel 32-bit floating point image CrossCorrValid_NormLevelAdvanced.

For common parameter descriptions, see *Common parameters for nppiSqrDistanceFull functions include:*.

NppStatus **nppiCrossCorrValid_NormLevelAdvanced_32f_C3R_Ctx**(const *Npp32f* *pSrc, int nSrcStep, *NppiSize* oSrcRoiSize, const *Npp32f* *pTpl, int nTplStep, *NppiSize* oTplRoiSize, *Npp32f* *pDst, int nDstStep, *Npp8u* *pDeviceBuffer, *Npp8u* *pAdvancedScratchBuffer, *NppStreamContext* nppStreamCtx)

Three-channel 32-bit floating point image CrossCorrValid_NormLevelAdvanced.

For common parameter descriptions, see *Common parameters for nppiSqrDistanceFull functions include:*.

NppStatus **nppiCrossCorrValid_NormLevelAdvanced_32f_C4R_Ctx**(const *Npp32f* *pSrc, int nSrcStep, *NppiSize* oSrcRoiSize, const *Npp32f* *pTpl, int nTplStep, *NppiSize* oTplRoiSize, *Npp32f* *pDst, int nDstStep, *Npp8u* *pDeviceBuffer, *Npp8u* *pAdvancedScratchBuffer, *NppStreamContext* nppStreamCtx)

Four-channel 32-bit floating point image CrossCorrValid_NormLevelAdvanced.

For common parameter descriptions, see *Common parameters for nppiSqrDistanceFull functions include:*.

NppStatus **nppiCrossCorrValid_NormLevelAdvanced_64f_C1R_Ctx**(const *Npp64f* *pSrc, int nSrcStep, *NppiSize* oSrcRoiSize, const *Npp64f* *pTpl, int nTplStep, *NppiSize* oTplRoiSize, *Npp64f* *pDst, int nDstStep, *Npp8u* *pDeviceBuffer, *Npp8u* *pAdvancedScratchBuffer, *NppStreamContext* nppStreamCtx)

One-channel 64-bit floating point image CrossCorrValid_NormLevelAdvanced.

For common parameter descriptions, see *Common parameters for nppiSqrDistanceFull functions include:*.

NppStatus **nppiCrossCorrValid_NormLevelAdvanced_64f_C3R_Ctx**(const *Npp64f* *pSrc, int nSrcStep, *NppiSize* oSrcRoiSize, const *Npp64f* *pTpl, int nTplStep, *NppiSize* oTplRoiSize, *Npp64f* *pDst, int nDstStep, *Npp8u* *pDeviceBuffer, *Npp8u* *pAdvancedScratchBuffer, *NppStreamContext* nppStreamCtx)

Three-channel 64-bit floating point image CrossCorrValid_NormLevelAdvanced.

For common parameter descriptions, see *Common parameters for nppiSqrDistanceFull functions include:*.

NppStatus **nppiCrossCorrValid_NormLevelAdvanced_64f_C4R_Ctx**(const *Npp64f* *pSrc, int nSrcStep, *NppiSize* oSrcRoiSize, const *Npp64f* *pTpl, int nTplStep, *NppiSize* oTplRoiSize, *Npp64f* *pDst, int nDstStep, *Npp8u* *pDeviceBuffer, *Npp8u* *pAdvancedScratchBuffer, *NppStreamContext* nppStreamCtx)

Four-channel 64-bit floating point image CrossCorrValid_NormLevelAdvanced.

For common parameter descriptions, see *Common parameters for nppiSqrDistanceFull functions include:*.

NppStatus **nppiCrossCorrValid_NormLevelAdvanced_8u32f_C1R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *NppiSize* oSrcRoiSize, const *Npp8u* *pTpl, int nTplStep, *NppiSize* oTplRoiSize, *Npp32f* *pDst, int nDstStep, *Npp8u* *pDeviceBuffer, *Npp8u* *pAdvanced-ScratchBuffer, *NppStreamContext* nppStreamCtx)

One-channel 8-bit unsigned image CrossCorrValid_NormLevelAdvanced.

For common parameter descriptions, see *Common parameters for nppiSqrDistanceFull functions include:*.

NppStatus **nppiCrossCorrValid_NormLevelAdvanced_8u32f_C3R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *NppiSize* oSrcRoiSize, const *Npp8u* *pTpl, int nTplStep, *NppiSize* oTplRoiSize, *Npp32f* *pDst, int nDstStep, *Npp8u* *pDeviceBuffer, *Npp8u* *pAdvanced-ScratchBuffer, *NppStreamContext* nppStreamCtx)

Three-channel 8-bit unsigned image CrossCorrValid_NormLevelAdvanced.

For common parameter descriptions, see *Common parameters for nppiSqrDistanceFull functions include:*.

NppStatus **nppiCrossCorrValid_NormLevelAdvanced_8u32f_C4R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *NppiSize* oSrcRoiSize, const *Npp8u* *pTpl, int nTplStep, *NppiSize* oTplRoiSize, *Npp32f* *pDst, int nDstStep, *Npp8u* *pDeviceBuffer, *Npp8u* *pAdvanced-ScratchBuffer, *NppStreamContext* nppStreamCtx)

Four-channel 8-bit unsigned image CrossCorrValid_NormLevelAdvanced.

For common parameter descriptions, see *Common parameters for nppiSqrDistanceFull functions include:*.

NppStatus **nppiCrossCorrValid_NormLevelAdvanced_8s32f_C1R_Ctx**(const *Npp8s* *pSrc, int nSrcStep, *NppiSize* oSrcRoiSize, const *Npp8s* *pTpl, int nTplStep, *NppiSize* oTplRoiSize, *Npp32f* *pDst, int nDstStep, *Npp8u* *pDeviceBuffer, *Npp8u* *pAdvanced-ScratchBuffer, *NppStreamContext* nppStreamCtx)

One-channel 8-bit signed image CrossCorrValid_NormLevelAdvanced.

For common parameter descriptions, see *Common parameters for nppiSqrDistanceFull functions include:*.

NppStatus **nppiCrossCorrValid_NormLevelAdvanced_8s32f_C3R_Ctx**(const *Npp8s* *pSrc, int nSrcStep, *NppiSize* oSrcRoiSize, const *Npp8s* *pTpl, int nTplStep, *NppiSize* oTplRoiSize, *Npp32f* *pDst, int nDstStep, *Npp8u* *pDeviceBuffer, *Npp8u* *pAdvanced-ScratchBuffer, *NppStreamContext* nppStreamCtx)

Three-channel 8-bit signed image CrossCorrValid_NormLevelAdvanced.

For common parameter descriptions, see *Common parameters for nppiSqrDistanceFull functions include:*.

NppStatus **nppiCrossCorrValid_NormLevelAdvanced_8s32f_C4R_Ctx**(const *Npp8s* *pSrc, int nSrcStep, *NppiSize* oSrcRoiSize, const *Npp8s* *pTpl, int nTplStep, *NppiSize* oTplRoiSize, *Npp32f* *pDst, int nDstStep, *Npp8u* *pDeviceBuffer, *Npp8u* *pAdvancedScratchBuffer, *NppStreamContext* nppStreamCtx)

Four-channel 8-bit signed image CrossCorrValid_NormLevelAdvanced.

For common parameter descriptions, see *Common parameters for nppiSqrDistanceFull functions include:*.

NppStatus **nppiCrossCorrValid_NormLevelAdvanced_16u32f_C1R_Ctx**(const *Npp16u* *pSrc, int nSrcStep, *NppiSize* oSrcRoiSize, const *Npp16u* *pTpl, int nTplStep, *NppiSize* oTplRoiSize, *Npp32f* *pDst, int nDstStep, *Npp8u* *pDeviceBuffer, *Npp8u* *pAdvancedScratchBuffer, *NppStreamContext* nppStreamCtx)

One-channel 16-bit unsigned image CrossCorrValid_NormLevelAdvanced.

For common parameter descriptions, see *Common parameters for nppiSqrDistanceFull functions include:*.

NppStatus **nppiCrossCorrValid_NormLevelAdvanced_16u32f_C3R_Ctx**(const *Npp16u* *pSrc, int nSrcStep, *NppiSize* oSrcRoiSize, const *Npp16u* *pTpl, int nTplStep, *NppiSize* oTplRoiSize, *Npp32f* *pDst, int nDstStep, *Npp8u* *pDeviceBuffer, *Npp8u* *pAdvancedScratchBuffer, *NppStreamContext* nppStreamCtx)

Three-channel 16-bit unsigned image CrossCorrValid_NormLevelAdvanced.

For common parameter descriptions, see *Common parameters for nppiSqrDistanceFull functions include:*.

NppStatus **nppiCrossCorrValid_NormLevelAdvanced_16u32f_C4R_Ctx**(const *Npp16u* *pSrc, int nSrcStep, *NppiSize* oSrcRoiSize, const *Npp16u* *pTpl, int nTplStep, *NppiSize* oTplRoiSize, *Npp32f* *pDst, int nDstStep, *Npp8u* *pDeviceBuffer, *Npp8u* *pAdvancedScratchBuffer, *NppStreamContext* nppStreamCtx)

Four-channel 16-bit unsigned image CrossCorrValid_NormLevelAdvanced.

For common parameter descriptions, see *Common parameters for nppiSqrDistanceFull functions include:*.

ValidNormLevelGetAdvancedScratchBufferHostSize

Companion primitives for computing the device buffer size (in bytes) required by the CrossCorrValid_NormLevelAdvanced primitives.

NppStatus **nppiCrossCorrValid_NormLevel_GetAdvancedScratchBufferSize**(*NppiSize* oSrcRoiSize, *NppiSize* oTplRoiSize, int nSizeofDstData, int nSrcChannels, size_t *hpBufferSize)

Buffer size (in bytes) for nppiCrossCorrValid_NormLevelAdvanced functions.

Parameters

- **oSrcRoiSize** – *Region-Of-Interest (ROI)*.
- **oTplRoiSize** – *Region-Of-Interest (ROI)*.
- **nSizeofDstData** – sizeof(destination data type (usually Npp32f)).
- **nSrcChannels** – number of source image color channels.
- **hpBufferSize** – Required buffer size. Important: hpBufferSize is a *host pointer. Scratch Buffer and Host Pointer*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

1.14.34. Image Quality Index

1.14.34.1 Image Quality Index

Primitives for computing the image quality index of two images.

QualityIndex

Given two images M and N (both $W \times H$), the mathematical formula to calculate the image quality index Q between them is expressed as:

$$Q = \frac{4\sigma_{MN}\tilde{M}\tilde{N}}{[(\tilde{M}^2) + (\tilde{N}^2)][(\sigma_M)^2 + (\sigma_N)^2]}$$

where

$$\tilde{M} = \frac{1}{W \cdot H} \sum_{j=0}^{H-1} \sum_{i=0}^{W-1} M(j,i)$$

$$\tilde{N} = \frac{1}{W \cdot H} \sum_{j=0}^{H-1} \sum_{i=0}^{W-1} N(j,i)$$

$$\sigma_M = \sqrt{\frac{1}{W \cdot H - 1} \sum_{j=0}^{H-1} \sum_{i=0}^{W-1} [M(j,i) - \tilde{M}]^2}$$

$$\sigma_N = \sqrt{\frac{1}{W \cdot H - 1} \sum_{j=0}^{H-1} \sum_{i=0}^{W-1} [N(j,i) - \tilde{N}]^2}$$

$$\sigma_{MN} = \frac{1}{W \cdot H - 1} \sum_{j=0}^{H-1} \sum_{i=0}^{W-1} [M(j,i) - \tilde{M}][N(j,i) - \tilde{N}]$$

The functions require additional scratch buffer for computations.

1.14.34.2 Common parameters for nppiQualityIndex functions include:

param pSrc1
Source-Image Pointer.

param nSrc1Step
Source-Image Line Step.

param pSrc2
Source-Image Pointer.

param nSrc2Step
Source-Image Line Step.

param oRoiSize
Region-Of-Interest (ROI).

param pDst
Pointer to the quality index.

param pDeviceBuffer
Pointer to the required device memory allocation, *Scratch Buffer and Host Pointer*.

param nppStreamCtx
Application Managed Stream Context.

return
Image Data Related Error Codes, *ROI Related Error Codes*, or NPP_QUALITY_INDEX_ERROR if pixels of either image are constant numberse.

NppStatus **nppiQualityIndex_8u32f_C1R_Ctx**(const *Npp8u* *pSrc1, int nSrc1Step, const *Npp8u* *pSrc2, int nSrc2Step, *NppiSize* oRoiSize, *Npp32f* *pDst, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

One-channel 8-bit unsigned image QualityIndex.

For common parameter descriptions, see *Common parameters for nppiQualityIndex functions include:*.

NppStatus **nppiQualityIndex_16u32f_C1R_Ctx**(const *Npp16u* *pSrc1, int nSrc1Step, const *Npp16u* *pSrc2, int nSrc2Step, *NppiSize* oRoiSize, *Npp32f* *pDst, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

One-channel 16-bit unsigned image QualityIndex.

For common parameter descriptions, see *Common parameters for nppiQualityIndex functions include:*.

NppStatus **nppiQualityIndex_32f_C1R_Ctx**(const *Npp32f* *pSrc1, int nSrc1Step, const *Npp32f* *pSrc2, int nSrc2Step, *NppiSize* oRoiSize, *Npp32f* *pDst, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

One-channel 32-bit floating point image QualityIndex.

For common parameter descriptions, see *Common parameters for nppiQualityIndex functions include:*.

NppStatus **nppiQualityIndex_8u32f_C3R_Ctx**(const *Npp8u* *pSrc1, int nSrc1Step, const *Npp8u* *pSrc2, int nSrc2Step, *NppiSize* oRoiSize, *Npp32f* *pDst, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Three-channel 8-bit unsigned image QualityIndex.

For common parameter descriptions, see *Common parameters for nppiQualityIndex functions include:*.

NppStatus **nppiQualityIndex_16u32f_C3R_Ctx**(const *Npp16u* *pSrc1, int nSrc1Step, const *Npp16u* *pSrc2, int nSrc2Step, *NppiSize* oRoiSize, *Npp32f* *pDst, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Three-channel 16-bit unsigned image QualityIndex.

For common parameter descriptions, see *Common parameters for nppiQualityIndex functions include:*.

NppStatus **nppiQualityIndex_32f_C3R_Ctx**(const *Npp32f* *pSrc1, int nSrc1Step, const *Npp32f* *pSrc2, int nSrc2Step, *NppiSize* oRoiSize, *Npp32f* *pDst, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Three-channel 32-bit floating point image QualityIndex.

For common parameter descriptions, see *Common parameters for nppiQualityIndex functions include:*.

NppStatus **nppiQualityIndex_8u32f_AC4R_Ctx**(const *Npp8u* *pSrc1, int nSrc1Step, const *Npp8u* *pSrc2, int nSrc2Step, *NppiSize* oRoiSize, *Npp32f* *pDst, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Four-channel 8-bit unsigned image QualityIndex.

For common parameter descriptions, see *Common parameters for nppiQualityIndex functions include:*.

NppStatus **nppiQualityIndex_16u32f_AC4R_Ctx**(const *Npp16u* *pSrc1, int nSrc1Step, const *Npp16u* *pSrc2, int nSrc2Step, *NppiSize* oRoiSize, *Npp32f* *pDst, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Four-channel 16-bit unsigned image QualityIndex.

For common parameter descriptions, see *Common parameters for nppiQualityIndex functions include:*.

NppStatus **nppiQualityIndex_32f_AC4R_Ctx**(const *Npp32f* *pSrc1, int nSrc1Step, const *Npp32f* *pSrc2, int nSrc2Step, *NppiSize* oRoiSize, *Npp32f* *pDst, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Four-channel 32-bit floating point image QualityIndex.

For common parameter descriptions, see *Common parameters for nppiQualityIndex functions include:*.

QualityIndexGetBufferHostSize

Companion primitives for computing the device buffer size (in bytes) required by the QualityIndex primitives.

1.14.34.3 CommonQualityIndexGetBufferHostSizeParameters

Common parameters for nppiQualityIndexGetBufferHostSize functions include:

param oSizeROI
Region-Of-Interest (ROI).

param hpBufferSize
Required buffer size. Important: hpBufferSize is a *host pointer.* *Scratch Buffer and Host Pointer*.

param nppStreamCtx
Application Managed Stream Context.

return
NPP_NULL_POINTER_ERROR if hpBufferSize is 0 (NULL), *ROI Related Error Codes*.

NppStatus **nppiQualityIndexGetBufferHostSize_8u32f_C1R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size (in bytes) for *nppiQualityIndex_8u32f_C1R_Ctx*.

For common parameter descriptions, see *CommonQualityIndexGetBufferHostSizeParameters*.

NppStatus **nppiQualityIndexGetBufferHostSize_16u32f_C1R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size (in bytes) for *nppiQualityIndex_16u32f_C1R_Ctx*.

For common parameter descriptions, see *CommonQualityIndexGetBufferHostSizeParameters*.

NppStatus **nppiQualityIndexGetBufferHostSize_32f_C1R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size (in bytes) for *nppiQualityIndex_32f_C1R_Ctx*.

For common parameter descriptions, see *CommonQualityIndexGetBufferHostSizeParameters*.

NppStatus **nppiQualityIndexGetBufferHostSize_8u32f_C3R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size (in bytes) for *nppiQualityIndex_8u32f_C3R_Ctx*.

For common parameter descriptions, see *CommonQualityIndexGetBufferHostSizeParameters*.

NppStatus **nppiQualityIndexGetBufferHostSize_16u32f_C3R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size (in bytes) for *nppiQualityIndex_16u32f_C3R_Ctx*.

For common parameter descriptions, see *CommonQualityIndexGetBufferHostSizeParameters*.

NppStatus **nppiQualityIndexGetBufferHostSize_32f_C3R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size (in bytes) for *nppiQualityIndex_32f_C3R_Ctx*.

For common parameter descriptions, see *CommonQualityIndexGetBufferHostSizeParameters*.

NppStatus **nppiQualityIndexGetBufferHostSize_8u32f_AC4R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size (in bytes) for *nppiQualityIndex_8u32f_AC4R_Ctx*.

For common parameter descriptions, see *CommonQualityIndexGetBufferHostSizeParameters*.

NppStatus **nppiQualityIndexGetBufferHostSize_16u32f_AC4R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size (in bytes) for *nppiQualityIndex_16u32f_AC4R_Ctx*.

For common parameter descriptions, see *CommonQualityIndexGetBufferHostSizeParameters*.

NppStatus **nppiQualityIndexGetBufferHostSize_32f_AC4R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size (in bytes) for *nppiQualityIndex_32f_AC4R_Ctx*.

For common parameter descriptions, see *CommonQualityIndexGetBufferHostSizeParameters*.

1.14.35. Image Maximum Error

1.14.35.1 MaximumError

Primitives for computing the maximum error between two images. Given two images $pSrc1$ and $pSrc2$ both with width W and height H, the maximum error is defined as the largest absolute difference between pixels of two images. If the image is in complex format, the absolute value of the complex number is provided.

1.14.35.2 Common parameters for nppiMaximumError functions include:

param pSrc1
Source-Image Pointer.

param nSrc1Step
Source-Image Line Step.

param pSrc2
Source-Image Pointer.

param nSrc2Step
Source-Image Line Step.

param oSizeROI
Region-Of-Interest (ROI).

param pError
Device memory pointer to the computed error.

param pDeviceBuffer
Pointer to the required device memory allocation, *Scratch Buffer and Host Pointer*.

param nppStreamCtx
Application Managed Stream Context.

return
Image Data Related Error Codes, *ROI Related Error Codes*.

MaximumError

NppStatus **nppiMaximumError_8u_C1R_Ctx**(const *Npp8u* *pSrc1, int nSrc1Step, const *Npp8u* *pSrc2, int nSrc2Step, *NppiSize* oSizeROI, *Npp64f* *pError, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

One-channel 8-bit unsigned image Maximum_Error.

For common parameter descriptions, see *Common parameters for nppiMaximumError functions include:*.

NppStatus **nppiMaximumError_8s_C1R_Ctx**(const *Npp8s* *pSrc1, int nSrc1Step, const *Npp8s* *pSrc2, int nSrc2Step, *NppiSize* oSizeROI, *Npp64f* *pError, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

One-channel 8-bit signed image Maximum_Error.

For common parameter descriptions, see *Common parameters for nppiMaximumError functions include:*.

NppStatus **nppiMaximumError_16u_C1R_Ctx**(const *Npp16u* *pSrc1, int nSrc1Step, const *Npp16u* *pSrc2, int nSrc2Step, *NppiSize* oSizeROI, *Npp64f* *pError, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

One-channel 16-bit unsigned image Maximum_Error.

For common parameter descriptions, see *Common parameters for nppiMaximumError functions include:*.

NppStatus **nppiMaximumError_16s_C1R_Ctx**(const *Npp16s* *pSrc1, int nSrc1Step, const *Npp16s* *pSrc2, int nSrc2Step, *NppiSize* oSizeROI, *Npp64f* *pError, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

One-channel 16-bit signed image Maximum_Error.

For common parameter descriptions, see *Common parameters for nppiMaximumError functions include:*.

NppStatus **nppiMaximumError_16sc_C1R_Ctx**(const *Npp16sc* *pSrc1, int nSrc1Step, const *Npp16sc* *pSrc2, int nSrc2Step, *NppiSize* oSizeROI, *Npp64f* *pError, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

One-channel 16-bit signed complex image Maximum_Error.

For common parameter descriptions, see *Common parameters for nppiMaximumError functions include:*.

NppStatus **nppiMaximumError_32u_C1R_Ctx**(const *Npp32u* *pSrc1, int nSrc1Step, const *Npp32u* *pSrc2, int nSrc2Step, *NppiSize* oSizeROI, *Npp64f* *pError, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

One-channel 32-bit unsigned image Maximum_Error.

For common parameter descriptions, see *Common parameters for nppiMaximumError functions include:*.

NppStatus **nppiMaximumError_32s_C1R_Ctx**(const *Npp32s* *pSrc1, int nSrc1Step, const *Npp32s* *pSrc2, int nSrc2Step, *NppiSize* oSizeROI, *Npp64f* *pError, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

One-channel 32-bit signed image Maximum_Error.

For common parameter descriptions, see *Common parameters for nppiMaximumError functions include:*.

NppStatus **nppiMaximumError_32sc_C1R_Ctx**(const *Npp32sc* *pSrc1, int nSrc1Step, const *Npp32sc* *pSrc2, int nSrc2Step, *NppiSize* oSizeROI, *Npp64f* *pError, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

One-channel 32-bit signed complex image Maximum_Error.

For common parameter descriptions, see *Common parameters for nppiMaximumError functions include:*.

NppStatus **nppiMaximumError_32f_C1R_Ctx**(const *Npp32f* *pSrc1, int nSrc1Step, const *Npp32f* *pSrc2, int nSrc2Step, *NppiSize* oSizeROI, *Npp64f* *pError, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

One-channel 32-bit floating point image Maximum_Error.

For common parameter descriptions, see *Common parameters for nppiMaximumError functions include:*.

NppStatus **nppiMaximumError_32fc_C1R_Ctx**(const *Npp32fc* *pSrc1, int nSrc1Step, const *Npp32fc* *pSrc2, int nSrc2Step, *NppiSize* oSizeROI, *Npp64f* *pError, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

One-channel 32-bit floating point complex image Maximum_Error.

For common parameter descriptions, see *Common parameters for nppiMaximumError functions include:*.

NppStatus **nppiMaximumError_64f_C1R_Ctx**(const *Npp64f* *pSrc1, int nSrc1Step, const *Npp64f* *pSrc2, int nSrc2Step, *NppiSize* oSizeROI, *Npp64f* *pError, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

One-channel 64-bit floating point image Maximum_Error.

For common parameter descriptions, see *Common parameters for nppiMaximumError functions include:*.

NppStatus **nppiMaximumError_8u_C2R_Ctx**(const *Npp8u* *pSrc1, int nSrc1Step, const *Npp8u* *pSrc2, int nSrc2Step, *NppiSize* oSizeROI, *Npp64f* *pError, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Two-channel 8-bit unsigned image Maximum_Error.

For common parameter descriptions, see *Common parameters for nppiMaximumError functions include:*.

NppStatus **nppiMaximumError_8s_C2R_Ctx**(const *Npp8s* *pSrc1, int nSrc1Step, const *Npp8s* *pSrc2, int nSrc2Step, *NppiSize* oSizeROI, *Npp64f* *pError, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Two-channel 8-bit signed image Maximum_Error.

For common parameter descriptions, see *Common parameters for nppiMaximumError functions include:*.

NppStatus **nppiMaximumError_16u_C2R_Ctx**(const *Npp16u* *pSrc1, int nSrc1Step, const *Npp16u* *pSrc2, int nSrc2Step, *NppiSize* oSizeROI, *Npp64f* *pError, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Two-channel 16-bit unsigned image Maximum_Error.

For common parameter descriptions, see *Common parameters for nppiMaximumError functions include:*.

NppStatus **nppiMaximumError_16s_C2R_Ctx**(const *Npp16s* *pSrc1, int nSrc1Step, const *Npp16s* *pSrc2, int nSrc2Step, *NppiSize* oSizeROI, *Npp64f* *pError, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Two-channel 16-bit signed image Maximum_Error.

For common parameter descriptions, see *Common parameters for nppiMaximumError functions include:*.

NppStatus **nppiMaximumError_16sc_C2R_Ctx**(const *Npp16sc* *pSrc1, int nSrc1Step, const *Npp16sc* *pSrc2, int nSrc2Step, *NppiSize* oSizeROI, *Npp64f* *pError, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Two-channel 16-bit signed complex image Maximum_Error.

For common parameter descriptions, see *Common parameters for nppiMaximumError functions include:*.

NppStatus **nppiMaximumError_32u_C2R_Ctx**(const *Npp32u* *pSrc1, int nSrc1Step, const *Npp32u* *pSrc2, int nSrc2Step, *NppiSize* oSizeROI, *Npp64f* *pError, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Two-channel 32-bit unsigned image Maximum_Error.

For common parameter descriptions, see *Common parameters for nppiMaximumError functions include:*.

NppStatus **nppiMaximumError_32s_C2R_Ctx**(const *Npp32s* *pSrc1, int nSrc1Step, const *Npp32s* *pSrc2, int nSrc2Step, *NppiSize* oSizeROI, *Npp64f* *pError, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Two-channel 32-bit signed image Maximum_Error.

For common parameter descriptions, see *Common parameters for nppiMaximumError functions include:*.

NppStatus **nppiMaximumError_32sc_C2R_Ctx**(const *Npp32sc* *pSrc1, int nSrc1Step, const *Npp32sc* *pSrc2, int nSrc2Step, *NppiSize* oSizeROI, *Npp64f* *pError, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Two-channel 32-bit signed complex image Maximum_Error.

For common parameter descriptions, see *Common parameters for nppiMaximumError functions include:*.

NppStatus **nppiMaximumError_32f_C2R_Ctx**(const *Npp32f* *pSrc1, int nSrc1Step, const *Npp32f* *pSrc2, int nSrc2Step, *NppiSize* oSizeROI, *Npp64f* *pError, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Two-channel 32-bit floating point image Maximum_Error.

For common parameter descriptions, see *Common parameters for nppiMaximumError functions include:*.

NppStatus **nppiMaximumError_32fc_C2R_Ctx**(const *Npp32fc* *pSrc1, int nSrc1Step, const *Npp32fc* *pSrc2, int nSrc2Step, *NppiSize* oSizeROI, *Npp64f* *pError, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Two-channel 32-bit floating point complex image Maximum_Error.

For common parameter descriptions, see *Common parameters for nppiMaximumError functions include:*.

NppStatus **nppiMaximumError_64f_C2R_Ctx**(const *Npp64f* *pSrc1, int nSrc1Step, const *Npp64f* *pSrc2, int nSrc2Step, *NppiSize* oSizeROI, *Npp64f* *pError, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Two-channel 64-bit floating point image Maximum_Error.

For common parameter descriptions, see *Common parameters for nppiMaximumError functions include:*.

NppStatus **nppiMaximumError_8u_C3R_Ctx**(const *Npp8u* *pSrc1, int nSrc1Step, const *Npp8u* *pSrc2, int nSrc2Step, *NppiSize* oSizeROI, *Npp64f* *pError, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Three-channel 8-bit unsigned image Maximum_Error.

For common parameter descriptions, see *Common parameters for nppiMaximumError functions include:*.

NppStatus **nppiMaximumError_8s_C3R_Ctx**(const *Npp8s* *pSrc1, int nSrc1Step, const *Npp8s* *pSrc2, int nSrc2Step, *NppiSize* oSizeROI, *Npp64f* *pError, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Three-channel 8-bit signed image Maximum_Error.

For common parameter descriptions, see *Common parameters for nppiMaximumError functions include:*.

NppStatus **nppiMaximumError_16u_C3R_Ctx**(const *Npp16u* *pSrc1, int nSrc1Step, const *Npp16u* *pSrc2, int nSrc2Step, *NppiSize* oSizeROI, *Npp64f* *pError, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Three-channel 16-bit unsigned image Maximum_Error.

For common parameter descriptions, see *Common parameters for nppiMaximumError functions include:*.

NppStatus **nppiMaximumError_16s_C3R_Ctx**(const *Npp16s* *pSrc1, int nSrc1Step, const *Npp16s* *pSrc2, int nSrc2Step, *NppiSize* oSizeROI, *Npp64f* *pError, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Three-channel 16-bit signed image Maximum_Error.

For common parameter descriptions, see *Common parameters for nppiMaximumError functions include:*.

NppStatus **nppiMaximumError_16sc_C3R_Ctx**(const *Npp16sc* *pSrc1, int nSrc1Step, const *Npp16sc* *pSrc2, int nSrc2Step, *NppiSize* oSizeROI, *Npp64f* *pError, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Three-channel 16-bit signed complex image Maximum_Error.

For common parameter descriptions, see *Common parameters for nppiMaximumError functions include:*.

NppStatus **nppiMaximumError_32u_C3R_Ctx**(const *Npp32u* *pSrc1, int nSrc1Step, const *Npp32u* *pSrc2, int nSrc2Step, *NppiSize* oSizeROI, *Npp64f* *pError, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Three-channel 32-bit unsigned image Maximum_Error.

For common parameter descriptions, see *Common parameters for nppiMaximumError functions include:*.

NppStatus **nppiMaximumError_32s_C3R_Ctx**(const *Npp32s* *pSrc1, int nSrc1Step, const *Npp32s* *pSrc2, int nSrc2Step, *NppiSize* oSizeROI, *Npp64f* *pError, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Three-channel 32-bit signed image Maximum_Error.

For common parameter descriptions, see *Common parameters for nppiMaximumError functions include:*.

NppStatus **nppiMaximumError_32sc_C3R_Ctx**(const *Npp32sc* *pSrc1, int nSrc1Step, const *Npp32sc* *pSrc2, int nSrc2Step, *NppiSize* oSizeROI, *Npp64f* *pError, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Three-channel 32-bit signed complex image Maximum_Error.

For common parameter descriptions, see *Common parameters for nppiMaximumError functions include:*.

NppStatus **nppiMaximumError_32f_C3R_Ctx**(const *Npp32f* *pSrc1, int nSrc1Step, const *Npp32f* *pSrc2, int nSrc2Step, *NppiSize* oSizeROI, *Npp64f* *pError, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Three-channel 32-bit floating point image Maximum_Error.

For common parameter descriptions, see *Common parameters for nppiMaximumError functions include:*.

NppStatus **nppiMaximumError_32fc_C3R_Ctx**(const *Npp32fc* *pSrc1, int nSrc1Step, const *Npp32fc* *pSrc2, int nSrc2Step, *NppiSize* oSizeROI, *Npp64f* *pError, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Three-channel 32-bit floating point complex image Maximum_Error.

For common parameter descriptions, see *Common parameters for nppiMaximumError functions include:*.

NppStatus **nppiMaximumError_64f_C3R_Ctx**(const *Npp64f* *pSrc1, int nSrc1Step, const *Npp64f* *pSrc2, int nSrc2Step, *NppiSize* oSizeROI, *Npp64f* *pError, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Three-channel 64-bit floating point image Maximum_Error.

For common parameter descriptions, see *Common parameters for nppiMaximumError functions include:*.

NppStatus **nppiMaximumError_8u_C4R_Ctx**(const *Npp8u* *pSrc1, int nSrc1Step, const *Npp8u* *pSrc2, int nSrc2Step, *NppiSize* oSizeROI, *Npp64f* *pError, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Four-channel 8-bit unsigned image Maximum_Error.

For common parameter descriptions, see *Common parameters for nppiMaximumError functions include:*.

NppStatus **nppiMaximumError_8s_C4R_Ctx**(const *Npp8s* *pSrc1, int nSrc1Step, const *Npp8s* *pSrc2, int nSrc2Step, *NppiSize* oSizeROI, *Npp64f* *pError, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Four-channel 8-bit signed image Maximum_Error.

For common parameter descriptions, see *Common parameters for nppiMaximumError functions include:*.

NppStatus **nppiMaximumError_16u_C4R_Ctx**(const *Npp16u* *pSrc1, int nSrc1Step, const *Npp16u* *pSrc2, int nSrc2Step, *NppiSize* oSizeROI, *Npp64f* *pError, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Four-channel 16-bit unsigned image Maximum_Error.

For common parameter descriptions, see *Common parameters for nppiMaximumError functions include:*.

NppStatus **nppiMaximumError_16s_C4R_Ctx**(const *Npp16s* *pSrc1, int nSrc1Step, const *Npp16s* *pSrc2, int nSrc2Step, *NppiSize* oSizeROI, *Npp64f* *pError, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Four-channel 16-bit signed image Maximum_Error.

For common parameter descriptions, see *Common parameters for nppiMaximumError functions include:*.

NppStatus **nppiMaximumError_16sc_C4R_Ctx**(const *Npp16sc* *pSrc1, int nSrc1Step, const *Npp16sc* *pSrc2, int nSrc2Step, *NppiSize* oSizeROI, *Npp64f* *pError, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Four-channel 16-bit signed complex image Maximum_Error.

For common parameter descriptions, see *Common parameters for nppiMaximumError functions include:*.

NppStatus **nppiMaximumError_32u_C4R_Ctx**(const *Npp32u* *pSrc1, int nSrc1Step, const *Npp32u* *pSrc2, int nSrc2Step, *NppiSize* oSizeROI, *Npp64f* *pError, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Four-channel 32-bit unsigned image Maximum_Error.

For common parameter descriptions, see *Common parameters for nppiMaximumError functions include:*.

NppStatus **nppiMaximumError_32s_C4R_Ctx**(const *Npp32s* *pSrc1, int nSrc1Step, const *Npp32s* *pSrc2, int nSrc2Step, *NppiSize* oSizeROI, *Npp64f* *pError, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Four-channel 32-bit signed image Maximum_Error.

For common parameter descriptions, see *Common parameters for nppiMaximumError functions include:*.

NppStatus **nppiMaximumError_32sc_C4R_Ctx**(const *Npp32sc* *pSrc1, int nSrc1Step, const *Npp32sc* *pSrc2, int nSrc2Step, *NppiSize* oSizeROI, *Npp64f* *pError, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Four-channel 32-bit signed complex image Maximum_Error.

For common parameter descriptions, see *Common parameters for nppiMaximumError functions include:*.

NppStatus **nppiMaximumError_32f_C4R_Ctx**(const *Npp32f* *pSrc1, int nSrc1Step, const *Npp32f* *pSrc2, int nSrc2Step, *NppiSize* oSizeROI, *Npp64f* *pError, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Four-channel 32-bit floating point image Maximum_Error.

For common parameter descriptions, see *Common parameters for nppiMaximumError functions include:*.

NppStatus **nppiMaximumError_32fc_C4R_Ctx**(const *Npp32fc* *pSrc1, int nSrc1Step, const *Npp32fc* *pSrc2, int nSrc2Step, *NppiSize* oSizeROI, *Npp64f* *pError, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Four-channel 32-bit floating point complex image Maximum_Error.

For common parameter descriptions, see *Common parameters for nppiMaximumError functions include:*.

NppStatus **nppiMaximumError_64f_C4R_Ctx**(const *Npp64f* *pSrc1, int nSrc1Step, const *Npp64f* *pSrc2, int nSrc2Step, *NppiSize* oSizeROI, *Npp64f* *pError, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Four-channel 64-bit floating point image Maximum_Error.

For common parameter descriptions, see *Common parameters for nppiMaximumError functions include:*.

MaximumErrorGetBufferHostSize

Companion primitives for computing the device buffer size (in bytes) required by the MaximumError primitives.

1.14.35.3 CommonMaximumErrorGetBufferHostSizeParameters

Common parameters for nppiMaximumErrorGetBufferHostSize functions include:

param oSizeROI
Region-Of-Interest (ROI).

param hpBufferSize
Required buffer size. Important: hpBufferSize is a *host pointer.* *Scratch Buffer and Host Pointer*.

param nppStreamCtx
Application Managed Stream Context.

return
NPP_NULL_POINTER_ERROR if hpBufferSize is 0 (NULL), *ROI Related Error Codes*.

NppStatus **nppiMaximumErrorGetBufferHostSize_8u_C1R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiMaximumError_8u_C1R_Ctx*.

For common parameter descriptions, see *CommonMaximumErrorGetBufferHostSizeParameters*.

NppStatus **nppiMaximumErrorGetBufferHostSize_8s_C1R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiMaximumError_8s_C1R_Ctx*.

For common parameter descriptions, see *CommonMaximumErrorGetBufferHostSizeParameters*.

NppStatus **nppiMaximumErrorGetBufferHostSize_16u_C1R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiMaximumError_16u_C1R_Ctx*.

For common parameter descriptions, see *CommonMaximumErrorGetBufferHostSizeParameters*.

NppStatus **nppiMaximumErrorGetBufferHostSize_16s_C1R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiMaximumError_16s_C1R_Ctx*.

For common parameter descriptions, see *CommonMaximumErrorGetBufferHostSizeParameters*.

NppStatus **nppiMaximumErrorGetBufferHostSize_16sc_C1R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiMaximumError_16sc_C1R_Ctx*.

For common parameter descriptions, see *CommonMaximumErrorGetBufferHostSizeParameters*.

NppStatus **nppiMaximumErrorGetBufferHostSize_32u_C1R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiMaximumError_32u_C1R_Ctx*.

For common parameter descriptions, see *CommonMaximumErrorGetBufferHostSizeParameters*.

NppStatus **nppiMaximumErrorGetBufferHostSize_32s_C1R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiMaximumError_32s_C1R_Ctx*.

For common parameter descriptions, see *CommonMaximumErrorGetBufferHostSizeParameters*.

NppStatus **nppiMaximumErrorGetBufferHostSize_32sc_C1R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiMaximumError_32sc_C1R_Ctx*.

For common parameter descriptions, see *CommonMaximumErrorGetBufferHostSizeParameters*.

NppStatus **nppiMaximumErrorGetBufferHostSize_32f_C1R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiMaximumError_32f_C1R_Ctx*.

For common parameter descriptions, see *CommonMaximumErrorGetBufferHostSizeParameters*.

NppStatus **nppiMaximumErrorGetBufferHostSize_32fc_C1R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiMaximumError_32fc_C1R_Ctx*.

For common parameter descriptions, see *CommonMaximumErrorGetBufferHostSizeParameters*.

NppStatus **nppiMaximumErrorGetBufferHostSize_64f_C1R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiMaximumError_64f_C1R_Ctx*.

For common parameter descriptions, see *CommonMaximumErrorGetBufferHostSizeParameters*.

NppStatus **nppiMaximumErrorGetBufferHostSize_8u_C2R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiMaximumError_8u_C2R_Ctx*.

For common parameter descriptions, see *CommonMaximumErrorGetBufferHostSizeParameters*.

NppStatus **nppiMaximumErrorGetBufferHostSize_8s_C2R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiMaximumError_8s_C2R_Ctx*.

For common parameter descriptions, see *CommonMaximumErrorGetBufferHostSizeParameters*.

NppStatus **nppiMaximumErrorGetBufferHostSize_16u_C2R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiMaximumError_16u_C2R_Ctx*.

For common parameter descriptions, see *CommonMaximumErrorGetBufferHostSizeParameters*.

NppStatus **nppiMaximumErrorGetBufferHostSize_16s_C2R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiMaximumError_16s_C2R_Ctx*.

For common parameter descriptions, see *CommonMaximumErrorGetBufferHostSizeParameters*.

NppStatus **nppiMaximumErrorGetBufferHostSize_16sc_C2R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiMaximumError_16sc_C2R_Ctx*.

For common parameter descriptions, see *CommonMaximumErrorGetBufferHostSizeParameters*.

NppStatus **nppiMaximumErrorGetBufferHostSize_32u_C2R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiMaximumError_32u_C2R_Ctx*.

For common parameter descriptions, see *CommonMaximumErrorGetBufferHostSizeParameters*.

NppStatus **nppiMaximumErrorGetBufferHostSize_32s_C2R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiMaximumError_32s_C2R_Ctx*.

For common parameter descriptions, see *CommonMaximumErrorGetBufferHostSizeParameters*.

NppStatus **nppiMaximumErrorGetBufferHostSize_32sc_C2R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiMaximumError_32sc_C2R_Ctx*.

For common parameter descriptions, see *CommonMaximumErrorGetBufferHostSizeParameters*.

NppStatus **nppiMaximumErrorGetBufferHostSize_32f_C2R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiMaximumError_32f_C2R_Ctx*.

For common parameter descriptions, see *CommonMaximumErrorGetBufferHostSizeParameters*.

NppStatus **nppiMaximumErrorGetBufferHostSize_32fc_C2R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiMaximumError_32fc_C2R_Ctx*.

For common parameter descriptions, see *CommonMaximumErrorGetBufferHostSizeParameters*.

NppStatus **nppiMaximumErrorGetBufferHostSize_64f_C2R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiMaximumError_64f_C2R_Ctx*.

For common parameter descriptions, see *CommonMaximumErrorGetBufferHostSizeParameters*.

NppStatus **nppiMaximumErrorGetBufferHostSize_8u_C3R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiMaximumError_8u_C3R_Ctx*.

For common parameter descriptions, see *CommonMaximumErrorGetBufferHostSizeParameters*.

NppStatus **nppiMaximumErrorGetBufferHostSize_8s_C3R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiMaximumError_8s_C3R_Ctx*.

For common parameter descriptions, see *CommonMaximumErrorGetBufferHostSizeParameters*.

NppStatus **nppiMaximumErrorGetBufferHostSize_16u_C3R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiMaximumError_16u_C3R_Ctx*.

For common parameter descriptions, see *CommonMaximumErrorGetBufferHostSizeParameters*.

NppStatus **nppiMaximumErrorGetBufferHostSize_16s_C3R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiMaximumError_16s_C3R_Ctx*.

For common parameter descriptions, see *CommonMaximumErrorGetBufferHostSizeParameters*.

NppStatus **nppiMaximumErrorGetBufferHostSize_16sc_C3R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiMaximumError_16sc_C3R_Ctx*.

For common parameter descriptions, see *CommonMaximumErrorGetBufferHostSizeParameters*.

NppStatus **nppiMaximumErrorGetBufferHostSize_32u_C3R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiMaximumError_32u_C3R_Ctx*.

For common parameter descriptions, see *CommonMaximumErrorGetBufferHostSizeParameters*.

NppStatus **nppiMaximumErrorGetBufferHostSize_32s_C3R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiMaximumError_32s_C3R_Ctx*.

For common parameter descriptions, see *CommonMaximumErrorGetBufferHostSizeParameters*.

NppStatus **nppiMaximumErrorGetBufferHostSize_32sc_C3R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiMaximumError_32sc_C3R_Ctx*.

For common parameter descriptions, see *CommonMaximumErrorGetBufferHostSizeParameters*.

NppStatus **nppiMaximumErrorGetBufferHostSize_32f_C3R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiMaximumError_32f_C3R_Ctx*.

For common parameter descriptions, see *CommonMaximumErrorGetBufferHostSizeParameters*.

NppStatus **nppiMaximumErrorGetBufferHostSize_32fc_C3R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiMaximumError_32fc_C3R_Ctx*.

For common parameter descriptions, see *CommonMaximumErrorGetBufferHostSizeParameters*.

NppStatus **nppiMaximumErrorGetBufferHostSize_64f_C3R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiMaximumError_64f_C3R_Ctx*.

For common parameter descriptions, see *CommonMaximumErrorGetBufferHostSizeParameters*.

NppStatus **nppiMaximumErrorGetBufferHostSize_8u_C4R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiMaximumError_8u_C4R_Ctx*.

For common parameter descriptions, see *CommonMaximumErrorGetBufferHostSizeParameters*.

NppStatus **nppiMaximumErrorGetBufferHostSize_8s_C4R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiMaximumError_8s_C4R_Ctx*.

For common parameter descriptions, see *CommonMaximumErrorGetBufferHostSizeParameters*.

NppStatus **nppiMaximumErrorGetBufferHostSize_16u_C4R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiMaximumError_16u_C4R_Ctx*.

For common parameter descriptions, see *CommonMaximumErrorGetBufferHostSizeParameters*.

NppStatus **nppiMaximumErrorGetBufferHostSize_16s_C4R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiMaximumError_16s_C4R_Ctx*.

For common parameter descriptions, see *CommonMaximumErrorGetBufferHostSizeParameters*.

NppStatus **nppiMaximumErrorGetBufferHostSize_16sc_C4R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiMaximumError_16sc_C4R_Ctx*.

For common parameter descriptions, see *CommonMaximumErrorGetBufferHostSizeParameters*.

NppStatus **nppiMaximumErrorGetBufferHostSize_32u_C4R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiMaximumError_32u_C4R_Ctx*.

For common parameter descriptions, see *CommonMaximumErrorGetBufferHostSizeParameters*.

NppStatus **nppiMaximumErrorGetBufferHostSize_32s_C4R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiMaximumError_32s_C4R_Ctx*.

For common parameter descriptions, see *CommonMaximumErrorGetBufferHostSizeParameters*.

NppStatus **nppiMaximumErrorGetBufferHostSize_32sc_C4R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiMaximumError_32sc_C4R_Ctx*.

For common parameter descriptions, see *CommonMaximumErrorGetBufferHostSizeParameters*.

NppStatus **nppiMaximumErrorGetBufferHostSize_32f_C4R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiMaximumError_32f_C4R_Ctx*.

For common parameter descriptions, see *CommonMaximumErrorGetBufferHostSizeParameters*.

NppStatus **nppiMaximumErrorGetBufferHostSize_32fc_C4R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiMaximumError_32fc_C4R_Ctx*.

For common parameter descriptions, see *CommonMaximumErrorGetBufferHostSizeParameters*.

NppStatus **nppiMaximumErrorGetBufferHostSize_64f_C4R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiMaximumError_64f_C4R_Ctx*.

For common parameter descriptions, see *CommonMaximumErrorGetBufferHostSizeParameters*.

1.14.36. Image Average Error

1.14.36.1 AverageError

Primitives for computing the average error between two images. Given two images $pSrc1$ and $pSrc2$ both with width W and height H, the average error is defined as:

$$AverageError = \frac{1}{W \cdot H \cdot N} \sum_{n=0}^{N-1} \sum_{j=0}^{H-1} \sum_{i=0}^{W-1} |pSrc1(j,i) - pSrc2(j,i)|$$

where N stands for the number of channels. If the image is in complex format, the absolute value is used for computation.

AverageError

NppStatus **nppiAverageError_8u_C1R_Ctx**(const *Npp8u* *pSrc1, int nSrc1Step, const *Npp8u* *pSrc2, int nSrc2Step, *NppiSize* oSizeROI, *Npp64f* *pError, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

One-channel 8-bit unsigned image Average_Error.

For common parameter descriptions, see *Common parameters for nppiMaximumError functions include:*.

NppStatus **nppiAverageError_8s_C1R_Ctx**(const *Npp8s* *pSrc1, int nSrc1Step, const *Npp8s* *pSrc2, int nSrc2Step, *NppiSize* oSizeROI, *Npp64f* *pError, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

One-channel 8-bit signed image Average_Error.

For common parameter descriptions, see *Common parameters for nppiMaximumError functions include:*.

NppStatus **nppiAverageError_16u_C1R_Ctx**(const *Npp16u* *pSrc1, int nSrc1Step, const *Npp16u* *pSrc2, int nSrc2Step, *NppiSize* oSizeROI, *Npp64f* *pError, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

One-channel 16-bit unsigned image Average_Error.

For common parameter descriptions, see *Common parameters for nppiMaximumError functions include:*.

NppStatus **nppiAverageError_16s_C1R_Ctx**(const *Npp16s* *pSrc1, int nSrc1Step, const *Npp16s* *pSrc2, int nSrc2Step, *NppiSize* oSizeROI, *Npp64f* *pError, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

One-channel 16-bit signed image Average_Error.

For common parameter descriptions, see *Common parameters for nppiMaximumError functions include:*.

NppStatus **nppiAverageError_16sc_C1R_Ctx**(const *Npp16sc* *pSrc1, int nSrc1Step, const *Npp16sc* *pSrc2, int nSrc2Step, *NppiSize* oSizeROI, *Npp64f* *pError, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

One-channel 16-bit signed complex image Average_Error.

For common parameter descriptions, see *Common parameters for nppiMaximumError functions include:*.

NppStatus **nppiAverageError_32u_C1R_Ctx**(const *Npp32u* *pSrc1, int nSrc1Step, const *Npp32u* *pSrc2, int nSrc2Step, *NppiSize* oSizeROI, *Npp64f* *pError, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

One-channel 32-bit unsigned image Average_Error.

For common parameter descriptions, see *Common parameters for nppiMaximumError functions include:*.

NppStatus **nppiAverageError_32s_C1R_Ctx**(const *Npp32s* *pSrc1, int nSrc1Step, const *Npp32s* *pSrc2, int nSrc2Step, *NppiSize* oSizeROI, *Npp64f* *pError, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

One-channel 32-bit signed image Average_Error.

For common parameter descriptions, see *Common parameters for nppiMaximumError functions include:*.

NppStatus **nppiAverageError_32sc_C1R_Ctx**(const *Npp32sc* *pSrc1, int nSrc1Step, const *Npp32sc* *pSrc2, int nSrc2Step, *NppiSize* oSizeROI, *Npp64f* *pError, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

One-channel 32-bit signed complex image Average_Error.

For common parameter descriptions, see *Common parameters for nppiMaximumError functions include:*.

NppStatus **nppiAverageError_32f_C1R_Ctx**(const *Npp32f* *pSrc1, int nSrc1Step, const *Npp32f* *pSrc2, int nSrc2Step, *NppiSize* oSizeROI, *Npp64f* *pError, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

One-channel 32-bit floating point image Average_Error.

For common parameter descriptions, see *Common parameters for nppiMaximumError functions include:*.

NppStatus **nppiAverageError_32fc_C1R_Ctx**(const *Npp32fc* *pSrc1, int nSrc1Step, const *Npp32fc* *pSrc2, int nSrc2Step, *NppiSize* oSizeROI, *Npp64f* *pError, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

One-channel 32-bit floating point complex image Average_Error.

For common parameter descriptions, see *Common parameters for nppiMaximumError functions include:*.

NppStatus **nppiAverageError_64f_C1R_Ctx**(const *Npp64f* *pSrc1, int nSrc1Step, const *Npp64f* *pSrc2, int nSrc2Step, *NppiSize* oSizeROI, *Npp64f* *pError, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

One-channel 64-bit floating point image Average_Error.

For common parameter descriptions, see *Common parameters for nppiMaximumError functions include:*.

NppStatus **nppiAverageError_8u_C2R_Ctx**(const *Npp8u* *pSrc1, int nSrc1Step, const *Npp8u* *pSrc2, int nSrc2Step, *NppiSize* oSizeROI, *Npp64f* *pError, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Two-channel 8-bit unsigned image Average_Error.

For common parameter descriptions, see *Common parameters for nppiMaximumError functions include:*.

NppStatus **nppiAverageError_8s_C2R_Ctx**(const *Npp8s* *pSrc1, int nSrc1Step, const *Npp8s* *pSrc2, int nSrc2Step, *NppiSize* oSizeROI, *Npp64f* *pError, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Two-channel 8-bit signed image Average_Error.

For common parameter descriptions, see *Common parameters for nppiMaximumError functions include:*.

NppStatus **nppiAverageError_16u_C2R_Ctx**(const *Npp16u* *pSrc1, int nSrc1Step, const *Npp16u* *pSrc2, int nSrc2Step, *NppiSize* oSizeROI, *Npp64f* *pError, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Two-channel 16-bit unsigned image Average_Error.

For common parameter descriptions, see *Common parameters for nppiMaximumError functions include:*.

NppStatus **nppiAverageError_16s_C2R_Ctx**(const *Npp16s* *pSrc1, int nSrc1Step, const *Npp16s* *pSrc2, int nSrc2Step, *NppiSize* oSizeROI, *Npp64f* *pError, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Two-channel 16-bit signed image Average_Error.

For common parameter descriptions, see *Common parameters for nppiMaximumError functions include:*.

NppStatus **nppiAverageError_16sc_C2R_Ctx**(const *Npp16sc* *pSrc1, int nSrc1Step, const *Npp16sc* *pSrc2, int nSrc2Step, *NppiSize* oSizeROI, *Npp64f* *pError, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Two-channel 16-bit signed complex image Average_Error.

For common parameter descriptions, see *Common parameters for nppiMaximumError functions include:*.

NppStatus **nppiAverageError_32u_C2R_Ctx**(const *Npp32u* *pSrc1, int nSrc1Step, const *Npp32u* *pSrc2, int nSrc2Step, *NppiSize* oSizeROI, *Npp64f* *pError, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Two-channel 32-bit unsigned image Average_Error.

For common parameter descriptions, see *Common parameters for nppiMaximumError functions include:*.

NppStatus **nppiAverageError_32s_C2R_Ctx**(const *Npp32s* *pSrc1, int nSrc1Step, const *Npp32s* *pSrc2, int nSrc2Step, *NppiSize* oSizeROI, *Npp64f* *pError, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Two-channel 32-bit signed image Average_Error.

For common parameter descriptions, see *Common parameters for nppiMaximumError functions include:*.

NppStatus **nppiAverageError_32sc_C2R_Ctx**(const *Npp32sc* *pSrc1, int nSrc1Step, const *Npp32sc* *pSrc2, int nSrc2Step, *NppiSize* oSizeROI, *Npp64f* *pError, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Two-channel 32-bit signed complex image Average_Error.

For common parameter descriptions, see *Common parameters for nppiMaximumError functions include:*.

NppStatus **nppiAverageError_32f_C2R_Ctx**(const *Npp32f* *pSrc1, int nSrc1Step, const *Npp32f* *pSrc2, int nSrc2Step, *NppiSize* oSizeROI, *Npp64f* *pError, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Two-channel 32-bit floating point image Average_Error.

For common parameter descriptions, see *Common parameters for nppiMaximumError functions include:*.

NppStatus **nppiAverageError_32fc_C2R_Ctx**(const *Npp32fc* *pSrc1, int nSrc1Step, const *Npp32fc* *pSrc2, int nSrc2Step, *NppiSize* oSizeROI, *Npp64f* *pError, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Two-channel 32-bit floating point complex image Average_Error.

For common parameter descriptions, see *Common parameters for nppiMaximumError functions include:*.

NppStatus **nppiAverageError_64f_C2R_Ctx**(const *Npp64f* *pSrc1, int nSrc1Step, const *Npp64f* *pSrc2, int nSrc2Step, *NppiSize* oSizeROI, *Npp64f* *pError, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Two-channel 64-bit floating point image Average_Error.

For common parameter descriptions, see *Common parameters for nppiMaximumError functions include:*.

NppStatus **nppiAverageError_8u_C3R_Ctx**(const *Npp8u* *pSrc1, int nSrc1Step, const *Npp8u* *pSrc2, int nSrc2Step, *NppiSize* oSizeROI, *Npp64f* *pError, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Three-channel 8-bit unsigned image Average_Error.

For common parameter descriptions, see *Common parameters for nppiMaximumError functions include:*.

NppStatus **nppiAverageError_8s_C3R_Ctx**(const *Npp8s* *pSrc1, int nSrc1Step, const *Npp8s* *pSrc2, int nSrc2Step, *NppiSize* oSizeROI, *Npp64f* *pError, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Three-channel 8-bit signed image Average_Error.

For common parameter descriptions, see *Common parameters for nppiMaximumError functions include:*.

NppStatus **nppiAverageError_16u_C3R_Ctx**(const *Npp16u* *pSrc1, int nSrc1Step, const *Npp16u* *pSrc2, int nSrc2Step, *NppiSize* oSizeROI, *Npp64f* *pError, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Three-channel 16-bit unsigned image Average_Error.

For common parameter descriptions, see *Common parameters for nppiMaximumError functions include:*.

NppStatus **nppiAverageError_16s_C3R_Ctx**(const *Npp16s* *pSrc1, int nSrc1Step, const *Npp16s* *pSrc2, int nSrc2Step, *NppiSize* oSizeROI, *Npp64f* *pError, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Three-channel 16-bit signed image Average_Error.

For common parameter descriptions, see *Common parameters for nppiMaximumError functions include:*.

NppStatus **nppiAverageError_16sc_C3R_Ctx**(const *Npp16sc* *pSrc1, int nSrc1Step, const *Npp16sc* *pSrc2, int nSrc2Step, *NppiSize* oSizeROI, *Npp64f* *pError, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Three-channel 16-bit signed complex image Average_Error.

For common parameter descriptions, see *Common parameters for nppiMaximumError functions include:*.

NppStatus **nppiAverageError_32u_C3R_Ctx**(const *Npp32u* *pSrc1, int nSrc1Step, const *Npp32u* *pSrc2, int nSrc2Step, *NppiSize* oSizeROI, *Npp64f* *pError, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Three-channel 32-bit unsigned image Average_Error.

For common parameter descriptions, see *Common parameters for nppiMaximumError functions include:*.

NppStatus **nppiAverageError_32s_C3R_Ctx**(const *Npp32s* *pSrc1, int nSrc1Step, const *Npp32s* *pSrc2, int nSrc2Step, *NppiSize* oSizeROI, *Npp64f* *pError, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Three-channel 32-bit signed image Average_Error.

For common parameter descriptions, see *Common parameters for nppiMaximumError functions include:*.

NppStatus **nppiAverageError_32sc_C3R_Ctx**(const *Npp32sc* *pSrc1, int nSrc1Step, const *Npp32sc* *pSrc2, int nSrc2Step, *NppiSize* oSizeROI, *Npp64f* *pError, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Three-channel 32-bit signed complex image Average_Error.

For common parameter descriptions, see *Common parameters for nppiMaximumError functions include:*.

NppStatus **nppiAverageError_32f_C3R_Ctx**(const *Npp32f* *pSrc1, int nSrc1Step, const *Npp32f* *pSrc2, int nSrc2Step, *NppiSize* oSizeROI, *Npp64f* *pError, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Three-channel 32-bit floating point image Average_Error.

For common parameter descriptions, see *Common parameters for nppiMaximumError functions include:*.

NppStatus **nppiAverageError_32fc_C3R_Ctx**(const *Npp32fc* *pSrc1, int nSrc1Step, const *Npp32fc* *pSrc2, int nSrc2Step, *NppiSize* oSizeROI, *Npp64f* *pError, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Three-channel 32-bit floating point complex image Average_Error.

For common parameter descriptions, see *Common parameters for nppiMaximumError functions include:*.

NppStatus **nppiAverageError_64f_C3R_Ctx**(const *Npp64f* *pSrc1, int nSrc1Step, const *Npp64f* *pSrc2, int nSrc2Step, *NppiSize* oSizeROI, *Npp64f* *pError, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Three-channel 64-bit floating point image Average_Error.

For common parameter descriptions, see *Common parameters for nppiMaximumError functions include:*.

NppStatus **nppiAverageError_8u_C4R_Ctx**(const *Npp8u* *pSrc1, int nSrc1Step, const *Npp8u* *pSrc2, int nSrc2Step, *NppiSize* oSizeROI, *Npp64f* *pError, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Four-channel 8-bit unsigned image Average_Error.

For common parameter descriptions, see *Common parameters for nppiMaximumError functions include:*.

NppStatus **nppiAverageError_8s_C4R_Ctx**(const *Npp8s* *pSrc1, int nSrc1Step, const *Npp8s* *pSrc2, int nSrc2Step, *NppiSize* oSizeROI, *Npp64f* *pError, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Four-channel 8-bit signed image Average_Error.

For common parameter descriptions, see *Common parameters for nppiMaximumError functions include:*.

NppStatus **nppiAverageError_16u_C4R_Ctx**(const *Npp16u* *pSrc1, int nSrc1Step, const *Npp16u* *pSrc2, int nSrc2Step, *NppiSize* oSizeROI, *Npp64f* *pError, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Four-channel 16-bit unsigned image Average_Error.

For common parameter descriptions, see *Common parameters for nppiMaximumError functions include:*.

NppStatus **nppiAverageError_16s_C4R_Ctx**(const *Npp16s* *pSrc1, int nSrc1Step, const *Npp16s* *pSrc2, int nSrc2Step, *NppiSize* oSizeROI, *Npp64f* *pError, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Four-channel 16-bit signed image Average_Error.

For common parameter descriptions, see *Common parameters for nppiMaximumError functions include:*.

NppStatus **nppiAverageError_16sc_C4R_Ctx**(const *Npp16sc* *pSrc1, int nSrc1Step, const *Npp16sc* *pSrc2, int nSrc2Step, *NppiSize* oSizeROI, *Npp64f* *pError, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Four-channel 16-bit signed complex image Average_Error.

For common parameter descriptions, see *Common parameters for nppiMaximumError functions include:*.

NppStatus **nppiAverageError_32u_C4R_Ctx**(const *Npp32u* *pSrc1, int nSrc1Step, const *Npp32u* *pSrc2, int nSrc2Step, *NppiSize* oSizeROI, *Npp64f* *pError, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Four-channel 32-bit unsigned image Average_Error.

For common parameter descriptions, see *Common parameters for nppiMaximumError functions include:*.

NppStatus **nppiAverageError_32s_C4R_Ctx**(const *Npp32s* *pSrc1, int nSrc1Step, const *Npp32s* *pSrc2, int nSrc2Step, *NppiSize* oSizeROI, *Npp64f* *pError, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Four-channel 32-bit signed image Average_Error.

For common parameter descriptions, see *Common parameters for nppiMaximumError functions include:*.

NppStatus **nppiAverageError_32sc_C4R_Ctx**(const *Npp32sc* *pSrc1, int nSrc1Step, const *Npp32sc* *pSrc2, int nSrc2Step, *NppiSize* oSizeROI, *Npp64f* *pError, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Four-channel 32-bit signed complex image Average_Error.

For common parameter descriptions, see *Common parameters for nppiMaximumError functions include:*.

NppStatus **nppiAverageError_32f_C4R_Ctx**(const *Npp32f* *pSrc1, int nSrc1Step, const *Npp32f* *pSrc2, int nSrc2Step, *NppiSize* oSizeROI, *Npp64f* *pError, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Four-channel 32-bit floating point image Average_Error.

For common parameter descriptions, see *Common parameters for nppiMaximumError functions include:*.

NppStatus **nppiAverageError_32fc_C4R_Ctx**(const *Npp32fc* *pSrc1, int nSrc1Step, const *Npp32fc* *pSrc2, int nSrc2Step, *NppiSize* oSizeROI, *Npp64f* *pError, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Four-channel 32-bit floating point complex image Average_Error.

For common parameter descriptions, see *Common parameters for nppiMaximumError functions include:*.

NppStatus **nppiAverageError_64f_C4R_Ctx**(const *Npp64f* *pSrc1, int nSrc1Step, const *Npp64f* *pSrc2, int nSrc2Step, *NppiSize* oSizeROI, *Npp64f* *pError, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Four-channel 64-bit floating point image Average_Error.

For common parameter descriptions, see *Common parameters for nppiMaximumError functions include:*.

AverageErrorGetBufferHostSize

Companion primitives for computing the device buffer size (in bytes) required by the NormDiff_Inf primitives.

1.14.36.2 CommonAverageErrorGetBufferHostSizeParameters

Common parameters for nppiSumAverageErrorBufferHostSize functions include:

param oSizeROI
Region-Of-Interest (ROI).

param hpBufferSize
Required buffer size. Important: hpBufferSize is a *host pointer.* *Scratch Buffer and Host Pointer*.

param nppStreamCtx
Application Managed Stream Context.

return
NPP_NULL_POINTER_ERROR if hpBufferSize is 0 (NULL), *ROI Related Error Codes*.

NppStatus **nppiAverageErrorGetBufferHostSize_8u_C1R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiAverageError_8u_C1R_Ctx*.

For common parameter descriptions, see *CommonAverageErrorGetBufferHostSizeParameters*.

NppStatus **nppiAverageErrorGetBufferHostSize_8s_C1R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiAverageError_8s_C1R_Ctx*.

For common parameter descriptions, see *CommonAverageErrorGetBufferHostSizeParameters*.

NppStatus **nppiAverageErrorGetBufferHostSize_16u_C1R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiAverageError_16u_C1R_Ctx*.

For common parameter descriptions, see *CommonAverageErrorGetBufferHostSizeParameters*.

NppStatus **nppiAverageErrorGetBufferHostSize_16s_C1R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiAverageError_16s_C1R_Ctx*.

For common parameter descriptions, see *CommonAverageErrorGetBufferHostSizeParameters*.

NppStatus **nppiAverageErrorGetBufferHostSize_16sc_C1R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiAverageError_16sc_C1R_Ctx*.

For common parameter descriptions, see *CommonAverageErrorGetBufferHostSizeParameters*.

NppStatus **nppiAverageErrorGetBufferHostSize_32u_C1R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiAverageError_32u_C1R_Ctx*.

For common parameter descriptions, see *CommonAverageErrorGetBufferHostSizeParameters*.

NppStatus **nppiAverageErrorGetBufferHostSize_32s_C1R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiAverageError_32s_C1R_Ctx*.

For common parameter descriptions, see *CommonAverageErrorGetBufferHostSizeParameters*.

NppStatus **nppiAverageErrorGetBufferHostSize_32sc_C1R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiAverageError_32sc_C1R_Ctx*.

For common parameter descriptions, see *CommonAverageErrorGetBufferHostSizeParameters*.

NppStatus **nppiAverageErrorGetBufferHostSize_32f_C1R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiAverageError_32f_C1R_Ctx*.

For common parameter descriptions, see *CommonAverageErrorGetBufferHostSizeParameters*.

NppStatus **nppiAverageErrorGetBufferHostSize_32fc_C1R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiAverageError_32fc_C1R_Ctx*.

For common parameter descriptions, see *CommonAverageErrorGetBufferHostSizeParameters*.

NppStatus **nppiAverageErrorGetBufferHostSize_64f_C1R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiAverageError_64f_C1R_Ctx*.

For common parameter descriptions, see *CommonAverageErrorGetBufferHostSizeParameters*.

NppStatus **nppiAverageErrorGetBufferHostSize_8u_C2R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiAverageError_8u_C2R_Ctx*.

For common parameter descriptions, see *CommonAverageErrorGetBufferHostSizeParameters*.

NppStatus **nppiAverageErrorGetBufferHostSize_8s_C2R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiAverageError_8s_C2R_Ctx*.

For common parameter descriptions, see *CommonAverageErrorGetBufferHostSizeParameters*.

NppStatus **nppiAverageErrorGetBufferHostSize_16u_C2R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiAverageError_16u_C2R_Ctx*.

For common parameter descriptions, see *CommonAverageErrorGetBufferHostSizeParameters*.

NppStatus **nppiAverageErrorGetBufferHostSize_16s_C2R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiAverageError_16s_C2R_Ctx*.

For common parameter descriptions, see *CommonAverageErrorGetBufferHostSizeParameters*.

NppStatus **nppiAverageErrorGetBufferHostSize_16sc_C2R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiAverageError_16sc_C2R_Ctx*.

For common parameter descriptions, see *CommonAverageErrorGetBufferHostSizeParameters*.

NppStatus **nppiAverageErrorGetBufferHostSize_32u_C2R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiAverageError_32u_C2R_Ctx*.

For common parameter descriptions, see *CommonAverageErrorGetBufferHostSizeParameters*.

NppStatus **nppiAverageErrorGetBufferHostSize_32s_C2R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiAverageError_32s_C2R_Ctx*.

For common parameter descriptions, see *CommonAverageErrorGetBufferHostSizeParameters*.

NppStatus **nppiAverageErrorGetBufferHostSize_32sc_C2R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiAverageError_32sc_C2R_Ctx*.

For common parameter descriptions, see *CommonAverageErrorGetBufferHostSizeParameters*.

NppStatus **nppiAverageErrorGetBufferHostSize_32f_C2R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiAverageError_32f_C2R_Ctx*.

For common parameter descriptions, see *CommonAverageErrorGetBufferHostSizeParameters*.

NppStatus **nppiAverageErrorGetBufferHostSize_32fc_C2R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiAverageError_32fc_C2R_Ctx*.

For common parameter descriptions, see *CommonAverageErrorGetBufferHostSizeParameters*.

NppStatus **nppiAverageErrorGetBufferHostSize_64f_C2R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiAverageError_64f_C2R_Ctx*.

For common parameter descriptions, see *CommonAverageErrorGetBufferHostSizeParameters*.

NppStatus **nppiAverageErrorGetBufferHostSize_8u_C3R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiAverageError_8u_C3R_Ctx*.

For common parameter descriptions, see *CommonAverageErrorGetBufferHostSizeParameters*.

NppStatus **nppiAverageErrorGetBufferHostSize_8s_C3R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiAverageError_8s_C3R_Ctx*.

For common parameter descriptions, see *CommonAverageErrorGetBufferHostSizeParameters*.

NppStatus **nppiAverageErrorGetBufferHostSize_16u_C3R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiAverageError_16u_C3R_Ctx*.

For common parameter descriptions, see *CommonAverageErrorGetBufferHostSizeParameters*.

NppStatus **nppiAverageErrorGetBufferHostSize_16s_C3R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiAverageError_16s_C3R_Ctx*.

For common parameter descriptions, see *CommonAverageErrorGetBufferHostSizeParameters*.

NppStatus **nppiAverageErrorGetBufferHostSize_16sc_C3R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiAverageError_16sc_C3R_Ctx*.

For common parameter descriptions, see *CommonAverageErrorGetBufferHostSizeParameters*.

NppStatus **nppiAverageErrorGetBufferHostSize_32u_C3R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiAverageError_32u_C3R_Ctx*.

For common parameter descriptions, see *CommonAverageErrorGetBufferHostSizeParameters*.

NppStatus **nppiAverageErrorGetBufferHostSize_32s_C3R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiAverageError_32s_C3R_Ctx*.

For common parameter descriptions, see *CommonAverageErrorGetBufferHostSizeParameters*.

NppStatus **nppiAverageErrorGetBufferHostSize_32sc_C3R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiAverageError_32sc_C3R_Ctx*.

For common parameter descriptions, see *CommonAverageErrorGetBufferHostSizeParameters*.

NppStatus **nppiAverageErrorGetBufferHostSize_32f_C3R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiAverageError_32f_C3R_Ctx*.

For common parameter descriptions, see *CommonAverageErrorGetBufferHostSizeParameters*.

NppStatus **nppiAverageErrorGetBufferHostSize_32fc_C3R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiAverageError_32fc_C3R_Ctx*.

For common parameter descriptions, see *CommonAverageErrorGetBufferHostSizeParameters*.

NppStatus **nppiAverageErrorGetBufferHostSize_64f_C3R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiAverageError_64f_C3R_Ctx*.

For common parameter descriptions, see *CommonAverageErrorGetBufferHostSizeParameters*.

NppStatus **nppiAverageErrorGetBufferHostSize_8u_C4R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiAverageError_8u_C4R_Ctx*.

For common parameter descriptions, see *CommonAverageErrorGetBufferHostSizeParameters*.

NppStatus **nppiAverageErrorGetBufferHostSize_8s_C4R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiAverageError_8s_C4R_Ctx*.

For common parameter descriptions, see *CommonAverageErrorGetBufferHostSizeParameters*.

NppStatus **nppiAverageErrorGetBufferHostSize_16u_C4R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiAverageError_16u_C4R_Ctx*.

For common parameter descriptions, see *CommonAverageErrorGetBufferHostSizeParameters*.

NppStatus **nppiAverageErrorGetBufferHostSize_16s_C4R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiAverageError_16s_C4R_Ctx*.

For common parameter descriptions, see *CommonAverageErrorGetBufferHostSizeParameters*.

NppStatus **nppiAverageErrorGetBufferHostSize_16sc_C4R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiAverageError_16sc_C4R_Ctx*.

For common parameter descriptions, see *CommonAverageErrorGetBufferHostSizeParameters*.

NppStatus **nppiAverageErrorGetBufferHostSize_32u_C4R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiAverageError_32u_C4R_Ctx*.

For common parameter descriptions, see *CommonAverageErrorGetBufferHostSizeParameters*.

NppStatus **nppiAverageErrorGetBufferHostSize_32s_C4R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiAverageError_32s_C4R_Ctx*.

For common parameter descriptions, see *CommonAverageErrorGetBufferHostSizeParameters*.

NppStatus **nppiAverageErrorGetBufferHostSize_32sc_C4R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiAverageError_32sc_C4R_Ctx*.

For common parameter descriptions, see *CommonAverageErrorGetBufferHostSizeParameters*.

NppStatus **nppiAverageErrorGetBufferHostSize_32f_C4R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiAverageError_32f_C4R_Ctx*.

For common parameter descriptions, see *CommonAverageErrorGetBufferHostSizeParameters*.

NppStatus **nppiAverageErrorGetBufferHostSize_32fc_C4R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiAverageError_32fc_C4R_Ctx*.

For common parameter descriptions, see *CommonAverageErrorGetBufferHostSizeParameters*.

NppStatus **nppiAverageErrorGetBufferHostSize_64f_C4R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiAverageError_64f_C4R_Ctx*.

For common parameter descriptions, see *CommonAverageErrorGetBufferHostSizeParameters*.

1.14.37. Image Maximum Relative Error

1.14.37.1 MaximumRelativeError

Primitives for computing the maximum relative error between two images. Given two images $pSrc1$ and $pSrc2$ both with width W and height H, the maximum relative error is defined as:

$$MaximumRelativeError = max \frac{|pSrc1(j,i) - pSrc2(j,i)|}{max(|pSrc1(j,i)|, |pSrc2(j,i)|)}$$

If the image is in complex format, the absolute value is used for computation. For multiple channles, the maximum relative error of all the channles is returned.

MaximumRelativeError

NppStatus **nppiMaximumRelativeError_8u_C1R_Ctx**(const *Npp8u* *pSrc1, int nSrc1Step, const *Npp8u* *pSrc2, int nSrc2Step, *NppiSize* oSizeROI, *Npp64f* *pError, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

One-channel 8-bit unsigned image MaximumRelative_Error.

For common parameter descriptions, see *Common parameters for nppiMaximumError functions include:*.

NppStatus **nppiMaximumRelativeError_8s_C1R_Ctx**(const *Npp8s* *pSrc1, int nSrc1Step, const *Npp8s* *pSrc2, int nSrc2Step, *NppiSize* oSizeROI, *Npp64f* *pError, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

One-channel 8-bit signed image MaximumRelative_Error.

For common parameter descriptions, see *Common parameters for nppiMaximumError functions include:*.

NppStatus **nppiMaximumRelativeError_16u_C1R_Ctx**(const *Npp16u* *pSrc1, int nSrc1Step, const *Npp16u* *pSrc2, int nSrc2Step, *NppiSize* oSizeROI, *Npp64f* *pError, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

One-channel 16-bit unsigned image MaximumRelative_Error.

For common parameter descriptions, see *Common parameters for nppiMaximumError functions include:*.

NppStatus **nppiMaximumRelativeError_16s_C1R_Ctx**(const *Npp16s* *pSrc1, int nSrc1Step, const *Npp16s* *pSrc2, int nSrc2Step, *NppiSize* oSizeROI, *Npp64f* *pError, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

One-channel 16-bit signed image MaximumRelative_Error.

For common parameter descriptions, see *Common parameters for nppiMaximumError functions include:*.

NppStatus **nppiMaximumRelativeError_16sc_C1R_Ctx**(const *Npp16sc* *pSrc1, int nSrc1Step, const *Npp16sc* *pSrc2, int nSrc2Step, *NppiSize* oSizeROI, *Npp64f* *pError, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

One-channel 16-bit signed complex image MaximumRelative_Error.

For common parameter descriptions, see *Common parameters for nppiMaximumError functions include:*.

NppStatus **nppiMaximumRelativeError_32u_C1R_Ctx**(const *Npp32u* *pSrc1, int nSrc1Step, const *Npp32u* *pSrc2, int nSrc2Step, *NppiSize* oSizeROI, *Npp64f* *pError, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

One-channel 32-bit unsigned image MaximumRelative_Error.

For common parameter descriptions, see *Common parameters for nppiMaximumError functions include:*.

NppStatus **nppiMaximumRelativeError_32s_C1R_Ctx**(const *Npp32s* *pSrc1, int nSrc1Step, const *Npp32s* *pSrc2, int nSrc2Step, *NppiSize* oSizeROI, *Npp64f* *pError, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

One-channel 32-bit signed image MaximumRelative_Error.

For common parameter descriptions, see *Common parameters for nppiMaximumError functions include:*.

NppStatus **nppiMaximumRelativeError_32sc_C1R_Ctx**(const *Npp32sc* *pSrc1, int nSrc1Step, const *Npp32sc* *pSrc2, int nSrc2Step, *NppiSize* oSizeROI, *Npp64f* *pError, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

One-channel 32-bit signed complex image MaximumRelative_Error.

For common parameter descriptions, see *Common parameters for nppiMaximumError functions include:*.

NppStatus **nppiMaximumRelativeError_32f_C1R_Ctx**(const *Npp32f* *pSrc1, int nSrc1Step, const *Npp32f* *pSrc2, int nSrc2Step, *NppiSize* oSizeROI, *Npp64f* *pError, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

One-channel 32-bit floating point image MaximumRelative_Error.

For common parameter descriptions, see *Common parameters for nppiMaximumError functions include:*.

NppStatus **nppiMaximumRelativeError_32fc_C1R_Ctx**(const *Npp32fc* *pSrc1, int nSrc1Step, const *Npp32fc* *pSrc2, int nSrc2Step, *NppiSize* oSizeROI, *Npp64f* *pError, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

One-channel 32-bit floating point complex image MaximumRelative_Error.

For common parameter descriptions, see *Common parameters for nppiMaximumError functions include:*.

NppStatus **nppiMaximumRelativeError_64f_C1R_Ctx**(const *Npp64f* *pSrc1, int nSrc1Step, const *Npp64f* *pSrc2, int nSrc2Step, *NppiSize* oSizeROI, *Npp64f* *pError, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

One-channel 64-bit floating point image MaximumRelative_Error.

For common parameter descriptions, see *Common parameters for nppiMaximumError functions include:*.

NppStatus **nppiMaximumRelativeError_8u_C2R_Ctx**(const *Npp8u* *pSrc1, int nSrc1Step, const *Npp8u* *pSrc2, int nSrc2Step, *NppiSize* oSizeROI, *Npp64f* *pError, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Two-channel 8-bit unsigned image MaximumRelative_Error.

For common parameter descriptions, see *Common parameters for nppiMaximumError functions include:*.

NppStatus **nppiMaximumRelativeError_8s_C2R_Ctx**(const *Npp8s* *pSrc1, int nSrc1Step, const *Npp8s* *pSrc2, int nSrc2Step, *NppiSize* oSizeROI, *Npp64f* *pError, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Two-channel 8-bit signed image MaximumRelative_Error.

For common parameter descriptions, see *Common parameters for nppiMaximumError functions include:*.

NppStatus **nppiMaximumRelativeError_16u_C2R_Ctx**(const *Npp16u* *pSrc1, int nSrc1Step, const *Npp16u* *pSrc2, int nSrc2Step, *NppiSize* oSizeROI, *Npp64f* *pError, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Two-channel 16-bit unsigned image MaximumRelative_Error.

For common parameter descriptions, see *Common parameters for nppiMaximumError functions include:*.

NppStatus **nppiMaximumRelativeError_16s_C2R_Ctx**(const *Npp16s* *pSrc1, int nSrc1Step, const *Npp16s* *pSrc2, int nSrc2Step, *NppiSize* oSizeROI, *Npp64f* *pError, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Two-channel 16-bit signed image MaximumRelative_Error.

For common parameter descriptions, see *Common parameters for nppiMaximumError functions include:*.

NppStatus **nppiMaximumRelativeError_16sc_C2R_Ctx**(const *Npp16sc* *pSrc1, int nSrc1Step, const *Npp16sc* *pSrc2, int nSrc2Step, *NppiSize* oSizeROI, *Npp64f* *pError, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Two-channel 16-bit signed complex image MaximumRelative_Error.

For common parameter descriptions, see *Common parameters for nppiMaximumError functions include:*.

NppStatus **nppiMaximumRelativeError_32u_C2R_Ctx**(const *Npp32u* *pSrc1, int nSrc1Step, const *Npp32u* *pSrc2, int nSrc2Step, *NppiSize* oSizeROI, *Npp64f* *pError, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Two-channel 32-bit unsigned image MaximumRelative_Error.

For common parameter descriptions, see *Common parameters for nppiMaximumError functions include:*.

NppStatus **nppiMaximumRelativeError_32s_C2R_Ctx**(const *Npp32s* *pSrc1, int nSrc1Step, const *Npp32s* *pSrc2, int nSrc2Step, *NppiSize* oSizeROI, *Npp64f* *pError, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Two-channel 32-bit signed image MaximumRelative_Error.

For common parameter descriptions, see *Common parameters for nppiMaximumError functions include:*.

NppStatus **nppiMaximumRelativeError_32sc_C2R_Ctx**(const *Npp32sc* *pSrc1, int nSrc1Step, const *Npp32sc* *pSrc2, int nSrc2Step, *NppiSize* oSizeROI, *Npp64f* *pError, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Two-channel 32-bit signed complex image MaximumRelative_Error.

For common parameter descriptions, see *Common parameters for nppiMaximumError functions include:*.

NppStatus **nppiMaximumRelativeError_32f_C2R_Ctx**(const *Npp32f* *pSrc1, int nSrc1Step, const *Npp32f* *pSrc2, int nSrc2Step, *NppiSize* oSizeROI, *Npp64f* *pError, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Two-channel 32-bit floating point image MaximumRelative_Error.

For common parameter descriptions, see *Common parameters for nppiMaximumError functions include:*.

NppStatus **nppiMaximumRelativeError_32fc_C2R_Ctx**(const *Npp32fc* *pSrc1, int nSrc1Step, const *Npp32fc* *pSrc2, int nSrc2Step, *NppiSize* oSizeROI, *Npp64f* *pError, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Two-channel 32-bit floating point complex image MaximumRelative_Error.

For common parameter descriptions, see *Common parameters for nppiMaximumError functions include:*.

NppStatus **nppiMaximumRelativeError_64f_C2R_Ctx**(const *Npp64f* *pSrc1, int nSrc1Step, const *Npp64f* *pSrc2, int nSrc2Step, *NppiSize* oSizeROI, *Npp64f* *pError, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Two-channel 64-bit floating point image MaximumRelative_Error.

For common parameter descriptions, see *Common parameters for nppiMaximumError functions include:*.

NppStatus **nppiMaximumRelativeError_8u_C3R_Ctx**(const *Npp8u* *pSrc1, int nSrc1Step, const *Npp8u* *pSrc2, int nSrc2Step, *NppiSize* oSizeROI, *Npp64f* *pError, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Three-channel 8-bit unsigned image MaximumRelative_Error.

For common parameter descriptions, see *Common parameters for nppiMaximumError functions include:*.

NppStatus **nppiMaximumRelativeError_8s_C3R_Ctx**(const *Npp8s* *pSrc1, int nSrc1Step, const *Npp8s* *pSrc2, int nSrc2Step, *NppiSize* oSizeROI, *Npp64f* *pError, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Three-channel 8-bit signed image MaximumRelative_Error.

For common parameter descriptions, see *Common parameters for nppiMaximumError functions include:*.

NppStatus **nppiMaximumRelativeError_16u_C3R_Ctx**(const *Npp16u* *pSrc1, int nSrc1Step, const *Npp16u* *pSrc2, int nSrc2Step, *NppiSize* oSizeROI, *Npp64f* *pError, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Three-channel 16-bit unsigned image MaximumRelative_Error.

For common parameter descriptions, see *Common parameters for nppiMaximumError functions include:*.

NppStatus **nppiMaximumRelativeError_16s_C3R_Ctx**(const *Npp16s* *pSrc1, int nSrc1Step, const *Npp16s* *pSrc2, int nSrc2Step, *NppiSize* oSizeROI, *Npp64f* *pError, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Three-channel 16-bit signed image MaximumRelative_Error.

For common parameter descriptions, see *Common parameters for nppiMaximumError functions include:*.

NppStatus **nppiMaximumRelativeError_16sc_C3R_Ctx**(const *Npp16sc* *pSrc1, int nSrc1Step, const *Npp16sc* *pSrc2, int nSrc2Step, *NppiSize* oSizeROI, *Npp64f* *pError, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Three-channel 16-bit signed complex image MaximumRelative_Error.

For common parameter descriptions, see *Common parameters for nppiMaximumError functions include:*.

NppStatus **nppiMaximumRelativeError_32u_C3R_Ctx**(const *Npp32u* *pSrc1, int nSrc1Step, const *Npp32u* *pSrc2, int nSrc2Step, *NppiSize* oSizeROI, *Npp64f* *pError, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Three-channel 32-bit unsigned image MaximumRelative_Error.

For common parameter descriptions, see *Common parameters for nppiMaximumError functions include:*.

NppStatus **nppiMaximumRelativeError_32s_C3R_Ctx**(const *Npp32s* *pSrc1, int nSrc1Step, const *Npp32s* *pSrc2, int nSrc2Step, *NppiSize* oSizeROI, *Npp64f* *pError, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Three-channel 32-bit signed image MaximumRelative_Error.

For common parameter descriptions, see *Common parameters for nppiMaximumError functions include:*.

NppStatus **nppiMaximumRelativeError_32sc_C3R_Ctx**(const *Npp32sc* *pSrc1, int nSrc1Step, const *Npp32sc* *pSrc2, int nSrc2Step, *NppiSize* oSizeROI, *Npp64f* *pError, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Three-channel 32-bit signed complex image MaximumRelative_Error.

For common parameter descriptions, see *Common parameters for nppiMaximumError functions include:*.

NppStatus **nppiMaximumRelativeError_32f_C3R_Ctx**(const *Npp32f* *pSrc1, int nSrc1Step, const *Npp32f* *pSrc2, int nSrc2Step, *NppiSize* oSizeROI, *Npp64f* *pError, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Three-channel 32-bit floating point image MaximumRelative_Error.

For common parameter descriptions, see *Common parameters for nppiMaximumError functions include:*.

NppStatus **nppiMaximumRelativeError_32fc_C3R_Ctx**(const *Npp32fc* *pSrc1, int nSrc1Step, const *Npp32fc* *pSrc2, int nSrc2Step, *NppiSize* oSizeROI, *Npp64f* *pError, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Three-channel 32-bit floating point complex image MaximumRelative_Error.

For common parameter descriptions, see *Common parameters for nppiMaximumError functions include:*.

NppStatus **nppiMaximumRelativeError_64f_C3R_Ctx**(const *Npp64f* *pSrc1, int nSrc1Step, const *Npp64f* *pSrc2, int nSrc2Step, *NppiSize* oSizeROI, *Npp64f* *pError, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Three-channel 64-bit floating point image MaximumRelative_Error.

For common parameter descriptions, see *Common parameters for nppiMaximumError functions include:*.

NppStatus **nppiMaximumRelativeError_8u_C4R_Ctx**(const *Npp8u* *pSrc1, int nSrc1Step, const *Npp8u* *pSrc2, int nSrc2Step, *NppiSize* oSizeROI, *Npp64f* *pError, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Four-channel 8-bit unsigned image MaximumRelative_Error.

For common parameter descriptions, see *Common parameters for nppiMaximumError functions include:*.

NppStatus **nppiMaximumRelativeError_8s_C4R_Ctx**(const *Npp8s* *pSrc1, int nSrc1Step, const *Npp8s* *pSrc2, int nSrc2Step, *NppiSize* oSizeROI, *Npp64f* *pError, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Four-channel 8-bit signed image MaximumRelative_Error.

For common parameter descriptions, see *Common parameters for nppiMaximumError functions include:*.

NppStatus **nppiMaximumRelativeError_16u_C4R_Ctx**(const *Npp16u* *pSrc1, int nSrc1Step, const *Npp16u* *pSrc2, int nSrc2Step, *NppiSize* oSizeROI, *Npp64f* *pError, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Four-channel 16-bit unsigned image MaximumRelative_Error.

For common parameter descriptions, see *Common parameters for nppiMaximumError functions include:*.

NppStatus **nppiMaximumRelativeError_16s_C4R_Ctx**(const *Npp16s* *pSrc1, int nSrc1Step, const *Npp16s* *pSrc2, int nSrc2Step, *NppiSize* oSizeROI, *Npp64f* *pError, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Four-channel 16-bit signed image MaximumRelative_Error.

For common parameter descriptions, see *Common parameters for nppiMaximumError functions include:*.

NppStatus **nppiMaximumRelativeError_16sc_C4R_Ctx**(const *Npp16sc* *pSrc1, int nSrc1Step, const *Npp16sc* *pSrc2, int nSrc2Step, *NppiSize* oSizeROI, *Npp64f* *pError, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Four-channel 16-bit signed complex image MaximumRelative_Error.

For common parameter descriptions, see *Common parameters for nppiMaximumError functions include:*.

NppStatus **nppiMaximumRelativeError_32u_C4R_Ctx**(const *Npp32u* *pSrc1, int nSrc1Step, const *Npp32u* *pSrc2, int nSrc2Step, *NppiSize* oSizeROI, *Npp64f* *pError, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Four-channel 32-bit unsigned image MaximumRelative_Error.

For common parameter descriptions, see *Common parameters for nppiMaximumError functions include:*.

NppStatus **nppiMaximumRelativeError_32s_C4R_Ctx**(const *Npp32s* *pSrc1, int nSrc1Step, const *Npp32s* *pSrc2, int nSrc2Step, *NppiSize* oSizeROI, *Npp64f* *pError, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Four-channel 32-bit signed image MaximumRelative_Error.

For common parameter descriptions, see *Common parameters for nppiMaximumError functions include:*.

NppStatus **nppiMaximumRelativeError_32sc_C4R_Ctx**(const *Npp32sc* *pSrc1, int nSrc1Step, const *Npp32sc* *pSrc2, int nSrc2Step, *NppiSize* oSizeROI, *Npp64f* *pError, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Four-channel 32-bit signed complex image MaximumRelative_Error.

For common parameter descriptions, see *Common parameters for nppiMaximumError functions include:*.

NppStatus **nppiMaximumRelativeError_32f_C4R_Ctx**(const *Npp32f* *pSrc1, int nSrc1Step, const *Npp32f* *pSrc2, int nSrc2Step, *NppiSize* oSizeROI, *Npp64f* *pError, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Four-channel 32-bit floating point image MaximumRelative_Error.

For common parameter descriptions, see *Common parameters for nppiMaximumError functions include:*.

NppStatus **nppiMaximumRelativeError_32fc_C4R_Ctx**(const *Npp32fc* *pSrc1, int nSrc1Step, const *Npp32fc* *pSrc2, int nSrc2Step, *NppiSize* oSizeROI, *Npp64f* *pError, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Four-channel 32-bit floating point complex image MaximumRelative_Error.

For common parameter descriptions, see *Common parameters for nppiMaximumError functions include:*.

NppStatus **nppiMaximumRelativeError_64f_C4R_Ctx**(const *Npp64f* *pSrc1, int nSrc1Step, const *Npp64f* *pSrc2, int nSrc2Step, *NppiSize* oSizeROI, *Npp64f* *pError, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Four-channel 64-bit floating point image MaximumRelative_Error.

For common parameter descriptions, see *Common parameters for nppiMaximumError functions include:*.

MaximumRelativeErrorGetBufferHostSize

Companion primitives for computing the device buffer size (in bytes) required by the NormDiff_Inf primitives.

1.14.37.2 CommonMaximumRelativeErrorGetBufferHostSizeParameters

Common parameters for nppiMaximumRelativeErrorGetBufferHostSize functions include:

param oSizeROI
Region-Of-Interest (ROI).

param hpBufferSize
Required buffer size. Important: hpBufferSize is a *host pointer.* *Scratch Buffer and Host Pointer*.

param nppStreamCtx
Application Managed Stream Context.

return
NPP_NULL_POINTER_ERROR if hpBufferSize is 0 (NULL), *ROI Related Error Codes*.

NppStatus **nppiMaximumRelativeErrorGetBufferHostSize_8u_C1R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiMaximumRelativeError_8u_C1R_Ctx*.

For common parameter descriptions, see *CommonMaximumRelativeErrorGetBufferHostSizeParameters*.

NppStatus **nppiMaximumRelativeErrorGetBufferHostSize_8s_C1R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiMaximumRelativeError_8s_C1R_Ctx*.

For common parameter descriptions, see *CommonMaximumRelativeErrorGetBufferHostSizeParameters*.

NppStatus **nppiMaximumRelativeErrorGetBufferHostSize_16u_C1R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiMaximumRelativeError_16u_C1R_Ctx*.

For common parameter descriptions, see *CommonMaximumRelativeErrorGetBufferHostSizeParameters*.

NppStatus **nppiMaximumRelativeErrorGetBufferHostSize_16s_C1R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiMaximumRelativeError_16s_C1R_Ctx*.

For common parameter descriptions, see *CommonMaximumRelativeErrorGetBufferHostSizeParameters*.

NppStatus **nppiMaximumRelativeErrorGetBufferHostSize_16sc_C1R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiMaximumRelativeError_16sc_C1R_Ctx*.

For common parameter descriptions, see *CommonMaximumRelativeErrorGetBufferHostSizeParameters*.

NppStatus **nppiMaximumRelativeErrorGetBufferHostSize_32u_C1R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiMaximumRelativeError_32u_C1R_Ctx*.

For common parameter descriptions, see *CommonMaximumRelativeErrorGetBufferHostSizeParameters*.

NppStatus **nppiMaximumRelativeErrorGetBufferHostSize_32s_C1R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiMaximumRelativeError_32s_C1R_Ctx*.

For common parameter descriptions, see *CommonMaximumRelativeErrorGetBufferHostSizeParameters*.

NppStatus **nppiMaximumRelativeErrorGetBufferHostSize_32sc_C1R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiMaximumRelativeError_32sc_C1R_Ctx*.

For common parameter descriptions, see *CommonMaximumRelativeErrorGetBufferHostSizeParameters*.

NppStatus **nppiMaximumRelativeErrorGetBufferHostSize_32f_C1R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiMaximumRelativeError_32f_C1R_Ctx*.

For common parameter descriptions, see *CommonMaximumRelativeErrorGetBufferHostSizeParameters*.

NppStatus **nppiMaximumRelativeErrorGetBufferHostSize_32fc_C1R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiMaximumRelativeError_32fc_C1R_Ctx*.

For common parameter descriptions, see *CommonMaximumRelativeErrorGetBufferHostSizeParameters*.

NppStatus **nppiMaximumRelativeErrorGetBufferHostSize_64f_C1R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiMaximumRelativeError_64f_C1R_Ctx*.

For common parameter descriptions, see *CommonMaximumRelativeErrorGetBufferHostSizeParameters*.

NppStatus **nppiMaximumRelativeErrorGetBufferHostSize_8u_C2R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiMaximumRelativeError_8u_C2R_Ctx*.

For common parameter descriptions, see *CommonMaximumRelativeErrorGetBufferHostSizeParameters*.

NppStatus **nppiMaximumRelativeErrorGetBufferHostSize_8s_C2R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiMaximumRelativeError_8s_C2R_Ctx*.

For common parameter descriptions, see *CommonMaximumRelativeErrorGetBufferHostSizeParameters*.

NppStatus **nppiMaximumRelativeErrorGetBufferHostSize_16u_C2R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiMaximumRelativeError_16u_C2R_Ctx*.

For common parameter descriptions, see *CommonMaximumRelativeErrorGetBufferHostSizeParameters*.

NppStatus **nppiMaximumRelativeErrorGetBufferHostSize_16s_C2R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiMaximumRelativeError_16s_C2R_Ctx*.

For common parameter descriptions, see *CommonMaximumRelativeErrorGetBufferHostSizeParameters*.

NppStatus **nppiMaximumRelativeErrorGetBufferHostSize_16sc_C2R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiMaximumRelativeError_16sc_C2R_Ctx*.

For common parameter descriptions, see *CommonMaximumRelativeErrorGetBufferHostSizeParameters*.

NppStatus **nppiMaximumRelativeErrorGetBufferHostSize_32u_C2R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiMaximumRelativeError_32u_C2R_Ctx*.

For common parameter descriptions, see *CommonMaximumRelativeErrorGetBufferHostSizeParameters*.

NppStatus **nppiMaximumRelativeErrorGetBufferHostSize_32s_C2R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiMaximumRelativeError_32s_C2R_Ctx*.

For common parameter descriptions, see *CommonMaximumRelativeErrorGetBufferHostSizeParameters*.

NppStatus **nppiMaximumRelativeErrorGetBufferHostSize_32sc_C2R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiMaximumRelativeError_32sc_C2R_Ctx*.

For common parameter descriptions, see *CommonMaximumRelativeErrorGetBufferHostSizeParameters*.

NppStatus **nppiMaximumRelativeErrorGetBufferHostSize_32f_C2R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiMaximumRelativeError_32f_C2R_Ctx*.

For common parameter descriptions, see *CommonMaximumRelativeErrorGetBufferHostSizeParameters*.

NppStatus **nppiMaximumRelativeErrorGetBufferHostSize_32fc_C2R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiMaximumRelativeError_32fc_C2R_Ctx*.

For common parameter descriptions, see *CommonMaximumRelativeErrorGetBufferHostSizeParameters*.

NppStatus **nppiMaximumRelativeErrorGetBufferHostSize_64f_C2R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiMaximumRelativeError_64f_C2R_Ctx*.

For common parameter descriptions, see *CommonMaximumRelativeErrorGetBufferHostSizeParameters*.

NppStatus **nppiMaximumRelativeErrorGetBufferHostSize_8u_C3R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiMaximumRelativeError_8u_C3R_Ctx*.

For common parameter descriptions, see *CommonMaximumRelativeErrorGetBufferHostSizeParameters*.

NppStatus **nppiMaximumRelativeErrorGetBufferHostSize_8s_C3R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiMaximumRelativeError_8s_C3R_Ctx*.

For common parameter descriptions, see *CommonMaximumRelativeErrorGetBufferHostSizeParameters*.

NppStatus **nppiMaximumRelativeErrorGetBufferHostSize_16u_C3R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiMaximumRelativeError_16u_C3R_Ctx*.

For common parameter descriptions, see *CommonMaximumRelativeErrorGetBufferHostSizeParameters*.

NppStatus **nppiMaximumRelativeErrorGetBufferHostSize_16s_C3R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiMaximumRelativeError_16s_C3R_Ctx*.

For common parameter descriptions, see *CommonMaximumRelativeErrorGetBufferHostSizeParameters*.

NppStatus **nppiMaximumRelativeErrorGetBufferHostSize_16sc_C3R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiMaximumRelativeError_16sc_C3R_Ctx*.

For common parameter descriptions, see *CommonMaximumRelativeErrorGetBufferHostSizeParameters*.

NppStatus **nppiMaximumRelativeErrorGetBufferHostSize_32u_C3R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiMaximumRelativeError_32u_C3R_Ctx*.

For common parameter descriptions, see *CommonMaximumRelativeErrorGetBufferHostSizeParameters*.

NppStatus **nppiMaximumRelativeErrorGetBufferHostSize_32s_C3R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiMaximumRelativeError_32s_C3R_Ctx*.

For common parameter descriptions, see *CommonMaximumRelativeErrorGetBufferHostSizeParameters*.

NppStatus **nppiMaximumRelativeErrorGetBufferHostSize_32sc_C3R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiMaximumRelativeError_32sc_C3R_Ctx*.

For common parameter descriptions, see *CommonMaximumRelativeErrorGetBufferHostSizeParameters*.

NppStatus **nppiMaximumRelativeErrorGetBufferHostSize_32f_C3R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiMaximumRelativeError_32f_C3R_Ctx*.

For common parameter descriptions, see *CommonMaximumRelativeErrorGetBufferHostSizeParameters*.

NppStatus **nppiMaximumRelativeErrorGetBufferHostSize_32fc_C3R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiMaximumRelativeError_32fc_C3R_Ctx*.

For common parameter descriptions, see *CommonMaximumRelativeErrorGetBufferHostSizeParameters*.

NppStatus **nppiMaximumRelativeErrorGetBufferHostSize_64f_C3R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiMaximumRelativeError_64f_C3R_Ctx*.

For common parameter descriptions, see *CommonMaximumRelativeErrorGetBufferHostSizeParameters*.

NppStatus **nppiMaximumRelativeErrorGetBufferHostSize_8u_C4R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiMaximumRelativeError_8u_C4R_Ctx*.

For common parameter descriptions, see *CommonMaximumRelativeErrorGetBufferHostSizeParameters*.

NppStatus **nppiMaximumRelativeErrorGetBufferHostSize_8s_C4R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiMaximumRelativeError_8s_C4R_Ctx*.

For common parameter descriptions, see *CommonMaximumRelativeErrorGetBufferHostSizeParameters*.

NppStatus **nppiMaximumRelativeErrorGetBufferHostSize_16u_C4R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiMaximumRelativeError_16u_C4R_Ctx*.

For common parameter descriptions, see *CommonMaximumRelativeErrorGetBufferHostSizeParameters*.

NppStatus **nppiMaximumRelativeErrorGetBufferHostSize_16s_C4R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiMaximumRelativeError_16s_C4R_Ctx*.

For common parameter descriptions, see *CommonMaximumRelativeErrorGetBufferHostSizeParameters*.

NppStatus **nppiMaximumRelativeErrorGetBufferHostSize_16sc_C4R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiMaximumRelativeError_16sc_C4R_Ctx*.

For common parameter descriptions, see *CommonMaximumRelativeErrorGetBufferHostSizeParameters*.

NppStatus **nppiMaximumRelativeErrorGetBufferHostSize_32u_C4R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiMaximumRelativeError_32u_C4R_Ctx*.

For common parameter descriptions, see *CommonMaximumRelativeErrorGetBufferHostSizeParameters*.

NppStatus **nppiMaximumRelativeErrorGetBufferHostSize_32s_C4R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiMaximumRelativeError_32s_C4R_Ctx*.

For common parameter descriptions, see *CommonMaximumRelativeErrorGetBufferHostSizeParameters*.

NppStatus **nppiMaximumRelativeErrorGetBufferHostSize_32sc_C4R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiMaximumRelativeError_32sc_C4R_Ctx*.

For common parameter descriptions, see *CommonMaximumRelativeErrorGetBufferHostSizeParameters*.

NppStatus **nppiMaximumRelativeErrorGetBufferHostSize_32f_C4R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiMaximumRelativeError_32f_C4R_Ctx*.

For common parameter descriptions, see *CommonMaximumRelativeErrorGetBufferHostSizeParameters*.

NppStatus **nppiMaximumRelativeErrorGetBufferHostSize_32fc_C4R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiMaximumRelativeError_32fc_C4R_Ctx*.

For common parameter descriptions, see *CommonMaximumRelativeErrorGetBufferHostSizeParameters*.

NppStatus **nppiMaximumRelativeErrorGetBufferHostSize_64f_C4R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiMaximumRelativeError_64f_C4R_Ctx*.

For common parameter descriptions, see *CommonMaximumRelativeErrorGetBufferHostSizeParameters*.

1.14.38. Image Average Relative Error

1.14.38.1 AverageRelativeError

Primitives for computing the average relative error between two images. Given two images $pSrc1$ and $pSrc2$ both with width W and height H, the maximum relative error is defined as:

$$AverageRelativeError = \frac{1}{W \cdot H \cdot N} \sum_{n=0}^{N-1} \sum_{j=0}^{H-1} \sum_{i=0}^{W-1} \frac{|pSrc1(j,i) - pSrc2(j,i)|}{max(|pSrc1(j,i)|, |pSrc2(j,i)|)}$$

where N is the number of channels. If the image is in complex format, the absolute value is used for computation.

AverageRelativeError

NppStatus **nppiAverageRelativeError_8u_C1R_Ctx**(const *Npp8u* *pSrc1, int nSrc1Step, const *Npp8u* *pSrc2, int nSrc2Step, *NppiSize* oSizeROI, *Npp64f* *pError, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

One-channel 8-bit unsigned image MaximumRelative_Error.

For common parameter descriptions, see *Common parameters for nppiMaximumError functions include:*.

NppStatus **nppiAverageRelativeError_8s_C1R_Ctx**(const *Npp8s* *pSrc1, int nSrc1Step, const *Npp8s* *pSrc2, int nSrc2Step, *NppiSize* oSizeROI, *Npp64f* *pError, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

One-channel 8-bit signed image MaximumRelative_Error.

For common parameter descriptions, see *Common parameters for nppiMaximumError functions include:*.

NppStatus **nppiAverageRelativeError_16u_C1R_Ctx**(const *Npp16u* *pSrc1, int nSrc1Step, const *Npp16u* *pSrc2, int nSrc2Step, *NppiSize* oSizeROI, *Npp64f* *pError, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

One-channel 16-bit unsigned image MaximumRelative_Error.

For common parameter descriptions, see *Common parameters for nppiMaximumError functions include:*.

NppStatus **nppiAverageRelativeError_16s_C1R_Ctx**(const *Npp16s* *pSrc1, int nSrc1Step, const *Npp16s* *pSrc2, int nSrc2Step, *NppiSize* oSizeROI, *Npp64f* *pError, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

One-channel 16-bit signed image MaximumRelative_Error.

For common parameter descriptions, see *Common parameters for nppiMaximumError functions include:*.

NppStatus **nppiAverageRelativeError_16sc_C1R_Ctx**(const *Npp16sc* *pSrc1, int nSrc1Step, const *Npp16sc* *pSrc2, int nSrc2Step, *NppiSize* oSizeROI, *Npp64f* *pError, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

One-channel 16-bit signed complex image MaximumRelative_Error.

For common parameter descriptions, see *Common parameters for nppiMaximumError functions include:*.

NppStatus **nppiAverageRelativeError_32u_C1R_Ctx**(const *Npp32u* *pSrc1, int nSrc1Step, const *Npp32u* *pSrc2, int nSrc2Step, *NppiSize* oSizeROI, *Npp64f* *pError, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

One-channel 32-bit unsigned image MaximumRelative_Error.

For common parameter descriptions, see *Common parameters for nppiMaximumError functions include:*.

NppStatus **nppiAverageRelativeError_32s_C1R_Ctx**(const *Npp32s* *pSrc1, int nSrc1Step, const *Npp32s* *pSrc2, int nSrc2Step, *NppiSize* oSizeROI, *Npp64f* *pError, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

One-channel 32-bit signed image MaximumRelative_Error.

For common parameter descriptions, see *Common parameters for nppiMaximumError functions include:*.

NppStatus **nppiAverageRelativeError_32sc_C1R_Ctx**(const *Npp32sc* *pSrc1, int nSrc1Step, const *Npp32sc* *pSrc2, int nSrc2Step, *NppiSize* oSizeROI, *Npp64f* *pError, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

One-channel 32-bit signed complex image MaximumRelative_Error.

For common parameter descriptions, see *Common parameters for nppiMaximumError functions include:*.

NppStatus **nppiAverageRelativeError_32f_C1R_Ctx**(const *Npp32f* *pSrc1, int nSrc1Step, const *Npp32f* *pSrc2, int nSrc2Step, *NppiSize* oSizeROI, *Npp64f* *pError, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

One-channel 32-bit floating point image MaximumRelative_Error.

For common parameter descriptions, see *Common parameters for nppiMaximumError functions include:*.

NppStatus **nppiAverageRelativeError_32fc_C1R_Ctx**(const *Npp32fc* *pSrc1, int nSrc1Step, const *Npp32fc* *pSrc2, int nSrc2Step, *NppiSize* oSizeROI, *Npp64f* *pError, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

One-channel 32-bit floating point complex image MaximumRelative_Error.

For common parameter descriptions, see *Common parameters for nppiMaximumError functions include:*.

NppStatus **nppiAverageRelativeError_64f_C1R_Ctx**(const *Npp64f* *pSrc1, int nSrc1Step, const *Npp64f* *pSrc2, int nSrc2Step, *NppiSize* oSizeROI, *Npp64f* *pError, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

One-channel 64-bit floating point image MaximumRelative_Error.

For common parameter descriptions, see *Common parameters for nppiMaximumError functions include:*.

NppStatus **nppiAverageRelativeError_8u_C2R_Ctx**(const *Npp8u* *pSrc1, int nSrc1Step, const *Npp8u* *pSrc2, int nSrc2Step, *NppiSize* oSizeROI, *Npp64f* *pError, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Two-channel 8-bit unsigned image MaximumRelative_Error.

For common parameter descriptions, see *Common parameters for nppiMaximumError functions include:*.

NppStatus **nppiAverageRelativeError_8s_C2R_Ctx**(const *Npp8s* *pSrc1, int nSrc1Step, const *Npp8s* *pSrc2, int nSrc2Step, *NppiSize* oSizeROI, *Npp64f* *pError, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Two-channel 8-bit signed image MaximumRelative_Error.

For common parameter descriptions, see *Common parameters for nppiMaximumError functions include:*.

NppStatus **nppiAverageRelativeError_16u_C2R_Ctx**(const *Npp16u* *pSrc1, int nSrc1Step, const *Npp16u* *pSrc2, int nSrc2Step, *NppiSize* oSizeROI, *Npp64f* *pError, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Two-channel 16-bit unsigned image MaximumRelative_Error.

For common parameter descriptions, see *Common parameters for nppiMaximumError functions include:*.

NppStatus **nppiAverageRelativeError_16s_C2R_Ctx**(const *Npp16s* *pSrc1, int nSrc1Step, const *Npp16s* *pSrc2, int nSrc2Step, *NppiSize* oSizeROI, *Npp64f* *pError, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Two-channel 16-bit signed image MaximumRelative_Error.

For common parameter descriptions, see *Common parameters for nppiMaximumError functions include:*.

NppStatus **nppiAverageRelativeError_16sc_C2R_Ctx**(const *Npp16sc* *pSrc1, int nSrc1Step, const *Npp16sc* *pSrc2, int nSrc2Step, *NppiSize* oSizeROI, *Npp64f* *pError, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Two-channel 16-bit signed complex image MaximumRelative_Error.

For common parameter descriptions, see *Common parameters for nppiMaximumError functions include:*.

NppStatus **nppiAverageRelativeError_32u_C2R_Ctx**(const *Npp32u* *pSrc1, int nSrc1Step, const *Npp32u* *pSrc2, int nSrc2Step, *NppiSize* oSizeROI, *Npp64f* *pError, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Two-channel 32-bit unsigned image MaximumRelative_Error.

For common parameter descriptions, see *Common parameters for nppiMaximumError functions include:*.

NppStatus **nppiAverageRelativeError_32s_C2R_Ctx**(const *Npp32s* *pSrc1, int nSrc1Step, const *Npp32s* *pSrc2, int nSrc2Step, *NppiSize* oSizeROI, *Npp64f* *pError, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Two-channel 32-bit signed image MaximumRelative_Error.

For common parameter descriptions, see *Common parameters for nppiMaximumError functions include:*.

NppStatus **nppiAverageRelativeError_32sc_C2R_Ctx**(const *Npp32sc* *pSrc1, int nSrc1Step, const *Npp32sc* *pSrc2, int nSrc2Step, *NppiSize* oSizeROI, *Npp64f* *pError, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Two-channel 32-bit signed complex image MaximumRelative_Error.

For common parameter descriptions, see *Common parameters for nppiMaximumError functions include:*.

NppStatus **nppiAverageRelativeError_32f_C2R_Ctx**(const *Npp32f* *pSrc1, int nSrc1Step, const *Npp32f* *pSrc2, int nSrc2Step, *NppiSize* oSizeROI, *Npp64f* *pError, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Two-channel 32-bit floating point image MaximumRelative_Error.

For common parameter descriptions, see *Common parameters for nppiMaximumError functions include:*.

NppStatus **nppiAverageRelativeError_32fc_C2R_Ctx**(const *Npp32fc* *pSrc1, int nSrc1Step, const *Npp32fc* *pSrc2, int nSrc2Step, *NppiSize* oSizeROI, *Npp64f* *pError, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Two-channel 32-bit floating point complex image MaximumRelative_Error.

For common parameter descriptions, see *Common parameters for nppiMaximumError functions include:*.

NppStatus **nppiAverageRelativeError_64f_C2R_Ctx**(const *Npp64f* *pSrc1, int nSrc1Step, const *Npp64f* *pSrc2, int nSrc2Step, *NppiSize* oSizeROI, *Npp64f* *pError, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Two-channel 64-bit floating point image MaximumRelative_Error.

For common parameter descriptions, see *Common parameters for nppiMaximumError functions include:*.

NppStatus **nppiAverageRelativeError_8u_C3R_Ctx**(const *Npp8u* *pSrc1, int nSrc1Step, const *Npp8u* *pSrc2, int nSrc2Step, *NppiSize* oSizeROI, *Npp64f* *pError, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Three-channel 8-bit unsigned image MaximumRelative_Error.

For common parameter descriptions, see *Common parameters for nppiMaximumError functions include:*.

NppStatus **nppiAverageRelativeError_8s_C3R_Ctx**(const *Npp8s* *pSrc1, int nSrc1Step, const *Npp8s* *pSrc2, int nSrc2Step, *NppiSize* oSizeROI, *Npp64f* *pError, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Three-channel 8-bit signed image MaximumRelative_Error.

For common parameter descriptions, see *Common parameters for nppiMaximumError functions include:*.

NppStatus **nppiAverageRelativeError_16u_C3R_Ctx**(const *Npp16u* *pSrc1, int nSrc1Step, const *Npp16u* *pSrc2, int nSrc2Step, *NppiSize* oSizeROI, *Npp64f* *pError, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Three-channel 16-bit unsigned image MaximumRelative_Error.

For common parameter descriptions, see *Common parameters for nppiMaximumError functions include:*.

NppStatus **nppiAverageRelativeError_16s_C3R_Ctx**(const *Npp16s* *pSrc1, int nSrc1Step, const *Npp16s* *pSrc2, int nSrc2Step, *NppiSize* oSizeROI, *Npp64f* *pError, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Three-channel 16-bit signed image MaximumRelative_Error.

For common parameter descriptions, see *Common parameters for nppiMaximumError functions include:*.

NppStatus **nppiAverageRelativeError_16sc_C3R_Ctx**(const *Npp16sc* *pSrc1, int nSrc1Step, const *Npp16sc* *pSrc2, int nSrc2Step, *NppiSize* oSizeROI, *Npp64f* *pError, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Three-channel 16-bit signed complex image MaximumRelative_Error.

For common parameter descriptions, see *Common parameters for nppiMaximumError functions include:*.

NppStatus **nppiAverageRelativeError_32u_C3R_Ctx**(const *Npp32u* *pSrc1, int nSrc1Step, const *Npp32u* *pSrc2, int nSrc2Step, *NppiSize* oSizeROI, *Npp64f* *pError, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Three-channel 32-bit unsigned image MaximumRelative_Error.

For common parameter descriptions, see *Common parameters for nppiMaximumError functions include:*.

NppStatus **nppiAverageRelativeError_32s_C3R_Ctx**(const *Npp32s* *pSrc1, int nSrc1Step, const *Npp32s* *pSrc2, int nSrc2Step, *NppiSize* oSizeROI, *Npp64f* *pError, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Three-channel 32-bit signed image MaximumRelative_Error.

For common parameter descriptions, see *Common parameters for nppiMaximumError functions include:*.

NppStatus **nppiAverageRelativeError_32sc_C3R_Ctx**(const *Npp32sc* *pSrc1, int nSrc1Step, const *Npp32sc* *pSrc2, int nSrc2Step, *NppiSize* oSizeROI, *Npp64f* *pError, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Three-channel 32-bit signed complex image MaximumRelative_Error.

For common parameter descriptions, see *Common parameters for nppiMaximumError functions include:*.

NppStatus **nppiAverageRelativeError_32f_C3R_Ctx**(const *Npp32f* *pSrc1, int nSrc1Step, const *Npp32f* *pSrc2, int nSrc2Step, *NppiSize* oSizeROI, *Npp64f* *pError, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Three-channel 32-bit floating point image MaximumRelative_Error.

For common parameter descriptions, see *Common parameters for nppiMaximumError functions include:*.

NppStatus **nppiAverageRelativeError_32fc_C3R_Ctx**(const *Npp32fc* *pSrc1, int nSrc1Step, const *Npp32fc* *pSrc2, int nSrc2Step, *NppiSize* oSizeROI, *Npp64f* *pError, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Three-channel 32-bit floating point complex image MaximumRelative_Error.

For common parameter descriptions, see *Common parameters for nppiMaximumError functions include:*.

NppStatus **nppiAverageRelativeError_64f_C3R_Ctx**(const *Npp64f* *pSrc1, int nSrc1Step, const *Npp64f* *pSrc2, int nSrc2Step, *NppiSize* oSizeROI, *Npp64f* *pError, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Three-channel 64-bit floating point image MaximumRelative_Error.

For common parameter descriptions, see *Common parameters for nppiMaximumError functions include:*.

NppStatus **nppiAverageRelativeError_8u_C4R_Ctx**(const *Npp8u* *pSrc1, int nSrc1Step, const *Npp8u* *pSrc2, int nSrc2Step, *NppiSize* oSizeROI, *Npp64f* *pError, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Four-channel 8-bit unsigned image MaximumRelative_Error.

For common parameter descriptions, see *Common parameters for nppiMaximumError functions include:*.

NppStatus **nppiAverageRelativeError_8s_C4R_Ctx**(const *Npp8s* *pSrc1, int nSrc1Step, const *Npp8s* *pSrc2, int nSrc2Step, *NppiSize* oSizeROI, *Npp64f* *pError, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Four-channel 8-bit signed image MaximumRelative_Error.

For common parameter descriptions, see *Common parameters for nppiMaximumError functions include:*.

NppStatus **nppiAverageRelativeError_16u_C4R_Ctx**(const *Npp16u* *pSrc1, int nSrc1Step, const *Npp16u* *pSrc2, int nSrc2Step, *NppiSize* oSizeROI, *Npp64f* *pError, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Four-channel 16-bit unsigned image MaximumRelative_Error.

For common parameter descriptions, see *Common parameters for nppiMaximumError functions include:*.

NppStatus **nppiAverageRelativeError_16s_C4R_Ctx**(const *Npp16s* *pSrc1, int nSrc1Step, const *Npp16s* *pSrc2, int nSrc2Step, *NppiSize* oSizeROI, *Npp64f* *pError, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Four-channel 16-bit signed image MaximumRelative_Error.

For common parameter descriptions, see *Common parameters for nppiMaximumError functions include:*.

NppStatus **nppiAverageRelativeError_16sc_C4R_Ctx**(const *Npp16sc* *pSrc1, int nSrc1Step, const *Npp16sc* *pSrc2, int nSrc2Step, *NppiSize* oSizeROI, *Npp64f* *pError, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Four-channel 16-bit signed complex image MaximumRelative_Error.

For common parameter descriptions, see *Common parameters for nppiMaximumError functions include:*.

NppStatus **nppiAverageRelativeError_32u_C4R_Ctx**(const *Npp32u* *pSrc1, int nSrc1Step, const *Npp32u* *pSrc2, int nSrc2Step, *NppiSize* oSizeROI, *Npp64f* *pError, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Four-channel 32-bit unsigned image MaximumRelative_Error.

For common parameter descriptions, see *Common parameters for nppiMaximumError functions include:*.

NppStatus **nppiAverageRelativeError_32s_C4R_Ctx**(const *Npp32s* *pSrc1, int nSrc1Step, const *Npp32s* *pSrc2, int nSrc2Step, *NppiSize* oSizeROI, *Npp64f* *pError, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Four-channel 32-bit signed image MaximumRelative_Error.

For common parameter descriptions, see *Common parameters for nppiMaximumError functions include:*.

NppStatus **nppiAverageRelativeError_32sc_C4R_Ctx**(const *Npp32sc* *pSrc1, int nSrc1Step, const *Npp32sc* *pSrc2, int nSrc2Step, *NppiSize* oSizeROI, *Npp64f* *pError, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Four-channel 32-bit signed complex image MaximumRelative_Error.

For common parameter descriptions, see *Common parameters for nppiMaximumError functions include:*.

NppStatus **nppiAverageRelativeError_32f_C4R_Ctx**(const *Npp32f* *pSrc1, int nSrc1Step, const *Npp32f* *pSrc2, int nSrc2Step, *NppiSize* oSizeROI, *Npp64f* *pError, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Four-channel 32-bit floating point image MaximumRelative_Error.

For common parameter descriptions, see *Common parameters for nppiMaximumError functions include:*.

NppStatus **nppiAverageRelativeError_32fc_C4R_Ctx**(const *Npp32fc* *pSrc1, int nSrc1Step, const *Npp32fc* *pSrc2, int nSrc2Step, *NppiSize* oSizeROI, *Npp64f* *pError, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Four-channel 32-bit floating point complex image MaximumRelative_Error.

For common parameter descriptions, see *Common parameters for nppiMaximumError functions include:*.

NppStatus **nppiAverageRelativeError_64f_C4R_Ctx**(const *Npp64f* *pSrc1, int nSrc1Step, const *Npp64f* *pSrc2, int nSrc2Step, *NppiSize* oSizeROI, *Npp64f* *pError, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Four-channel 64-bit floating point image MaximumRelative_Error.

For common parameter descriptions, see *Common parameters for nppiMaximumError functions include:*.

AverageRelativeErrorGetBufferHostSize

Companion primitives for computing the device buffer size (in bytes) required by the NormDiff_Inf primitives.

1.14.38.2 CommonAverageRelativeErrorGetBufferHostSizeParameters

Common parameters for nppiAverageRelativeErrorGetBufferHostSize functions include:

param oSizeROI
Region-Of-Interest (ROI).

param hpBufferSize
Required buffer size. Important: hpBufferSize is a *host pointer.* *Scratch Buffer and Host Pointer*.

param nppStreamCtx
Application Managed Stream Context.

return
NPP_NULL_POINTER_ERROR if hpBufferSize is 0 (NULL), *ROI Related Error Codes*.

NppStatus **nppiAverageRelativeErrorGetBufferHostSize_8u_C1R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiAverageRelativeError_8u_C1R_Ctx*.

For common parameter descriptions, see *CommonAverageRelativeErrorGetBufferHostSizeParameters*.

NppStatus **nppiAverageRelativeErrorGetBufferHostSize_8s_C1R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiAverageRelativeError_8s_C1R_Ctx*.

For common parameter descriptions, see *CommonAverageRelativeErrorGetBufferHostSizeParameters*.

NppStatus **nppiAverageRelativeErrorGetBufferHostSize_16u_C1R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiAverageRelativeError_16u_C1R_Ctx*.

For common parameter descriptions, see *CommonAverageRelativeErrorGetBufferHostSizeParameters*.

NppStatus **nppiAverageRelativeErrorGetBufferHostSize_16s_C1R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiAverageRelativeError_16s_C1R_Ctx*.

For common parameter descriptions, see *CommonAverageRelativeErrorGetBufferHostSizeParameters*.

NppStatus **nppiAverageRelativeErrorGetBufferHostSize_16sc_C1R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiAverageRelativeError_16sc_C1R_Ctx*.

For common parameter descriptions, see *CommonAverageRelativeErrorGetBufferHostSizeParameters*.

NppStatus **nppiAverageRelativeErrorGetBufferHostSize_32u_C1R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiAverageRelativeError_32u_C1R_Ctx*.

For common parameter descriptions, see *CommonAverageRelativeErrorGetBufferHostSizeParameters*.

NppStatus **nppiAverageRelativeErrorGetBufferHostSize_32s_C1R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiAverageRelativeError_32s_C1R_Ctx*.

For common parameter descriptions, see *CommonAverageRelativeErrorGetBufferHostSizeParameters*.

NppStatus **nppiAverageRelativeErrorGetBufferHostSize_32sc_C1R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiAverageRelativeError_32sc_C1R_Ctx*.

For common parameter descriptions, see *CommonAverageRelativeErrorGetBufferHostSizeParameters*.

NppStatus **nppiAverageRelativeErrorGetBufferHostSize_32f_C1R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiAverageRelativeError_32f_C1R_Ctx*.

For common parameter descriptions, see *CommonAverageRelativeErrorGetBufferHostSizeParameters*.

NppStatus **nppiAverageRelativeErrorGetBufferHostSize_32fc_C1R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiAverageRelativeError_32fc_C1R_Ctx*.

For common parameter descriptions, see *CommonAverageRelativeErrorGetBufferHostSizeParameters*.

NppStatus **nppiAverageRelativeErrorGetBufferHostSize_64f_C1R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiAverageRelativeError_64f_C1R_Ctx*.

For common parameter descriptions, see *CommonAverageRelativeErrorGetBufferHostSizeParameters*.

NppStatus **nppiAverageRelativeErrorGetBufferHostSize_8u_C2R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiAverageRelativeError_8u_C2R_Ctx*.

For common parameter descriptions, see *CommonAverageRelativeErrorGetBufferHostSizeParameters*.

NppStatus **nppiAverageRelativeErrorGetBufferHostSize_8s_C2R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiAverageRelativeError_8s_C2R_Ctx*.

For common parameter descriptions, see *CommonAverageRelativeErrorGetBufferHostSizeParameters*.

NppStatus **nppiAverageRelativeErrorGetBufferHostSize_16u_C2R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiAverageRelativeError_16u_C2R_Ctx*.

For common parameter descriptions, see *CommonAverageRelativeErrorGetBufferHostSizeParameters*.

NppStatus **nppiAverageRelativeErrorGetBufferHostSize_16s_C2R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiAverageRelativeError_16s_C2R_Ctx*.

For common parameter descriptions, see *CommonAverageRelativeErrorGetBufferHostSizeParameters*.

NppStatus **nppiAverageRelativeErrorGetBufferHostSize_16sc_C2R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiAverageRelativeError_16sc_C2R_Ctx*.

For common parameter descriptions, see *CommonAverageRelativeErrorGetBufferHostSizeParameters*.

NppStatus **nppiAverageRelativeErrorGetBufferHostSize_32u_C2R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiAverageRelativeError_32u_C2R_Ctx*.

For common parameter descriptions, see *CommonAverageRelativeErrorGetBufferHostSizeParameters*.

NppStatus **nppiAverageRelativeErrorGetBufferHostSize_32s_C2R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiAverageRelativeError_32s_C2R_Ctx*.

For common parameter descriptions, see *CommonAverageRelativeErrorGetBufferHostSizeParameters*.

NppStatus **nppiAverageRelativeErrorGetBufferHostSize_32sc_C2R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiAverageRelativeError_32sc_C2R_Ctx*.

For common parameter descriptions, see *CommonAverageRelativeErrorGetBufferHostSizeParameters*.

NppStatus **nppiAverageRelativeErrorGetBufferHostSize_32f_C2R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiAverageRelativeError_32f_C2R_Ctx*.

For common parameter descriptions, see *CommonAverageRelativeErrorGetBufferHostSizeParameters*.

NppStatus **nppiAverageRelativeErrorGetBufferHostSize_32fc_C2R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiAverageRelativeError_32fc_C2R_Ctx*.

For common parameter descriptions, see *CommonAverageRelativeErrorGetBufferHostSizeParameters*.

NppStatus **nppiAverageRelativeErrorGetBufferHostSize_64f_C2R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiAverageRelativeError_64f_C2R_Ctx*.

For common parameter descriptions, see *CommonAverageRelativeErrorGetBufferHostSizeParameters*.

NppStatus **nppiAverageRelativeErrorGetBufferHostSize_8u_C3R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiAverageRelativeError_8u_C3R_Ctx*.

For common parameter descriptions, see *CommonAverageRelativeErrorGetBufferHostSizeParameters*.

NppStatus **nppiAverageRelativeErrorGetBufferHostSize_8s_C3R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiAverageRelativeError_8s_C3R_Ctx*.

For common parameter descriptions, see *CommonAverageRelativeErrorGetBufferHostSizeParameters*.

NppStatus **nppiAverageRelativeErrorGetBufferHostSize_16u_C3R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiAverageRelativeError_16u_C3R_Ctx*.

For common parameter descriptions, see *CommonAverageRelativeErrorGetBufferHostSizeParameters*.

NppStatus **nppiAverageRelativeErrorGetBufferHostSize_16s_C3R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiAverageRelativeError_16s_C3R_Ctx*.

For common parameter descriptions, see *CommonAverageRelativeErrorGetBufferHostSizeParameters*.

NppStatus **nppiAverageRelativeErrorGetBufferHostSize_16sc_C3R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiAverageRelativeError_16sc_C3R_Ctx*.

For common parameter descriptions, see *CommonAverageRelativeErrorGetBufferHostSizeParameters*.

NppStatus **nppiAverageRelativeErrorGetBufferHostSize_32u_C3R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiAverageRelativeError_32u_C3R_Ctx*.

For common parameter descriptions, see *CommonAverageRelativeErrorGetBufferHostSizeParameters*.

NppStatus **nppiAverageRelativeErrorGetBufferHostSize_32s_C3R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiAverageRelativeError_32s_C3R_Ctx*.

For common parameter descriptions, see *CommonAverageRelativeErrorGetBufferHostSizeParameters*.

NppStatus **nppiAverageRelativeErrorGetBufferHostSize_32sc_C3R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiAverageRelativeError_32sc_C3R_Ctx*.

For common parameter descriptions, see *CommonAverageRelativeErrorGetBufferHostSizeParameters*.

NppStatus **nppiAverageRelativeErrorGetBufferHostSize_32f_C3R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiAverageRelativeError_32f_C3R_Ctx*.

For common parameter descriptions, see *CommonAverageRelativeErrorGetBufferHostSizeParameters*.

NppStatus **nppiAverageRelativeErrorGetBufferHostSize_32fc_C3R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiAverageRelativeError_32fc_C3R_Ctx*.

For common parameter descriptions, see *CommonAverageRelativeErrorGetBufferHostSizeParameters*.

NppStatus **nppiAverageRelativeErrorGetBufferHostSize_64f_C3R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiAverageRelativeError_64f_C3R_Ctx*.

For common parameter descriptions, see *CommonAverageRelativeErrorGetBufferHostSizeParameters*.

NppStatus **nppiAverageRelativeErrorGetBufferHostSize_8u_C4R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiAverageRelativeError_8u_C4R_Ctx*.

For common parameter descriptions, see *CommonAverageRelativeErrorGetBufferHostSizeParameters*.

NppStatus **nppiAverageRelativeErrorGetBufferHostSize_8s_C4R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiAverageRelativeError_8s_C4R_Ctx*.

For common parameter descriptions, see *CommonAverageRelativeErrorGetBufferHostSizeParameters*.

NppStatus **nppiAverageRelativeErrorGetBufferHostSize_16u_C4R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiAverageRelativeError_16u_C4R_Ctx*.

For common parameter descriptions, see *CommonAverageRelativeErrorGetBufferHostSizeParameters*.

NppStatus **nppiAverageRelativeErrorGetBufferHostSize_16s_C4R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiAverageRelativeError_16s_C4R_Ctx*.

For common parameter descriptions, see *CommonAverageRelativeErrorGetBufferHostSizeParameters*.

NppStatus **nppiAverageRelativeErrorGetBufferHostSize_16sc_C4R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiAverageRelativeError_16sc_C4R_Ctx*.

For common parameter descriptions, see *CommonAverageRelativeErrorGetBufferHostSizeParameters*.

NppStatus **nppiAverageRelativeErrorGetBufferHostSize_32u_C4R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiAverageRelativeError_32u_C4R_Ctx*.

For common parameter descriptions, see *CommonAverageRelativeErrorGetBufferHostSizeParameters*.

NppStatus **nppiAverageRelativeErrorGetBufferHostSize_32s_C4R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiAverageRelativeError_32s_C4R_Ctx*.

For common parameter descriptions, see *CommonAverageRelativeErrorGetBufferHostSizeParameters*.

NppStatus **nppiAverageRelativeErrorGetBufferHostSize_32sc_C4R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiAverageRelativeError_32sc_C4R_Ctx*.

For common parameter descriptions, see *CommonAverageRelativeErrorGetBufferHostSizeParameters*.

NppStatus **nppiAverageRelativeErrorGetBufferHostSize_32f_C4R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiAverageRelativeError_32f_C4R_Ctx*.

For common parameter descriptions, see *CommonAverageRelativeErrorGetBufferHostSizeParameters*.

NppStatus **nppiAverageRelativeErrorGetBufferHostSize_32fc_C4R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiAverageRelativeError_32fc_C4R_Ctx*.

For common parameter descriptions, see *CommonAverageRelativeErrorGetBufferHostSizeParameters*.

NppStatus **nppiAverageRelativeErrorGetBufferHostSize_64f_C4R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiAverageRelativeError_64f_C4R_Ctx*.

For common parameter descriptions, see *CommonAverageRelativeErrorGetBufferHostSizeParameters*.

1.14.39. Image Quality Assessment IQA

1.14.39.1 IQA

Primitives for computing the image quality between two images, such as MSE, PSNR, SSIM, and MS-SSIM.

MSE

NppStatus **nppiMSE_8u_C1R_Ctx**(const *Npp8u* *pSrc1, int nSrc1Step, const *Npp8u* *pSrc2, int nSrc2Step, *NppiSize* oSizeROI, *Npp32f* *pMSE, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

One-channel 8-bit unsigned image MSE.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **pSrc2** – *Source-Image Pointer*.
- **nSrc2Step** – *Source-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **pMSE** – Device memory pointer to the computed MSE of two images.
- **pDeviceBuffer** – Pointer to the required device memory allocation, *Scratch Buffer and Host Pointer*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiMSE_8u_C3R_Ctx**(const *Npp8u* *pSrc1, int nSrc1Step, const *Npp8u* *pSrc2, int nSrc2Step, *NppiSize* oSizeROI, *Npp32f* *pMSE, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Three-channel 8-bit unsigned image MSE.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **pSrc2** – *Source-Image Pointer*.
- **nSrc2Step** – *Source-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **pMSE** – Device memory pointer to the computed MSE of two images.
- **pDeviceBuffer** – Pointer to the required device memory allocation, *Scratch Buffer and Host Pointer*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

PSNR

NppStatus **nppiPSNR_8u_C1R_Ctx**(const *Npp8u* *pSrc1, int nSrc1Step, const *Npp8u* *pSrc2, int nSrc2Step, *NppiSize* oSizeROI, *Npp32f* *pPSNR, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

One-channel 8-bit unsigned image PSNR_Ctx.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **pSrc2** – *Source-Image Pointer*.
- **nSrc2Step** – *Source-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **pPSNR** – Device memory pointer to the computed PSNR of two images.
- **pDeviceBuffer** – Pointer to the required device memory allocation, *Scratch Buffer and Host Pointer*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiPSNR_8u_C3R_Ctx**(const *Npp8u* *pSrc1, int nSrc1Step, const *Npp8u* *pSrc2, int nSrc2Step, *NppiSize* oSizeROI, *Npp32f* *pPSNR, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Three-channel 8-bit unsigned image PSNR_Ctx.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **pSrc2** – *Source-Image Pointer*.
- **nSrc2Step** – *Source-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **pPSNR** – Device memory pointer to the computed PSNR of two images.
- **pDeviceBuffer** – Pointer to the required device memory allocation, *Scratch Buffer and Host Pointer*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

SSIM

NppStatus **nppiSSIM_8u_C1R_Ctx**(const *Npp8u* *pSrc1, int nSrc1Step, const *Npp8u* *pSrc2, int nSrc2Step, *NppiSize* oSizeROI, *Npp32f* *pSSIM, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

One-channel 8-bit unsigned image SSIM.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **pSrc2** – *Source-Image Pointer*.
- **nSrc2Step** – *Source-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **pSSIM** – Device memory pointer to the computed SSIM of two images.
- **pDeviceBuffer** – Pointer to the required device memory allocation, *Scratch Buffer and Host Pointer*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiSSIM_8u_C3R_Ctx**(const *Npp8u* *pSrc1, int nSrc1Step, const *Npp8u* *pSrc2, int nSrc2Step, *NppiSize* oSizeROI, *Npp32f* *pSSIM, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Three-channel 8-bit unsigned image SSIM.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **pSrc2** – *Source-Image Pointer*.
- **nSrc2Step** – *Source-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **pSSIM** – Device memory pointer to the computed SSIM of two images.
- **pDeviceBuffer** – Pointer to the required device memory allocation, *Scratch Buffer and Host Pointer*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

MSSSIM

NppStatus **nppiMSSSIM_8u_C1R_Ctx**(const *Npp8u* *pSrc1, int nSrc1Step, const *Npp8u* *pSrc2, int nSrc2Step, *NppiSize* oSizeROI, *Npp32f* *pMSSSIM, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

One-channel 8-bit unsigned image MS-SSIM*.

This function will be deprecated in a future release use the nppiWMSSSIM functions instead.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **pSrc2** – *Source-Image Pointer*.
- **nSrc2Step** – *Source-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **pMSSSIM** – Device memory pointer to the computed MS-SSIM of two images.
- **pDeviceBuffer** – Pointer to the required device memory allocation, *Scratch Buffer and Host Pointer*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

WMSSSIM

NppStatus **nppiWMSSSIM_8u_C1R_Ctx**(const *Npp8u* *pSrc1, int nSrc1Step, const *Npp8u* *pSrc2, int nSrc2Step, *NppiSize* oSizeROI, *Npp32f* *pMSSSIM, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

One-channel 8-bit unsigned image MS-SSIM*.

This function uses the algorithm described in the paper by Wang et. al. Wang, Z., Simoncelli, E.P., Bovik, A.C. Multiscale Structural Similarity for Image Quality Assessment. In: The Thirty-Seventh Asilomar Conference on Signals, Systems & Computers, 2003, 13981402. Pacific Grove, CA, USA: IEEE,

a. https://doi.org/10.1109/ACSSC.2003.1292216. NOTE: this API call can only process oSizeROI dimensions 16px by 16px and above. Any oSizeROI dimensions less than 16px by 16px will result in undefined behaviour.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **pSrc2** – *Source-Image Pointer*.
- **nSrc2Step** – *Source-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **pMSSSIM** – Device memory pointer to the computed MS-SSIM of two images.

- **pDeviceBuffer** – Pointer to the required device memory allocation, *Scratch Buffer and Host Pointer*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiWMSSSIM_8u_C3R_Ctx**(const *Npp8u* *pSrc1, int nSrc1Step, const *Npp8u* *pSrc2, int nSrc2Step, *NppiSize* oSizeROI, *Npp32f* *pMSSSIM, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Three-channel 8-bit unsigned image MS-SSIM*.

This function uses the algorithm described in the paper by Wang et. al. Wang, Z., Simoncelli, E.P., Bovik, A.C. Multiscale Structural Similarity for Image Quality Assessment. In: The Thirty-Seventh Asilomar Conference on Signals, Systems & Computers, 2003, 13981402. Pacific Grove, CA, USA: IEEE,

a. https://doi.org/10.1109/ACSSC.2003.1292216. NOTE: this API call can only process oSizeROI dimensions 16px by 16px and above. Any oSizeROI dimensions less than 16px by 16px will result in undefined behaviour.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **pSrc2** – *Source-Image Pointer*.
- **nSrc2Step** – *Source-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **pMSSSIM** – Device memory pointer to the computed MS-SSIM of two images.
- **pDeviceBuffer** – Pointer to the required device memory allocation, *Scratch Buffer and Host Pointer*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

NppStatus **nppiWMSSSIM_8u_C4R_Ctx**(const *Npp8u* *pSrc1, int nSrc1Step, const *Npp8u* *pSrc2, int nSrc2Step, *NppiSize* oSizeROI, *Npp32f* *pMSSSIM, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Four-channel 8-bit unsigned image MS-SSIM*.

This function uses the algorithm described in the paper by Wang et. al. Wang, Z., Simoncelli, E.P., Bovik, A.C. Multiscale Structural Similarity for Image Quality Assessment. In: The Thirty-Seventh Asilomar Conference on Signals, Systems & Computers, 2003, 13981402. Pacific Grove, CA, USA: IEEE,

a. https://doi.org/10.1109/ACSSC.2003.1292216. NOTE: this API call can only process oSizeROI dimensions 16px by 16px and above. Any oSizeROI dimensions less than 16px by 16px will result in undefined behaviour.

Parameters

- **pSrc1** – *Source-Image Pointer*.
- **nSrc1Step** – *Source-Image Line Step*.
- **pSrc2** – *Source-Image Pointer*.
- **nSrc2Step** – *Source-Image Line Step*.
- **oSizeROI** – *Region-Of-Interest (ROI)*.
- **pMSSSIM** – Device memory pointer to the computed MS-SSIM of two images.
- **pDeviceBuffer** – Pointer to the required device memory allocation, *Scratch Buffer and Host Pointer*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*.

MSEGetBufferHostSize

NppStatus **nppiMSEGetBufferHostSize_8u_C1R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiMSE_8u_C1R_Ctx*.

For common parameter descriptions, see *CommonGetBufferHostSizeParameters*.

NppStatus **nppiMSEGetBufferHostSize_8u_C3R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiMSE_8u_C3R_Ctx*.

For common parameter descriptions, see *CommonGetBufferHostSizeParameters*.

NppStatus **nppiPSNRGetBufferHostSize_8u_C1R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiPSNR_8u_C1R_Ctx*.

For common parameter descriptions, see *CommonGetBufferHostSizeParameters*.

NppStatus **nppiPSNRGetBufferHostSize_8u_C3R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiPSNR_8u_C3R_Ctx*.

For common parameter descriptions, see *CommonGetBufferHostSizeParameters*.

NppStatus **nppiSSIMGetBufferHostSize_8u_C1R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiSSIM_8u_C1R_Ctx*.

For common parameter descriptions, see *CommonGetBufferHostSizeParameters*.

NppStatus **nppiSSIMGetBufferHostSize_8u_C3R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiSSIM_8u_C3R_Ctx*.

For common parameter descriptions, see *CommonGetBufferHostSizeParameters*.

NppStatus **nppiMSSSIMGetBufferHostSize_8u_C1R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiMSSSIM_8u_C1R_Ctx*.

For common parameter descriptions, see *CommonGetBufferHostSizeParameters*.

NppStatus **nppiWMSSSIMGetBufferHostSize_8u_C1R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiWMSSSIM_8u_C1R_Ctx*.

For common parameter descriptions, see *CommonGetBufferHostSizeParameters*.

NppStatus **nppiWMSSSIMGetBufferHostSize_8u_C3R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiWMSSSIM_8u_C3R_Ctx*.

For common parameter descriptions, see *CommonGetBufferHostSizeParameters*.

NppStatus **nppiWMSSSIMGetBufferHostSize_8u_C4R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for *nppiWMSSSIM_8u_C4R_Ctx*.

For common parameter descriptions, see *CommonGetBufferHostSizeParameters*.

1.14.40. Image Batch Quality Assessment

1.14.40.1 IQABatch

Primitives for computing the image quality for a batch of image pairs, such as MSE, PSNR, SSIM, and MS-SSIM with a single *Region-Of-Interest (ROI)* for all pairs of input images

MSEBatch

NppStatus **nppiMSEBatch_8u_C1R_Ctx**(const *NppiImageDescriptor* *pSrc1BatchList, const *NppiImageDescriptor* *pSrc2BatchList, int nBatchSize, *NppiSize* oSizeROI, *Npp32f* *pMSE, *NppiBufferDescriptor* *pDeviceBufferList, *NppStreamContext* nppStreamCtx)

1 channel 8-bit unsigned MSE for a batch of image pairs for a single ROI.

Provided oSizeROI will be used for all images passed in pSrc1BatchList and pSrc2BatchList arguments. API user must ensure that provided ROI (oSizeROI) does not go beyond the borders of any of provided images.

Parameters

- **pSrc1BatchList** – *Source-Batch-Images Pointer* device memory pointer to the list of device memory image descriptors, per image oSize must be initialized.
- **pSrc2BatchList** – *Source-Batch-Images Pointer* device memory pointer to the list of device memory image descriptors, per image oSize must be initialized.

- **nBatchSize** – Number of *NppiImageDescriptor*, *NppiBufferDescriptor*, and new max number structures/values processed in this call (must be > 1).
- **oSizeROI** – *Region-Of-Interest (ROI)* ROI width and height of ALL images in the batch, MUST match the ROI used when the label markers UF image was generated.
- **pMSE** – Device memory pointer to output array of the computed MSE for nBatchSize * sizeof(Npp32f) * 1 image pairs.
- **pDeviceBufferList** – Device memory pointer to the list of *NppiBufferDescriptor* buffer descriptors specifying per image device memory buffer pointers and size as returned by at least one nppiMSEBatchGetBufferHostSize call.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiMSEBatch_8u_C3R_Ctx**(const *NppiImageDescriptor* *pSrc1BatchList, const *NppiImageDescriptor* *pSrc2BatchList, int nBatchSize, *NppiSize* oSizeROI, *Npp32f* *pMSE, *NppiBufferDescriptor* *pDeviceBufferList, *NppStreamContext* nppStreamCtx)

3 channel 8-bit unsigned MSE for a batch of image pairs for a single ROI.

Provided oSizeROI will be used for all images passed in pSrc1BatchList and pSrc2BatchList arguments. API user must ensure that provided ROI (oSizeROI) does not go beyond the borders of any of provided images.

Parameters

- **pSrc1BatchList** – *Source-Batch-Images Pointer* device memory pointer to the list of device memory image descriptors, per image oSize must be initialized.
- **pSrc2BatchList** – *Source-Batch-Images Pointer* device memory pointer to the list of device memory image descriptors, per image oSize must be initialized.
- **nBatchSize** – Number of *NppiImageDescriptor*, *NppiBufferDescriptor*, and new max number structures/values processed in this call (must be > 1).
- **oSizeROI** – *Region-Of-Interest (ROI)* ROI width and height of ALL images in the batch, MUST match the ROI used when the label markers UF image was generated.
- **pMSE** – Device memory pointer to output array of the computed MSE for nBatchSize * sizeof(Npp32f) * 3 image pairs.
- **pDeviceBufferList** – Device memory pointer to the list of *NppiBufferDescriptor* buffer descriptors specifying per image device memory buffer pointers and size as returned by at least one nppiMSEBatchGetBufferHostSize call.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

PSNRBatch

NppStatus **nppiPSNRBatch_8u_C1R_Ctx**(const *NppiImageDescriptor* *pSrc1BatchList, const *NppiImageDescriptor* *pSrc2BatchList, int nBatchSize, *NppiSize* oSizeROI, *Npp32f* *pPSNR, *NppiBufferDescriptor* *pDeviceBufferList, *NppStreamContext* nppStreamCtx)

1 channel 8-bit unsigned PSNR for a batch of image pairs for a single ROI.

Provided oSizeROI will be used for all images passed in pSrc1BatchList and pSrc2BatchList arguments. API user must ensure that provided ROI (oSizeROI) does not go beyond the borders of any of provided images.

Parameters

- **pSrc1BatchList** – *Source-Batch-Images Pointer* device memory pointer to the list of device memory image descriptors, per image oSize must be initialized.
- **pSrc2BatchList** – *Source-Batch-Images Pointer* device memory pointer to the list of device memory image descriptors, per image oSize must be initialized.
- **nBatchSize** – Number of *NppiImageDescriptor*, *NppiBufferDescriptor*, and new max number structures/values processed in this call (must be > 1).
- **oSizeROI** – *Region-Of-Interest (ROI)* ROI width and height of ALL images in the batch, MUST match the ROI used when the label markers UF image was generated.
- **pPSNR** – Device memory pointer to output array of the computed PSNR for nBatchSize * sizeof(Npp32f) * 1 image pairs.
- **pDeviceBufferList** – Device memory pointer to the list of *NppiBufferDescriptor* buffer descriptors specifying per image device memory buffer pointers and size as returned by at least one nppiPSNRBatchGetBufferHostSize call.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiPSNRBatch_8u_C3R_Ctx**(const *NppiImageDescriptor* *pSrc1BatchList, const *NppiImageDescriptor* *pSrc2BatchList, int nBatchSize, *NppiSize* oSizeROI, *Npp32f* *pPSNR, *NppiBufferDescriptor* *pDeviceBufferList, *NppStreamContext* nppStreamCtx)

3 channel 8-bit unsigned PSNR for a batch of image pairs for a single ROI.

Provided oSizeROI will be used for all images passed in pSrc1BatchList and pSrc2BatchList arguments. API user must ensure that provided ROI (oSizeROI) does not go beyond the borders of any of provided images.

Parameters

- **pSrc1BatchList** – *Source-Batch-Images Pointer* device memory pointer to the list of device memory image descriptors, per image oSize must be initialized.
- **pSrc2BatchList** – *Source-Batch-Images Pointer* device memory pointer to the list of device memory image descriptors, per image oSize must be initialized.
- **nBatchSize** – Number of *NppiImageDescriptor*, *NppiBufferDescriptor*, and new max number structures/values processed in this call (must be > 1).

- **oSizeROI** – *Region-Of-Interest (ROI)* ROI width and height of ALL images in the batch, MUST match the ROI used when the label markers UF image was generated.
- **pPSNR** – Device memory pointer to output array of the computed PSNR for nBatchSize * sizeof(Npp32f) * 3 image pairs.
- **pDeviceBufferList** – Device memory pointer to the list of *NppiBufferDescriptor* buffer descriptors specifying per image device memory buffer pointers and size as returned by at least one nppiPSNRBatchGetBufferHostSize call.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

SSIMBatch

NppStatus **nppiSSIMBatch_8u_C1R_Ctx**(const *NppiImageDescriptor* *pSrc1BatchList, const *NppiImageDescriptor* *pSrc2BatchList, int nBatchSize, *NppiSize* oSizeROI, *Npp32f* *pSSIM, *NppiBufferDescriptor* *pDeviceBufferList, *NppStreamContext* nppStreamCtx)

1 channel 8-bit unsigned SSIM for a batch of image pairs for a single ROI.

Provided oSizeROI will be used for all images passed in pSrc1BatchList and pSrc2BatchList arguments. API user must ensure that provided ROI (oSizeROI) does not go beyond the borders of any of provided images.

Parameters

- **pSrc1BatchList** – *Source-Batch-Images Pointer* device memory pointer to the list of device memory image descriptors, per image oSize must be initialized.
- **pSrc2BatchList** – *Source-Batch-Images Pointer* device memory pointer to the list of device memory image descriptors, per image oSize must be initialized.
- **nBatchSize** – Number of *NppiImageDescriptor*, *NppiBufferDescriptor*, and new max number structures/values processed in this call (must be > 1).
- **oSizeROI** – *Region-Of-Interest (ROI)* ROI width and height of ALL images in the batch, MUST match the ROI used when the label markers UF image was generated.
- **pSSIM** – Device memory pointer to output array of the computed SSIM for nBatchSize * sizeof(Npp32f) * 1 image pairs.
- **pDeviceBufferList** – Device memory pointer to the list of *NppiBufferDescriptor* buffer descriptors specifying per image device memory buffer pointers and size as returned by at least one nppiSSIMBatchGetBufferHostSize call.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiSSIMBatch_8u_C3R_Ctx**(const *NppiImageDescriptor* *pSrc1BatchList, const *NppiImageDescriptor* *pSrc2BatchList, int nBatchSize, *NppiSize* oSizeROI, *Npp32f* *pSSIM, *NppiBufferDescriptor* *pDeviceBufferList, *NppStreamContext* nppStreamCtx)

3 channel 8-bit unsigned SSIM for a batch of image pairs for a single ROI.

Provided oSizeROI will be used for all images passed in pSrc1BatchList and pSrc2BatchList arguments. API user must ensure that provided ROI (oSizeROI) does not go beyond the borders of any of provided images.

Parameters

- **pSrc1BatchList** – *Source-Batch-Images Pointer* device memory pointer to the list of device memory image descriptors, per image oSize must be initialized.
- **pSrc2BatchList** – *Source-Batch-Images Pointer* device memory pointer to the list of device memory image descriptors, per image oSize must be initialized.
- **nBatchSize** – Number of *NppiImageDescriptor*, *NppiBufferDescriptor*, and new max number structures/values processed in this call (must be > 1).
- **oSizeROI** – *Region-Of-Interest (ROI)* ROI width and height of ALL images in the batch, MUST match the ROI used when the label markers UF image was generated.
- **pSSIM** – Device memory pointer to output array of the computed SSIM for nBatchSize * sizeof(Npp32f) * 3 image pairs.
- **pDeviceBufferList** – Device memory pointer to the list of *NppiBufferDescriptor* buffer descriptors specifying per image device memory buffer pointers and size as returned by at least one nppiSSIMBatchGetBufferHostSize call.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

WMSSSIMBatch

NppStatus **nppiWMSSSIMBatch_8u_C1R_Ctx**(const *NppiImageDescriptor* *pSrc1BatchList, const *NppiImageDescriptor* *pSrc2BatchList, int nBatchSize, *NppiSize* oSizeROI, *Npp32f* *pWMSSSIM, *NppiBufferDescriptor* *pDeviceBufferList, *NppStreamContext* nppStreamCtx)

1 channel 8-bit unsigned WMSSSIM for a batch of image pairs for a single ROI.

Provided oSizeROI will be used for all images passed in pSrc1BatchList and pSrc2BatchList arguments. API user must ensure that provided ROI (oSizeROI) does not go beyond the borders of any of provided images. NOTE: this API call can only process oSizeROI dimensions 16 pixels by 16 pixels and above. Any oSizeROI dimensions less than 16 pixels by 16 pixels will result in undefined behaviour.

Parameters

- **pSrc1BatchList** – *Source-Batch-Images Pointer* device memory pointer to the list of device memory image descriptors, per image oSize must be initialized.
- **pSrc2BatchList** – *Source-Batch-Images Pointer* device memory pointer to the list of device memory image descriptors, per image oSize must be initialized.

- **nBatchSize** – Number of *NppiImageDescriptor*, *NppiBufferDescriptor*, and new max number structures/values processed in this call (must be > 1).
- **oSizeROI** – *Region-Of-Interest (ROI)* ROI width and height of ALL images in the batch, MUST match the ROI used when the label markers UF image was generated.
- **pWMSSSIM** – Device memory pointer to output array of the computed WMSSSIM for nBatchSize * sizeof(Npp32f) * 1 image pairs.
- **pDeviceBufferList** – Device memory pointer to the list of *NppiBufferDescriptor* buffer descriptors specifying per image device memory buffer pointers and size as returned by at least one nppiWMSSSIMBatchGetBufferHostSize call.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiWMSSSIMBatch_8u_C3R_Ctx**(const *NppiImageDescriptor* *pSrc1BatchList, const *NppiImageDescriptor* *pSrc2BatchList, int nBatchSize, *NppiSize* oSizeROI, *Npp32f* *pWMSSSIM, *NppiBufferDescriptor* *pDeviceBufferList, *NppStreamContext* nppStreamCtx)

3 channel 8-bit unsigned WMSSSIM for a batch of image pairs for a single ROI.

Provided oSizeROI will be used for all images passed in pSrc1BatchList and pSrc2BatchList arguments. API user must ensure that provided ROI (oSizeROI) does not go beyond the borders of any of provided images. NOTE: this API call can only process ROI dimensions 16 pixels by 16 pixels and above. Any ROI dimensions less than 16 pixels by 16 pixels will result in undefined behaviour.

Parameters

- **pSrc1BatchList** – *Source-Batch-Images Pointer* device memory pointer to the list of device memory image descriptors, per image oSize must be initialized.
- **pSrc2BatchList** – *Source-Batch-Images Pointer* device memory pointer to the list of device memory image descriptors, per image oSize must be initialized.
- **nBatchSize** – Number of *NppiImageDescriptor*, *NppiBufferDescriptor*, and new max number structures/values processed in this call (must be > 1).
- **oSizeROI** – *Region-Of-Interest (ROI)* ROI width and height of ALL images in the batch, MUST match the ROI used when the label markers UF image was generated.
- **pWMSSSIM** – Device memory pointer to output array of the computed WMSSSIM for nBatchSize * sizeof(Npp32f) * 3 image pairs.
- **pDeviceBufferList** – Device memory pointer to the list of *NppiBufferDescriptor* buffer descriptors specifying per image device memory buffer pointers and size as returned by at least one nppiWMSSSIMBatchGetBufferHostSize call.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiWMSSSIMBatch_8u_C4R_Ctx**(const *NppiImageDescriptor* *pSrc1BatchList, const *NppiImageDescriptor* *pSrc2BatchList, int nBatchSize, *NppiSize* oSizeROI, *Npp32f* *pWMSSSIM, *NppiBufferDescriptor* *pDeviceBufferList, *NppStreamContext* nppStreamCtx)

4 channel 8-bit unsigned WMSSSIM for a batch of image pairs for a single ROI.

Provided oSizeROI will be used for all images passed in pSrc1BatchList and pSrc2BatchList arguments. API user must ensure that provided ROI (oSizeROI) does not go beyond the borders of any of provided images. NOTE: this API call can only process ROI dimensions 16 pixels by 16 pixels and above. Any ROI dimensions less than 16 pixels by 16 pixels will result in undefined behaviour.

Parameters

- **pSrc1BatchList** – *Source-Batch-Images Pointer* device memory pointer to the list of device memory image descriptors, per image oSize must be initialized.
- **pSrc2BatchList** – *Source-Batch-Images Pointer* device memory pointer to the list of device memory image descriptors, per image oSize must be initialized.
- **nBatchSize** – Number of *NppiImageDescriptor*, *NppiBufferDescriptor*, and new max number structures/values processed in this call (must be > 1).
- **oSizeROI** – *Region-Of-Interest (ROI)* ROI width and height of ALL images in the batch, MUST match the ROI used when the label markers UF image was generated.
- **pWMSSSIM** – Device memory pointer to output array of the computed WMSSSIM for nBatchSize * sizeof(Npp32f) * 4 image pairs.
- **pDeviceBufferList** – Device memory pointer to the list of *NppiBufferDescriptor* buffer descriptors specifying per image device memory buffer pointers and size as returned by at least one nppiWMSSSIMBatchGetBufferHostSize call.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

MSEBatchGetBufferHostSize

NppStatus **nppiMSEBatchGetBufferHostSize_8u_C1R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for a single image pair in the batch of image pairs for *nppiMSEBatch_8u_C1R_Ctx* For common parameter descriptions, see *CommonGetBufferHostSizeParameters*.

NppStatus **nppiMSEBatchGetBufferHostSize_8u_C3R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for a single image pair in the batch of image pairs for *nppiMSEBatch_8u_C3R_Ctx* For common parameter descriptions, see *CommonGetBufferHostSizeParameters*.

NppStatus **nppiPSNRBatchGetBufferHostSize_8u_C1R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for a single image pair in the batch of image pairs for *nppiPSNRBatch_8u_C1R_Ctx*.

For common parameter descriptions, see *CommonGetBufferHostSizeParameters*.

NppStatus **nppiPSNRBatchGetBufferHostSize_8u_C3R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for a single image pair in the batch of image pairs for *nppiPSNRBatch_8u_C3R_Ctx*.

For common parameter descriptions, see *CommonGetBufferHostSizeParameters*.

NppStatus **nppiSSIMBatchGetBufferHostSize_8u_C1R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for a single image pair in the batch of image pairs for *nppiSSIMBatch_8u_C1R_Ctx*.

For common parameter descriptions, see *CommonGetBufferHostSizeParameters*.

NppStatus **nppiSSIMBatchGetBufferHostSize_8u_C3R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for a single image pair in the batch of image pairs for *nppiSSIMBatch_8u_C3R_Ctx*.

For common parameter descriptions, see *CommonGetBufferHostSizeParameters*.

NppStatus **nppiWMSSSIMBatchGetBufferHostSize_8u_C1R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for a single image pair in the batch of image pairs for *nppiWMSSSIMBatch_8u_C1R_Ctx*.

For common parameter descriptions, see *CommonGetBufferHostSizeParameters*.

NppStatus **nppiWMSSSIMBatchGetBufferHostSize_8u_C3R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for a single image pair in the batch of image pairs for *nppiWMSSSIMBatch_8u_C3R_Ctx*.

For common parameter descriptions, see *CommonGetBufferHostSizeParameters*.

NppStatus **nppiWMSSSIMBatchGetBufferHostSize_8u_C4R_Ctx**(*NppiSize* oSizeROI, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Buffer size for a single image pair in the batch of image pairs for *nppiWMSSSIMBatch_8u_C4R_Ctx*.

For common parameter descriptions, see *CommonGetBufferHostSizeParameters*.

1.14.41. Image Advanced Batch Quality Assessment

1.14.41.1 IQABatchAdvanced

Primitives for computing the image quality for a batch of image pairs, such as MSE, PSNR, SSIM, and MS-SSIM with per-image *Region-Of-Interest (ROI)*

MSEBatchAdvanced

NppStatus **nppiMSEBatch_8u_C1R_Advanced_Ctx**(const *NppiImageDescriptor* *pSrc1BatchList, const *NppiImageDescriptor* *pSrc2BatchList, int nBatchSize, *NppiSize* oMaxSizeROI, *Npp32f* *pMSE, *NppiBufferDescriptor* *pDeviceBufferList, *NppStreamContext* nppStreamCtx)

1 channel 8-bit unsigned MSE for a batch of image pairs with per-image ROI

Parameters

- **pSrc1BatchList** – *Source-Batch-Images Pointer* device memory pointer to the list of device memory image descriptors.
- **pSrc2BatchList** – *Source-Batch-Images Pointer* device memory pointer to the list of device memory image descriptors.
- **nBatchSize** – Number of *NppiImageDescriptor*, *NppiBufferDescriptor*, and new max number structures/values processed in this call (must be > 1).
- **oMaxSizeROI** – *Region-Of-Interest (ROI)* maximum ROI width and height of ALL images in the batch.
- **pMSE** – Device memory pointer to output array of the computed MSE for nBatchSize * sizeof(Npp32f * 1 image pairs.
- **pDeviceBufferList** – Device memory pointer to the list of *NppiBufferDescriptor* buffer descriptors specifying per image device memory buffer pointers and size as returned by at least one nppiMSEBatchGetBufferHostSize call.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiMSEBatch_8u_C3R_Advanced_Ctx**(const *NppiImageDescriptor* *pSrc1BatchList, const *NppiImageDescriptor* *pSrc2BatchList, int nBatchSize, *NppiSize* oMaxSizeROI, *Npp32f* *pMSE, *NppiBufferDescriptor* *pDeviceBufferList, *NppStreamContext* nppStreamCtx)

3 channel 8-bit unsigned MSE for a batch of image pairs with per-image ROI

Parameters

- **pSrc1BatchList** – *Source-Batch-Images Pointer* device memory pointer to the list of device memory image descriptors.

- **pSrc2BatchList** – *Source-Batch-Images Pointer* device memory pointer to the list of device memory image descriptors.
- **nBatchSize** – Number of *NppiImageDescriptor*, *NppiBufferDescriptor*, and new max number structures/values processed in this call (must be > 1).
- **oMaxSizeROI** – *Region-Of-Interest (ROI)* maximum ROI width and height of ALL images in the batch.
- **pMSE** – Device memory pointer to output array of the computed MSE for nBatchSize * sizeof(Npp32f) * 3 image pairs.
- **pDeviceBufferList** – Device memory pointer to the list of *NppiBufferDescriptor* buffer descriptors specifying per image device memory buffer pointers and size as returned by at least one nppiMSEBatchGetBufferHostSize call.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

PSNRBatchAdvanced

NppStatus **nppiPSNRBatch_8u_C1R_Advanced_Ctx**(const *NppiImageDescriptor* *pSrc1BatchList, const *NppiImageDescriptor* *pSrc2BatchList, int nBatchSize, *NppiSize* oMaxSizeROI, *Npp32f* *pPSNR, *NppiBufferDescriptor* *pDeviceBufferList, *NppStreamContext* nppStreamCtx)

1 channel 8-bit unsigned PSNR for a batch of image pairs with per-image ROI

Parameters

- **pSrc1BatchList** – *Source-Batch-Images Pointer* device memory pointer to the list of device memory image descriptors.
- **pSrc2BatchList** – *Source-Batch-Images Pointer* device memory pointer to the list of device memory image descriptors.
- **nBatchSize** – Number of *NppiImageDescriptor*, *NppiBufferDescriptor*, and new max number structures/values processed in this call (must be > 1).
- **oMaxSizeROI** – *Region-Of-Interest (ROI)* maximum ROI width and height of ALL images in the batch.
- **pPSNR** – Device memory pointer to output array of the computed PSNR for nBatchSize * sizeof(Npp32f) * 1 image pairs.
- **pDeviceBufferList** – Device memory pointer to the list of *NppiBufferDescriptor* buffer descriptors specifying per image device memory buffer pointers and size as returned by at least one nppiPSNRBatchGetBufferHostSize call.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiPSNRBatch_8u_C3R_Advanced_Ctx**(const *NppiImageDescriptor* *pSrc1BatchList, const *NppiImageDescriptor* *pSrc2BatchList, int nBatchSize, *NppiSize* oMaxSizeROI, *Npp32f* *pPSNR, *NppiBufferDescriptor* *pDeviceBufferList, *NppStreamContext* nppStreamCtx)

3 channel 8-bit unsigned PSNR for a batch of image pairs with per-image ROI

Parameters

- **pSrc1BatchList** – *Source-Batch-Images Pointer* device memory pointer to the list of device memory image descriptors.
- **pSrc2BatchList** – *Source-Batch-Images Pointer* device memory pointer to the list of device memory image descriptors.
- **nBatchSize** – Number of *NppiImageDescriptor*, *NppiBufferDescriptor*, and new max number structures/values processed in this call (must be > 1).
- **oMaxSizeROI** – *Region-Of-Interest (ROI)* maximum ROI width and height of ALL images in the batch.
- **pPSNR** – Device memory pointer to output array of the computed PSNR for nBatchSize * sizeof(Npp32f) * 3 image pairs.
- **pDeviceBufferList** – Device memory pointer to the list of *NppiBufferDescriptor* buffer descriptors specifying per image device memory buffer pointers and size as returned by at least one nppiPSNRBatchGetBufferHostSize call.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

WMSSSIMBatchAdvanced

NppStatus **nppiWMSSSIMBatch_8u_C1R_Advanced_Ctx**(const *NppiImageDescriptor* *pSrc1BatchList, const *NppiImageDescriptor* *pSrc2BatchList, int nBatchSize, *NppiSize* oMaxSizeROI, *Npp32f* *pWMSSSIM, *NppiBufferDescriptor* *pDeviceBufferList, *NppStreamContext* nppStreamCtx)

1 channel 8-bit unsigned WMSSSIM for a batch of image pairs with per-image ROI NOTE: It is the user's responsibility to make sure the dimensions of per-image ROIs are 16 pixels by 16 pixels and above.

Any per-image ROI dimensions less than 16 pixels by 16 pixels will result in undefined behaviour.

Parameters

- **pSrc1BatchList** – *Source-Batch-Images Pointer* device memory pointer to the list of device memory image descriptors.
- **pSrc2BatchList** – *Source-Batch-Images Pointer* device memory pointer to the list of device memory image descriptors.

- **nBatchSize** – Number of *NppiImageDescriptor*, *NppiBufferDescriptor*, and new max number structures/values processed in this call (must be > 1).
- **oMaxSizeROI** – *Region-Of-Interest (ROI)* maximum ROI width and height of ALL images in the batch.
- **pWMSSSIM** – Device memory pointer to output array of the computed WMSSSIM for nBatchSize * sizeof(Npp32f) * 1 image pairs.
- **pDeviceBufferList** – Device memory pointer to the list of *NppiBufferDescriptor* buffer descriptors specifying per image device memory buffer pointers and size as returned by at least one nppiWMSSSIMBatchGetBufferHostSize call.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiWMSSSIMBatch_8u_C3R_Advanced_Ctx**(const *NppiImageDescriptor* *pSrc1BatchList, const *NppiImageDescriptor* *pSrc2BatchList, int nBatchSize, *NppiSize* oMaxSizeROI, *Npp32f* *pWMSSSIM, *NppiBufferDescriptor* *pDeviceBufferList, *NppStreamContext* nppStreamCtx)

3 channel 8-bit unsigned WMSSSIM for a batch of image pairs with per-image ROI NOTE: It is the user's responsibility to make sure the dimensions of per-image ROIs are 16 pixels by 16 pixels and above.

Any per-image ROI dimensions less than 16 pixels by 16 pixels will result in undefined behaviour.

Parameters

- **pSrc1BatchList** – *Source-Batch-Images Pointer* device memory pointer to the list of device memory image descriptors.
- **pSrc2BatchList** – *Source-Batch-Images Pointer* device memory pointer to the list of device memory image descriptors.
- **nBatchSize** – Number of *NppiImageDescriptor*, *NppiBufferDescriptor*, and new max number structures/values processed in this call (must be > 1).
- **oMaxSizeROI** – *Region-Of-Interest (ROI)* maximum ROI width and height of ALL images in the batch.
- **pWMSSSIM** – Device memory pointer to output array of the computed WMSSSIM for nBatchSize * sizeof(Npp32f) * 3 image pairs.
- **pDeviceBufferList** – Device memory pointer to the list of *NppiBufferDescriptor* buffer descriptors specifying per image device memory buffer pointers and size as returned by at least one nppiWMSSSIMBatchGetBufferHostSize call.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

NppStatus **nppiWMSSSIMBatch_8u_C4R_Advanced_Ctx**(const *NppiImageDescriptor* *pSrc1BatchList, const *NppiImageDescriptor* *pSrc2BatchList, int nBatchSize, *NppiSize* oMaxSizeROI, *Npp32f* *pWMSSSIM, *NppiBufferDescriptor* *pDeviceBufferList, *NppStreamContext* nppStreamCtx)

4 channel 8-bit unsigned WMSSSIM for a batch of image pairs with per-image ROI NOTE: It is the user's responsibility to make sure the dimensions of per-image ROIs are 16 pixels by 16 pixels and above.

Any per-image ROI dimensions less than 16 pixels by 16 pixels will result in undefined behaviour.

Parameters

- **pSrc1BatchList** – *Source-Batch-Images Pointer* device memory pointer to the list of device memory image descriptors.
- **pSrc2BatchList** – *Source-Batch-Images Pointer* device memory pointer to the list of device memory image descriptors.
- **nBatchSize** – Number of *NppiImageDescriptor*, *NppiBufferDescriptor*, and new max number structures/values processed in this call (must be > 1).
- **oMaxSizeROI** – *Region-Of-Interest (ROI)* maximum ROI width and height of ALL images in the batch.
- **pWMSSSIM** – Device memory pointer to output array of the computed WMSSSIM for nBatchSize * sizeof(Npp32f) * 4 image pairs.
- **pDeviceBufferList** – Device memory pointer to the list of *NppiBufferDescriptor* buffer descriptors specifying per image device memory buffer pointers and size as returned by at least one nppiWMSSSIMBatchGetBufferHostSize call.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Image Data Related Error Codes, *ROI Related Error Codes*

1.15. Image Threshold And Compare Operations

Methods for pixel-wise threshold and compare operations.

These functions can be found in the nppitc library. Linking to only the sub-libraries that you use can significantly save link time, application load time, and CUDA runtime startup time when using dynamic libraries.

1.15.1. Image Threshold Operations

1.15.1.1 Threshold Operations

Threshold image pixels.

1.15.1.1.1 Common parameters for nppiThreshold non-inplace and inplace functions:

param pSrcDst
In-Place Image Pointer for inplace functions.

param nSrcDstStep
In-Place-Image Line Step for inplace functions.

param pSrc
Source-Image Pointer for non-inplace functions.

param nSrcStep
Source-Image Line Step for non-inplace functions.

param pDst
Destination-Image Pointer for non-inplace functions.

param nDstStep
Destination-Image Line Step for non-inplace functions.

param oSizeROI
Region-Of-Interest (ROI).

param nThreshold
The threshold value.

param eComparisonOperation
The type of comparison operation to be used. The only valid values are: NPP_CMP_LESS and NPP_CMP_GREATER.

param nppStreamCtx
Application Managed Stream Context.

return
Image Data Related Error Codes, *ROI Related Error Codes*, or NPP_NOT_SUPPORTED_MODE_ERROR if an invalid comparison operation type is specified.

Functions

NppStatus **nppiThreshold_8u_C1R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp8u* nThreshold, *NppCmpOp* eComparisonOperation, *NppStreamContext* nppStreamCtx)

1 channel 8-bit unsigned char threshold.

If for a comparison operations OP the predicate (sourcePixel OP nThreshold) is true, the pixel is set to nThreshold, otherwise it is set to sourcePixel.

For common parameter descriptions, see *Common parameters for nppiThreshold non-inplace and inplace functions:*.

NppStatus **nppiThreshold_8u_C1IR_Ctx**(*Npp8u* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, const *Npp8u* nThreshold, *NppCmpOp* eComparisonOperation, *NppStreamContext* nppStreamCtx)

1 channel 8-bit unsigned char in place threshold.

If for a comparison operations OP the predicate (sourcePixel OP nThreshold) is true, the pixel is set to nThreshold, otherwise it is set to sourcePixel.

For common parameter descriptions, see *Common parameters for nppiThreshold non-inplace and inplace functions:*.

NppStatus **nppiThreshold_16u_C1R_Ctx**(const *Npp16u* *pSrc, int nSrcStep, *Npp16u* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp16u* nThreshold, *NppCmpOp* eComparisonOperation, *NppStreamContext* nppStreamCtx)

1 channel 16-bit unsigned short threshold.

If for a comparison operations OP the predicate (sourcePixel OP nThreshold) is true, the pixel is set to nThreshold, otherwise it is set to sourcePixel.

For common parameter descriptions, see *Common parameters for nppiThreshold non-inplace and inplace functions:*.

NppStatus **nppiThreshold_16u_C1IR_Ctx**(*Npp16u* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, const *Npp16u* nThreshold, *NppCmpOp* eComparisonOperation, *NppStreamContext* nppStreamCtx)

1 channel 16-bit unsigned short in place threshold.

If for a comparison operations OP the predicate (sourcePixel OP nThreshold) is true, the pixel is set to nThreshold, otherwise it is set to sourcePixel.

For common parameter descriptions, see *Common parameters for nppiThreshold non-inplace and inplace functions:*.

NppStatus **nppiThreshold_16s_C1R_Ctx**(const *Npp16s* *pSrc, int nSrcStep, *Npp16s* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp16s* nThreshold, *NppCmpOp* eComparisonOperation, *NppStreamContext* nppStreamCtx)

1 channel 16-bit signed short threshold.

If for a comparison operations OP the predicate (sourcePixel OP nThreshold) is true, the pixel is set to nThreshold, otherwise it is set to sourcePixel.

For common parameter descriptions, see *Common parameters for nppiThreshold non-inplace and inplace functions:*.

NppStatus **nppiThreshold_16s_C1IR_Ctx**(*Npp16s* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, const *Npp16s* nThreshold, *NppCmpOp* eComparisonOperation, *NppStreamContext* nppStreamCtx)

1 channel 16-bit signed short in place threshold.

If for a comparison operations OP the predicate (sourcePixel OP nThreshold) is true, the pixel is set to nThreshold, otherwise it is set to sourcePixel.

For common parameter descriptions, see *Common parameters for nppiThreshold non-inplace and inplace functions:*.

NppStatus **nppiThreshold_32f_C1R_Ctx**(const *Npp32f* *pSrc, int nSrcStep, *Npp32f* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp32f* nThreshold, *NppCmpOp* eComparisonOperation, *NppStreamContext* nppStreamCtx)

1 channel 32-bit floating point threshold.

If for a comparison operations OP the predicate (sourcePixel OP nThreshold) is true, the pixel is set to nThreshold, otherwise it is set to sourcePixel.

For common parameter descriptions, see *Common parameters for nppiThreshold non-inplace and inplace functions:*.

NppStatus **nppiThreshold_32f_C1IR_Ctx**(*Npp32f* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, const *Npp32f* nThreshold, *NppCmpOp* eComparisonOperation, *NppStreamContext* nppStreamCtx)

1 channel 32-bit floating point in place threshold.

If for a comparison operations OP the predicate (sourcePixel OP nThreshold) is true, the pixel is set to nThreshold, otherwise it is set to sourcePixel.

For common parameter descriptions, see *Common parameters for nppiThreshold non-inplace and inplace functions:*.

NppStatus **nppiThreshold_8u_C3R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp8u* rThresholds[3], *NppCmpOp* eComparisonOperation, *NppStreamContext* nppStreamCtx)

3 channel 8-bit unsigned char threshold.

If for a comparison operations OP the predicate (sourcePixel OP nThreshold) is true, the pixel is set to nThreshold, otherwise it is set to sourcePixel.

For common parameter descriptions, see *Common parameters for nppiThreshold non-inplace and inplace functions:*.

NppStatus **nppiThreshold_8u_C3IR_Ctx**(*Npp8u* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, const *Npp8u* rThresholds[3], *NppCmpOp* eComparisonOperation, *NppStreamContext* nppStreamCtx)

3 channel 8-bit unsigned char in place threshold.

If for a comparison operations OP the predicate (sourcePixel OP nThreshold) is true, the pixel is set to nThreshold, otherwise it is set to sourcePixel.

For common parameter descriptions, see *Common parameters for nppiThreshold non-inplace and inplace functions:*.

NppStatus **nppiThreshold_16u_C3R_Ctx**(const *Npp16u* *pSrc, int nSrcStep, *Npp16u* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp16u* rThresholds[3], *NppCmpOp* eComparisonOperation, *NppStreamContext* nppStreamCtx)

3 channel 16-bit unsigned short threshold.

If for a comparison operations OP the predicate (sourcePixel OP nThreshold) is true, the pixel is set to nThreshold, otherwise it is set to sourcePixel.

For common parameter descriptions, see *Common parameters for nppiThreshold non-inplace and inplace functions:*.

NppStatus **nppiThreshold_16u_C3IR_Ctx**(*Npp16u* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, const *Npp16u* rThresholds[3], *NppCmpOp* eComparisonOperation, *NppStreamContext* nppStreamCtx)

3 channel 16-bit unsigned short in place threshold.

If for a comparison operations OP the predicate (sourcePixel OP nThreshold) is true, the pixel is set to nThreshold, otherwise it is set to sourcePixel.

For common parameter descriptions, see *Common parameters for nppiThreshold non-inplace and inplace functions:*.

NppStatus **nppiThreshold_16s_C3R_Ctx**(const *Npp16s* *pSrc, int nSrcStep, *Npp16s* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp16s* rThresholds[3], *NppCmpOp* eComparisonOperation, *NppStreamContext* nppStreamCtx)

3 channel 16-bit signed short threshold.

If for a comparison operations OP the predicate (sourcePixel OP nThreshold) is true, the pixel is set to nThreshold, otherwise it is set to sourcePixel.

For common parameter descriptions, see *Common parameters for nppiThreshold non-inplace and inplace functions:*.

NppStatus **nppiThreshold_16s_C3IR_Ctx**(*Npp16s* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, const *Npp16s* rThresholds[3], *NppCmpOp* eComparisonOperation, *NppStreamContext* nppStreamCtx)

3 channel 16-bit signed short in place threshold.

If for a comparison operations OP the predicate (sourcePixel OP nThreshold) is true, the pixel is set to nThreshold, otherwise it is set to sourcePixel.

For common parameter descriptions, see *Common parameters for nppiThreshold non-inplace and inplace functions:*.

NppStatus **nppiThreshold_32f_C3R_Ctx**(const *Npp32f* *pSrc, int nSrcStep, *Npp32f* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp32f* rThresholds[3], *NppCmpOp* eComparisonOperation, *NppStreamContext* nppStreamCtx)

3 channel 32-bit floating point threshold.

If for a comparison operations OP the predicate (sourcePixel OP nThreshold) is true, the pixel is set to nThreshold, otherwise it is set to sourcePixel.

For common parameter descriptions, see *Common parameters for nppiThreshold non-inplace and inplace functions:*.

NppStatus **nppiThreshold_32f_C3IR_Ctx**(*Npp32f* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, const *Npp32f* rThresholds[3], *NppCmpOp* eComparisonOperation, *NppStreamContext* nppStreamCtx)

3 channel 32-bit floating point in place threshold.

If for a comparison operations OP the predicate (sourcePixel OP nThreshold) is true, the pixel is set to nThreshold, otherwise it is set to sourcePixel.

For common parameter descriptions, see *Common parameters for nppiThreshold non-inplace and inplace functions:*.

NppStatus **nppiThreshold_8u_AC4R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp8u* rThresholds[3], *NppCmpOp* eComparisonOperation, *NppStreamContext* nppStreamCtx)

4 channel 8-bit unsigned char image threshold, not affecting Alpha.

If for a comparison operations OP the predicate (sourcePixel.channel OP nThreshold) is true, the channel value is set to nThreshold, otherwise it is set to sourcePixel.

For common parameter descriptions, see *Common parameters for nppiThreshold non-inplace and inplace functions:*.

NppStatus **nppiThreshold_8u_AC4IR_Ctx**(*Npp8u* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, const *Npp8u* rThresholds[3], *NppCmpOp* eComparisonOperation, *NppStreamContext* nppStreamCtx)

4 channel 8-bit unsigned char in place image threshold, not affecting Alpha.

If for a comparison operations OP the predicate (sourcePixel.channel OP nThreshold) is true, the channel value is set to nThreshold, otherwise it is set to sourcePixel.

For common parameter descriptions, see *Common parameters for nppiThreshold non-inplace and inplace functions:*.

NppStatus **nppiThreshold_16u_AC4R_Ctx**(const *Npp16u* *pSrc, int nSrcStep, *Npp16u* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp16u* rThresholds[3], *NppCmpOp* eComparisonOperation, *NppStreamContext* nppStreamCtx)

4 channel 16-bit unsigned short image threshold, not affecting Alpha.

If for a comparison operations OP the predicate (sourcePixel.channel OP nThreshold) is true, the channel value is set to nThreshold, otherwise it is set to sourcePixel.

For common parameter descriptions, see *Common parameters for nppiThreshold non-inplace and inplace functions:*.

NppStatus **nppiThreshold_16u_AC4IR_Ctx**(*Npp16u* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, const *Npp16u* rThresholds[3], *NppCmpOp* eComparisonOperation, *NppStreamContext* nppStreamCtx)

4 channel 16-bit unsigned short in place image threshold, not affecting Alpha.

If for a comparison operations OP the predicate (sourcePixel.channel OP nThreshold) is true, the channel value is set to nThreshold, otherwise it is set to sourcePixel.

For common parameter descriptions, see *Common parameters for nppiThreshold non-inplace and inplace functions:*.

NppStatus **nppiThreshold_16s_AC4R_Ctx**(const *Npp16s* *pSrc, int nSrcStep, *Npp16s* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp16s* rThresholds[3], *NppCmpOp* eComparisonOperation, *NppStreamContext* nppStreamCtx)

4 channel 16-bit signed short image threshold, not affecting Alpha.

If for a comparison operations OP the predicate (sourcePixel.channel OP nThreshold) is true, the channel value is set to nThreshold, otherwise it is set to sourcePixel.

For common parameter descriptions, see *Common parameters for nppiThreshold non-inplace and inplace functions:*.

NppStatus **nppiThreshold_16s_AC4IR_Ctx**(*Npp16s* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, const *Npp16s* rThresholds[3], *NppCmpOp* eComparisonOperation, *NppStreamContext* nppStreamCtx)

4 channel 16-bit signed short in place image threshold, not affecting Alpha.

If for a comparison operations OP the predicate (sourcePixel.channel OP nThreshold) is true, the channel value is set to nThreshold, otherwise it is set to sourcePixel.

For common parameter descriptions, see *Common parameters for nppiThreshold non-inplace and inplace functions:*.

NppStatus **nppiThreshold_32f_AC4R_Ctx**(const *Npp32f* *pSrc, int nSrcStep, *Npp32f* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp32f* rThresholds[3], *NppCmpOp* eComparisonOperation, *NppStreamContext* nppStreamCtx)

4 channel 32-bit floating point image threshold, not affecting Alpha.

If for a comparison operations OP the predicate (sourcePixel.channel OP nThreshold) is true, the channel value is set to nThreshold, otherwise it is set to sourcePixel.

For common parameter descriptions, see *Common parameters for nppiThreshold non-inplace and inplace functions:*.

NppStatus **nppiThreshold_32f_AC4IR_Ctx**(*Npp32f* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, const *Npp32f* rThresholds[3], *NppCmpOp* eComparisonOperation, *NppStreamContext* nppStreamCtx)

4 channel 32-bit floating point in place image threshold, not affecting Alpha.

If for a comparison operations OP the predicate (sourcePixel.channel OP nThreshold) is true, the channel value is set to nThreshold, otherwise it is set to sourcePixel.

For common parameter descriptions, see *Common parameters for nppiThreshold non-inplace and inplace functions:*.

1.15.1.2 Image Threshold Greater Than Operations

1.15.1.2.1 Threshold Greater Than Operations

Threshold greater than image pixels.

1.15.1.2.1.1 Common parameters for nppiThreshold_GT non-inplace and inplace functions:

param pSrcDst
In-Place Image Pointer for inplace functions.

param nSrcDstStep
In-Place-Image Line Step for inplace functions.

param pSrc
Source-Image Pointer for non-inplace functions.

param nSrcStep
Source-Image Line Step for non-inplace functions.

param pDst
Destination-Image Pointer for non-inplace functions.

param nDstStep
Destination-Image Line Step for non-inplace functions.

param oSizeROI
Region-Of-Interest (ROI).

param nThreshold
The threshold value.

param nppStreamCtx
Application Managed Stream Context.

return
Image Data Related Error Codes, *ROI Related Error Codes*.

Functions

NppStatus **nppiThreshold_GT_8u_C1R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp8u* nThreshold, *NppStreamContext* nppStreamCtx)

1 channel 8-bit unsigned char threshold.

If for a comparison operations sourcePixel is greater than nThreshold is true, the pixel is set to nThreshold, otherwise it is set to sourcePixel.

For common parameter descriptions, see *Common parameters for nppiThreshold_GT non-inplace and inplace functions:*.

NppStatus **nppiThreshold_GT_8u_C1IR_Ctx**(*Npp8u* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, const *Npp8u* nThreshold, *NppStreamContext* nppStreamCtx)

1 channel 8-bit unsigned char in place threshold.

If for a comparison operations sourcePixel is greater than nThreshold is true, the pixel is set to nThreshold, otherwise it is set to sourcePixel.

For common parameter descriptions, see *Common parameters for nppiThreshold_GT non-inplace and inplace functions:*.

NppStatus **nppiThreshold_GT_16u_C1R_Ctx**(const *Npp16u* *pSrc, int nSrcStep, *Npp16u* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp16u* nThreshold, *NppStreamContext* nppStreamCtx)

1 channel 16-bit unsigned short threshold.

If for a comparison operations sourcePixel is greater than nThreshold is true, the pixel is set to nThreshold, otherwise it is set to sourcePixel.

For common parameter descriptions, see *Common parameters for nppiThreshold_GT non-inplace and inplace functions:*.

NppStatus **nppiThreshold_GT_16u_C1IR_Ctx**(*Npp16u* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, const *Npp16u* nThreshold, *NppStreamContext* nppStreamCtx)

1 channel 16-bit unsigned short in place threshold.

If for a comparison operations sourcePixel is greater than nThreshold is true, the pixel is set to nThreshold, otherwise it is set to sourcePixel.

For common parameter descriptions, see *Common parameters for nppiThreshold_GT non-inplace and inplace functions:*.

NppStatus **nppiThreshold_GT_16s_C1R_Ctx**(const *Npp16s* *pSrc, int nSrcStep, *Npp16s* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp16s* nThreshold, *NppStreamContext* nppStreamCtx)

1 channel 16-bit signed short threshold.

If for a comparison operations sourcePixel is greater than nThreshold is true, the pixel is set to nThreshold, otherwise it is set to sourcePixel.

For common parameter descriptions, see *Common parameters for nppiThreshold_GT non-inplace and inplace functions:*.

NppStatus **nppiThreshold_GT_16s_C1IR_Ctx**(*Npp16s* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, const *Npp16s* nThreshold, *NppStreamContext* nppStreamCtx)

1 channel 16-bit signed short in place threshold.

If for a comparison operations sourcePixel is greater than nThreshold is true, the pixel is set to nThreshold, otherwise it is set to sourcePixel.

For common parameter descriptions, see *Common parameters for nppiThreshold_GT non-inplace and inplace functions:*.

NppStatus **nppiThreshold_GT_32f_C1R_Ctx**(const *Npp32f* *pSrc, int nSrcStep, *Npp32f* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp32f* nThreshold, *NppStreamContext* nppStreamCtx)

1 channel 32-bit floating point threshold.

If for a comparison operations sourcePixel is greater than nThreshold is true, the pixel is set to nThreshold, otherwise it is set to sourcePixel.

For common parameter descriptions, see *Common parameters for nppiThreshold_GT non-inplace and inplace functions:*.

NppStatus **nppiThreshold_GT_32f_C1IR_Ctx**(*Npp32f* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, const *Npp32f* nThreshold, *NppStreamContext* nppStreamCtx)

1 channel 32-bit floating point in place threshold.

If for a comparison operations sourcePixel is greater than nThreshold is true, the pixel is set to nThreshold, otherwise it is set to sourcePixel.

For common parameter descriptions, see *Common parameters for nppiThreshold_GT non-inplace and inplace functions:*.

NppStatus **nppiThreshold_GT_8u_C3R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp8u* rThresholds[3], *NppStreamContext* nppStreamCtx)

3 channel 8-bit unsigned char threshold.

If for a comparison operations sourcePixel is greater than nThreshold is true, the pixel is set to nThreshold, otherwise it is set to sourcePixel.

For common parameter descriptions, see *Common parameters for nppiThreshold_GT non-inplace and inplace functions:*.

NppStatus **nppiThreshold_GT_8u_C3IR_Ctx**(*Npp8u* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, const *Npp8u* rThresholds[3], *NppStreamContext* nppStreamCtx)

3 channel 8-bit unsigned char in place threshold.

If for a comparison operations sourcePixel is greater than nThreshold is true, the pixel is set to nThreshold, otherwise it is set to sourcePixel.

For common parameter descriptions, see *Common parameters for nppiThreshold_GT non-inplace and inplace functions:*.

NppStatus **nppiThreshold_GT_16u_C3R_Ctx**(const *Npp16u* *pSrc, int nSrcStep, *Npp16u* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp16u* rThresholds[3], *NppStreamContext* nppStreamCtx)

3 channel 16-bit unsigned short threshold.

If for a comparison operations sourcePixel is greater than nThreshold is true, the pixel is set to nThreshold, otherwise it is set to sourcePixel.

For common parameter descriptions, see *Common parameters for nppiThreshold_GT non-inplace and inplace functions:*.

NppStatus **nppiThreshold_GT_16u_C3IR_Ctx**(*Npp16u* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, const *Npp16u* rThresholds[3], *NppStreamContext* nppStreamCtx)

3 channel 16-bit unsigned short in place threshold.

If for a comparison operations sourcePixel is greater than nThreshold is true, the pixel is set to nThreshold, otherwise it is set to sourcePixel.

For common parameter descriptions, see *Common parameters for nppiThreshold_GT non-inplace and inplace functions:*.

NppStatus **nppiThreshold_GT_16s_C3R_Ctx**(const *Npp16s* *pSrc, int nSrcStep, *Npp16s* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp16s* rThresholds[3], *NppStreamContext* nppStreamCtx)

3 channel 16-bit signed short threshold.

If for a comparison operations sourcePixel is greater than nThreshold is true, the pixel is set to nThreshold, otherwise it is set to sourcePixel.

For common parameter descriptions, see *Common parameters for nppiThreshold_GT non-inplace and inplace functions:*.

NppStatus **nppiThreshold_GT_16s_C3IR_Ctx**(*Npp16s* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, const *Npp16s* rThresholds[3], *NppStreamContext* nppStreamCtx)

3 channel 16-bit signed short in place threshold.

If for a comparison operations sourcePixel is greater than nThreshold is true, the pixel is set to nThreshold, otherwise it is set to sourcePixel.

For common parameter descriptions, see *Common parameters for nppiThreshold_GT non-inplace and inplace functions:*.

NppStatus **nppiThreshold_GT_32f_C3R_Ctx**(const *Npp32f* *pSrc, int nSrcStep, *Npp32f* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp32f* rThresholds[3], *NppStreamContext* nppStreamCtx)

3 channel 32-bit floating point threshold.

If for a comparison operations sourcePixel is greater than nThreshold is true, the pixel is set to nThreshold, otherwise it is set to sourcePixel.

For common parameter descriptions, see *Common parameters for nppiThreshold_GT non-inplace and inplace functions:*.

NppStatus **nppiThreshold_GT_32f_C3IR_Ctx**(*Npp32f* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, const *Npp32f* rThresholds[3], *NppStreamContext* nppStreamCtx)

3 channel 32-bit floating point in place threshold.

If for a comparison operations sourcePixel is greater than nThreshold is true, the pixel is set to nThreshold, otherwise it is set to sourcePixel.

For common parameter descriptions, see *Common parameters for nppiThreshold_GT non-inplace and inplace functions:*.

NppStatus **nppiThreshold_GT_8u_AC4R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp8u* rThresholds[3], *NppStreamContext* nppStreamCtx)

4 channel 8-bit unsigned char image threshold, not affecting Alpha.

If for a comparison operations sourcePixel is greater than nThreshold is true, the pixel is set value is set to nThreshold, otherwise it is set to sourcePixel.

For common parameter descriptions, see *Common parameters for nppiThreshold_GT non-inplace and inplace functions:*.

NppStatus **nppiThreshold_GT_8u_AC4IR_Ctx**(*Npp8u* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, const *Npp8u* rThresholds[3], *NppStreamContext* nppStreamCtx)

4 channel 8-bit unsigned char in place image threshold, not affecting Alpha.

If for a comparison operations sourcePixel is greater than nThreshold is true, the pixel is set value is set to nThreshold, otherwise it is set to sourcePixel.

For common parameter descriptions, see *Common parameters for nppiThreshold_GT non-inplace and inplace functions:*.

NppStatus **nppiThreshold_GT_16u_AC4R_Ctx**(const *Npp16u* *pSrc, int nSrcStep, *Npp16u* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp16u* rThresholds[3], *NppStreamContext* nppStreamCtx)

4 channel 16-bit unsigned short image threshold, not affecting Alpha.

If for a comparison operations sourcePixel is greater than nThreshold is true, the pixel is set value is set to nThreshold, otherwise it is set to sourcePixel.

For common parameter descriptions, see *Common parameters for nppiThreshold_GT non-inplace and inplace functions:*.

NppStatus **nppiThreshold_GT_16u_AC4IR_Ctx**(*Npp16u* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, const *Npp16u* rThresholds[3], *NppStreamContext* nppStreamCtx)

4 channel 16-bit unsigned short in place image threshold, not affecting Alpha.

If for a comparison operations sourcePixel is greater than nThreshold is true, the pixel is set value is set to nThreshold, otherwise it is set to sourcePixel.

For common parameter descriptions, see *Common parameters for nppiThreshold_GT non-inplace and inplace functions:*.

NppStatus **nppiThreshold_GT_16s_AC4R_Ctx**(const *Npp16s* *pSrc, int nSrcStep, *Npp16s* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp16s* rThresholds[3], *NppStreamContext* nppStreamCtx)

4 channel 16-bit signed short image threshold, not affecting Alpha.

If for a comparison operations sourcePixel is greater than nThreshold is true, the pixel is set value is set to nThreshold, otherwise it is set to sourcePixel.

For common parameter descriptions, see *Common parameters for nppiThreshold_GT non-inplace and inplace functions:*.

NppStatus **nppiThreshold_GT_16s_AC4IR_Ctx**(*Npp16s* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, const *Npp16s* rThresholds[3], *NppStreamContext* nppStreamCtx)

4 channel 16-bit signed short in place image threshold, not affecting Alpha.

If for a comparison operations sourcePixel is greater than nThreshold is true, the pixel is set value is set to nThreshold, otherwise it is set to sourcePixel.

For common parameter descriptions, see *Common parameters for nppiThreshold_GT non-inplace and inplace functions:*.

NppStatus **nppiThreshold_GT_32f_AC4R_Ctx**(const *Npp32f* *pSrc, int nSrcStep, *Npp32f* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp32f* rThresholds[3], *NppStreamContext* nppStreamCtx)

4 channel 32-bit floating point image threshold, not affecting Alpha.

If for a comparison operations sourcePixel is greater than nThreshold is true, the pixel is set value is set to nThreshold, otherwise it is set to sourcePixel.

For common parameter descriptions, see *Common parameters for nppiThreshold_GT non-inplace and inplace functions:*.

NppStatus **nppiThreshold_GT_32f_AC4IR_Ctx**(*Npp32f* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, const *Npp32f* rThresholds[3], *NppStreamContext* nppStreamCtx)

4 channel 32-bit floating point in place image threshold, not affecting Alpha.

If for a comparison operations sourcePixel is greater than nThreshold is true, the pixel is set value is set to nThreshold, otherwise it is set to sourcePixel.

For common parameter descriptions, see *Common parameters for nppiThreshold_GT non-inplace and inplace functions:*.

1.15.1.3 Image Threshold Less Than Operations

1.15.1.3.1 Threshold Less Than Operations

Threshold less than image pixels.

1.15.1.3.1.1 Common parameters for nppiThreshold_LT non-inplace and inplace functions:

param pSrcDst
In-Place Image Pointer for inplace functions.

param nSrcDstStep
In-Place-Image Line Step for inplace functions.

param pSrc
Source-Image Pointer for non-inplace functions.

param nSrcStep
Source-Image Line Step for non-inplace functions.

param pDst
Destination-Image Pointer for non-inplace functions.

param nDstStep
Destination-Image Line Step for non-inplace functions.

param oSizeROI
Region-Of-Interest (ROI).

param nThreshold
The threshold value.

param nppStreamCtx
Application Managed Stream Context.

return
Image Data Related Error Codes, *ROI Related Error Codes*.

Functions

NppStatus **nppiThreshold_LT_8u_C1R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp8u* nThreshold, *NppStreamContext* nppStreamCtx)

1 channel 8-bit unsigned char threshold.

If for a comparison operations sourcePixel is less than nThreshold is true, the pixel is set to nThreshold, otherwise it is set to sourcePixel.

For common parameter descriptions, see *Common parameters for nppiThreshold_LT non-inplace and inplace functions:*.

NppStatus **nppiThreshold_LT_8u_C1IR_Ctx**(*Npp8u* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, const *Npp8u* nThreshold, *NppStreamContext* nppStreamCtx)

1 channel 8-bit unsigned char in place threshold.

If for a comparison operations sourcePixel is less than nThreshold is true, the pixel is set to nThreshold, otherwise it is set to sourcePixel.

For common parameter descriptions, see *Common parameters for nppiThreshold_LT non-inplace and inplace functions:*.

NppStatus **nppiThreshold_LT_16u_C1R_Ctx**(const *Npp16u* *pSrc, int nSrcStep, *Npp16u* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp16u* nThreshold, *NppStreamContext* nppStreamCtx)

1 channel 16-bit unsigned short threshold.

If for a comparison operations sourcePixel is less than nThreshold is true, the pixel is set to nThreshold, otherwise it is set to sourcePixel.

For common parameter descriptions, see *Common parameters for nppiThreshold_LT non-inplace and inplace functions:*.

NppStatus **nppiThreshold_LT_16u_C1IR_Ctx**(*Npp16u* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, const *Npp16u* nThreshold, *NppStreamContext* nppStreamCtx)

1 channel 16-bit unsigned short in place threshold.

If for a comparison operations sourcePixel is less than nThreshold is true, the pixel is set to nThreshold, otherwise it is set to sourcePixel.

For common parameter descriptions, see *Common parameters for nppiThreshold_LT non-inplace and inplace functions:*.

NppStatus **nppiThreshold_LT_16s_C1R_Ctx**(const *Npp16s* *pSrc, int nSrcStep, *Npp16s* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp16s* nThreshold, *NppStreamContext* nppStreamCtx)

1 channel 16-bit signed short threshold.

If for a comparison operations sourcePixel is less than nThreshold is true, the pixel is set to nThreshold, otherwise it is set to sourcePixel.

For common parameter descriptions, see *Common parameters for nppiThreshold_LT non-inplace and inplace functions:*.

NppStatus **nppiThreshold_LT_16s_C1IR_Ctx**(*Npp16s* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, const *Npp16s* nThreshold, *NppStreamContext* nppStreamCtx)

1 channel 16-bit signed short in place threshold.

If for a comparison operations sourcePixel is less than nThreshold is true, the pixel is set to nThreshold, otherwise it is set to sourcePixel.

For common parameter descriptions, see *Common parameters for nppiThreshold_LT non-inplace and inplace functions:*.

NppStatus **nppiThreshold_LT_32f_C1R_Ctx**(const *Npp32f* *pSrc, int nSrcStep, *Npp32f* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp32f* nThreshold, *NppStreamContext* nppStreamCtx)

1 channel 32-bit floating point threshold.

If for a comparison operations sourcePixel is less than nThreshold is true, the pixel is set to nThreshold, otherwise it is set to sourcePixel.

For common parameter descriptions, see *Common parameters for nppiThreshold_LT non-inplace and inplace functions:*.

NppStatus **nppiThreshold_LT_32f_C1IR_Ctx**(*Npp32f* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, const *Npp32f* nThreshold, *NppStreamContext* nppStreamCtx)

1 channel 32-bit floating point in place threshold.

If for a comparison operations sourcePixel is less than nThreshold is true, the pixel is set to nThreshold, otherwise it is set to sourcePixel.

For common parameter descriptions, see *Common parameters for nppiThreshold_LT non-inplace and inplace functions:*.

NppStatus **nppiThreshold_LT_8u_C3R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp8u* rThresholds[3], *NppStreamContext* nppStreamCtx)

3 channel 8-bit unsigned char threshold.

If for a comparison operations sourcePixel is less than nThreshold is true, the pixel is set to nThreshold, otherwise it is set to sourcePixel.

For common parameter descriptions, see *Common parameters for nppiThreshold_LT non-inplace and inplace functions:*.

NppStatus **nppiThreshold_LT_8u_C3IR_Ctx**(*Npp8u* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, const *Npp8u* rThresholds[3], *NppStreamContext* nppStreamCtx)

3 channel 8-bit unsigned char in place threshold.

If for a comparison operations sourcePixel is less than nThreshold is true, the pixel is set to nThreshold, otherwise it is set to sourcePixel.

For common parameter descriptions, see *Common parameters for nppiThreshold_LT non-inplace and inplace functions:*.

NppStatus **nppiThreshold_LT_16u_C3R_Ctx**(const *Npp16u* *pSrc, int nSrcStep, *Npp16u* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp16u* rThresholds[3], *NppStreamContext* nppStreamCtx)

3 channel 16-bit unsigned short threshold.

If for a comparison operations sourcePixel is less than nThreshold is true, the pixel is set to nThreshold, otherwise it is set to sourcePixel.

For common parameter descriptions, see *Common parameters for nppiThreshold_LT non-inplace and inplace functions:*.

NppStatus **nppiThreshold_LT_16u_C3IR_Ctx**(*Npp16u* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, const *Npp16u* rThresholds[3], *NppStreamContext* nppStreamCtx)

3 channel 16-bit unsigned short in place threshold.

If for a comparison operations sourcePixel is less than nThreshold is true, the pixel is set to nThreshold, otherwise it is set to sourcePixel.

For common parameter descriptions, see *Common parameters for nppiThreshold_LT non-inplace and inplace functions:*.

NppStatus **nppiThreshold_LT_16s_C3R_Ctx**(const *Npp16s* *pSrc, int nSrcStep, *Npp16s* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp16s* rThresholds[3], *NppStreamContext* nppStreamCtx)

3 channel 16-bit signed short threshold.

If for a comparison operations sourcePixel is less than nThreshold is true, the pixel is set to nThreshold, otherwise it is set to sourcePixel.

For common parameter descriptions, see *Common parameters for nppiThreshold_LT non-inplace and inplace functions:*.

NppStatus **nppiThreshold_LT_16s_C3IR_Ctx**(*Npp16s* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, const *Npp16s* rThresholds[3], *NppStreamContext* nppStreamCtx)

3 channel 16-bit signed short in place threshold.

If for a comparison operations sourcePixel is less than nThreshold is true, the pixel is set to nThreshold, otherwise it is set to sourcePixel.

For common parameter descriptions, see *Common parameters for nppiThreshold_LT non-inplace and inplace functions:*.

NppStatus **nppiThreshold_LT_32f_C3R_Ctx**(const *Npp32f* *pSrc, int nSrcStep, *Npp32f* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp32f* rThresholds[3], *NppStreamContext* nppStreamCtx)

3 channel 32-bit floating point threshold.

If for a comparison operations sourcePixel is less than nThreshold is true, the pixel is set to nThreshold, otherwise it is set to sourcePixel.

For common parameter descriptions, see *Common parameters for nppiThreshold_LT non-inplace and inplace functions:*.

NppStatus **nppiThreshold_LT_32f_C3IR_Ctx**(*Npp32f* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, const *Npp32f* rThresholds[3], *NppStreamContext* nppStreamCtx)

3 channel 32-bit floating point in place threshold.

If for a comparison operations sourcePixel is less than nThreshold is true, the pixel is set to nThreshold, otherwise it is set to sourcePixel.

For common parameter descriptions, see *Common parameters for nppiThreshold_LT non-inplace and inplace functions:*.

NppStatus **nppiThreshold_LT_8u_AC4R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp8u* rThresholds[3], *NppStreamContext* nppStreamCtx)

4 channel 8-bit unsigned char image threshold, not affecting Alpha.

If for a comparison operations sourcePixel is less than nThreshold is true, the pixel is set value is set to nThreshold, otherwise it is set to sourcePixel.

For common parameter descriptions, see *Common parameters for nppiThreshold_LT non-inplace and inplace functions:*.

NppStatus **nppiThreshold_LT_8u_AC4IR_Ctx**(*Npp8u* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, const *Npp8u* rThresholds[3], *NppStreamContext* nppStreamCtx)

4 channel 8-bit unsigned char in place image threshold, not affecting Alpha.

If for a comparison operations sourcePixel is less than nThreshold is true, the pixel is set value is set to nThreshold, otherwise it is set to sourcePixel.

For common parameter descriptions, see *Common parameters for nppiThreshold_LT non-inplace and inplace functions:*.

NppStatus **nppiThreshold_LT_16u_AC4R_Ctx**(const *Npp16u* *pSrc, int nSrcStep, *Npp16u* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp16u* rThresholds[3], *NppStreamContext* nppStreamCtx)

4 channel 16-bit unsigned short image threshold, not affecting Alpha.

If for a comparison operations sourcePixel is less than nThreshold is true, the pixel is set value is set to nThreshold, otherwise it is set to sourcePixel.

For common parameter descriptions, see *Common parameters for nppiThreshold_LT non-inplace and inplace functions:*.

NppStatus **nppiThreshold_LT_16u_AC4IR_Ctx**(*Npp16u* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, const *Npp16u* rThresholds[3], *NppStreamContext* nppStreamCtx)

4 channel 16-bit unsigned short in place image threshold, not affecting Alpha.

If for a comparison operations sourcePixel is less than nThreshold is true, the pixel is set value is set to nThreshold, otherwise it is set to sourcePixel.

For common parameter descriptions, see *Common parameters for nppiThreshold_LT non-inplace and inplace functions:*.

NppStatus **nppiThreshold_LT_16s_AC4R_Ctx**(const *Npp16s* *pSrc, int nSrcStep, *Npp16s* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp16s* rThresholds[3], *NppStreamContext* nppStreamCtx)

4 channel 16-bit signed short image threshold, not affecting Alpha.

If for a comparison operations sourcePixel is less than nThreshold is true, the pixel is set value is set to nThreshold, otherwise it is set to sourcePixel.

For common parameter descriptions, see *Common parameters for nppiThreshold_LT non-inplace and inplace functions:*.

NppStatus **nppiThreshold_LT_16s_AC4IR_Ctx**(*Npp16s* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, const *Npp16s* rThresholds[3], *NppStreamContext* nppStreamCtx)

4 channel 16-bit signed short in place image threshold, not affecting Alpha.

If for a comparison operations sourcePixel is less than nThreshold is true, the pixel is set value is set to nThreshold, otherwise it is set to sourcePixel.

For common parameter descriptions, see *Common parameters for nppiThreshold_LT non-inplace and inplace functions:*.

NppStatus **nppiThreshold_LT_32f_AC4R_Ctx**(const *Npp32f* *pSrc, int nSrcStep, *Npp32f* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp32f* rThresholds[3], *NppStreamContext* nppStreamCtx)

4 channel 32-bit floating point image threshold, not affecting Alpha.

If for a comparison operations sourcePixel is less than nThreshold is true, the pixel is set value is set to nThreshold, otherwise it is set to sourcePixel.

For common parameter descriptions, see *Common parameters for nppiThreshold_LT non-inplace and inplace functions:*.

NppStatus **nppiThreshold_LT_32f_AC4IR_Ctx**(*Npp32f* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, const *Npp32f* rThresholds[3], *NppStreamContext* nppStreamCtx)

4 channel 32-bit floating point in place image threshold, not affecting Alpha.

If for a comparison operations sourcePixel is less than nThreshold is true, the pixel is set value is set to nThreshold, otherwise it is set to sourcePixel.

For common parameter descriptions, see *Common parameters for nppiThreshold_LT non-inplace and inplace functions:*.

1.15.1.4 Image Threshold Value Operations

1.15.1.4.1 Threshold Value Operations

Replace thresholded image pixels with a value.

1.15.1.4.1.1 Common parameters for nppiThreshold_Val non-inplace and inplace functions:

param pSrcDst
In-Place Image Pointer for inplace functions.

param nSrcDstStep
In-Place-Image Line Step for inplace functions.

param pSrc
Source-Image Pointer for non-inplace functions.

param nSrcStep
Source-Image Line Step for non-inplace functions.

param pDst
Destination-Image Pointer for non-inplace functions.

param nDstStep
Destination-Image Line Step for non-inplace functions.

param oSizeROI
Region-Of-Interest (ROI).

param nThreshold
The threshold value.

param nValue
The threshold replacement value.

param eComparisonOperation
The type of comparison operation to be used. The only valid values are: NPP_CMP_LESS and NPP_CMP_GREATER.

param nppStreamCtx
Application Managed Stream Context.

return
Image Data Related Error Codes, *ROI Related Error Codes*, or

NPP_NOT_SUPPORTED_MODE_ERROR if an invalid comparison operation type is specified.

Functions

NppStatus **nppiThreshold_Val_8u_C1R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp8u* nThreshold, const *Npp8u* nValue, *NppCmpOp* eComparisonOperation, *NppStreamContext* nppStreamCtx)

1 channel 8-bit unsigned char threshold.

If for a comparison operations OP the predicate (sourcePixel OP nThreshold) is true, the pixel is set to nValue, otherwise it is set to sourcePixel.

For common parameter descriptions, see *Common parameters for nppiThreshold_Val non-inplace and inplace functions:*.

NppStatus **nppiThreshold_Val_8u_C1IR_Ctx**(*Npp8u* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, const *Npp8u* nThreshold, const *Npp8u* nValue, *NppCmpOp* eComparisonOperation, *NppStreamContext* nppStreamCtx)

1 channel 8-bit unsigned char in place threshold.

If for a comparison operations OP the predicate (sourcePixel OP nThreshold) is true, the pixel is set to nValue, otherwise it is set to sourcePixel.

For common parameter descriptions, see *Common parameters for nppiThreshold_Val non-inplace and inplace functions:*.

NppStatus **nppiThreshold_Val_16u_C1R_Ctx**(const *Npp16u* *pSrc, int nSrcStep, *Npp16u* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp16u* nThreshold, const *Npp16u* nValue, *NppCmpOp* eComparisonOperation, *NppStreamContext* nppStreamCtx)

1 channel 16-bit unsigned short threshold.

If for a comparison operations OP the predicate (sourcePixel OP nThreshold) is true, the pixel is set to nValue, otherwise it is set to sourcePixel.

For common parameter descriptions, see *Common parameters for nppiThreshold_Val non-inplace and inplace functions:*.

NppStatus **nppiThreshold_Val_16u_C1IR_Ctx**(*Npp16u* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, const *Npp16u* nThreshold, const *Npp16u* nValue, *NppCmpOp* eComparisonOperation, *NppStreamContext* nppStreamCtx)

1 channel 16-bit unsigned short in place threshold.

If for a comparison operations OP the predicate (sourcePixel OP nThreshold) is true, the pixel is set to nValue, otherwise it is set to sourcePixel.

For common parameter descriptions, see *Common parameters for nppiThreshold_Val non-inplace and inplace functions:*.

NppStatus **nppiThreshold_Val_16s_C1R_Ctx**(const *Npp16s* *pSrc, int nSrcStep, *Npp16s* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp16s* nThreshold, const *Npp16s* nValue, *NppCmpOp* eComparisonOperation, *NppStreamContext* nppStreamCtx)

1 channel 16-bit signed short threshold.

If for a comparison operations OP the predicate (sourcePixel OP nThreshold) is true, the pixel is set to nValue, otherwise it is set to sourcePixel.

For common parameter descriptions, see *Common parameters for nppiThreshold_Val non-inplace and inplace functions:*.

NppStatus **nppiThreshold_Val_16s_C1IR_Ctx**(*Npp16s* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, const *Npp16s* nThreshold, const *Npp16s* nValue, *NppCmpOp* eComparisonOperation, *NppStreamContext* nppStreamCtx)

1 channel 16-bit signed short in place threshold.

If for a comparison operations OP the predicate (sourcePixel OP nThreshold) is true, the pixel is set to nValue, otherwise it is set to sourcePixel.

For common parameter descriptions, see *Common parameters for nppiThreshold_Val non-inplace and inplace functions:*.

NppStatus **nppiThreshold_Val_32f_C1R_Ctx**(const *Npp32f* *pSrc, int nSrcStep, *Npp32f* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp32f* nThreshold, const *Npp32f* nValue, *NppCmpOp* eComparisonOperation, *NppStreamContext* nppStreamCtx)

1 channel 32-bit floating point threshold.

If for a comparison operations OP the predicate (sourcePixel OP nThreshold) is true, the pixel is set to nValue, otherwise it is set to sourcePixel.

For common parameter descriptions, see *Common parameters for nppiThreshold_Val non-inplace and inplace functions:*.

NppStatus **nppiThreshold_Val_32f_C1IR_Ctx**(*Npp32f* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, const *Npp32f* nThreshold, const *Npp32f* nValue, *NppCmpOp* eComparisonOperation, *NppStreamContext* nppStreamCtx)

1 channel 32-bit floating point in place threshold.

If for a comparison operations OP the predicate (sourcePixel OP nThreshold) is true, the pixel is set to nValue, otherwise it is set to sourcePixel.

For common parameter descriptions, see *Common parameters for nppiThreshold_Val non-inplace and inplace functions:*.

NppStatus **nppiThreshold_Val_8u_C3R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp8u* rThresholds[3], const *Npp8u* rValues[3], *NppCmpOp* eComparisonOperation, *NppStreamContext* nppStreamCtx)

3 channel 8-bit unsigned char threshold.

If for a comparison operations OP the predicate (sourcePixel OP nThreshold) is true, the pixel is set to nValue, otherwise it is set to sourcePixel.

For common parameter descriptions, see *Common parameters for nppiThreshold_Val non-inplace and inplace functions:*.

NppStatus **nppiThreshold_Val_8u_C3IR_Ctx**(*Npp8u* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, const *Npp8u* rThresholds[3], const *Npp8u* rValues[3], *NppCmpOp* eComparisonOperation, *NppStreamContext* nppStreamCtx)

3 channel 8-bit unsigned char in place threshold.

If for a comparison operations OP the predicate (sourcePixel OP nThreshold) is true, the pixel is set to nValue, otherwise it is set to sourcePixel.

For common parameter descriptions, see *Common parameters for nppiThreshold_Val non-inplace and inplace functions:*.

NppStatus **nppiThreshold_Val_16u_C3R_Ctx**(const *Npp16u* *pSrc, int nSrcStep, *Npp16u* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp16u* rThresholds[3], const *Npp16u* rValues[3], *NppCmpOp* eComparisonOperation, *NppStreamContext* nppStreamCtx)

3 channel 16-bit unsigned short threshold.

If for a comparison operations OP the predicate (sourcePixel OP nThreshold) is true, the pixel is set to nValue, otherwise it is set to sourcePixel.

For common parameter descriptions, see *Common parameters for nppiThreshold_Val non-inplace and inplace functions:*.

NppStatus **nppiThreshold_Val_16u_C3IR_Ctx**(*Npp16u* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, const *Npp16u* rThresholds[3], const *Npp16u* rValues[3], *NppCmpOp* eComparisonOperation, *NppStreamContext* nppStreamCtx)

3 channel 16-bit unsigned short in place threshold.

If for a comparison operations OP the predicate (sourcePixel OP nThreshold) is true, the pixel is set to nValue, otherwise it is set to sourcePixel.

For common parameter descriptions, see *Common parameters for nppiThreshold_Val non-inplace and inplace functions:*.

NppStatus **nppiThreshold_Val_16s_C3R_Ctx**(const *Npp16s* *pSrc, int nSrcStep, *Npp16s* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp16s* rThresholds[3], const *Npp16s* rValues[3], *NppCmpOp* eComparisonOperation, *NppStreamContext* nppStreamCtx)

3 channel 16-bit signed short threshold.

If for a comparison operations OP the predicate (sourcePixel OP nThreshold) is true, the pixel is set to nValue, otherwise it is set to sourcePixel.

For common parameter descriptions, see *Common parameters for nppiThreshold_Val non-inplace and inplace functions:*.

NppStatus **nppiThreshold_Val_16s_C3IR_Ctx**(*Npp16s* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, const *Npp16s* rThresholds[3], const *Npp16s* rValues[3], *NppCmpOp* eComparisonOperation, *NppStreamContext* nppStreamCtx)

3 channel 16-bit signed short in place threshold.

If for a comparison operations OP the predicate (sourcePixel OP nThreshold) is true, the pixel is set to nValue, otherwise it is set to sourcePixel.

For common parameter descriptions, see *Common parameters for nppiThreshold_Val non-inplace and inplace functions:*.

NppStatus **nppiThreshold_Val_32f_C3R_Ctx**(const *Npp32f* *pSrc, int nSrcStep, *Npp32f* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp32f* rThresholds[3], const *Npp32f* rValues[3], *NppCmpOp* eComparisonOperation, *NppStreamContext* nppStreamCtx)

3 channel 32-bit floating point threshold.

If for a comparison operations OP the predicate (sourcePixel OP nThreshold) is true, the pixel is set to nValue, otherwise it is set to sourcePixel.

For common parameter descriptions, see *Common parameters for nppiThreshold_Val non-inplace and inplace functions:*.

NppStatus **nppiThreshold_Val_32f_C3IR_Ctx**(*Npp32f* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, const *Npp32f* rThresholds[3], const *Npp32f* rValues[3], *NppCmpOp* eComparisonOperation, *NppStreamContext* nppStreamCtx)

3 channel 32-bit floating point in place threshold.

If for a comparison operations OP the predicate (sourcePixel OP nThreshold) is true, the pixel is set to nValue, otherwise it is set to sourcePixel.

For common parameter descriptions, see *Common parameters for nppiThreshold_Val non-inplace and inplace functions:*.

NppStatus **nppiThreshold_Val_8u_AC4R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp8u* rThresholds[3], const *Npp8u* rValues[3], *NppCmpOp* eComparisonOperation, *NppStreamContext* nppStreamCtx)

4 channel 8-bit unsigned char image threshold, not affecting Alpha.

If for a comparison operations OP the predicate (sourcePixel.channel OP nThreshold) is true, the channel value is set to nValue, otherwise it is set to sourcePixel.

For common parameter descriptions, see *Common parameters for nppiThreshold_Val non-inplace and inplace functions:*.

NppStatus **nppiThreshold_Val_8u_AC4IR_Ctx**(*Npp8u* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, const *Npp8u* rThresholds[3], const *Npp8u* rValues[3], *NppCmpOp* eComparisonOperation, *NppStreamContext* nppStreamCtx)

4 channel 8-bit unsigned char in place image threshold, not affecting Alpha.

If for a comparison operations OP the predicate (sourcePixel.channel OP nThreshold) is true, the channel value is set to nValue, otherwise it is set to sourcePixel.

For common parameter descriptions, see *Common parameters for nppiThreshold_Val non-inplace and inplace functions:*.

NppStatus **nppiThreshold_Val_16u_AC4R_Ctx**(const *Npp16u* *pSrc, int nSrcStep, *Npp16u* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp16u* rThresholds[3], const *Npp16u* rValues[3], *NppCmpOp* eComparisonOperation, *NppStreamContext* nppStreamCtx)

4 channel 16-bit unsigned short image threshold, not affecting Alpha.

If for a comparison operations OP the predicate (sourcePixel.channel OP nThreshold) is true, the channel value is set to nValue, otherwise it is set to sourcePixel.

For common parameter descriptions, see *Common parameters for nppiThreshold_Val non-inplace and inplace functions:*.

NppStatus **nppiThreshold_Val_16u_AC4IR_Ctx**(*Npp16u* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, const *Npp16u* rThresholds[3], const *Npp16u* rValues[3], *NppCmpOp* eComparisonOperation, *NppStreamContext* nppStreamCtx)

4 channel 16-bit unsigned short in place image threshold, not affecting Alpha.

If for a comparison operations OP the predicate (sourcePixel.channel OP nThreshold) is true, the channel value is set to nValue, otherwise it is set to sourcePixel.

For common parameter descriptions, see *Common parameters for nppiThreshold_Val non-inplace and inplace functions:*.

NppStatus **nppiThreshold_Val_16s_AC4R_Ctx**(const *Npp16s* *pSrc, int nSrcStep, *Npp16s* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp16s* rThresholds[3], const *Npp16s* rValues[3], *NppCmpOp* eComparisonOperation, *NppStreamContext* nppStreamCtx)

4 channel 16-bit signed short image threshold, not affecting Alpha.

If for a comparison operations OP the predicate (sourcePixel.channel OP nThreshold) is true, the channel value is set to nValue, otherwise it is set to sourcePixel.

For common parameter descriptions, see *Common parameters for nppiThreshold_Val non-inplace and inplace functions:*.

NppStatus **nppiThreshold_Val_16s_AC4IR_Ctx**(*Npp16s* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, const *Npp16s* rThresholds[3], const *Npp16s* rValues[3], *NppCmpOp* eComparisonOperation, *NppStreamContext* nppStreamCtx)

4 channel 16-bit signed short in place image threshold, not affecting Alpha.

If for a comparison operations OP the predicate (sourcePixel.channel OP nThreshold) is true, the channel value is set to nValue, otherwise it is set to sourcePixel.

For common parameter descriptions, see *Common parameters for nppiThreshold_Val non-inplace and inplace functions:*.

NppStatus **nppiThreshold_Val_32f_AC4R_Ctx**(const *Npp32f* *pSrc, int nSrcStep, *Npp32f* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp32f* rThresholds[3], const *Npp32f* rValues[3], *NppCmpOp* eComparisonOperation, *NppStreamContext* nppStreamCtx)

4 channel 32-bit floating point image threshold, not affecting Alpha.

If for a comparison operations OP the predicate (sourcePixel.channel OP nThreshold) is true, the channel value is set to nValue, otherwise it is set to sourcePixel.

For common parameter descriptions, see *Common parameters for nppiThreshold_Val non-inplace and inplace functions:*.

NppStatus **nppiThreshold_Val_32f_AC4IR_Ctx**(*Npp32f* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, const *Npp32f* rThresholds[3], const *Npp32f* rValues[3], *NppCmpOp* eComparisonOperation, *NppStreamContext* nppStreamCtx)

4 channel 32-bit floating point in place image threshold, not affecting Alpha.

If for a comparison operations OP the predicate (sourcePixel.channel OP nThreshold) is true, the channel value is set to nValue, otherwise it is set to sourcePixel.

For common parameter descriptions, see *Common parameters for nppiThreshold_Val non-inplace and inplace functions:*.

1.15.1.5 Image Threshold Greater Than Value Operations

1.15.1.5.1 Threshold Greater Than Value Operations

Replace image pixels greater than threshold with a value.

1.15.1.5.1.1 Common parameters for nppiThreshold_GTVal non-inplace and inplace functions:

param pSrcDst
In-Place Image Pointer for inplace functions.

param nSrcDstStep
In-Place-Image Line Step for inplace functions.

param pSrc
Source-Image Pointer for non-inplace functions.

param nSrcStep
Source-Image Line Step for non-inplace functions.

param pDst
Destination-Image Pointer for non-inplace functions.

param nDstStep
Destination-Image Line Step for non-inplace functions.

param oSizeROI
Region-Of-Interest (ROI).

param nThreshold
The threshold value.

param nValue
The threshold replacement value.

param nppStreamCtx
Application Managed Stream Context.

return
Image Data Related Error Codes, *ROI Related Error Codes*.

Functions

NppStatus **nppiThreshold_GTVal_8u_C1R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp8u* nThreshold, const *Npp8u* nValue, *NppStreamContext* nppStreamCtx)

1 channel 8-bit unsigned char threshold.

If for a comparison operations sourcePixel is greater than nThreshold is true, the pixel is set to nValue, otherwise it is set to sourcePixel.

For common parameter descriptions, see *Common parameters for nppiThreshold_GTVal non-inplace and inplace functions:*.

NppStatus **nppiThreshold_GTVal_8u_C1IR_Ctx**(*Npp8u* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, const *Npp8u* nThreshold, const *Npp8u* nValue, *NppStreamContext* nppStreamCtx)

1 channel 8-bit unsigned char in place threshold.

If for a comparison operations sourcePixel is greater than nThreshold is true, the pixel is set to nValue, otherwise it is set to sourcePixel.

For common parameter descriptions, see *Common parameters for nppiThreshold_GTVal non-inplace and inplace functions:*.

NppStatus **nppiThreshold_GTVal_16u_C1R_Ctx**(const *Npp16u* *pSrc, int nSrcStep, *Npp16u* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp16u* nThreshold, const *Npp16u* nValue, *NppStreamContext* nppStreamCtx)

1 channel 16-bit unsigned short threshold.

If for a comparison operations sourcePixel is greater than nThreshold is true, the pixel is set to nValue, otherwise it is set to sourcePixel.

For common parameter descriptions, see *Common parameters for nppiThreshold_GTVal non-inplace and inplace functions:*.

NppStatus **nppiThreshold_GTVal_16u_C1IR_Ctx**(*Npp16u* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, const *Npp16u* nThreshold, const *Npp16u* nValue, *NppStreamContext* nppStreamCtx)

1 channel 16-bit unsigned short in place threshold.

If for a comparison operations sourcePixel is greater than nThreshold is true, the pixel is set to nValue, otherwise it is set to sourcePixel.

For common parameter descriptions, see *Common parameters for nppiThreshold_GTVal non-inplace and inplace functions:*.

NppStatus **nppiThreshold_GTVal_16s_C1R_Ctx**(const *Npp16s* *pSrc, int nSrcStep, *Npp16s* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp16s* nThreshold, const *Npp16s* nValue, *NppStreamContext* nppStreamCtx)

1 channel 16-bit signed short threshold.

If for a comparison operations sourcePixel is greater than nThreshold is true, the pixel is set to nValue, otherwise it is set to sourcePixel.

For common parameter descriptions, see *Common parameters for nppiThreshold_GTVal non-inplace and inplace functions:*.

NppStatus **nppiThreshold_GTVal_16s_C1IR_Ctx**(*Npp16s* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, const *Npp16s* nThreshold, const *Npp16s* nValue, *NppStreamContext* nppStreamCtx)

1 channel 16-bit signed short in place threshold.

If for a comparison operations sourcePixel is greater than nThreshold is true, the pixel is set to nValue, otherwise it is set to sourcePixel.

For common parameter descriptions, see *Common parameters for nppiThreshold_GTVal non-inplace and inplace functions:*.

NppStatus **nppiThreshold_GTVal_32f_C1R_Ctx**(const *Npp32f* *pSrc, int nSrcStep, *Npp32f* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp32f* nThreshold, const *Npp32f* nValue, *NppStreamContext* nppStreamCtx)

1 channel 32-bit floating point threshold.

If for a comparison operations sourcePixel is greater than nThreshold is true, the pixel is set to nValue, otherwise it is set to sourcePixel.

For common parameter descriptions, see *Common parameters for nppiThreshold_GTVal non-inplace and inplace functions:*.

NppStatus **nppiThreshold_GTVal_32f_C1IR_Ctx**(*Npp32f* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, const *Npp32f* nThreshold, const *Npp32f* nValue, *NppStreamContext* nppStreamCtx)

1 channel 32-bit floating point in place threshold.

If for a comparison operations sourcePixel is greater than nThreshold is true, the pixel is set to nValue, otherwise it is set to sourcePixel.

For common parameter descriptions, see *Common parameters for nppiThreshold_GTVal non-inplace and inplace functions:*.

NppStatus **nppiThreshold_GTVal_8u_C3R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp8u* rThresholds[3], const *Npp8u* rValues[3], *NppStreamContext* nppStreamCtx)

3 channel 8-bit unsigned char threshold.

If for a comparison operations sourcePixel is greater than rThreshold is true, the pixel is set to rValue, otherwise it is set to sourcePixel.

For common parameter descriptions, see *Common parameters for nppiThreshold_GTVal non-inplace and inplace functions:*.

NppStatus **nppiThreshold_GTVal_8u_C3IR_Ctx**(*Npp8u* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, const *Npp8u* rThresholds[3], const *Npp8u* rValues[3], *NppStreamContext* nppStreamCtx)

3 channel 8-bit unsigned char in place threshold.

If for a comparison operations sourcePixel is greater than rThreshold is true, the pixel is set to rValue, otherwise it is set to sourcePixel.

For common parameter descriptions, see *Common parameters for nppiThreshold_GTVal non-inplace and inplace functions:*.

NppStatus **nppiThreshold_GTVal_16u_C3R_Ctx**(const *Npp16u* *pSrc, int nSrcStep, *Npp16u* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp16u* rThresholds[3], const *Npp16u* rValues[3], *NppStreamContext* nppStreamCtx)

3 channel 16-bit unsigned short threshold.

If for a comparison operations sourcePixel is greater than rThreshold is true, the pixel is set to rValue, otherwise it is set to sourcePixel.

For common parameter descriptions, see *Common parameters for nppiThreshold_GTVal non-inplace and inplace functions:*.

NppStatus **nppiThreshold_GTVal_16u_C3IR_Ctx**(*Npp16u* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, const *Npp16u* rThresholds[3], const *Npp16u* rValues[3], *NppStreamContext* nppStreamCtx)

3 channel 16-bit unsigned short in place threshold.

If for a comparison operations sourcePixel is greater than rThreshold is true, the pixel is set to rValue, otherwise it is set to sourcePixel.

For common parameter descriptions, see *Common parameters for nppiThreshold_GTVal non-inplace and inplace functions:*.

NppStatus **nppiThreshold_GTVal_16s_C3R_Ctx**(const *Npp16s* *pSrc, int nSrcStep, *Npp16s* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp16s* rThresholds[3], const *Npp16s* rValues[3], *NppStreamContext* nppStreamCtx)

3 channel 16-bit signed short threshold.

If for a comparison operations sourcePixel is greater than rThreshold is true, the pixel is set to rValue, otherwise it is set to sourcePixel.

For common parameter descriptions, see *Common parameters for nppiThreshold_GTVal non-inplace and inplace functions:*.

NppStatus **nppiThreshold_GTVal_16s_C3IR_Ctx**(*Npp16s* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, const *Npp16s* rThresholds[3], const *Npp16s* rValues[3], *NppStreamContext* nppStreamCtx)

3 channel 16-bit signed short in place threshold.

If for a comparison operations sourcePixel is greater than rThreshold is true, the pixel is set to rValue, otherwise it is set to sourcePixel.

For common parameter descriptions, see *Common parameters for nppiThreshold_GTVal non-inplace and inplace functions:*.

NppStatus **nppiThreshold_GTVal_32f_C3R_Ctx**(const *Npp32f* *pSrc, int nSrcStep, *Npp32f* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp32f* rThresholds[3], const *Npp32f* rValues[3], *NppStreamContext* nppStreamCtx)

3 channel 32-bit floating point threshold.

If for a comparison operations sourcePixel is greater than rThreshold is true, the pixel is set to rValue, otherwise it is set to sourcePixel.

For common parameter descriptions, see *Common parameters for nppiThreshold_GTVal non-inplace and inplace functions:*.

NppStatus **nppiThreshold_GTVal_32f_C3IR_Ctx**(*Npp32f* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, const *Npp32f* rThresholds[3], const *Npp32f* rValues[3], *NppStreamContext* nppStreamCtx)

3 channel 32-bit floating point in place threshold.

If for a comparison operations sourcePixel is greater than rThreshold is true, the pixel is set to rValue, otherwise it is set to sourcePixel.

For common parameter descriptions, see *Common parameters for nppiThreshold_GTVal non-inplace and inplace functions:*.

NppStatus **nppiThreshold_GTVal_8u_AC4R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp8u* rThresholds[3], const *Npp8u* rValues[3], *NppStreamContext* nppStreamCtx)

4 channel 8-bit unsigned char image threshold, not affecting Alpha.

If for a comparison operations sourcePixel is greater than rThreshold is true, the pixel is set value is set to rValue, otherwise it is set to sourcePixel.

For common parameter descriptions, see *Common parameters for nppiThreshold_GTVal non-inplace and inplace functions:*.

NppStatus **nppiThreshold_GTVal_8u_AC4IR_Ctx**(*Npp8u* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, const *Npp8u* rThresholds[3], const *Npp8u* rValues[3], *NppStreamContext* nppStreamCtx)

4 channel 8-bit unsigned char in place image threshold, not affecting Alpha.

If for a comparison operations sourcePixel is greater than rThreshold is true, the pixel is set value is set to rValue, otherwise it is set to sourcePixel.

For common parameter descriptions, see *Common parameters for nppiThreshold_GTVal non-inplace and inplace functions:*.

NppStatus **nppiThreshold_GTVal_16u_AC4R_Ctx**(const *Npp16u* *pSrc, int nSrcStep, *Npp16u* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp16u* rThresholds[3], const *Npp16u* rValues[3], *NppStreamContext* nppStreamCtx)

4 channel 16-bit unsigned short image threshold, not affecting Alpha.

If for a comparison operations sourcePixel is greater than rThreshold is true, the pixel is set value is set to rValue, otherwise it is set to sourcePixel.

For common parameter descriptions, see *Common parameters for nppiThreshold_GTVal non-inplace and inplace functions:*.

NppStatus **nppiThreshold_GTVal_16u_AC4IR_Ctx**(*Npp16u* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, const *Npp16u* rThresholds[3], const *Npp16u* rValues[3], *NppStreamContext* nppStreamCtx)

4 channel 16-bit unsigned short in place image threshold, not affecting Alpha.

If for a comparison operations sourcePixel is greater than rThreshold is true, the pixel is set value is set to rValue, otherwise it is set to sourcePixel.

For common parameter descriptions, see *Common parameters for nppiThreshold_GTVal non-inplace and inplace functions:*.

NppStatus **nppiThreshold_GTVal_16s_AC4R_Ctx**(const *Npp16s* *pSrc, int nSrcStep, *Npp16s* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp16s* rThresholds[3], const *Npp16s* rValues[3], *NppStreamContext* nppStreamCtx)

4 channel 16-bit signed short image threshold, not affecting Alpha.

If for a comparison operations sourcePixel is greater than rThreshold is true, the pixel is set value is set to rValue, otherwise it is set to sourcePixel.

For common parameter descriptions, see *Common parameters for nppiThreshold_GTVal non-inplace and inplace functions:*.

NppStatus **nppiThreshold_GTVal_16s_AC4IR_Ctx**(*Npp16s* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, const *Npp16s* rThresholds[3], const *Npp16s* rValues[3], *NppStreamContext* nppStreamCtx)

4 channel 16-bit signed short in place image threshold, not affecting Alpha.

If for a comparison operations sourcePixel is greater than rThreshold is true, the pixel is set value is set to rValue, otherwise it is set to sourcePixel.

For common parameter descriptions, see *Common parameters for nppiThreshold_GTVal non-inplace and inplace functions:*.

NppStatus **nppiThreshold_GTVal_32f_AC4R_Ctx**(const *Npp32f* *pSrc, int nSrcStep, *Npp32f* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp32f* rThresholds[3], const *Npp32f* rValues[3], *NppStreamContext* nppStreamCtx)

4 channel 32-bit floating point image threshold, not affecting Alpha.

If for a comparison operations sourcePixel is greater than rThreshold is true, the pixel is set value is set to rValue, otherwise it is set to sourcePixel.

For common parameter descriptions, see *Common parameters for nppiThreshold_GTVal non-inplace and inplace functions:*.

NppStatus **nppiThreshold_GTVal_32f_AC4IR_Ctx**(*Npp32f* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, const *Npp32f* rThresholds[3], const *Npp32f* rValues[3], *NppStreamContext* nppStreamCtx)

4 channel 32-bit floating point in place image threshold, not affecting Alpha.

If for a comparison operations sourcePixel is greater than rThreshold is true, the pixel is set value is set to rValue, otherwise it is set to sourcePixel.

For common parameter descriptions, see *Common parameters for nppiThreshold_GTVal non-inplace and inplace functions:*.

1.15.1.6 Image Threshold Less Than Value Operations

1.15.1.6.1 Threshold Less Than Value Operations

Replace image pixels less than threshold with a value.

1.15.1.6.1.1 Common parameters for nppiThreshold_LTVal non-inplace and inplace functions:

param pSrcDst
In-Place Image Pointer for inplace functions.

param nSrcDstStep
In-Place-Image Line Step for inplace functions.

param pSrc
Source-Image Pointer for non-inplace functions.

param nSrcStep
Source-Image Line Step for non-inplace functions.

param pDst
Destination-Image Pointer for non-inplace functions.

param nDstStep
Destination-Image Line Step for non-inplace functions.

param oSizeROI
Region-Of-Interest (ROI).

param nThreshold
The threshold value.

param nValue
The threshold replacement value.

param nppStreamCtx
Application Managed Stream Context.

return
Image Data Related Error Codes, *ROI Related Error Codes*.

Functions

NppStatus **nppiThreshold_LTVal_8u_C1R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp8u* nThreshold, const *Npp8u* nValue, *NppStreamContext* nppStreamCtx)

1 channel 8-bit unsigned char threshold.

If for a comparison operations sourcePixel is less than nThreshold is true, the pixel is set to nValue, otherwise it is set to sourcePixel.

For common parameter descriptions, see *Common parameters for nppiThreshold_LTVal non-inplace and inplace functions:*.

NppStatus **nppiThreshold_LTVal_8u_C1IR_Ctx**(*Npp8u* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, const *Npp8u* nThreshold, const *Npp8u* nValue, *NppStreamContext* nppStreamCtx)

1 channel 8-bit unsigned char in place threshold.

If for a comparison operations sourcePixel is less than nThreshold is true, the pixel is set to nValue, otherwise it is set to sourcePixel.

For common parameter descriptions, see *Common parameters for nppiThreshold_LTVal non-inplace and inplace functions:*.

NppStatus **nppiThreshold_LTVal_16u_C1R_Ctx**(const *Npp16u* *pSrc, int nSrcStep, *Npp16u* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp16u* nThreshold, const *Npp16u* nValue, *NppStreamContext* nppStreamCtx)

1 channel 16-bit unsigned short threshold.

If for a comparison operations sourcePixel is less than nThreshold is true, the pixel is set to nValue, otherwise it is set to sourcePixel.

For common parameter descriptions, see *Common parameters for nppiThreshold_LTVal non-inplace and inplace functions:*.

NppStatus **nppiThreshold_LTVal_16u_C1IR_Ctx**(*Npp16u* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, const *Npp16u* nThreshold, const *Npp16u* nValue, *NppStreamContext* nppStreamCtx)

1 channel 16-bit unsigned short in place threshold.

If for a comparison operations sourcePixel is less than nThreshold is true, the pixel is set to nValue, otherwise it is set to sourcePixel.

For common parameter descriptions, see *Common parameters for nppiThreshold_LTVal non-inplace and inplace functions:*.

NppStatus **nppiThreshold_LTVal_16s_C1R_Ctx**(const *Npp16s* *pSrc, int nSrcStep, *Npp16s* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp16s* nThreshold, const *Npp16s* nValue, *NppStreamContext* nppStreamCtx)

1 channel 16-bit signed short threshold.

If for a comparison operations sourcePixel is less than nThreshold is true, the pixel is set to nValue, otherwise it is set to sourcePixel.

For common parameter descriptions, see *Common parameters for nppiThreshold_LTVal non-inplace and inplace functions:*.

NppStatus **nppiThreshold_LTVal_16s_C1IR_Ctx**(*Npp16s* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, const *Npp16s* nThreshold, const *Npp16s* nValue, *NppStreamContext* nppStreamCtx)

1 channel 16-bit signed short in place threshold.

If for a comparison operations sourcePixel is less than nThreshold is true, the pixel is set to nValue, otherwise it is set to sourcePixel.

For common parameter descriptions, see *Common parameters for nppiThreshold_LTVal non-inplace and inplace functions:*.

NppStatus **nppiThreshold_LTVal_32f_C1R_Ctx**(const *Npp32f* *pSrc, int nSrcStep, *Npp32f* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp32f* nThreshold, const *Npp32f* nValue, *NppStreamContext* nppStreamCtx)

1 channel 32-bit floating point threshold.

If for a comparison operations sourcePixel is less than nThreshold is true, the pixel is set to nValue, otherwise it is set to sourcePixel.

For common parameter descriptions, see *Common parameters for nppiThreshold_LTVal non-inplace and inplace functions:*.

NppStatus **nppiThreshold_LTVal_32f_C1IR_Ctx**(*Npp32f* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, const *Npp32f* nThreshold, const *Npp32f* nValue, *NppStreamContext* nppStreamCtx)

1 channel 32-bit floating point in place threshold.

If for a comparison operations sourcePixel is less than nThreshold is true, the pixel is set to nValue, otherwise it is set to sourcePixel.

For common parameter descriptions, see *Common parameters for nppiThreshold_LTVal non-inplace and inplace functions:*.

NppStatus **nppiThreshold_LTVal_8u_C3R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp8u* rThresholds[3], const *Npp8u* rValues[3], *NppStreamContext* nppStreamCtx)

3 channel 8-bit unsigned char threshold.

If for a comparison operations sourcePixel is less than rThreshold is true, the pixel is set to rValue, otherwise it is set to sourcePixel.

For common parameter descriptions, see *Common parameters for nppiThreshold_LTVal non-inplace and inplace functions:*.

NppStatus **nppiThreshold_LTVal_8u_C3IR_Ctx**(*Npp8u* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, const *Npp8u* rThresholds[3], const *Npp8u* rValues[3], *NppStreamContext* nppStreamCtx)

3 channel 8-bit unsigned char in place threshold.

If for a comparison operations sourcePixel is less than rThreshold is true, the pixel is set to rValue, otherwise it is set to sourcePixel.

For common parameter descriptions, see *Common parameters for nppiThreshold_LTVal non-inplace and inplace functions:*.

NppStatus **nppiThreshold_LTVal_16u_C3R_Ctx**(const *Npp16u* *pSrc, int nSrcStep, *Npp16u* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp16u* rThresholds[3], const *Npp16u* rValues[3], *NppStreamContext* nppStreamCtx)

3 channel 16-bit unsigned short threshold.

If for a comparison operations sourcePixel is less than rThreshold is true, the pixel is set to rValue, otherwise it is set to sourcePixel.

For common parameter descriptions, see *Common parameters for nppiThreshold_LTVal non-inplace and inplace functions:*.

NppStatus **nppiThreshold_LTVal_16u_C3IR_Ctx**(*Npp16u* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, const *Npp16u* rThresholds[3], const *Npp16u* rValues[3], *NppStreamContext* nppStreamCtx)

3 channel 16-bit unsigned short in place threshold.

If for a comparison operations sourcePixel is less than rThreshold is true, the pixel is set to rValue, otherwise it is set to sourcePixel.

For common parameter descriptions, see *Common parameters for nppiThreshold_LTVal non-inplace and inplace functions:*.

NppStatus **nppiThreshold_LTVal_16s_C3R_Ctx**(const *Npp16s* *pSrc, int nSrcStep, *Npp16s* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp16s* rThresholds[3], const *Npp16s* rValues[3], *NppStreamContext* nppStreamCtx)

3 channel 16-bit signed short threshold.

If for a comparison operations sourcePixel is less than rThreshold is true, the pixel is set to rValue, otherwise it is set to sourcePixel.

For common parameter descriptions, see *Common parameters for nppiThreshold_LTVal non-inplace and inplace functions:*.

NppStatus **nppiThreshold_LTVal_16s_C3IR_Ctx**(*Npp16s* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, const *Npp16s* rThresholds[3], const *Npp16s* rValues[3], *NppStreamContext* nppStreamCtx)

3 channel 16-bit signed short in place threshold.

If for a comparison operations sourcePixel is less than rThreshold is true, the pixel is set to rValue, otherwise it is set to sourcePixel.

For common parameter descriptions, see *Common parameters for nppiThreshold_LTVal non-inplace and inplace functions:*.

NppStatus **nppiThreshold_LTVal_32f_C3R_Ctx**(const *Npp32f* *pSrc, int nSrcStep, *Npp32f* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp32f* rThresholds[3], const *Npp32f* rValues[3], *NppStreamContext* nppStreamCtx)

3 channel 32-bit floating point threshold.

If for a comparison operations sourcePixel is less than rThreshold is true, the pixel is set to rValue, otherwise it is set to sourcePixel.

For common parameter descriptions, see *Common parameters for nppiThreshold_LTVal non-inplace and inplace functions:*.

NppStatus **nppiThreshold_LTVal_32f_C3IR_Ctx**(*Npp32f* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, const *Npp32f* rThresholds[3], const *Npp32f* rValues[3], *NppStreamContext* nppStreamCtx)

3 channel 32-bit floating point in place threshold.

If for a comparison operations sourcePixel is less than rThreshold is true, the pixel is set to rValue, otherwise it is set to sourcePixel.

For common parameter descriptions, see *Common parameters for nppiThreshold_LTVal non-inplace and inplace functions:*.

NppStatus **nppiThreshold_LTVal_8u_AC4R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp8u* rThresholds[3], const *Npp8u* rValues[3], *NppStreamContext* nppStreamCtx)

4 channel 8-bit unsigned char image threshold, not affecting Alpha.

If for a comparison operations sourcePixel is less than rThreshold is true, the pixel is set value is set to rValue, otherwise it is set to sourcePixel.

For common parameter descriptions, see *Common parameters for nppiThreshold_LTVal non-inplace and inplace functions:*.

NppStatus **nppiThreshold_LTVal_8u_AC4IR_Ctx**(*Npp8u* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, const *Npp8u* rThresholds[3], const *Npp8u* rValues[3], *NppStreamContext* nppStreamCtx)

4 channel 8-bit unsigned char in place image threshold, not affecting Alpha.

If for a comparison operations sourcePixel is less than rThreshold is true, the pixel is set value is set to rValue, otherwise it is set to sourcePixel.

For common parameter descriptions, see *Common parameters for nppiThreshold_LTVal non-inplace and inplace functions:*.

NppStatus **nppiThreshold_LTVal_16u_AC4R_Ctx**(const *Npp16u* *pSrc, int nSrcStep, *Npp16u* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp16u* rThresholds[3], const *Npp16u* rValues[3], *NppStreamContext* nppStreamCtx)

4 channel 16-bit unsigned short image threshold, not affecting Alpha.

If for a comparison operations sourcePixel is less than rThreshold is true, the pixel is set value is set to rValue, otherwise it is set to sourcePixel.

For common parameter descriptions, see *Common parameters for nppiThreshold_LTVal non-inplace and inplace functions:*.

NppStatus **nppiThreshold_LTVal_16u_AC4IR_Ctx**(*Npp16u* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, const *Npp16u* rThresholds[3], const *Npp16u* rValues[3], *NppStreamContext* nppStreamCtx)

4 channel 16-bit unsigned short in place image threshold, not affecting Alpha.

If for a comparison operations sourcePixel is less than rThreshold is true, the pixel is set value is set to rValue, otherwise it is set to sourcePixel.

For common parameter descriptions, see *Common parameters for nppiThreshold_LTVal non-inplace and inplace functions:*.

NppStatus **nppiThreshold_LTVal_16s_AC4R_Ctx**(const *Npp16s* *pSrc, int nSrcStep, *Npp16s* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp16s* rThresholds[3], const *Npp16s* rValues[3], *NppStreamContext* nppStreamCtx)

4 channel 16-bit signed short image threshold, not affecting Alpha.

If for a comparison operations sourcePixel is less than rThreshold is true, the pixel is set value is set to rValue, otherwise it is set to sourcePixel.

For common parameter descriptions, see *Common parameters for nppiThreshold_LTVal non-inplace and inplace functions:*.

NppStatus **nppiThreshold_LTVal_16s_AC4IR_Ctx**(*Npp16s* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, const *Npp16s* rThresholds[3], const *Npp16s* rValues[3], *NppStreamContext* nppStreamCtx)

4 channel 16-bit signed short in place image threshold, not affecting Alpha.

If for a comparison operations sourcePixel is less than rThreshold is true, the pixel is set value is set to rValue, otherwise it is set to sourcePixel.

For common parameter descriptions, see *Common parameters for nppiThreshold_LTVal non-inplace and inplace functions:*.

NppStatus **nppiThreshold_LTVal_32f_AC4R_Ctx**(const *Npp32f* *pSrc, int nSrcStep, *Npp32f* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp32f* rThresholds[3], const *Npp32f* rValues[3], *NppStreamContext* nppStreamCtx)

4 channel 32-bit floating point image threshold, not affecting Alpha.

If for a comparison operations sourcePixel is less than rThreshold is true, the pixel is set value is set to rValue, otherwise it is set to sourcePixel.

For common parameter descriptions, see *Common parameters for nppiThreshold_LTVal non-inplace and inplace functions:*.

NppStatus **nppiThreshold_LTVal_32f_AC4IR_Ctx**(*Npp32f* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, const *Npp32f* rThresholds[3], const *Npp32f* rValues[3], *NppStreamContext* nppStreamCtx)

4 channel 32-bit floating point in place image threshold, not affecting Alpha.

If for a comparison operations sourcePixel is less than rThreshold is true, the pixel is set value is set to rValue, otherwise it is set to sourcePixel.

For common parameter descriptions, see *Common parameters for nppiThreshold_LTVal non-inplace and inplace functions:*.

1.15.1.7 Image Fused AbsDiff Threshold Greater Than Value Operations

1.15.1.7.1 Fused AbsDiff Threshold Greater Than Value Operations

Replace image pixels greater than threshold with a value.

Supported data types include NPP_8U, NPP_16U, NPP_16S, NPP_32F. Supported channel counts include NPP_CH_1, NPP_CH_3, NPP_CH_A4.

param eSrcDstType
image data type.

param eSrcDstChannels
image channels.

param pSrcDst
In-Place Image Pointer for inplace functions.

param nSrcDstStep
In-Place-Image Line Step for inplace functions.

param pSrc1
Source-Image Pointer for non-inplace functions.

param nSrc1Step
Source-Image Line Step for non-inplace functions.

param pSrc2
Source-Image Pointer to second source image for non-inplace functions.

param nSrc2Step
Source-Image Line Step of second source image for non-inplace functions.

param pDst
Destination-Image Pointer for non-inplace functions.

param nDstStep
Destination-Image Line Step for non-inplace functions.

param oSizeROI
Region-Of-Interest (ROI).

param pThreshold
The threshold value.

param pValue
The threshold replacement value.

param nppStreamCtx
Application Managed Stream Context.

return
Image Data Related Error Codes, *ROI Related Error Codes*.

Functions

NppStatus **nppiFusedAbsDiff_Threshold_GTVal_Ctx**(*NppDataType* eSrcDstType, *NppiChannels* eSrcDstChannels, const void *pSrc1, int nSrc1Step, const void *pSrc2, int nSrc2Step, void *pDst, int nDstStep, *NppiSize* oSizeROI, const void *pThreshold, const void *pvalue, *NppStreamContext* nppStreamCtx)

Image fused absdiff and greater than threshold value.

If for a comparison operations absdiff of sourcePixels is greater than pThreshold is true, the output pixel is set to pValue, otherwise it is set to absdiff of sourcePixels.

NppStatus **nppiFusedAbsDiff_Threshold_GTVal_I_Ctx**(*NppDataType* eSrcDstType, *NppiChannels* eSrcDstChannels, void *pSrcDst, int nSrcDstStep, const void *pSrc2, int nSrc2Step, *NppiSize* oSizeROI, const void *pThreshold, const void *pvalue, *NppStreamContext* nppStreamCtx)

In place fused absdiff image greater than threshold value.

If for a comparison operations absdiff of sourcePixels is greater than pThreshold is true, the output pixel is set to pValue, otherwise it is set to absdiff of sourcePixels.

1.15.1.8 Image Threshold Less Than Value Greater Than Value Operations

1.15.1.8.1 Threshold Less Than Value Or Greater Than Value Operations

Replace image pixels less than thresholdLT or greater than thresholdGT with with valueLT or valueGT respectively.

1.15.1.8.1.1 Common parameters for nppiThreshold_LTValGTVal non-inplace and inplace functions:

param pSrcDst
In-Place Image Pointer for inplace functions.

param nSrcDstStep
In-Place-Image Line Step for inplace functions.

param pSrc
Source-Image Pointer for non-inplace functions.

param nSrcStep
Source-Image Line Step for non-inplace functions.

param pDst
Destination-Image Pointer for non-inplace functions.

param nDstStep
Destination-Image Line Step for non-inplace functions.

param oSizeROI
Region-Of-Interest (ROI).

param nThresholdLT
The thresholdLT value.

param nValueLT
The thresholdLT replacement value.

param nThresholdGT
The thresholdGT value.

param nValueGT
The thresholdGT replacement value.

param nppStreamCtx
Application Managed Stream Context.

return
Image Data Related Error Codes, *ROI Related Error Codes*.

Functions

NppStatus **nppiThreshold_LTValGTVal_8u_C1R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp8u* nThresholdLT, const *Npp8u* nValueLT, const *Npp8u* nThresholdGT, const *Npp8u* nValueGT, *NppStreamContext* nppStreamCtx)

1 channel 8-bit unsigned char threshold.

If for a comparison operations sourcePixel is less than nThresholdLT is true, the pixel is set to nValueLT, else if sourcePixel is greater than nThresholdGT the pixel is set to nValueGT, otherwise it is set to sourcePixel.

For common parameter descriptions, see *Common parameters for nppiThreshold_LTValGTVal non-inplace and inplace functions:*.

NppStatus **nppiThreshold_LTValGTVal_8u_C1IR_Ctx**(*Npp8u* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, const *Npp8u* nThresholdLT, const *Npp8u* nValueLT, const *Npp8u* nThresholdGT, const *Npp8u* nValueGT, *NppStreamContext* nppStreamCtx)

1 channel 8-bit unsigned char in place threshold.

If for a comparison operations sourcePixel is less than nThresholdLT is true, the pixel is set to nValueLT, else if sourcePixel is greater than nThresholdGT the pixel is set to nValueGT, otherwise it is set to sourcePixel.

For common parameter descriptions, see *Common parameters for nppiThreshold_LTValGTVal non-inplace and inplace functions:*.

NppStatus **nppiThreshold_LTValGTVal_16u_C1R_Ctx**(const *Npp16u* *pSrc, int nSrcStep, *Npp16u* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp16u* nThresholdLT, const *Npp16u* nValueLT, const *Npp16u* nThresholdGT, const *Npp16u* nValueGT, *NppStreamContext* nppStreamCtx)

1 channel 16-bit unsigned short threshold.

If for a comparison operations sourcePixel is less than nThresholdLT is true, the pixel is set to nValueLT, else if sourcePixel is greater than nThresholdGT the pixel is set to nValueGT, otherwise it is set to sourcePixel.

For common parameter descriptions, see *Common parameters for nppiThreshold_LTValGTVal non-inplace and inplace functions:*.

NppStatus **nppiThreshold_LTValGTVal_16u_C1IR_Ctx**(*Npp16u* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, const *Npp16u* nThresholdLT, const *Npp16u* nValueLT, const *Npp16u* nThresholdGT, const *Npp16u* nValueGT, *NppStreamContext* nppStreamCtx)

1 channel 16-bit unsigned short in place threshold.

If for a comparison operations sourcePixel is less than nThresholdLT is true, the pixel is set to nValueLT, else if sourcePixel is greater than nThresholdGT the pixel is set to nValueGT, otherwise it is set to sourcePixel.

For common parameter descriptions, see *Common parameters for nppiThreshold_LTValGTVal non-inplace and inplace functions:*.

NppStatus **nppiThreshold_LTValGTVal_16s_C1R_Ctx**(const *Npp16s* *pSrc, int nSrcStep, *Npp16s* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp16s* nThresholdLT, const *Npp16s* nValueLT, const *Npp16s* nThresholdGT, const *Npp16s* nValueGT, *NppStreamContext* nppStreamCtx)

1 channel 16-bit signed short threshold.

If for a comparison operations sourcePixel is less than nThresholdLT is true, the pixel is set to nValueLT, else if sourcePixel is greater than nThresholdGT the pixel is set to nValueGT, otherwise it is set to sourcePixel.

For common parameter descriptions, see *Common parameters for nppiThreshold_LTValGTVal non-inplace and inplace functions:*.

NppStatus **nppiThreshold_LTValGTVal_16s_C1IR_Ctx**(*Npp16s* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, const *Npp16s* nThresholdLT, const *Npp16s* nValueLT, const *Npp16s* nThresholdGT, const *Npp16s* nValueGT, *NppStreamContext* nppStreamCtx)

1 channel 16-bit signed short in place threshold.

If for a comparison operations sourcePixel is less than nThresholdLT is true, the pixel is set to nValueLT, else if sourcePixel is greater than nThresholdGT the pixel is set to nValueGT, otherwise it is set to sourcePixel.

For common parameter descriptions, see *Common parameters for nppiThreshold_LTValGTVal non-inplace and inplace functions:*.

NppStatus **nppiThreshold_LTValGTVal_32f_C1R_Ctx**(const *Npp32f* *pSrc, int nSrcStep, *Npp32f* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp32f* nThresholdLT, const *Npp32f* nValueLT, const *Npp32f* nThresholdGT, const *Npp32f* nValueGT, *NppStreamContext* nppStreamCtx)

1 channel 32-bit floating point threshold.

If for a comparison operations sourcePixel is less than nThresholdLT is true, the pixel is set to nValueLT, else if sourcePixel is greater than nThresholdGT the pixel is set to nValueGT, otherwise it is set to sourcePixel.

For common parameter descriptions, see *Common parameters for nppiThreshold_LTValGTVal non-inplace and inplace functions:*.

NppStatus **nppiThreshold_LTValGTVal_32f_C1IR_Ctx**(*Npp32f* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, const *Npp32f* nThresholdLT, const *Npp32f* nValueLT, const *Npp32f* nThresholdGT, const *Npp32f* nValueGT, *NppStreamContext* nppStreamCtx)

1 channel 32-bit floating point in place threshold.

If for a comparison operations sourcePixel is less than nThresholdLT is true, the pixel is set to nValueLT, else if sourcePixel is greater than nThresholdGT the pixel is set to nValueGT, otherwise

it is set to sourcePixel.

For common parameter descriptions, see *Common parameters for nppiThreshold_LTValGTVal non-inplace and inplace functions:*.

NppStatus **nppiThreshold_LTValGTVal_8u_C3R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp8u* rThresholdsLT[3], const *Npp8u* rValuesLT[3], const *Npp8u* rThresholdsGT[3], const *Npp8u* rValuesGT[3], *NppStreamContext* nppStreamCtx)

3 channel 8-bit unsigned char threshold.

If for a comparison operations sourcePixel is less than rThresholdLT is true, the pixel is set to rValueLT, else if sourcePixel is greater than rThresholdGT the pixel is set to rValueGT, otherwise it is set to sourcePixel.

For common parameter descriptions, see *Common parameters for nppiThreshold_LTValGTVal non-inplace and inplace functions:*.

NppStatus **nppiThreshold_LTValGTVal_8u_C3IR_Ctx**(*Npp8u* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, const *Npp8u* rThresholdsLT[3], const *Npp8u* rValuesLT[3], const *Npp8u* rThresholdsGT[3], const *Npp8u* rValuesGT[3], *NppStreamContext* nppStreamCtx)

3 channel 8-bit unsigned char in place threshold.

If for a comparison operations sourcePixel is less than rThresholdLT is true, the pixel is set to rValueLT, else if sourcePixel is greater than rThresholdGT the pixel is set to rValueGT, otherwise it is set to sourcePixel.

For common parameter descriptions, see *Common parameters for nppiThreshold_LTValGTVal non-inplace and inplace functions:*.

NppStatus **nppiThreshold_LTValGTVal_16u_C3R_Ctx**(const *Npp16u* *pSrc, int nSrcStep, *Npp16u* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp16u* rThresholdsLT[3], const *Npp16u* rValuesLT[3], const *Npp16u* rThresholdsGT[3], const *Npp16u* rValuesGT[3], *NppStreamContext* nppStreamCtx)

3 channel 16-bit unsigned short threshold.

If for a comparison operations sourcePixel is less than rThresholdLT is true, the pixel is set to rValueLT, else if sourcePixel is greater than rThresholdGT the pixel is set to rValueGT, otherwise it is set to sourcePixel.

For common parameter descriptions, see *Common parameters for nppiThreshold_LTValGTVal non-inplace and inplace functions:*.

NppStatus **nppiThreshold_LTValGTVal_16u_C3IR_Ctx**(*Npp16u* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, const *Npp16u* rThresholdsLT[3], const *Npp16u* rValuesLT[3], const *Npp16u* rThresholdsGT[3], const *Npp16u* rValuesGT[3], *NppStreamContext* nppStreamCtx)

3 channel 16-bit unsigned short in place threshold.

If for a comparison operations sourcePixel is less than rThresholdLT is true, the pixel is set to rValueLT, else if sourcePixel is greater than rThresholdGT the pixel is set to rValueGT, otherwise it is set to sourcePixel.

For common parameter descriptions, see *Common parameters for nppiThreshold_LTValGTVal non-inplace and inplace functions:*.

NppStatus **nppiThreshold_LTValGTVal_16s_C3R_Ctx**(const *Npp16s* *pSrc, int nSrcStep, *Npp16s* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp16s* rThresholdsLT[3], const *Npp16s* rValuesLT[3], const *Npp16s* rThresholdsGT[3], const *Npp16s* rValuesGT[3], *NppStreamContext* nppStreamCtx)

3 channel 16-bit signed short threshold.

If for a comparison operations sourcePixel is less than rThresholdLT is true, the pixel is set to rValueLT, else if sourcePixel is greater than rThresholdGT the pixel is set to rValueGT, otherwise it is set to sourcePixel.

For common parameter descriptions, see *Common parameters for nppiThreshold_LTValGTVal non-inplace and inplace functions:*.

NppStatus **nppiThreshold_LTValGTVal_16s_C3IR_Ctx**(*Npp16s* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, const *Npp16s* rThresholdsLT[3], const *Npp16s* rValuesLT[3], const *Npp16s* rThresholdsGT[3], const *Npp16s* rValuesGT[3], *NppStreamContext* nppStreamCtx)

3 channel 16-bit signed short in place threshold.

If for a comparison operations sourcePixel is less than rThresholdLT is true, the pixel is set to rValueLT, else if sourcePixel is greater than rThresholdGT the pixel is set to rValueGT, otherwise it is set to sourcePixel.

For common parameter descriptions, see *Common parameters for nppiThreshold_LTValGTVal non-inplace and inplace functions:*.

NppStatus **nppiThreshold_LTValGTVal_32f_C3R_Ctx**(const *Npp32f* *pSrc, int nSrcStep, *Npp32f* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp32f* rThresholdsLT[3], const *Npp32f* rValuesLT[3], const *Npp32f* rThresholdsGT[3], const *Npp32f* rValuesGT[3], *NppStreamContext* nppStreamCtx)

3 channel 32-bit floating point threshold.

If for a comparison operations sourcePixel is less than rThresholdLT is true, the pixel is set to rValueLT, else if sourcePixel is greater than rThresholdGT the pixel is set to rValueGT, otherwise it is set to sourcePixel.

For common parameter descriptions, see *Common parameters for nppiThreshold_LTValGTVal non-inplace and inplace functions:*.

NppStatus **nppiThreshold_LTValGTVal_32f_C3IR_Ctx**(*Npp32f* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, const *Npp32f* rThresholdsLT[3], const *Npp32f* rValuesLT[3], const *Npp32f* rThresholdsGT[3], const *Npp32f* rValuesGT[3], *NppStreamContext* nppStreamCtx)

3 channel 32-bit floating point in place threshold.

If for a comparison operations sourcePixel is less than rThresholdLT is true, the pixel is set to rValueLT, else if sourcePixel is greater than rThresholdGT the pixel is set to rValueGT, otherwise it is set to sourcePixel.

For common parameter descriptions, see *Common parameters for nppiThreshold_LTValGTVal non-inplace and inplace functions:*.

NppStatus **nppiThreshold_LTValGTVal_8u_AC4R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp8u* rThresholdsLT[3], const *Npp8u* rValuesLT[3], const *Npp8u* rThresholdsGT[3], const *Npp8u* rValuesGT[3], *NppStreamContext* nppStreamCtx)

4 channel 8-bit unsigned char image threshold, not affecting Alpha.

If for a comparison operations sourcePixel is less than rThresholdLT is true, the pixel is set value is set to rValueLT, else if sourcePixel is greater than rThresholdGT the pixel is set to rValueGT, otherwise it is set to sourcePixel.

For common parameter descriptions, see *Common parameters for nppiThreshold_LTValGTVal non-inplace and inplace functions:*.

NppStatus **nppiThreshold_LTValGTVal_8u_AC4IR_Ctx**(*Npp8u* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, const *Npp8u* rThresholdsLT[3], const *Npp8u* rValuesLT[3], const *Npp8u* rThresholdsGT[3], const *Npp8u* rValuesGT[3], *NppStreamContext* nppStreamCtx)

4 channel 8-bit unsigned char in place image threshold, not affecting Alpha.

If for a comparison operations sourcePixel is less than rThresholdLT is true, the pixel is set value is set to rValueLT, else if sourcePixel is greater than rThresholdGT the pixel is set to rValueGT, otherwise it is set to sourcePixel.

For common parameter descriptions, see *Common parameters for nppiThreshold_LTValGTVal non-inplace and inplace functions:*.

NppStatus **nppiThreshold_LTValGTVal_16u_AC4R_Ctx**(const *Npp16u* *pSrc, int nSrcStep, *Npp16u* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp16u* rThresholdsLT[3], const *Npp16u* rValuesLT[3], const *Npp16u* rThresholdsGT[3], const *Npp16u* rValuesGT[3], *NppStreamContext* nppStreamCtx)

4 channel 16-bit unsigned short image threshold, not affecting Alpha.

If for a comparison operations sourcePixel is less than rThresholdLT is true, the pixel is set value is set to rValueLT, else if sourcePixel is greater than rThresholdGT the pixel is set to rValueGT, otherwise it is set to sourcePixel.

For common parameter descriptions, see *Common parameters for nppiThreshold_LTValGTVal non-inplace and inplace functions:*.

NppStatus **nppiThreshold_LTValGTVal_16u_AC4IR_Ctx**(*Npp16u* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, const *Npp16u* rThresholdsLT[3], const *Npp16u* rValuesLT[3], const *Npp16u* rThresholdsGT[3], const *Npp16u* rValuesGT[3], *NppStreamContext* nppStreamCtx)

4 channel 16-bit unsigned short in place image threshold, not affecting Alpha.

If for a comparison operations sourcePixel is less than rThresholdLT is true, the pixel is set value is set to rValueLT, else if sourcePixel is greater than rThresholdGT the pixel is set to rValueGT, otherwise it is set to sourcePixel.

For common parameter descriptions, see *Common parameters for nppiThreshold_LTValGTVal non-inplace and inplace functions:*.

NppStatus **nppiThreshold_LTValGTVal_16s_AC4R_Ctx**(const *Npp16s* *pSrc, int nSrcStep, *Npp16s* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp16s* rThresholdsLT[3], const *Npp16s* rValuesLT[3], const *Npp16s* rThresholdsGT[3], const *Npp16s* rValuesGT[3], *NppStreamContext* nppStreamCtx)

4 channel 16-bit signed short image threshold, not affecting Alpha.

If for a comparison operations sourcePixel is less than rThresholdLT is true, the pixel is set value is set to rValueLT, else if sourcePixel is greater than rThresholdGT the pixel is set to rValueGT, otherwise it is set to sourcePixel.

For common parameter descriptions, see *Common parameters for nppiThreshold_LTValGTVal non-inplace and inplace functions:*.

NppStatus **nppiThreshold_LTValGTVal_16s_AC4IR_Ctx**(*Npp16s* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, const *Npp16s* rThresholdsLT[3], const *Npp16s* rValuesLT[3], const *Npp16s* rThresholdsGT[3], const *Npp16s* rValuesGT[3], *NppStreamContext* nppStreamCtx)

4 channel 16-bit signed short in place image threshold, not affecting Alpha.

If for a comparison operations sourcePixel is less than rThresholdLT is true, the pixel is set value is set to rValueLT, else if sourcePixel is greater than rThresholdGT the pixel is set to rValueGT, otherwise it is set to sourcePixel.

For common parameter descriptions, see *Common parameters for nppiThreshold_LTValGTVal non-inplace and inplace functions:*.

NppStatus **nppiThreshold_LTValGTVal_32f_AC4R_Ctx**(const *Npp32f* *pSrc, int nSrcStep, *Npp32f* *pDst, int nDstStep, *NppiSize* oSizeROI, const *Npp32f* rThresholdsLT[3], const *Npp32f* rValuesLT[3], const *Npp32f* rThresholdsGT[3], const *Npp32f* rValuesGT[3], *NppStreamContext* nppStreamCtx)

4 channel 32-bit floating point image threshold, not affecting Alpha.

If for a comparison operations sourcePixel is less than rThresholdLT is true, the pixel is set value is set to rValueLT, else if sourcePixel is greater than rThresholdGT the pixel is set to rValueGT, otherwise it is set to sourcePixel.

For common parameter descriptions, see *Common parameters for nppiThreshold_LTValGTVal non-inplace and inplace functions:*.

NppStatus **nppiThreshold_LTValGTVal_32f_AC4IR_Ctx**(*Npp32f* *pSrcDst, int nSrcDstStep, *NppiSize* oSizeROI, const *Npp32f* rThresholdsLT[3], const *Npp32f* rValuesLT[3], const *Npp32f* rThresholdsGT[3], const *Npp32f* rValuesGT[3], *NppStreamContext* nppStreamCtx)

4 channel 32-bit floating point in place image threshold, not affecting Alpha.

If for a comparison operations sourcePixel is less than rThresholdLT is true, the pixel is set value is set to rValueLT, else if sourcePixel is greater than rThresholdGT the pixel is set to rValueGT, otherwise it is set to sourcePixel.

For common parameter descriptions, see *Common parameters for nppiThreshold_LTValGTVal non-inplace and inplace functions:*.

1.15.2. Image Comparison Operations

1.15.2.1 Comparison Operations

Compare the pixels of two images or one image and a constant value and create a binary result image. In case of multi-channel image types, the condition must be fulfilled for all channels, otherwise the comparison is considered false. The “binary” result image is of type 8u_C1. False is represented by 0, true by NPP_MAX_8U.

1.15.2.2 Compare Images Operations

1.15.2.2.1 Compare Images Operations

Compare the pixels of two images and create a binary result image. In case of multi-channel image types, the condition must be fulfilled for all channels, otherwise the comparison is considered false. The "binary" result image is of type 8u_C1. False is represented by 0, true by NPP_MAX_8U.

1.15.2.2.1.1 Common parameters for nppiCompare functions:

param pSrc1
Source-Image Pointer.

param nSrc1Step
Source-Image Line Step.

param pSrc2
Source-Image Pointer.

param nSrc2Step
Source-Image Line Step.

param pDst
Destination-Image Pointer.

param nDstStep
Destination-Image Line Step.

param oSizeROI
Region-Of-Interest (ROI).

param eComparisonOperation
Specifies the comparison operation to be used in the pixel comparison.

param nppStreamCtx
Application Managed Stream Context.

return
Image Data Related Error Codes, *ROI Related Error Codes*

Functions

NppStatus **nppiCompare_8u_C1R_Ctx**(const *Npp8u* *pSrc1, int nSrc1Step, const *Npp8u* *pSrc2, int nSrc2Step, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppCmpOp* eComparisonOperation, *NppStreamContext* nppStreamCtx)

1 channel 8-bit unsigned char image compare.

Compare pSrc1's pixels with corresponding pixels in pSrc2.

For common parameter descriptions, see *Common parameters for nppiCompare functions:*.

NppStatus **nppiCompare_8u_C3R_Ctx**(const *Npp8u* *pSrc1, int nSrc1Step, const *Npp8u* *pSrc2, int nSrc2Step, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppCmpOp* eComparisonOperation, *NppStreamContext* nppStreamCtx)

3 channel 8-bit unsigned char image compare.

Compare pSrc1's pixels with corresponding pixels in pSrc2.

For common parameter descriptions, see *Common parameters for nppiCompare functions:*.

NppStatus **nppiCompare_8u_C4R_Ctx**(const *Npp8u* *pSrc1, int nSrc1Step, const *Npp8u* *pSrc2, int nSrc2Step, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppCmpOp* eComparisonOperation, *NppStreamContext* nppStreamCtx)

4 channel 8-bit unsigned char image compare.

Compare pSrc1's pixels with corresponding pixels in pSrc2.

For common parameter descriptions, see *Common parameters for nppiCompare functions:*.

NppStatus **nppiCompare_8u_AC4R_Ctx**(const *Npp8u* *pSrc1, int nSrc1Step, const *Npp8u* *pSrc2, int nSrc2Step, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppCmpOp* eComparisonOperation, *NppStreamContext* nppStreamCtx)

4 channel 8-bit unsigned char image compare, not affecting Alpha.

Compare pSrc1's pixels with corresponding pixels in pSrc2.

For common parameter descriptions, see *Common parameters for nppiCompare functions:*.

NppStatus **nppiCompare_16u_C1R_Ctx**(const *Npp16u* *pSrc1, int nSrc1Step, const *Npp16u* *pSrc2, int nSrc2Step, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppCmpOp* eComparisonOperation, *NppStreamContext* nppStreamCtx)

1 channel 16-bit unsigned short image compare.

Compare pSrc1's pixels with corresponding pixels in pSrc2.

For common parameter descriptions, see *Common parameters for nppiCompare functions:*.

NppStatus **nppiCompare_16u_C3R_Ctx**(const *Npp16u* *pSrc1, int nSrc1Step, const *Npp16u* *pSrc2, int nSrc2Step, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppCmpOp* eComparisonOperation, *NppStreamContext* nppStreamCtx)

3 channel 16-bit unsigned short image compare.

Compare pSrc1's pixels with corresponding pixels in pSrc2.

For common parameter descriptions, see *Common parameters for nppiCompare functions:*.

NppStatus **nppiCompare_16u_C4R_Ctx**(const *Npp16u* *pSrc1, int nSrc1Step, const *Npp16u* *pSrc2, int nSrc2Step, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppCmpOp* eComparisonOperation, *NppStreamContext* nppStreamCtx)

4 channel 16-bit unsigned short image compare.

Compare pSrc1's pixels with corresponding pixels in pSrc2.

For common parameter descriptions, see *Common parameters for nppiCompare functions:*.

NppStatus **nppiCompare_16u_AC4R_Ctx**(const *Npp16u* *pSrc1, int nSrc1Step, const *Npp16u* *pSrc2, int nSrc2Step, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppCmpOp* eComparisonOperation, *NppStreamContext* nppStreamCtx)

4 channel 16-bit unsigned short image compare, not affecting Alpha.

Compare pSrc1's pixels with corresponding pixels in pSrc2.

For common parameter descriptions, see *Common parameters for nppiCompare functions:*.

NppStatus **nppiCompare_16s_C1R_Ctx**(const *Npp16s* *pSrc1, int nSrc1Step, const *Npp16s* *pSrc2, int nSrc2Step, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppCmpOp* eComparisonOperation, *NppStreamContext* nppStreamCtx)

1 channel 16-bit signed short image compare.

Compare pSrc1's pixels with corresponding pixels in pSrc2.

For common parameter descriptions, see *Common parameters for nppiCompare functions:*.

NppStatus **nppiCompare_16s_C3R_Ctx**(const *Npp16s* *pSrc1, int nSrc1Step, const *Npp16s* *pSrc2, int nSrc2Step, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppCmpOp* eComparisonOperation, *NppStreamContext* nppStreamCtx)

3 channel 16-bit signed short image compare.

Compare pSrc1's pixels with corresponding pixels in pSrc2.

For common parameter descriptions, see *Common parameters for nppiCompare functions:*.

NppStatus **nppiCompare_16s_C4R_Ctx**(const *Npp16s* *pSrc1, int nSrc1Step, const *Npp16s* *pSrc2, int nSrc2Step, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppCmpOp* eComparisonOperation, *NppStreamContext* nppStreamCtx)

4 channel 16-bit signed short image compare.

Compare pSrc1's pixels with corresponding pixels in pSrc2.

For common parameter descriptions, see *Common parameters for nppiCompare functions:*.

NppStatus **nppiCompare_16s_AC4R_Ctx**(const *Npp16s* *pSrc1, int nSrc1Step, const *Npp16s* *pSrc2, int nSrc2Step, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppCmpOp* eComparisonOperation, *NppStreamContext* nppStreamCtx)

4 channel 16-bit signed short image compare, not affecting Alpha.

Compare pSrc1's pixels with corresponding pixels in pSrc2.

For common parameter descriptions, see *Common parameters for nppiCompare functions:*.

NppStatus **nppiCompare_32f_C1R_Ctx**(const *Npp32f* *pSrc1, int nSrc1Step, const *Npp32f* *pSrc2, int nSrc2Step, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppCmpOp* eComparisonOperation, *NppStreamContext* nppStreamCtx)

1 channel 32-bit floating point image compare.

Compare pSrc1's pixels with corresponding pixels in pSrc2.

For common parameter descriptions, see *Common parameters for nppiCompare functions:*.

NppStatus **nppiCompare_32f_C3R_Ctx**(const *Npp32f* *pSrc1, int nSrc1Step, const *Npp32f* *pSrc2, int nSrc2Step, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppCmpOp* eComparisonOperation, *NppStreamContext* nppStreamCtx)

3 channel 32-bit floating point image compare.

Compare pSrc1's pixels with corresponding pixels in pSrc2.

For common parameter descriptions, see *Common parameters for nppiCompare functions:*.

NppStatus **nppiCompare_32f_C4R_Ctx**(const *Npp32f* *pSrc1, int nSrc1Step, const *Npp32f* *pSrc2, int nSrc2Step, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppCmpOp* eComparisonOperation, *NppStreamContext* nppStreamCtx)

4 channel 32-bit floating point image compare.

Compare pSrc1's pixels with corresponding pixels in pSrc2.

For common parameter descriptions, see *Common parameters for nppiCompare functions:*.

NppStatus **nppiCompare_32f_AC4R_Ctx**(const *Npp32f* *pSrc1, int nSrc1Step, const *Npp32f* *pSrc2, int nSrc2Step, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppCmpOp* eComparisonOperation, *NppStreamContext* nppStreamCtx)

4 channel 32-bit signed floating point compare, not affecting Alpha.

Compare pSrc1's pixels with corresponding pixels in pSrc2.

For common parameter descriptions, see *Common parameters for nppiCompare functions:*.

1.15.2.3 Compare Image With Constant Operations

1.15.2.3.1 Compare Image With Constant Operations

Compare the pixels of an image with a constant value and create a binary result image. In case of multi-channel image types, the condition must be fulfilled for all channels, otherwise the comparison is considered false. The "binary" result image is of type 8u_C1. False is represented by 0, true by NPP_MAX_8U.

1.15.2.3.1.1 Common parameters for nppiCompareC functions:

param pSrc
Source-Image Pointer.

param nSrcStep
Source-Image Line Step.

param nConstant
constant value for single channel functions.

param pConstants
pointer to a list of constant values, one per color channel for multi-channel functions.

param pDst
Destination-Image Pointer.

param nDstStep
Destination-Image Line Step.

param oSizeROI
Region-Of-Interest (ROI).

param eComparisonOperation
Specifies the comparison operation to be used in the pixel comparison.

param nppStreamCtx
Application Managed Stream Context.

return
Image Data Related Error Codes, *ROI Related Error Codes*

Functions

NppStatus **nppiCompareC_8u_C1R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, const *Npp8u* nConstant, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppCmpOp* eComparisonOperation, *NppStreamContext* nppStreamCtx)

1 channel 8-bit unsigned char image compare with constant value.

Compare pSrc's pixels with constant value.

For common parameter descriptions, see *Common parameters for nppiCompareC functions:*.

NppStatus **nppiCompareC_8u_C3R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, const *Npp8u* *pConstants, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppCmpOp* eComparisonOperation, *NppStreamContext* nppStreamCtx)

3 channel 8-bit unsigned char image compare with constant value.

Compare pSrc's pixels with constant value.

For common parameter descriptions, see *Common parameters for nppiCompareC functions:*.

NppStatus **nppiCompareC_8u_C4R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, const *Npp8u* *pConstants, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppCmpOp* eComparisonOperation, *NppStreamContext* nppStreamCtx)

4 channel 8-bit unsigned char image compare with constant value.

Compare pSrc's pixels with constant value.

For common parameter descriptions, see *Common parameters for nppiCompareC functions:*.

NppStatus **nppiCompareC_8u_AC4R_Ctx**(const *Npp8u* *pSrc, int nSrcStep, const *Npp8u* *pConstants, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppCmpOp* eComparisonOperation, *NppStreamContext* nppStreamCtx)

4 channel 8-bit unsigned char image compare, not affecting Alpha.

Compare pSrc's pixels with constant value.

For common parameter descriptions, see *Common parameters for nppiCompareC functions:*.

NppStatus **nppiCompareC_16u_C1R_Ctx**(const *Npp16u* *pSrc, int nSrcStep, const *Npp16u* nConstant, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppCmpOp* eComparisonOperation, *NppStreamContext* nppStreamCtx)

1 channel 16-bit unsigned short image compare with constant value.

Compare pSrc's pixels with constant value.

For common parameter descriptions, see *Common parameters for nppiCompareC functions:*.

NppStatus **nppiCompareC_16u_C3R_Ctx**(const *Npp16u* *pSrc, int nSrcStep, const *Npp16u* *pConstants, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppCmpOp* eComparisonOperation, *NppStreamContext* nppStreamCtx)

3 channel 16-bit unsigned short image compare with constant value.

Compare pSrc's pixels with constant value.

For common parameter descriptions, see *Common parameters for nppiCompareC functions:*.

NppStatus **nppiCompareC_16u_C4R_Ctx**(const *Npp16u* *pSrc, int nSrcStep, const *Npp16u* *pConstants, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppCmpOp* eComparisonOperation, *NppStreamContext* nppStreamCtx)

4 channel 16-bit unsigned short image compare with constant value.

Compare pSrc's pixels with constant value.

For common parameter descriptions, see *Common parameters for nppiCompareC functions:*.

NppStatus **nppiCompareC_16u_AC4R_Ctx**(const *Npp16u* *pSrc, int nSrcStep, const *Npp16u* *pConstants, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppCmpOp* eComparisonOperation, *NppStreamContext* nppStreamCtx)

4 channel 16-bit unsigned short image compare, not affecting Alpha.

Compare pSrc's pixels with constant value.

For common parameter descriptions, see *Common parameters for nppiCompareC functions:*.

NppStatus **nppiCompareC_16s_C1R_Ctx**(const *Npp16s* *pSrc, int nSrcStep, const *Npp16s* nConstant, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppCmpOp* eComparisonOperation, *NppStreamContext* nppStreamCtx)

1 channel 16-bit signed short image compare with constant value.

Compare pSrc's pixels with constant value.

For common parameter descriptions, see *Common parameters for nppiCompareC functions:*.

NppStatus **nppiCompareC_16s_C3R_Ctx**(const *Npp16s* *pSrc, int nSrcStep, const *Npp16s* *pConstants, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppCmpOp* eComparisonOperation, *NppStreamContext* nppStreamCtx)

3 channel 16-bit signed short image compare with constant value.

Compare pSrc's pixels with constant value.

For common parameter descriptions, see *Common parameters for nppiCompareC functions:*.

NppStatus **nppiCompareC_16s_C4R_Ctx**(const *Npp16s* *pSrc, int nSrcStep, const *Npp16s* *pConstants, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppCmpOp* eComparisonOperation, *NppStreamContext* nppStreamCtx)

4 channel 16-bit signed short image compare with constant value.

Compare pSrc's pixels with constant value.

For common parameter descriptions, see *Common parameters for nppiCompareC functions:*.

NppStatus **nppiCompareC_16s_AC4R_Ctx**(const *Npp16s* *pSrc, int nSrcStep, const *Npp16s* *pConstants, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppCmpOp* eComparisonOperation, *NppStreamContext* nppStreamCtx)

4 channel 16-bit signed short image compare, not affecting Alpha.

Compare pSrc's pixels with constant value.

For common parameter descriptions, see *Common parameters for nppiCompareC functions:*.

NppStatus **nppiCompareC_32f_C1R_Ctx**(const *Npp32f* *pSrc, int nSrcStep, const *Npp32f* nConstant, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppCmpOp* eComparisonOperation, *NppStreamContext* nppStreamCtx)

1 channel 32-bit floating point image compare with constant value.

Compare pSrc's pixels with constant value.

For common parameter descriptions, see *Common parameters for nppiCompareC functions:*.

NppStatus **nppiCompareC_32f_C3R_Ctx**(const *Npp32f* *pSrc, int nSrcStep, const *Npp32f* *pConstants, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppCmpOp* eComparisonOperation, *NppStreamContext* nppStreamCtx)

3 channel 32-bit floating point image compare with constant value.

Compare pSrc's pixels with constant value.

For common parameter descriptions, see *Common parameters for nppiCompareC functions:*.

NppStatus **nppiCompareC_32f_C4R_Ctx**(const *Npp32f* *pSrc, int nSrcStep, const *Npp32f* *pConstants, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppCmpOp* eComparisonOperation, *NppStreamContext* nppStreamCtx)

4 channel 32-bit floating point image compare with constant value.

Compare pSrc's pixels with constant value.

For common parameter descriptions, see *Common parameters for nppiCompareC functions:*.

NppStatus **nppiCompareC_32f_AC4R_Ctx**(const *Npp32f* *pSrc, int nSrcStep, const *Npp32f* *pConstants, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, *NppCmpOp* eComparisonOperation, *NppStreamContext* nppStreamCtx)

4 channel 32-bit signed floating point compare, not affecting Alpha.

Compare pSrc's pixels with constant value.

For common parameter descriptions, see *Common parameters for nppiCompareC functions:*.

1.15.2.4 Compare Image Differences With Epsilon Operations

1.15.2.4.1 Compare Image Differences With Epsilon Operations

Compare the pixels value differences of two images with an epsilon value and create a binary result image. In case of multi-channel image types, the condition must be fulfilled for all channels, otherwise the comparison is considered false. The “binary” result image is of type 8u_C1. False is represented by 0, true by NPP_MAX_8U.

1.15.2.4.1.1 Common parameters for nppiCompareEqualEps functions include:

param pSrc1
Source-Image Pointer.

param nSrc1Step
Source-Image Line Step.

param pSrc2
Source-Image Pointer.

param nSrc2Step
Source-Image Line Step.

param pDst
Destination-Image Pointer.

param nDstStep
Destination-Image Line Step.

param oSizeROI
Region-Of-Interest (ROI).

param nEpsilon
epsilon tolerance value to compare to pixel absolute differences

param nppStreamCtx
Application Managed Stream Context.

return
Image Data Related Error Codes, *ROI Related Error Codes*

Functions

NppStatus **nppiCompareEqualEps_32f_C1R_Ctx**(const *Npp32f* *pSrc1, int nSrc1Step, const *Npp32f* *pSrc2, int nSrc2Step, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, *Npp32f* nEpsilon, *NppStreamContext* nppStreamCtx)

1 channel 32-bit floating point image compare whether two images are equal within epsilon.

Compare pSrc1’s pixels with corresponding pixels in pSrc2 to determine whether they are equal with a difference of epsilon.

For common parameter descriptions, see *Common parameters for nppiCompareEqualEps functions include:*.

NppStatus **nppiCompareEqualEps_32f_C3R_Ctx**(const *Npp32f* *pSrc1, int nSrc1Step, const *Npp32f* *pSrc2, int nSrc2Step, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, *Npp32f* nEpsilon, *NppStreamContext* nppStreamCtx)

3 channel 32-bit floating point image compare whether two images are equal within epsilon.

Compare pSrc1's pixels with corresponding pixels in pSrc2 to determine whether they are equal with a difference of epsilon.

For common parameter descriptions, see *Common parameters for nppiCompareEqualEps functions include:*.

NppStatus **nppiCompareEqualEps_32f_C4R_Ctx**(const *Npp32f* *pSrc1, int nSrc1Step, const *Npp32f* *pSrc2, int nSrc2Step, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, *Npp32f* nEpsilon, *NppStreamContext* nppStreamCtx)

4 channel 32-bit floating point image compare whether two images are equal within epsilon.

Compare pSrc1's pixels with corresponding pixels in pSrc2 to determine whether they are equal with a difference of epsilon.

For common parameter descriptions, see *Common parameters for nppiCompareEqualEps functions include:*.

NppStatus **nppiCompareEqualEps_32f_AC4R_Ctx**(const *Npp32f* *pSrc1, int nSrc1Step, const *Npp32f* *pSrc2, int nSrc2Step, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, *Npp32f* nEpsilon, *NppStreamContext* nppStreamCtx)

4 channel 32-bit signed floating point compare whether two images are equal within epsilon, not affecting Alpha.

Compare pSrc1's pixels with corresponding pixels in pSrc2 to determine whether they are equal with a difference of epsilon.

For common parameter descriptions, see *Common parameters for nppiCompareEqualEps functions include:*.

1.15.2.5 Compare Image Difference To Constant With Epsilon Operations

1.15.2.5.1 Compare Image Difference With Constant Within Epsilon Operations

Compare differences between image pixels and constant within an epsilon value and create a binary result image. In case of multi-channel image types, the condition must be fulfilled for all channels, otherwise the comparison is considered false. The "binary" result image is of type 8u_C1. False is represented by 0, true by NPP_MAX_8U.

1.15.2.5.1.1 Common parameters for nppiCompareEqualEpsC functions:

param pSrc
Source-Image Pointer.

param nSrcStep
Source-Image Line Step.

param nConstant
constant value for single channel functions.

param pConstants
pointer to a list of constants, one per color channel for multi-channel image functions.

param pDst
Destination-Image Pointer.

param nDstStep
Destination-Image Line Step.

param oSizeROI
Region-Of-Interest (ROI).

param nEpsilon
epsilon tolerance value to compare to per color channel pixel absolute differences

param nppStreamCtx
Application Managed Stream Context.

return
Image Data Related Error Codes, *ROI Related Error Codes*

Functions

NppStatus **nppiCompareEqualEpsC_32f_C1R_Ctx**(const *Npp32f* *pSrc, int nSrcStep, const *Npp32f* nConstant, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, *Npp32f* nEpsilon, *NppStreamContext* nppStreamCtx)

1 channel 32-bit floating point image compare whether image and constant are equal within epsilon.

Compare pSrc's pixels with constant value to determine whether they are equal within a difference of epsilon.

For common parameter descriptions, see *Common parameters for nppiCompareEqualEpsC functions:*.

NppStatus **nppiCompareEqualEpsC_32f_C3R_Ctx**(const *Npp32f* *pSrc, int nSrcStep, const *Npp32f* *pConstants, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, *Npp32f* nEpsilon, *NppStreamContext* nppStreamCtx)

3 channel 32-bit floating point image compare whether image and constant are equal within epsilon.

Compare pSrc's pixels with constant value to determine whether they are equal within a difference of epsilon.

For common parameter descriptions, see *Common parameters for nppiCompareEqualEpsC functions:*.

NppStatus **nppiCompareEqualEpsC_32f_C4R_Ctx**(const *Npp32f* *pSrc, int nSrcStep, const *Npp32f* *pConstants, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, *Npp32f* nEpsilon, *NppStreamContext* nppStreamCtx)

4 channel 32-bit floating point image compare whether image and constant are equal within epsilon.

Compare pSrc's pixels with constant value to determine whether they are equal within a difference of epsilon.

For common parameter descriptions, see *Common parameters for nppiCompareEqualEpsC functions:*.

NppStatus **nppiCompareEqualEpsC_32f_AC4R_Ctx**(const *Npp32f* *pSrc, int nSrcStep, const *Npp32f* *pConstants, *Npp8u* *pDst, int nDstStep, *NppiSize* oSizeROI, *Npp32f* nEpsilon, *NppStreamContext* nppStreamCtx)

4 channel 32-bit signed floating point compare whether image and constant are equal within epsilon, not affecting Alpha.

Compare pSrc's pixels with constant value to determine whether they are equal within a difference of epsilon.

For common parameter descriptions, see *Common parameters for nppiCompareEqualEpsC functions:*.

1.16. Image Memory Management Functions

Routines for allocating and deallocating pitched image storage.

These methods are provided for convenience. They allocate memory that may contain additional padding bytes at the end of each line of pixels. Though padding is not necessary for any of the NPP image-processing primitives to work correctly, its absence may cause sever performance degradation compared to properly padded images.

These functions can be found in the nppisu library. Linking to only the sub-libraries that you use can significantly save link time, application load time, and CUDA runtime startup time when using dynamic libraries.

Image Memory Allocation

ImageAllocator methods for 2D arrays of data.

The allocators have width and height parameters to specify the size of the image data being allocated. They return a pointer to the newly created memory and return the numbers of bytes between successive lines.

If the memory allocation failed due to lack of free device memory or device memory fragmentation the routine returns 0.

All allocators return memory with line strides that are beneficial for performance. It is not mandatory to use these allocators. Any valid CUDA device-memory pointers can be used by the NPP primitives and there are no restrictions on line strides.

Npp8u ***nppiMalloc_8u_C1**(int nWidthPixels, int nHeightPixels, int *pStepBytes)

8-bit unsigned image memory allocator.

Parameters

- **nWidthPixels** – Image width.
- **nHeightPixels** – Image height.
- **pStepBytes** – *Line Step*.

Returns

Pointer to new image data.

Npp8u ***nppiMalloc_8u_C2**(int nWidthPixels, int nHeightPixels, int *pStepBytes)

2 channel 8-bit unsigned image memory allocator.

Parameters

- **nWidthPixels** – Image width.
- **nHeightPixels** – Image height.
- **pStepBytes** – *Line Step*.

Returns

Pointer to new image data.

Npp8u ***nppiMalloc_8u_C3**(int nWidthPixels, int nHeightPixels, int *pStepBytes)

3 channel 8-bit unsigned image memory allocator.

Parameters

- **nWidthPixels** – Image width.
- **nHeightPixels** – Image height.
- **pStepBytes** – *Line Step*.

Returns

Pointer to new image data.

Npp8u ***nppiMalloc_8u_C4**(int nWidthPixels, int nHeightPixels, int *pStepBytes)

4 channel 8-bit unsigned image memory allocator.

Parameters

- **nWidthPixels** – Image width.
- **nHeightPixels** – Image height.
- **pStepBytes** – *Line Step*.

Returns

Pointer to new image data.

Npp16u ***nppiMalloc_16u_C1**(int nWidthPixels, int nHeightPixels, int *pStepBytes)*

16-bit unsigned image memory allocator.

Parameters

- **nWidthPixels** – Image width.
- **nHeightPixels** – Image height.
- **pStepBytes** – *Line Step*.

Returns

Pointer to new image data.

Npp16u ***nppiMalloc_16u_C2**(int nWidthPixels, int nHeightPixels, int *pStepBytes)*

2 channel 16-bit unsigned image memory allocator.

Parameters

- **nWidthPixels** – Image width.
- **nHeightPixels** – Image height.
- **pStepBytes** – *Line Step*.

Returns

Pointer to new image data.

Npp16u ***nppiMalloc_16u_C3**(int nWidthPixels, int nHeightPixels, int *pStepBytes)*

3 channel 16-bit unsigned image memory allocator.

Parameters

- **nWidthPixels** – Image width.
- **nHeightPixels** – Image height.
- **pStepBytes** – *Line Step*.

Returns

Pointer to new image data.

Npp16u ***nppiMalloc_16u_C4**(int nWidthPixels, int nHeightPixels, int *pStepBytes)*

4 channel 16-bit unsigned image memory allocator.

Parameters

- **nWidthPixels** – Image width.
- **nHeightPixels** – Image height.
- **pStepBytes** – *Line Step*.

Returns

Pointer to new image data.

Npp16s ***nppiMalloc_16s_C1**(int nWidthPixels, int nHeightPixels, int *pStepBytes)*

16-bit signed image memory allocator.

Parameters

- **nWidthPixels** – Image width.
- **nHeightPixels** – Image height.
- **pStepBytes** – *Line Step*.

Returns
Pointer to new image data.

Npp16s ***nppiMalloc_16s_C2**(int nWidthPixels, int nHeightPixels, int *pStepBytes)
2 channel 16-bit signed image memory allocator.

Parameters

- **nWidthPixels** – Image width.
- **nHeightPixels** – Image height.
- **pStepBytes** – *Line Step*.

Returns
Pointer to new image data.

Npp16s ***nppiMalloc_16s_C4**(int nWidthPixels, int nHeightPixels, int *pStepBytes)
4 channel 16-bit signed image memory allocator.

Parameters

- **nWidthPixels** – Image width.
- **nHeightPixels** – Image height.
- **pStepBytes** – *Line Step*.

Returns
Pointer to new image data.

Npp16sc ***nppiMalloc_16sc_C1**(int nWidthPixels, int nHeightPixels, int *pStepBytes)
1 channel 16-bit signed complex image memory allocator.

Parameters

- **nWidthPixels** – Image width.
- **nHeightPixels** – Image height.
- **pStepBytes** – *Line Step*.

Returns
Pointer to new image data.

Npp16sc ***nppiMalloc_16sc_C2**(int nWidthPixels, int nHeightPixels, int *pStepBytes)
2 channel 16-bit signed complex image memory allocator.

Parameters

- **nWidthPixels** – Image width.
- **nHeightPixels** – Image height.
- **pStepBytes** – *Line Step*.

Returns
Pointer to new image data.

Npp16sc ***nppiMalloc_16sc_C3**(int nWidthPixels, int nHeightPixels, int *pStepBytes)
3 channel 16-bit signed complex image memory allocator.

Parameters

- **nWidthPixels** – Image width.
- **nHeightPixels** – Image height.
- **pStepBytes** – *Line Step*.

Returns
Pointer to new image data.

Npp16sc ***nppiMalloc_16sc_C4**(int nWidthPixels, int nHeightPixels, int *pStepBytes)
4 channel 16-bit signed complex image memory allocator.

Parameters

- **nWidthPixels** – Image width.
- **nHeightPixels** – Image height.
- **pStepBytes** – *Line Step*.

Returns
Pointer to new image data.

Npp32s ***nppiMalloc_32s_C1**(int nWidthPixels, int nHeightPixels, int *pStepBytes)
32-bit signed image memory allocator.

Parameters

- **nWidthPixels** – Image width.
- **nHeightPixels** – Image height.
- **pStepBytes** – *Line Step*.

Returns
Pointer to new image data.

Npp32s ***nppiMalloc_32s_C3**(int nWidthPixels, int nHeightPixels, int *pStepBytes)
3 channel 32-bit signed image memory allocator.

Parameters

- **nWidthPixels** – Image width.
- **nHeightPixels** – Image height.
- **pStepBytes** – *Line Step*.

Returns
Pointer to new image data.

Npp32s ***nppiMalloc_32s_C4***(int nWidthPixels, int nHeightPixels, int *pStepBytes)

4 channel 32-bit signed image memory allocator.

Parameters

- **nWidthPixels** – Image width.
- **nHeightPixels** – Image height.
- **pStepBytes** – *Line Step*.

Returns

Pointer to new image data.

Npp32sc ***nppiMalloc_32sc_C1***(int nWidthPixels, int nHeightPixels, int *pStepBytes)

32-bit integer complex image memory allocator.

Parameters

- **nWidthPixels** – Image width.
- **nHeightPixels** – Image height.
- **pStepBytes** – *Line Step*.

Returns

Pointer to new image data.

Npp32sc ***nppiMalloc_32sc_C2***(int nWidthPixels, int nHeightPixels, int *pStepBytes)

2 channel 32-bit integer complex image memory allocator.

Parameters

- **nWidthPixels** – Image width.
- **nHeightPixels** – Image height.
- **pStepBytes** – *Line Step*.

Returns

Pointer to new image data.

Npp32sc ***nppiMalloc_32sc_C3***(int nWidthPixels, int nHeightPixels, int *pStepBytes)

3 channel 32-bit integer complex image memory allocator.

Parameters

- **nWidthPixels** – Image width.
- **nHeightPixels** – Image height.
- **pStepBytes** – *Line Step*.

Returns

Pointer to new image data.

Npp32sc ***nppiMalloc_32sc_C4***(int nWidthPixels, int nHeightPixels, int *pStepBytes)

4 channel 32-bit integer complex image memory allocator.

Parameters

- **nWidthPixels** – Image width.
- **nHeightPixels** – Image height.
- **pStepBytes** – *Line Step*.

Returns
Pointer to new image data.

Npp32f ***nppiMalloc_32f_C1**(int nWidthPixels, int nHeightPixels, int *pStepBytes)
32-bit floating point image memory allocator.

Parameters

- **nWidthPixels** – Image width.
- **nHeightPixels** – Image height.
- **pStepBytes** – *Line Step*.

Returns
Pointer to new image data.

Npp32f ***nppiMalloc_32f_C2**(int nWidthPixels, int nHeightPixels, int *pStepBytes)
2 channel 32-bit floating point image memory allocator.

Parameters

- **nWidthPixels** – Image width.
- **nHeightPixels** – Image height.
- **pStepBytes** – *Line Step*.

Returns
Pointer to new image data.

Npp32f ***nppiMalloc_32f_C3**(int nWidthPixels, int nHeightPixels, int *pStepBytes)
3 channel 32-bit floating point image memory allocator.

Parameters

- **nWidthPixels** – Image width.
- **nHeightPixels** – Image height.
- **pStepBytes** – *Line Step*.

Returns
Pointer to new image data.

Npp32f ***nppiMalloc_32f_C4**(int nWidthPixels, int nHeightPixels, int *pStepBytes)
4 channel 32-bit floating point image memory allocator.

Parameters

- **nWidthPixels** – Image width.
- **nHeightPixels** – Image height.
- **pStepBytes** – *Line Step*.

Returns
Pointer to new image data.

Npp32fc ***nppiMalloc_32fc_C1**(int nWidthPixels, int nHeightPixels, int *pStepBytes)*
32-bit float complex image memory allocator.

Parameters

- **nWidthPixels** – Image width.
- **nHeightPixels** – Image height.
- **pStepBytes** – *Line Step*.

Returns
Pointer to new image data.

Npp32fc ***nppiMalloc_32fc_C2**(int nWidthPixels, int nHeightPixels, int *pStepBytes)*
2 channel 32-bit float complex image memory allocator.

Parameters

- **nWidthPixels** – Image width.
- **nHeightPixels** – Image height.
- **pStepBytes** – *Line Step*.

Returns
Pointer to new image data.

Npp32fc ***nppiMalloc_32fc_C3**(int nWidthPixels, int nHeightPixels, int *pStepBytes)*
3 channel 32-bit float complex image memory allocator.

Parameters

- **nWidthPixels** – Image width.
- **nHeightPixels** – Image height.
- **pStepBytes** – *Line Step*.

Returns
Pointer to new image data.

Npp32fc ***nppiMalloc_32fc_C4**(int nWidthPixels, int nHeightPixels, int *pStepBytes)*
4 channel 32-bit float complex image memory allocator.

Parameters

- **nWidthPixels** – Image width.
- **nHeightPixels** – Image height.
- **pStepBytes** – *Line Step*.

Returns
Pointer to new image data.

Functions

void **nppiFree**(void *pData)

Free method for any 2D allocated memory.

This method should be used to free memory allocated with any of the nppiMalloc_<modifier> methods.

Parameters

- **pData** – A pointer to memory allocated using nppiMalloc_<modifier>.

1.17. Signal Arithmetic And Logical Operations

Functions that provide common arithmetic and logical operations.

1.17.1. Signal Arithmetic Functions

1.17.1.1 Arithmetic Operations

The set of arithmetic operations for signal processing available in the library.

1.17.1.2 Signal AddC

1.17.1.2.1 AddC

Adds a constant value to each sample of a signal.

Functions

NppStatus **nppsAddC_8u_ISfs_Ctx**(*Npp8u* nValue, *Npp8u* *pSrcDst, size_t nLength, int nScaleFactor, *NppStreamContext* nppStreamCtx)

8-bit unsigned char in place signal add constant, scale, then clamp to saturated value

Parameters

- **pSrcDst** – *In-Place Signal Pointer*.
- **nValue** – Constant value to be added to each vector element
- **nLength** – *Signal Length*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsAddC_8u_Sfs_Ctx**(const *Npp8u* *pSrc, *Npp8u* nValue, *Npp8u* *pDst, size_t nLength, int nScaleFactor, *NppStreamContext* nppStreamCtx)

8-bit unsigned charvector add constant, scale, then clamp to saturated value.

Parameters

- **pSrc** – *Source Signal Pointer*.
- **nValue** – Constant value to be added to each vector element
- **pDst** – *Destination Signal Pointer*.
- **nLength** – *Signal Length*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsAddC_16u_ISfs_Ctx**(*Npp16u* nValue, *Npp16u* *pSrcDst, size_t nLength, int nScaleFactor, *NppStreamContext* nppStreamCtx)

16-bit unsigned short in place signal add constant, scale, then clamp to saturated value.

Parameters

- **pSrcDst** – *In-Place Signal Pointer*.
- **nValue** – Constant value to be added to each vector element
- **nLength** – *Signal Length*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsAddC_16u_Sfs_Ctx**(const *Npp16u* *pSrc, *Npp16u* nValue, *Npp16u* *pDst, size_t nLength, int nScaleFactor, *NppStreamContext* nppStreamCtx)

16-bit unsigned short vector add constant, scale, then clamp to saturated value.

Parameters

- **pSrc** – *Source Signal Pointer*.
- **nValue** – Constant value to be added to each vector element
- **pDst** – *Destination Signal Pointer*.
- **nLength** – *Signal Length*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsAddC_16s_ISfs_Ctx**(*Npp16s* nValue, *Npp16s* *pSrcDst, size_t nLength, int nScaleFactor, *NppStreamContext* nppStreamCtx)

16-bit signed short in place signal add constant, scale, then clamp to saturated value.

Parameters

- **pSrcDst** – *In-Place Signal Pointer*.
- **nValue** – Constant value to be added to each vector element
- **nLength** – *Signal Length*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsAddC_16s_Sfs_Ctx**(const *Npp16s* *pSrc, *Npp16s* nValue, *Npp16s* *pDst, size_t nLength, int nScaleFactor, *NppStreamContext* nppStreamCtx)

16-bit signed short signal add constant, scale, then clamp to saturated value.

Parameters

- **pSrc** – *Source Signal Pointer*.
- **nValue** – Constant value to be added to each vector element
- **pDst** – *Destination Signal Pointer*.
- **nLength** – *Signal Length*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsAddC_16sc_ISfs_Ctx**(*Npp16sc* nValue, *Npp16sc* *pSrcDst, size_t nLength, int nScaleFactor, *NppStreamContext* nppStreamCtx)

16-bit integer complex number (16 bit real, 16 bit imaginary)signal add constant, scale, then clamp to saturated value.

Parameters

- **pSrcDst** – *In-Place Signal Pointer*.
- **nValue** – Constant value to be added to each vector element
- **nLength** – *Signal Length*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsAddC_16sc_Sfs_Ctx**(const *Npp16sc* *pSrc, *Npp16sc* nValue, *Npp16sc* *pDst, size_t nLength, int nScaleFactor, *NppStreamContext* nppStreamCtx)

16-bit integer complex number (16 bit real, 16 bit imaginary) signal add constant, scale, then clamp to saturated value.

Parameters

- **pSrc** – *Source Signal Pointer*.
- **nValue** – Constant value to be added to each vector element
- **pDst** – *Destination Signal Pointer*.
- **nLength** – *Signal Length*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsAddC_32s_ISfs_Ctx**(*Npp32s* nValue, *Npp32s* *pSrcDst, size_t nLength, int nScaleFactor, *NppStreamContext* nppStreamCtx)

32-bit signed integer in place signal add constant and scale.

Parameters

- **pSrcDst** – *In-Place Signal Pointer*.
- **nValue** – Constant value to be added to each vector element
- **nLength** – *Signal Length*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsAddC_32s_Sfs_Ctx**(const *Npp32s* *pSrc, *Npp32s* nValue, *Npp32s* *pDst, size_t nLength, int nScaleFactor, *NppStreamContext* nppStreamCtx)

32-bit signed integersignal add constant and scale.

Parameters

- **pSrc** – *Source Signal Pointer*.
- **nValue** – Constant value to be added to each vector element
- **pDst** – *Destination Signal Pointer*.
- **nLength** – *Signal Length*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsAddC_32sc_ISfs_Ctx**(*Npp32sc* nValue, *Npp32sc* *pSrcDst, size_t nLength, int nScaleFactor, *NppStreamContext* nppStreamCtx)

32-bit integer complex number (32 bit real, 32 bit imaginary) in place signal add constant and scale.

Parameters

- **pSrcDst** – *In-Place Signal Pointer*.
- **nValue** – Constant value to be added to each vector element
- **nLength** – *Signal Length*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsAddC_32sc_Sfs_Ctx**(const *Npp32sc* *pSrc, *Npp32sc* nValue, *Npp32sc* *pDst, size_t nLength, int nScaleFactor, *NppStreamContext* nppStreamCtx)

32-bit integer complex number (32 bit real, 32 bit imaginary) signal add constant and scale.

Parameters

- **pSrc** – *Source Signal Pointer*.
- **nValue** – Constant value to be added to each vector element
- **pDst** – *Destination Signal Pointer*.
- **nLength** – *Signal Length*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsAddC_32f_I_Ctx**(*Npp32f* nValue, *Npp32f* *pSrcDst, size_t nLength, *NppStreamContext* nppStreamCtx)

32-bit floating point in place signal add constant.

Parameters

- **pSrcDst** – *In-Place Signal Pointer*.
- **nValue** – Constant value to be added to each vector element
- **nLength** – *Signal Length*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsAddC_32f_Ctx**(const *Npp32f* *pSrc, *Npp32f* nValue, *Npp32f* *pDst, size_t nLength, *NppStreamContext* nppStreamCtx)

32-bit floating point signal add constant.

Parameters

- **pSrc** – *Source Signal Pointer*.
- **nValue** – Constant value to be added to each vector element
- **pDst** – *Destination Signal Pointer*.
- **nLength** – *Signal Length*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsAddC_32fc_I_Ctx**(*Npp32fc* nValue, *Npp32fc* *pSrcDst, size_t nLength, *NppStreamContext* nppStreamCtx)

32-bit floating point complex number (32 bit real, 32 bit imaginary) in place signal add constant.

Parameters

- **pSrcDst** – *In-Place Signal Pointer*.
- **nValue** – Constant value to be added to each vector element
- **nLength** – *Signal Length*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsAddC_32fc_Ctx**(const *Npp32fc* *pSrc, *Npp32fc* nValue, *Npp32fc* *pDst, size_t nLength, *NppStreamContext* nppStreamCtx)

32-bit floating point complex number (32 bit real, 32 bit imaginary) signal add constant.

Parameters

- **pSrc** – *Source Signal Pointer*.
- **nValue** – Constant value to be added to each vector element.
- **pDst** – *Destination Signal Pointer*.
- **nLength** – *Signal Length*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsAddC_64f_I_Ctx**(*Npp64f* nValue, *Npp64f* *pSrcDst, size_t nLength, *NppStreamContext* nppStreamCtx)

64-bit floating point, in place signal add constant.

Parameters

- **pSrcDst** – *In-Place Signal Pointer*.
- **nValue** – Constant value to be added to each vector element
- **nLength** – Length of the vectors, number of items.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsAddC_64f_Ctx**(const *Npp64f* *pSrc, *Npp64f* nValue, *Npp64f* *pDst, size_t nLength, *NppStreamContext* nppStreamCtx)

64-bit floating pointsignal add constant.

Parameters

- **pSrc** – *Source Signal Pointer*.
- **nValue** – Constant value to be added to each vector element
- **pDst** – *Destination Signal Pointer*.
- **nLength** – *Signal Length*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsAddC_64fc_I_Ctx**(*Npp64fc* nValue, *Npp64fc* *pSrcDst, size_t nLength, *NppStreamContext* nppStreamCtx)

64-bit floating point complex number (64 bit real, 64 bit imaginary) in place signal add constant.

Parameters

- **pSrcDst** – *In-Place Signal Pointer*.
- **nValue** – Constant value to be added to each vector element
- **nLength** – *Signal Length*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsAddC_64fc_Ctx**(const *Npp64fc* *pSrc, *Npp64fc* nValue, *Npp64fc* *pDst, size_t nLength, *NppStreamContext* nppStreamCtx)

64-bit floating point complex number (64 bit real, 64 bit imaginary) signal add constant.

Parameters

- **pSrc** – *Source Signal Pointer*.
- **nValue** – Constant value to be added to each vector element
- **pDst** – *Destination Signal Pointer*.
- **nLength** – *Signal Length*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

1.17.1.3 Signal AddProductC

1.17.1.3.1 AddProductC

Adds product of a constant and each sample of a source signal to the each sample of destination signal.

Functions

NppStatus **nppsAddProductC_32f_Ctx**(const *Npp32f* *pSrc, *Npp32f* nValue, *Npp32f* *pDst, size_t nLength, *NppStreamContext* nppStreamCtx)

32-bit floating point signal add product of signal times constant to destination signal.

Parameters

- **pSrc** – *Source Signal Pointer*.
- **nValue** – Constant value to be multiplied by each vector element
- **pDst** – *Destination Signal Pointer*.
- **nLength** – *Signal Length*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

1.17.1.4 Signal MulC

1.17.1.4.1 MulC

Multiplies each sample of a signal by a constant value.

Functions

NppStatus **nppsMulC_8u_ISfs_Ctx**(*Npp8u* nValue, *Npp8u* *pSrcDst, size_t nLength, int nScaleFactor, *NppStreamContext* nppStreamCtx)

8-bit unsigned char in place signal times constant, scale, then clamp to saturated value

Parameters

- **pSrcDst** – *In-Place Signal Pointer*.
- **nValue** – Constant value to be multiplied by each vector element
- **nLength** – *Signal Length*.
- **nScaleFactor** – *Integer Result Scaling*.

- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsMulC_8u_Sfs_Ctx**(const *Npp8u* *pSrc, *Npp8u* nValue, *Npp8u* *pDst, size_t nLength, int nScaleFactor, *NppStreamContext* nppStreamCtx)

8-bit unsigned char signal times constant, scale, then clamp to saturated value.

Parameters

- **pSrc** – *Source Signal Pointer*.
- **nValue** – Constant value to be multiplied by each vector element
- **pDst** – *Destination Signal Pointer*.
- **nLength** – *Signal Length*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsMulC_16u_ISfs_Ctx**(*Npp16u* nValue, *Npp16u* *pSrcDst, size_t nLength, int nScaleFactor, *NppStreamContext* nppStreamCtx)

16-bit unsigned short in place signal times constant, scale, then clamp to saturated value.

Parameters

- **pSrcDst** – *In-Place Signal Pointer*.
- **nValue** – Constant value to be multiplied by each vector element
- **nLength** – *Signal Length*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsMulC_16u_Sfs_Ctx**(const *Npp16u* *pSrc, *Npp16u* nValue, *Npp16u* *pDst, size_t nLength, int nScaleFactor, *NppStreamContext* nppStreamCtx)

16-bit unsigned short signal times constant, scale, then clamp to saturated value.

Parameters

- **pSrc** – *Source Signal Pointer*.
- **nValue** – Constant value to be multiplied by each vector element
- **pDst** – *Destination Signal Pointer*.
- **nLength** – *Signal Length*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsMulC_16s_ISfs_Ctx**(*Npp16s* nValue, *Npp16s* *pSrcDst, size_t nLength, int nScaleFactor, *NppStreamContext* nppStreamCtx)

16-bit signed short in place signal times constant, scale, then clamp to saturated value.

Parameters

- **pSrcDst** – *In-Place Signal Pointer*.
- **nValue** – Constant value to be multiplied by each vector element
- **nLength** – *Signal Length*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsMulC_16s_Sfs_Ctx**(const *Npp16s* *pSrc, *Npp16s* nValue, *Npp16s* *pDst, size_t nLength, int nScaleFactor, *NppStreamContext* nppStreamCtx)

16-bit signed short signal times constant, scale, then clamp to saturated value.

Parameters

- **pSrc** – *Source Signal Pointer*.
- **nValue** – Constant value to be multiplied by each vector element
- **pDst** – *Destination Signal Pointer*.
- **nLength** – *Signal Length*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsMulC_16sc_ISfs_Ctx**(*Npp16sc* nValue, *Npp16sc* *pSrcDst, size_t nLength, int nScaleFactor, *NppStreamContext* nppStreamCtx)

16-bit integer complex number (16 bit real, 16 bit imaginary)signal times constant, scale, then clamp to saturated value.

Parameters

- **pSrcDst** – *In-Place Signal Pointer*.
- **nValue** – Constant value to be multiplied by each vector element
- **nLength** – *Signal Length*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsMulC_16sc_Sfs_Ctx**(const *Npp16sc* *pSrc, *Npp16sc* nValue, *Npp16sc* *pDst, size_t nLength, int nScaleFactor, *NppStreamContext* nppStreamCtx)

16-bit integer complex number (16 bit real, 16 bit imaginary)signal times constant, scale, then clamp to saturated value.

Parameters

- **pSrc** – *Source Signal Pointer*.
- **nValue** – Constant value to be multiplied by each vector element
- **pDst** – *Destination Signal Pointer*.
- **nLength** – *Signal Length*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsMulC_32s_ISfs_Ctx**(*Npp32s* nValue, *Npp32s* *pSrcDst, size_t nLength, int nScaleFactor, *NppStreamContext* nppStreamCtx)

32-bit signed integer in place signal times constant and scale.

Parameters

- **pSrcDst** – *In-Place Signal Pointer*.
- **nValue** – Constant value to be multiplied by each vector element
- **nLength** – *Signal Length*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsMulC_32s_Sfs_Ctx**(const *Npp32s* *pSrc, *Npp32s* nValue, *Npp32s* *pDst, size_t nLength, int nScaleFactor, *NppStreamContext* nppStreamCtx)

32-bit signed integer signal times constant and scale.

Parameters

- **pSrc** – *Source Signal Pointer*.
- **nValue** – Constant value to be multiplied by each vector element
- **pDst** – *Destination Signal Pointer*.
- **nLength** – *Signal Length*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsMulC_32sc_ISfs_Ctx**(*Npp32sc* nValue, *Npp32sc* *pSrcDst, size_t nLength, int nScaleFactor, *NppStreamContext* nppStreamCtx)

32-bit integer complex number (32 bit real, 32 bit imaginary) in place signal times constant and scale.

Parameters

- **pSrcDst** – *In-Place Signal Pointer*.
- **nValue** – Constant value to be multiplied by each vector element
- **nLength** – *Signal Length*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsMulC_32sc_Sfs_Ctx**(const *Npp32sc* *pSrc, *Npp32sc* nValue, *Npp32sc* *pDst, size_t nLength, int nScaleFactor, *NppStreamContext* nppStreamCtx)

32-bit integer complex number (32 bit real, 32 bit imaginary) signal times constant and scale.

Parameters

- **pSrc** – *Source Signal Pointer*.
- **nValue** – Constant value to be multiplied by each vector element
- **pDst** – *Destination Signal Pointer*.
- **nLength** – *Signal Length*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsMulC_32f_I_Ctx**(*Npp32f* nValue, *Npp32f* *pSrcDst, size_t nLength, *NppStreamContext* nppStreamCtx)

32-bit floating point in place signal times constant.

Parameters

- **pSrcDst** – *In-Place Signal Pointer*.
- **nValue** – Constant value to be multiplied by each vector element
- **nLength** – *Signal Length*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsMulC_32f_Ctx**(const *Npp32f* *pSrc, *Npp32f* nValue, *Npp32f* *pDst, size_t nLength, *NppStreamContext* nppStreamCtx)

32-bit floating point signal times constant.

Parameters

- **pSrc** – *Source Signal Pointer*.
- **nValue** – Constant value to be multiplied by each vector element
- **pDst** – *Destination Signal Pointer*.
- **nLength** – *Signal Length*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsMulC_Low_32f16s_Ctx**(const *Npp32f* *pSrc, *Npp32f* nValue, *Npp16s* *pDst, size_t nLength, *NppStreamContext* nppStreamCtx)

32-bit floating point signal times constant with output converted to 16-bit signed integer.

Parameters

- **pSrc** – *Source Signal Pointer*.
- **nValue** – Constant value to be multiplied by each vector element
- **pDst** – *Destination Signal Pointer*.
- **nLength** – *Signal Length*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsMulC_32f16s_Sfs_Ctx**(const *Npp32f* *pSrc, *Npp32f* nValue, *Npp16s* *pDst, size_t nLength, int nScaleFactor, *NppStreamContext* nppStreamCtx)

32-bit floating point signal times constant with output converted to 16-bit signed integer with scaling and saturation of output result.

Parameters

- **pSrc** – *Source Signal Pointer*.
- **nValue** – Constant value to be multiplied by each vector element
- **pDst** – *Destination Signal Pointer*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nLength** – *Signal Length*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsMulC_32fc_I_Ctx**(*Npp32fc* nValue, *Npp32fc* *pSrcDst, size_t nLength, *NppStreamContext* nppStreamCtx)

32-bit floating point complex number (32 bit real, 32 bit imaginary) in place signal times constant.

Parameters

- **pSrcDst** – *In-Place Signal Pointer*.
- **nValue** – Constant value to be multiplied by each vector element
- **nLength** – *Signal Length*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsMulC_32fc_Ctx**(const *Npp32fc* *pSrc, *Npp32fc* nValue, *Npp32fc* *pDst, size_t nLength, *NppStreamContext* nppStreamCtx)

32-bit floating point complex number (32 bit real, 32 bit imaginary) signal times constant.

Parameters

- **pSrc** – *Source Signal Pointer*.
- **nValue** – Constant value to be multiplied by each vector element
- **pDst** – *Destination Signal Pointer*.
- **nLength** – *Signal Length*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsMulC_64f_I_Ctx**(*Npp64f* nValue, *Npp64f* *pSrcDst, size_t nLength, *NppStreamContext* nppStreamCtx)

64-bit floating point, in place signal times constant.

Parameters

- **pSrcDst** – *In-Place Signal Pointer*.
- **nValue** – Constant value to be multiplied by each vector element
- **nLength** – Length of the vectors, number of items.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsMulC_64f_Ctx**(const *Npp64f* *pSrc, *Npp64f* nValue, *Npp64f* *pDst, size_t nLength, *NppStreamContext* nppStreamCtx)

64-bit floating point signal times constant.

Parameters

- **pSrc** – *Source Signal Pointer*.

- **nValue** – Constant value to be multiplied by each vector element
- **pDst** – *Destination Signal Pointer*.
- **nLength** – *Signal Length*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsMulC_64f64s_ISfs_Ctx**(*Npp64f* nValue, *Npp64s* *pDst, size_t nLength, int nScaleFactor, *NppStreamContext* nppStreamCtx)

64-bit floating point signal times constant with in place conversion to 64-bit signed integer and with scaling and saturation of output result.

Parameters

- **nValue** – Constant value to be multiplied by each vector element
- **pDst** – *Destination Signal Pointer*.
- **nLength** – *Signal Length*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsMulC_64fc_I_Ctx**(*Npp64fc* nValue, *Npp64fc* *pSrcDst, size_t nLength, *NppStreamContext* nppStreamCtx)

64-bit floating point complex number (64 bit real, 64 bit imaginary) in place signal times constant.

Parameters

- **pSrcDst** – *In-Place Signal Pointer*.
- **nValue** – Constant value to be multiplied by each vector element
- **nLength** – *Signal Length*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsMulC_64fc_Ctx**(const *Npp64fc* *pSrc, *Npp64fc* nValue, *Npp64fc* *pDst, size_t nLength, *NppStreamContext* nppStreamCtx)

64-bit floating point complex number (64 bit real, 64 bit imaginary) signal times constant.

Parameters

- **pSrc** – *Source Signal Pointer*.
- **nValue** – Constant value to be multiplied by each vector element
- **pDst** – *Destination Signal Pointer*.
- **nLength** – *Signal Length*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

1.17.1.5 Signal SubC

1.17.1.5.1 SubC

Subtracts a constant from each sample of a signal.

Functions

NppStatus **nppsSubC_8u_ISfs_Ctx**(*Npp8u* nValue, *Npp8u* *pSrcDst, size_t nLength, int nScaleFactor, *NppStreamContext* nppStreamCtx)

8-bit unsigned char in place signal subtract constant, scale, then clamp to saturated value

Parameters

- **pSrcDst** – *In-Place Signal Pointer*.
- **nValue** – Constant value to be subtracted from each vector element
- **nLength** – *Signal Length*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsSubC_8u_Sfs_Ctx**(const *Npp8u* *pSrc, *Npp8u* nValue, *Npp8u* *pDst, size_t nLength, int nScaleFactor, *NppStreamContext* nppStreamCtx)

8-bit unsigned char signal subtract constant, scale, then clamp to saturated value.

Parameters

- **pSrc** – *Source Signal Pointer*.
- **nValue** – Constant value to be subtracted from each vector element
- **pDst** – *Destination Signal Pointer*.
- **nLength** – *Signal Length*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsSubC_16u_ISfs_Ctx**(*Npp16u* nValue, *Npp16u* *pSrcDst, size_t nLength, int nScaleFactor, *NppStreamContext* nppStreamCtx)

16-bit unsigned short in place signal subtract constant, scale, then clamp to saturated value.

Parameters

- **pSrcDst** – *In-Place Signal Pointer*.
- **nValue** – Constant value to be subtracted from each vector element
- **nLength** – *Signal Length*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsSubC_16u_Sfs_Ctx**(const *Npp16u* *pSrc, *Npp16u* nValue, *Npp16u* *pDst, size_t nLength, int nScaleFactor, *NppStreamContext* nppStreamCtx)

16-bit unsigned short signal subtract constant, scale, then clamp to saturated value.

Parameters

- **pSrc** – *Source Signal Pointer*.
- **nValue** – Constant value to be subtracted from each vector element
- **pDst** – *Destination Signal Pointer*.
- **nLength** – *Signal Length*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsSubC_16s_ISfs_Ctx**(*Npp16s* nValue, *Npp16s* *pSrcDst, size_t nLength, int nScaleFactor, *NppStreamContext* nppStreamCtx)

16-bit signed short in place signal subtract constant, scale, then clamp to saturated value.

Parameters

- **pSrcDst** – *In-Place Signal Pointer*.
- **nValue** – Constant value to be subtracted from each vector element
- **nLength** – *Signal Length*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsSubC_16s_Sfs_Ctx**(const *Npp16s* *pSrc, *Npp16s* nValue, *Npp16s* *pDst, size_t nLength, int nScaleFactor, *NppStreamContext* nppStreamCtx)

16-bit signed short signal subtract constant, scale, then clamp to saturated value.

Parameters

- **pSrc** – *Source Signal Pointer*.
- **nValue** – Constant value to be subtracted from each vector element

- **pDst** – *Destination Signal Pointer*.
- **nLength** – *Signal Length*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsSubC_16sc_ISfs_Ctx**(*Npp16sc* nValue, *Npp16sc* *pSrcDst, size_t nLength, int nScaleFactor, *NppStreamContext* nppStreamCtx)

16-bit integer complex number (16 bit real, 16 bit imaginary) signal subtract constant, scale, then clamp to saturated value.

Parameters

- **pSrcDst** – *In-Place Signal Pointer*.
- **nValue** – Constant value to be subtracted from each vector element
- **nLength** – *Signal Length*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsSubC_16sc_Sfs_Ctx**(const *Npp16sc* *pSrc, *Npp16sc* nValue, *Npp16sc* *pDst, size_t nLength, int nScaleFactor, *NppStreamContext* nppStreamCtx)

16-bit integer complex number (16 bit real, 16 bit imaginary) signal subtract constant, scale, then clamp to saturated value.

Parameters

- **pSrc** – *Source Signal Pointer*.
- **nValue** – Constant value to be subtracted from each vector element
- **pDst** – *Destination Signal Pointer*.
- **nLength** – *Signal Length*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsSubC_32s_ISfs_Ctx**(*Npp32s* nValue, *Npp32s* *pSrcDst, size_t nLength, int nScaleFactor, *NppStreamContext* nppStreamCtx)

32-bit signed integer in place signal subtract constant and scale.

Parameters

- **pSrcDst** – *In-Place Signal Pointer*.

- **nValue** – Constant value to be subtracted from each vector element
- **nLength** – *Signal Length*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsSubC_32s_Sfs_Ctx**(const *Npp32s* *pSrc, *Npp32s* nValue, *Npp32s* *pDst, size_t nLength, int nScaleFactor, *NppStreamContext* nppStreamCtx)

32-bit signed integer signal subtract constant and scale.

Parameters

- **pSrc** – *Source Signal Pointer*.
- **nValue** – Constant value to be subtracted from each vector element
- **pDst** – *Destination Signal Pointer*.
- **nLength** – *Signal Length*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsSubC_32sc_ISfs_Ctx**(*Npp32sc* nValue, *Npp32sc* *pSrcDst, size_t nLength, int nScaleFactor, *NppStreamContext* nppStreamCtx)

32-bit integer complex number (32 bit real, 32 bit imaginary) in place signal subtract constant and scale.

Parameters

- **pSrcDst** – *In-Place Signal Pointer*.
- **nValue** – Constant value to be subtracted from each vector element
- **nLength** – *Signal Length*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsSubC_32sc_Sfs_Ctx**(const *Npp32sc* *pSrc, *Npp32sc* nValue, *Npp32sc* *pDst, size_t nLength, int nScaleFactor, *NppStreamContext* nppStreamCtx)

32-bit integer complex number (32 bit real, 32 bit imaginary)signal subtract constant and scale.

Parameters

- **pSrc** – *Source Signal Pointer*.
- **nValue** – Constant value to be subtracted from each vector element

- **pDst** – *Destination Signal Pointer*.
- **nLength** – *Signal Length*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsSubC_32f_I_Ctx**(*Npp32f* nValue, *Npp32f* *pSrcDst, size_t nLength, *NppStreamContext* nppStreamCtx)

32-bit floating point in place signal subtract constant.

Parameters

- **pSrcDst** – *In-Place Signal Pointer*.
- **nValue** – Constant value to be subtracted from each vector element
- **nLength** – *Signal Length*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsSubC_32f_Ctx**(const *Npp32f* *pSrc, *Npp32f* nValue, *Npp32f* *pDst, size_t nLength, *NppStreamContext* nppStreamCtx)

32-bit floating point signal subtract constant.

Parameters

- **pSrc** – *Source Signal Pointer*.
- **nValue** – Constant value to be subtracted from each vector element
- **pDst** – *Destination Signal Pointer*.
- **nLength** – *Signal Length*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsSubC_32fc_I_Ctx**(*Npp32fc* nValue, *Npp32fc* *pSrcDst, size_t nLength, *NppStreamContext* nppStreamCtx)

32-bit floating point complex number (32 bit real, 32 bit imaginary) in place signal subtract constant.

Parameters

- **pSrcDst** – *In-Place Signal Pointer*.
- **nValue** – Constant value to be subtracted from each vector element
- **nLength** – *Signal Length*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsSubC_32fc_Ctx**(const *Npp32fc* *pSrc, *Npp32fc* nValue, *Npp32fc* *pDst, size_t nLength, *NppStreamContext* nppStreamCtx)

32-bit floating point complex number (32 bit real, 32 bit imaginary) signal subtract constant.

Parameters

- **pSrc** – *Source Signal Pointer*.
- **nValue** – Constant value to be subtracted from each vector element
- **pDst** – *Destination Signal Pointer*.
- **nLength** – *Signal Length*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsSubC_64f_I_Ctx**(*Npp64f* nValue, *Npp64f* *pSrcDst, size_t nLength, *NppStreamContext* nppStreamCtx)

64-bit floating point, in place signal subtract constant.

Parameters

- **pSrcDst** – *In-Place Signal Pointer*.
- **nValue** – Constant value to be subtracted from each vector element
- **nLength** – Length of the vectors, number of items.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsSubC_64f_Ctx**(const *Npp64f* *pSrc, *Npp64f* nValue, *Npp64f* *pDst, size_t nLength, *NppStreamContext* nppStreamCtx)

64-bit floating point signal subtract constant.

Parameters

- **pSrc** – *Source Signal Pointer*.
- **nValue** – Constant value to be subtracted from each vector element
- **pDst** – *Destination Signal Pointer*.
- **nLength** – *Signal Length*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsSubC_64fc_I_Ctx**(*Npp64fc* nValue, *Npp64fc* *pSrcDst, size_t nLength, *NppStreamContext* nppStreamCtx)

64-bit floating point complex number (64 bit real, 64 bit imaginary) in place signal subtract constant.

Parameters

- **pSrcDst** – *In-Place Signal Pointer*.
- **nValue** – Constant value to be subtracted from each vector element
- **nLength** – *Signal Length*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsSubC_64fc_Ctx**(const *Npp64fc* *pSrc, *Npp64fc* nValue, *Npp64fc* *pDst, size_t nLength, *NppStreamContext* nppStreamCtx)

64-bit floating point complex number (64 bit real, 64 bit imaginary) signal subtract constant.

Parameters

- **pSrc** – *Source Signal Pointer*.
- **nValue** – Constant value to be subtracted from each vector element
- **pDst** – *Destination Signal Pointer*.
- **nLength** – *Signal Length*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

1.17.1.6 Signal SubCRev

1.17.1.6.1 SubCRev

Subtracts each sample of a signal from a constant.

Functions

NppStatus **nppsSubCRev_8u_ISfs_Ctx**(*Npp8u* nValue, *Npp8u* *pSrcDst, size_t nLength, int nScaleFactor, *NppStreamContext* nppStreamCtx)

8-bit unsigned char in place signal subtract from constant, scale, then clamp to saturated value

Parameters

- **pSrcDst** – *In-Place Signal Pointer*.
- **nValue** – Constant value each vector element is to be subtracted from
- **nLength** – *Signal Length*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsSubCRev_8u_Sfs_Ctx**(const *Npp8u* *pSrc, *Npp8u* nValue, *Npp8u* *pDst, size_t nLength, int nScaleFactor, *NppStreamContext* nppStreamCtx)

8-bit unsigned char signal subtract from constant, scale, then clamp to saturated value.

Parameters

- **pSrc** – *Source Signal Pointer*.
- **nValue** – Constant value each vector element is to be subtracted from
- **pDst** – *Destination Signal Pointer*.
- **nLength** – *Signal Length*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsSubCRev_16u_ISfs_Ctx**(*Npp16u* nValue, *Npp16u* *pSrcDst, size_t nLength, int nScaleFactor, *NppStreamContext* nppStreamCtx)

16-bit unsigned short in place signal subtract from constant, scale, then clamp to saturated value.

Parameters

- **pSrcDst** – *In-Place Signal Pointer*.
- **nValue** – Constant value each vector element is to be subtracted from
- **nLength** – *Signal Length*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsSubCRev_16u_Sfs_Ctx**(const *Npp16u* *pSrc, *Npp16u* nValue, *Npp16u* *pDst, size_t nLength, int nScaleFactor, *NppStreamContext* nppStreamCtx)

16-bit unsigned short signal subtract from constant, scale, then clamp to saturated value.

Parameters

- **pSrc** – *Source Signal Pointer*.
- **nValue** – Constant value each vector element is to be subtracted from
- **pDst** – *Destination Signal Pointer*.
- **nLength** – *Signal Length*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsSubCRev_16s_ISfs_Ctx**(*Npp16s* nValue, *Npp16s* *pSrcDst, size_t nLength, int nScaleFactor, *NppStreamContext* nppStreamCtx)

16-bit signed short in place signal subtract from constant, scale, then clamp to saturated value.

Parameters

- **pSrcDst** – *In-Place Signal Pointer*.
- **nValue** – Constant value each vector element is to be subtracted from
- **nLength** – *Signal Length*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsSubCRev_16s_Sfs_Ctx**(const *Npp16s* *pSrc, *Npp16s* nValue, *Npp16s* *pDst, size_t nLength, int nScaleFactor, *NppStreamContext* nppStreamCtx)

16-bit signed short signal subtract from constant, scale, then clamp to saturated value.

Parameters

- **pSrc** – *Source Signal Pointer*.
- **nValue** – Constant value each vector element is to be subtracted from
- **pDst** – *Destination Signal Pointer*.
- **nLength** – *Signal Length*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsSubCRev_16sc_ISfs_Ctx**(*Npp16sc* nValue, *Npp16sc* *pSrcDst, size_t nLength, int nScaleFactor, *NppStreamContext* nppStreamCtx)

16-bit integer complex number (16 bit real, 16 bit imaginary) signal subtract from constant, scale, then clamp to saturated value.

Parameters

- **pSrcDst** – *In-Place Signal Pointer*.
- **nValue** – Constant value each vector element is to be subtracted from
- **nLength** – *Signal Length*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsSubCRev_16sc_Sfs_Ctx**(const *Npp16sc* *pSrc, *Npp16sc* nValue, *Npp16sc* *pDst, size_t nLength, int nScaleFactor, *NppStreamContext* nppStreamCtx)

16-bit integer complex number (16 bit real, 16 bit imaginary) signal subtract from constant, scale, then clamp to saturated value.

Parameters

- **pSrc** – *Source Signal Pointer*.
- **nValue** – Constant value each vector element is to be subtracted from
- **pDst** – *Destination Signal Pointer*.
- **nLength** – *Signal Length*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsSubCRev_32s_ISfs_Ctx**(*Npp32s* nValue, *Npp32s* *pSrcDst, size_t nLength, int nScaleFactor, *NppStreamContext* nppStreamCtx)

32-bit signed integer in place signal subtract from constant and scale.

Parameters

- **pSrcDst** – *In-Place Signal Pointer*.
- **nValue** – Constant value each vector element is to be subtracted from
- **nLength** – *Signal Length*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsSubCRev_32s_Sfs_Ctx**(const *Npp32s* *pSrc, *Npp32s* nValue, *Npp32s* *pDst, size_t nLength, int nScaleFactor, *NppStreamContext* nppStreamCtx)

32-bit signed integersignal subtract from constant and scale.

Parameters

- **pSrc** – *Source Signal Pointer*.
- **nValue** – Constant value each vector element is to be subtracted from
- **pDst** – *Destination Signal Pointer*.
- **nLength** – *Signal Length*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsSubCRev_32sc_ISfs_Ctx**(*Npp32sc* nValue, *Npp32sc* *pSrcDst, size_t nLength, int nScaleFactor, *NppStreamContext* nppStreamCtx)

32-bit integer complex number (32 bit real, 32 bit imaginary) in place signal subtract from constant and scale.

Parameters

- **pSrcDst** – *In-Place Signal Pointer*.
- **nValue** – Constant value each vector element is to be subtracted from
- **nLength** – *Signal Length*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsSubCRev_32sc_Sfs_Ctx**(const *Npp32sc* *pSrc, *Npp32sc* nValue, *Npp32sc* *pDst, size_t nLength, int nScaleFactor, *NppStreamContext* nppStreamCtx)

32-bit integer complex number (32 bit real, 32 bit imaginary) signal subtract from constant and scale.

Parameters

- **pSrc** – *Source Signal Pointer*.
- **nValue** – Constant value each vector element is to be subtracted from
- **pDst** – *Destination Signal Pointer*.
- **nLength** – *Signal Length*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsSubCRev_32f_I_Ctx**(*Npp32f* nValue, *Npp32f* *pSrcDst, size_t nLength, *NppStreamContext* nppStreamCtx)

32-bit floating point in place signal subtract from constant.

Parameters

- **pSrcDst** – *In-Place Signal Pointer*.
- **nValue** – Constant value each vector element is to be subtracted from
- **nLength** – *Signal Length*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsSubCRev_32f_Ctx**(const *Npp32f* *pSrc, *Npp32f* nValue, *Npp32f* *pDst, size_t nLength, *NppStreamContext* nppStreamCtx)

32-bit floating point signal subtract from constant.

Parameters

- **pSrc** – *Source Signal Pointer*.
- **nValue** – Constant value each vector element is to be subtracted from
- **pDst** – *Destination Signal Pointer*.
- **nLength** – *Signal Length*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsSubCRev_32fc_I_Ctx**(*Npp32fc* nValue, *Npp32fc* *pSrcDst, size_t nLength, *NppStreamContext* nppStreamCtx)

32-bit floating point complex number (32 bit real, 32 bit imaginary) in place signal subtract from constant.

Parameters

- **pSrcDst** – *In-Place Signal Pointer*.
- **nValue** – Constant value each vector element is to be subtracted from
- **nLength** – *Signal Length*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsSubCRev_32fc_Ctx**(const *Npp32fc* *pSrc, *Npp32fc* nValue, *Npp32fc* *pDst, size_t nLength, *NppStreamContext* nppStreamCtx)

32-bit floating point complex number (32 bit real, 32 bit imaginary) signal subtract from constant.

Parameters

- **pSrc** – *Source Signal Pointer*.
- **nValue** – Constant value each vector element is to be subtracted from
- **pDst** – *Destination Signal Pointer*.
- **nLength** – *Signal Length*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsSubCRev_64f_I_Ctx**(*Npp64f* nValue, *Npp64f* *pSrcDst, size_t nLength, *NppStreamContext* nppStreamCtx)

64-bit floating point, in place signal subtract from constant.

Parameters

- **pSrcDst** – *In-Place Signal Pointer*.
- **nValue** – Constant value each vector element is to be subtracted from
- **nLength** – Length of the vectors, number of items.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsSubCRev_64f_Ctx**(const *Npp64f* *pSrc, *Npp64f* nValue, *Npp64f* *pDst, size_t nLength, *NppStreamContext* nppStreamCtx)

64-bit floating point signal subtract from constant.

Parameters

- **pSrc** – *Source Signal Pointer*.
- **nValue** – Constant value each vector element is to be subtracted from
- **pDst** – *Destination Signal Pointer*.
- **nLength** – *Signal Length*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsSubCRev_64fc_I_Ctx**(*Npp64fc* nValue, *Npp64fc* *pSrcDst, size_t nLength, *NppStreamContext* nppStreamCtx)

64-bit floating point complex number (64 bit real, 64 bit imaginary) in place signal subtract from constant.

Parameters

- **pSrcDst** – *In-Place Signal Pointer*.
- **nValue** – Constant value each vector element is to be subtracted from
- **nLength** – *Signal Length*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsSubCRev_64fc_Ctx**(const *Npp64fc* *pSrc, *Npp64fc* nValue, *Npp64fc* *pDst, size_t nLength, *NppStreamContext* nppStreamCtx)

64-bit floating point complex number (64 bit real, 64 bit imaginary) signal subtract from constant.

Parameters

- **pSrc** – *Source Signal Pointer*.
- **nValue** – Constant value each vector element is to be subtracted from
- **pDst** – *Destination Signal Pointer*.
- **nLength** – *Signal Length*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

1.17.1.7 Signal DivC

1.17.1.7.1 DivC

Divides each sample of a signal by a constant.

Functions

NppStatus **nppsDivC_8u_ISfs_Ctx**(*Npp8u* nValue, *Npp8u* *pSrcDst, size_t nLength, int nScaleFactor, *NppStreamContext* nppStreamCtx)

8-bit unsigned char in place signal divided by constant, scale, then clamp to saturated value

Parameters

- **pSrcDst** – *In-Place Signal Pointer*.
- **nValue** – Constant value to be divided into each vector element
- **nLength** – *Signal Length*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsDivC_8u_Sfs_Ctx**(const *Npp8u* *pSrc, *Npp8u* nValue, *Npp8u* *pDst, size_t nLength, int nScaleFactor, *NppStreamContext* nppStreamCtx)

8-bit unsigned char signal divided by constant, scale, then clamp to saturated value.

Parameters

- **pSrc** – *Source Signal Pointer*.
- **nValue** – Constant value to be divided into each vector element
- **pDst** – *Destination Signal Pointer*.
- **nLength** – *Signal Length*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsDivC_16u_ISfs_Ctx**(*Npp16u* nValue, *Npp16u* *pSrcDst, size_t nLength, int nScaleFactor, *NppStreamContext* nppStreamCtx)

16-bit unsigned short in place signal divided by constant, scale, then clamp to saturated value.

Parameters

- **pSrcDst** – *In-Place Signal Pointer*.
- **nValue** – Constant value to be divided into each vector element
- **nLength** – *Signal Length*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsDivC_16u_Sfs_Ctx**(const *Npp16u* *pSrc, *Npp16u* nValue, *Npp16u* *pDst, size_t nLength, int nScaleFactor, *NppStreamContext* nppStreamCtx)

16-bit unsigned short signal divided by constant, scale, then clamp to saturated value.

Parameters

- **pSrc** – *Source Signal Pointer*.
- **nValue** – Constant value to be divided into each vector element
- **pDst** – *Destination Signal Pointer*.
- **nLength** – *Signal Length*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsDivC_16s_ISfs_Ctx**(*Npp16s* nValue, *Npp16s* *pSrcDst, size_t nLength, int nScaleFactor, *NppStreamContext* nppStreamCtx)

16-bit signed short in place signal divided by constant, scale, then clamp to saturated value.

Parameters

- **pSrcDst** – *In-Place Signal Pointer*.
- **nValue** – Constant value to be divided into each vector element
- **nLength** – *Signal Length*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsDivC_16s_Sfs_Ctx**(const *Npp16s* *pSrc, *Npp16s* nValue, *Npp16s* *pDst, size_t nLength, int nScaleFactor, *NppStreamContext* nppStreamCtx)

16-bit signed short signal divided by constant, scale, then clamp to saturated value.

Parameters

- **pSrc** – *Source Signal Pointer*.
- **nValue** – Constant value to be divided into each vector element

- **pDst** – *Destination Signal Pointer*.
- **nLength** – *Signal Length*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsDivC_16sc_ISfs_Ctx**(*Npp16sc* nValue, *Npp16sc* *pSrcDst, size_t nLength, int nScaleFactor, *NppStreamContext* nppStreamCtx)

16-bit integer complex number (16 bit real, 16 bit imaginary)signal divided by constant, scale, then clamp to saturated value.

Parameters

- **pSrcDst** – *In-Place Signal Pointer*.
- **nValue** – Constant value to be divided into each vector element
- **nLength** – *Signal Length*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsDivC_16sc_Sfs_Ctx**(const *Npp16sc* *pSrc, *Npp16sc* nValue, *Npp16sc* *pDst, size_t nLength, int nScaleFactor, *NppStreamContext* nppStreamCtx)

16-bit integer complex number (16 bit real, 16 bit imaginary) signal divided by constant, scale, then clamp to saturated value.

Parameters

- **pSrc** – *Source Signal Pointer*.
- **nValue** – Constant value to be divided into each vector element
- **pDst** – *Destination Signal Pointer*.
- **nLength** – *Signal Length*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsDivC_32f_I_Ctx**(*Npp32f* nValue, *Npp32f* *pSrcDst, size_t nLength, *NppStreamContext* nppStreamCtx)

32-bit floating point in place signal divided by constant.

Parameters

- **pSrcDst** – *In-Place Signal Pointer*.

- **nValue** – Constant value to be divided into each vector element
- **nLength** – *Signal Length*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsDivC_32f_Ctx**(const *Npp32f* *pSrc, *Npp32f* nValue, *Npp32f* *pDst, size_t nLength, *NppStreamContext* nppStreamCtx)

32-bit floating point signal divided by constant.

Parameters

- **pSrc** – *Source Signal Pointer*.
- **nValue** – Constant value to be divided into each vector element
- **pDst** – *Destination Signal Pointer*.
- **nLength** – *Signal Length*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsDivC_32fc_I_Ctx**(*Npp32fc* nValue, *Npp32fc* *pSrcDst, size_t nLength, *NppStreamContext* nppStreamCtx)

32-bit floating point complex number (32 bit real, 32 bit imaginary) in place signal divided by constant.

Parameters

- **pSrcDst** – *In-Place Signal Pointer*.
- **nValue** – Constant value to be divided into each vector element
- **nLength** – *Signal Length*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsDivC_32fc_Ctx**(const *Npp32fc* *pSrc, *Npp32fc* nValue, *Npp32fc* *pDst, size_t nLength, *NppStreamContext* nppStreamCtx)

32-bit floating point complex number (32 bit real, 32 bit imaginary) signal divided by constant.

Parameters

- **pSrc** – *Source Signal Pointer*.
- **nValue** – Constant value to be divided into each vector element
- **pDst** – *Destination Signal Pointer*.
- **nLength** – *Signal Length*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsDivC_64f_I_Ctx**(*Npp64f* nValue, *Npp64f* *pSrcDst, size_t nLength, *NppStreamContext* nppStreamCtx)

64-bit floating point in place signal divided by constant.

Parameters

- **pSrcDst** – *In-Place Signal Pointer*.
- **nValue** – Constant value to be divided into each vector element
- **nLength** – Length of the vectors, number of items.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsDivC_64f_Ctx**(const *Npp64f* *pSrc, *Npp64f* nValue, *Npp64f* *pDst, size_t nLength, *NppStreamContext* nppStreamCtx)

64-bit floating point signal divided by constant.

Parameters

- **pSrc** – *Source Signal Pointer*.
- **nValue** – Constant value to be divided into each vector element
- **pDst** – *Destination Signal Pointer*.
- **nLength** – *Signal Length*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsDivC_64fc_I_Ctx**(*Npp64fc* nValue, *Npp64fc* *pSrcDst, size_t nLength, *NppStreamContext* nppStreamCtx)

64-bit floating point complex number (64 bit real, 64 bit imaginary) in place signal divided by constant.

Parameters

- **pSrcDst** – *In-Place Signal Pointer*.
- **nValue** – Constant value to be divided into each vector element
- **nLength** – *Signal Length*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsDivC_64fc_Ctx**(const *Npp64fc* *pSrc, *Npp64fc* nValue, *Npp64fc* *pDst, size_t nLength, *NppStreamContext* nppStreamCtx)

64-bit floating point complex number (64 bit real, 64 bit imaginary) signal divided by constant.

Parameters

- **pSrc** – *Source Signal Pointer*.
- **nValue** – Constant value to be divided into each vector element
- **pDst** – *Destination Signal Pointer*.
- **nLength** – *Signal Length*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

1.17.1.8 Signal DivCRev

1.17.1.8.1 DivCRev

Divides a constant by each sample of a signal.

Functions

NppStatus **nppsDivCRev_16u_I_Ctx**(*Npp16u* nValue, *Npp16u* *pSrcDst, size_t nLength, *NppStreamContext* nppStreamCtx)

16-bit unsigned short in place constant divided by signal, then clamp to saturated value.

Parameters

- **pSrcDst** – *In-Place Signal Pointer*.
- **nValue** – Constant value to be divided by each vector element
- **nLength** – *Signal Length*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsDivCRev_16u_Ctx**(const *Npp16u* *pSrc, *Npp16u* nValue, *Npp16u* *pDst, size_t nLength, *NppStreamContext* nppStreamCtx)

16-bit unsigned short signal divided by constant, then clamp to saturated value.

Parameters

- **pSrc** – *Source Signal Pointer*.
- **nValue** – Constant value to be divided by each vector element
- **pDst** – *Destination Signal Pointer*.
- **nLength** – *Signal Length*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsDivCRev_32f_I_Ctx**(*Npp32f* nValue, *Npp32f* *pSrcDst, size_t nLength, *NppStreamContext* nppStreamCtx)

32-bit floating point in place constant divided by signal.

Parameters

- **pSrcDst** – *In-Place Signal Pointer*.
- **nValue** – Constant value to be divided by each vector element
- **nLength** – *Signal Length*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsDivCRev_32f_Ctx**(const *Npp32f* *pSrc, *Npp32f* nValue, *Npp32f* *pDst, size_t nLength, *NppStreamContext* nppStreamCtx)

32-bit floating point constant divided by signal.

Parameters

- **pSrc** – *Source Signal Pointer*.
- **nValue** – Constant value to be divided by each vector element
- **pDst** – *Destination Signal Pointer*.
- **nLength** – *Signal Length*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

1.17.1.9 Signal Add

1.17.1.9.1 Add

Sample by sample addition of two signals.

Functions

NppStatus **nppsAdd_16s_Ctx**(const *Npp16s* *pSrc1, const *Npp16s* *pSrc2, *Npp16s* *pDst, size_t nLength, *NppStreamContext* nppStreamCtx)

16-bit signed short signal add signal, then clamp to saturated value.

Parameters

- **pSrc1** – *Source Signal Pointer*.
- **pSrc2** – *Source Signal Pointer*. signal2 elements to be added to signal1 elements
- **pDst** – *Destination Signal Pointer*.
- **nLength** – *Signal Length*.

- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsAdd_16u_Ctx**(const *Npp16u* *pSrc1, const *Npp16u* *pSrc2, *Npp16u* *pDst, size_t nLength, *NppStreamContext* nppStreamCtx)

16-bit unsigned short signal add signal, then clamp to saturated value.

Parameters

- **pSrc1** – *Source Signal Pointer*.
- **pSrc2** – *Source Signal Pointer*. signal2 elements to be added to signal1 elements
- **pDst** – *Destination Signal Pointer*.
- **nLength** – *Signal Length*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsAdd_32u_Ctx**(const *Npp32u* *pSrc1, const *Npp32u* *pSrc2, *Npp32u* *pDst, size_t nLength, *NppStreamContext* nppStreamCtx)

32-bit unsigned int signal add signal, then clamp to saturated value.

Parameters

- **pSrc1** – *Source Signal Pointer*.
- **pSrc2** – *Source Signal Pointer*. signal2 elements to be added to signal1 elements
- **pDst** – *Destination Signal Pointer*.
- **nLength** – *Signal Length*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsAdd_32f_Ctx**(const *Npp32f* *pSrc1, const *Npp32f* *pSrc2, *Npp32f* *pDst, size_t nLength, *NppStreamContext* nppStreamCtx)

32-bit floating point signal add signal, then clamp to saturated value.

Parameters

- **pSrc1** – *Source Signal Pointer*.
- **pSrc2** – *Source Signal Pointer*. signal2 elements to be added to signal1 elements
- **pDst** – *Destination Signal Pointer*.
- **nLength** – *Signal Length*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsAdd_64f_Ctx**(const *Npp64f* *pSrc1, const *Npp64f* *pSrc2, *Npp64f* *pDst, size_t nLength, *NppStreamContext* nppStreamCtx)

64-bit floating point signal add signal, then clamp to saturated value.

Parameters

- **pSrc1** – *Source Signal Pointer*.
- **pSrc2** – *Source Signal Pointer*. signal2 elements to be added to signal1 elements
- **pDst** – *Destination Signal Pointer*.
- **nLength** – *Signal Length*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsAdd_32fc_Ctx**(const *Npp32fc* *pSrc1, const *Npp32fc* *pSrc2, *Npp32fc* *pDst, size_t nLength, *NppStreamContext* nppStreamCtx)

32-bit complex floating point signal add signal, then clamp to saturated value.

Parameters

- **pSrc1** – *Source Signal Pointer*.
- **pSrc2** – *Source Signal Pointer*. signal2 elements to be added to signal1 elements
- **pDst** – *Destination Signal Pointer*.
- **nLength** – *Signal Length*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsAdd_64fc_Ctx**(const *Npp64fc* *pSrc1, const *Npp64fc* *pSrc2, *Npp64fc* *pDst, size_t nLength, *NppStreamContext* nppStreamCtx)

64-bit complex floating point signal add signal, then clamp to saturated value.

Parameters

- **pSrc1** – *Source Signal Pointer*.
- **pSrc2** – *Source Signal Pointer*. signal2 elements to be added to signal1 elements
- **pDst** – *Destination Signal Pointer*.
- **nLength** – *Signal Length*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsAdd_8u16u_Ctx**(const *Npp8u* *pSrc1, const *Npp8u* *pSrc2, *Npp16u* *pDst, size_t nLength, *NppStreamContext* nppStreamCtx)

8-bit unsigned char signal add signal with 16-bit unsigned result, then clamp to saturated value.

Parameters

- **pSrc1** – *Source Signal Pointer*.
- **pSrc2** – *Source Signal Pointer*. signal2 elements to be added to signal1 elements
- **pDst** – *Destination Signal Pointer*.
- **nLength** – *Signal Length*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsAdd_16s32f_Ctx**(const *Npp16s* *pSrc1, const *Npp16s* *pSrc2, *Npp32f* *pDst, size_t nLength, *NppStreamContext* nppStreamCtx)

16-bit signed short signal add signal with 32-bit floating point result, then clamp to saturated value.

Parameters

- **pSrc1** – *Source Signal Pointer*.
- **pSrc2** – *Source Signal Pointer*. signal2 elements to be added to signal1 elements
- **pDst** – *Destination Signal Pointer*.
- **nLength** – *Signal Length*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsAdd_8u_Sfs_Ctx**(const *Npp8u* *pSrc1, const *Npp8u* *pSrc2, *Npp8u* *pDst, size_t nLength, int nScaleFactor, *NppStreamContext* nppStreamCtx)

8-bit unsigned char add signal, scale, then clamp to saturated value.

Parameters

- **pSrc1** – *Source Signal Pointer*.
- **pSrc2** – *Source Signal Pointer*, signal2 elements to be added to signal1 elements.
- **pDst** – *Destination Signal Pointer*.
- **nLength** – *Signal Length*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsAdd_16u_Sfs_Ctx**(const *Npp16u* *pSrc1, const *Npp16u* *pSrc2, *Npp16u* *pDst, size_t nLength, int nScaleFactor, *NppStreamContext* nppStreamCtx)

16-bit unsigned short add signal, scale, then clamp to saturated value.

Parameters

- **pSrc1** – *Source Signal Pointer*.
- **pSrc2** – *Source Signal Pointer*, signal2 elements to be added to signal1 elements.
- **pDst** – *Destination Signal Pointer*.
- **nLength** – *Signal Length*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsAdd_16s_Sfs_Ctx**(const *Npp16s* *pSrc1, const *Npp16s* *pSrc2, *Npp16s* *pDst, size_t nLength, int nScaleFactor, *NppStreamContext* nppStreamCtx)

16-bit signed short add signal, scale, then clamp to saturated value.

Parameters

- **pSrc1** – *Source Signal Pointer*.
- **pSrc2** – *Source Signal Pointer*, signal2 elements to be added to signal1 elements.
- **pDst** – *Destination Signal Pointer*.
- **nLength** – *Signal Length*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsAdd_32s_Sfs_Ctx**(const *Npp32s* *pSrc1, const *Npp32s* *pSrc2, *Npp32s* *pDst, size_t nLength, int nScaleFactor, *NppStreamContext* nppStreamCtx)

32-bit signed integer add signal, scale, then clamp to saturated value.

Parameters

- **pSrc1** – *Source Signal Pointer*.
- **pSrc2** – *Source Signal Pointer*, signal2 elements to be added to signal1 elements.
- **pDst** – *Destination Signal Pointer*.
- **nLength** – *Signal Length*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsAdd_64s_Sfs_Ctx**(const *Npp64s* *pSrc1, const *Npp64s* *pSrc2, *Npp64s* *pDst, size_t nLength, int nScaleFactor, *NppStreamContext* nppStreamCtx)

64-bit signed integer add signal, scale, then clamp to saturated value.

Parameters

- **pSrc1** – *Source Signal Pointer*.
- **pSrc2** – *Source Signal Pointer*, signal2 elements to be added to signal1 elements.
- **pDst** – *Destination Signal Pointer*.
- **nLength** – *Signal Length*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsAdd_16sc_Sfs_Ctx**(const *Npp16sc* *pSrc1, const *Npp16sc* *pSrc2, *Npp16sc* *pDst, size_t nLength, int nScaleFactor, *NppStreamContext* nppStreamCtx)

16-bit signed complex short add signal, scale, then clamp to saturated value.

Parameters

- **pSrc1** – *Source Signal Pointer*.
- **pSrc2** – *Source Signal Pointer*, signal2 elements to be added to signal1 elements.
- **pDst** – *Destination Signal Pointer*.
- **nLength** – *Signal Length*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsAdd_32sc_Sfs_Ctx**(const *Npp32sc* *pSrc1, const *Npp32sc* *pSrc2, *Npp32sc* *pDst, size_t nLength, int nScaleFactor, *NppStreamContext* nppStreamCtx)

32-bit signed complex integer add signal, scale, then clamp to saturated value.

Parameters

- **pSrc1** – *Source Signal Pointer*.
- **pSrc2** – *Source Signal Pointer*, signal2 elements to be added to signal1 elements.
- **pDst** – *Destination Signal Pointer*.
- **nLength** – *Signal Length*.

- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsAdd_16s_I_Ctx**(const *Npp16s* *pSrc, *Npp16s* *pSrcDst, size_t nLength, *NppStreamContext* nppStreamCtx)

16-bit signed short in place signal add signal, then clamp to saturated value.

Parameters

- **pSrc** – *Source Signal Pointer*.
- **pSrcDst** – *In-Place Signal Pointer*. signal2 elements to be added to signal1 elements
- **nLength** – *Signal Length*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsAdd_32f_I_Ctx**(const *Npp32f* *pSrc, *Npp32f* *pSrcDst, size_t nLength, *NppStreamContext* nppStreamCtx)

32-bit floating point in place signal add signal, then clamp to saturated value.

Parameters

- **pSrc** – *Source Signal Pointer*.
- **pSrcDst** – *In-Place Signal Pointer*. signal2 elements to be added to signal1 elements
- **nLength** – *Signal Length*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsAdd_64f_I_Ctx**(const *Npp64f* *pSrc, *Npp64f* *pSrcDst, size_t nLength, *NppStreamContext* nppStreamCtx)

64-bit floating point in place signal add signal, then clamp to saturated value.

Parameters

- **pSrc** – *Source Signal Pointer*.
- **pSrcDst** – *In-Place Signal Pointer*. signal2 elements to be added to signal1 elements
- **nLength** – *Signal Length*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsAdd_32fc_I_Ctx**(const *Npp32fc* *pSrc, *Npp32fc* *pSrcDst, size_t nLength, *NppStreamContext* nppStreamCtx)

32-bit complex floating point in place signal add signal, then clamp to saturated value.

Parameters

- **pSrc** – *Source Signal Pointer*.
- **pSrcDst** – *In-Place Signal Pointer*. signal2 elements to be added to signal1 elements
- **nLength** – *Signal Length*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsAdd_64fc_I_Ctx**(const *Npp64fc* *pSrc, *Npp64fc* *pSrcDst, size_t nLength, *NppStreamContext* nppStreamCtx)

64-bit complex floating point in place signal add signal, then clamp to saturated value.

Parameters

- **pSrc** – *Source Signal Pointer*.
- **pSrcDst** – *In-Place Signal Pointer*. signal2 elements to be added to signal1 elements
- **nLength** – *Signal Length*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsAdd_16s32s_I_Ctx**(const *Npp16s* *pSrc, *Npp32s* *pSrcDst, size_t nLength, *NppStreamContext* nppStreamCtx)

16/32-bit signed short in place signal add signal with 32-bit signed integer results, then clamp to saturated value.

Parameters

- **pSrc** – *Source Signal Pointer*.
- **pSrcDst** – *In-Place Signal Pointer*. signal2 elements to be added to signal1 elements
- **nLength** – *Signal Length*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsAdd_8u_ISfs_Ctx**(const *Npp8u* *pSrc, *Npp8u* *pSrcDst, size_t nLength, int nScaleFactor, *NppStreamContext* nppStreamCtx)

8-bit unsigned char in place signal add signal, with scaling, then clamp to saturated value.

Parameters

- **pSrc** – *Source Signal Pointer*.
- **pSrcDst** – *In-Place Signal Pointer*. signal2 elements to be added to signal1 elements
- **nLength** – *Signal Length*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsAdd_16u_ISfs_Ctx**(const *Npp16u* *pSrc, *Npp16u* *pSrcDst, size_t nLength, int nScaleFactor, *NppStreamContext* nppStreamCtx)

16-bit unsigned short in place signal add signal, with scaling, then clamp to saturated value.

Parameters

- **pSrc** – *Source Signal Pointer*.
- **pSrcDst** – *In-Place Signal Pointer*. signal2 elements to be added to signal1 elements
- **nLength** – *Signal Length*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsAdd_16s_ISfs_Ctx**(const *Npp16s* *pSrc, *Npp16s* *pSrcDst, size_t nLength, int nScaleFactor, *NppStreamContext* nppStreamCtx)

16-bit signed short in place signal add signal, with scaling, then clamp to saturated value.

Parameters

- **pSrc** – *Source Signal Pointer*.
- **pSrcDst** – *In-Place Signal Pointer*. signal2 elements to be added to signal1 elements
- **nLength** – *Signal Length*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsAdd_32s_ISfs_Ctx**(const *Npp32s* *pSrc, *Npp32s* *pSrcDst, size_t nLength, int nScaleFactor, *NppStreamContext* nppStreamCtx)

32-bit signed integer in place signal add signal, with scaling, then clamp to saturated value.

Parameters

- **pSrc** – *Source Signal Pointer*.

- **pSrcDst** – *In-Place Signal Pointer*. signal2 elements to be added to signal1 elements
- **nLength** – *Signal Length*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsAdd_16sc_ISfs_Ctx**(const *Npp16sc* *pSrc, *Npp16sc* *pSrcDst, size_t nLength, int nScaleFactor, *NppStreamContext* nppStreamCtx)

16-bit complex signed short in place signal add signal, with scaling, then clamp to saturated value.

Parameters

- **pSrc** – *Source Signal Pointer*.
- **pSrcDst** – *In-Place Signal Pointer*. signal2 elements to be added to signal1 elements
- **nLength** – *Signal Length*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsAdd_32sc_ISfs_Ctx**(const *Npp32sc* *pSrc, *Npp32sc* *pSrcDst, size_t nLength, int nScaleFactor, *NppStreamContext* nppStreamCtx)

32-bit complex signed integer in place signal add signal, with scaling, then clamp to saturated value.

Parameters

- **pSrc** – *Source Signal Pointer*.
- **pSrcDst** – *In-Place Signal Pointer*. signal2 elements to be added to signal1 elements
- **nLength** – *Signal Length*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Signal Data Related Error Codes, *Length Related Error Codes*.

1.17.1.10 Signal AddProduct

1.17.1.10.1 AddProduct

Adds sample by sample product of two signals to the destination signal.

Functions

NppStatus **nppsAddProduct_32f_Ctx**(const *Npp32f* *pSrc1, const *Npp32f* *pSrc2, *Npp32f* *pDst, size_t nLength, *NppStreamContext* nppStreamCtx)

32-bit floating point signal add product of source signal times destination signal to destination signal, then clamp to saturated value.

Parameters

- **pSrc1** – *Source Signal Pointer*.
- **pSrc2** – *Source Signal Pointer*.
- **pDst** – *Destination Signal Pointer*. product of source1 and source2 signal elements to be added to destination elements
- **nLength** – *Signal Length*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsAddProduct_64f_Ctx**(const *Npp64f* *pSrc1, const *Npp64f* *pSrc2, *Npp64f* *pDst, size_t nLength, *NppStreamContext* nppStreamCtx)

64-bit floating point signal add product of source signal times destination signal to destination signal, then clamp to saturated value.

Parameters

- **pSrc1** – *Source Signal Pointer*.
- **pSrc2** – *Source Signal Pointer*.
- **pDst** – *Destination Signal Pointer*. product of source1 and source2 signal elements to be added to destination elements
- **nLength** – *Signal Length*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsAddProduct_32fc_Ctx**(const *Npp32fc* *pSrc1, const *Npp32fc* *pSrc2, *Npp32fc* *pDst, size_t nLength, *NppStreamContext* nppStreamCtx)

32-bit complex floating point signal add product of source signal times destination signal to destination signal, then clamp to saturated value.

Parameters

- **pSrc1** – *Source Signal Pointer*.
- **pSrc2** – *Source Signal Pointer*.
- **pDst** – *Destination Signal Pointer*. product of source1 and source2 signal elements to be added to destination elements
- **nLength** – *Signal Length*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsAddProduct_64fc_Ctx**(const *Npp64fc* *pSrc1, const *Npp64fc* *pSrc2, *Npp64fc* *pDst, size_t nLength, *NppStreamContext* nppStreamCtx)

64-bit complex floating point signal add product of source signal times destination signal to destination signal, then clamp to saturated value.

Parameters

- **pSrc1** – *Source Signal Pointer*.
- **pSrc2** – *Source Signal Pointer*.
- **pDst** – *Destination Signal Pointer*. product of source1 and source2 signal elements to be added to destination elements
- **nLength** – *Signal Length*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsAddProduct_16s_Sfs_Ctx**(const *Npp16s* *pSrc1, const *Npp16s* *pSrc2, *Npp16s* *pDst, size_t nLength, int nScaleFactor, *NppStreamContext* nppStreamCtx)

16-bit signed short signal add product of source signal1 times source signal2 to destination signal, with scaling, then clamp to saturated value.

Parameters

- **pSrc1** – *Source Signal Pointer*.
- **pSrc2** – *Source Signal Pointer*.
- **pDst** – *Destination Signal Pointer*. product of source1 and source2 signal elements to be added to destination elements
- **nLength** – *Signal Length*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsAddProduct_32s_Sfs_Ctx**(const *Npp32s* *pSrc1, const *Npp32s* *pSrc2, *Npp32s* *pDst, size_t nLength, int nScaleFactor, *NppStreamContext* nppStreamCtx)

32-bit signed short signal add product of source signal1 times source signal2 to destination signal, with scaling, then clamp to saturated value.

Parameters

- **pSrc1** – *Source Signal Pointer*.
- **pSrc2** – *Source Signal Pointer*.
- **pDst** – *Destination Signal Pointer*. product of source1 and source2 signal elements to be added to destination elements
- **nLength** – *Signal Length*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsAddProduct_16s32s_Sfs_Ctx**(const *Npp16s* *pSrc1, const *Npp16s* *pSrc2, *Npp32s* *pDst, size_t nLength, int nScaleFactor, *NppStreamContext* nppStreamCtx)

16-bit signed short signal add product of source signal1 times source signal2 to 32-bit signed integer destination signal, with scaling, then clamp to saturated value.

Parameters

- **pSrc1** – *Source Signal Pointer*.
- **pSrc2** – *Source Signal Pointer*.
- **pDst** – *Destination Signal Pointer*. product of source1 and source2 signal elements to be added to destination elements
- **nLength** – *Signal Length*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Signal Data Related Error Codes, *Length Related Error Codes*.

1.17.1.11 Signal Mul

1.17.1.11.1 Mul

Sample by sample multiplication the samples of two signals.

Functions

NppStatus **nppsMul_16s_Ctx**(const *Npp16s* *pSrc1, const *Npp16s* *pSrc2, *Npp16s* *pDst, size_t nLength, *NppStreamContext* nppStreamCtx)

16-bit signed short signal times signal, then clamp to saturated value.

Parameters

- **pSrc1** – *Source Signal Pointer*.
- **pSrc2** – *Source Signal Pointer*. signal2 elements to be multiplied by signal1 elements
- **pDst** – *Destination Signal Pointer*.
- **nLength** – *Signal Length*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsMul_32f_Ctx**(const *Npp32f* *pSrc1, const *Npp32f* *pSrc2, *Npp32f* *pDst, size_t nLength, *NppStreamContext* nppStreamCtx)

32-bit floating point signal times signal, then clamp to saturated value.

Parameters

- **pSrc1** – *Source Signal Pointer*.
- **pSrc2** – *Source Signal Pointer*. signal2 elements to be multiplied by signal1 elements
- **pDst** – *Destination Signal Pointer*.
- **nLength** – *Signal Length*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsMul_64f_Ctx**(const *Npp64f* *pSrc1, const *Npp64f* *pSrc2, *Npp64f* *pDst, size_t nLength, *NppStreamContext* nppStreamCtx)

64-bit floating point signal times signal, then clamp to saturated value.

Parameters

- **pSrc1** – *Source Signal Pointer*.
- **pSrc2** – *Source Signal Pointer*. signal2 elements to be multiplied by signal1 elements
- **pDst** – *Destination Signal Pointer*.
- **nLength** – *Signal Length*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsMul_32fc_Ctx**(const *Npp32fc* *pSrc1, const *Npp32fc* *pSrc2, *Npp32fc* *pDst, size_t nLength, *NppStreamContext* nppStreamCtx)

32-bit complex floating point signal times signal, then clamp to saturated value.

Parameters

- **pSrc1** – *Source Signal Pointer*.
- **pSrc2** – *Source Signal Pointer*. signal2 elements to be multiplied by signal1 elements
- **pDst** – *Destination Signal Pointer*.
- **nLength** – *Signal Length*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsMul_64fc_Ctx**(const *Npp64fc* *pSrc1, const *Npp64fc* *pSrc2, *Npp64fc* *pDst, size_t nLength, *NppStreamContext* nppStreamCtx)

64-bit complex floating point signal times signal, then clamp to saturated value.

Parameters

- **pSrc1** – *Source Signal Pointer*.
- **pSrc2** – *Source Signal Pointer*. signal2 elements to be multiplied by signal1 elements
- **pDst** – *Destination Signal Pointer*.
- **nLength** – *Signal Length*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsMul_8u16u_Ctx**(const *Npp8u* *pSrc1, const *Npp8u* *pSrc2, *Npp16u* *pDst, size_t nLength, *NppStreamContext* nppStreamCtx)

8-bit unsigned char signal times signal with 16-bit unsigned result, then clamp to saturated value.

Parameters

- **pSrc1** – *Source Signal Pointer*.
- **pSrc2** – *Source Signal Pointer*. signal2 elements to be multiplied by signal1 elements
- **pDst** – *Destination Signal Pointer*.
- **nLength** – *Signal Length*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsMul_16s32f_Ctx**(const *Npp16s* *pSrc1, const *Npp16s* *pSrc2, *Npp32f* *pDst, size_t nLength, *NppStreamContext* nppStreamCtx)

16-bit signed short signal times signal with 32-bit floating point result, then clamp to saturated value.

Parameters

- **pSrc1** – *Source Signal Pointer*.
- **pSrc2** – *Source Signal Pointer*. signal2 elements to be multiplied by signal1 elements
- **pDst** – *Destination Signal Pointer*.
- **nLength** – *Signal Length*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsMul_32f32fc_Ctx**(const *Npp32f* *pSrc1, const *Npp32fc* *pSrc2, *Npp32fc* *pDst, size_t nLength, *NppStreamContext* nppStreamCtx)

32-bit floating point signal times 32-bit complex floating point signal with complex 32-bit floating point result, then clamp to saturated value.

Parameters

- **pSrc1** – *Source Signal Pointer*.
- **pSrc2** – *Source Signal Pointer*. signal2 elements to be multiplied by signal1 elements
- **pDst** – *Destination Signal Pointer*.
- **nLength** – *Signal Length*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsMul_8u_Sfs_Ctx**(const *Npp8u* *pSrc1, const *Npp8u* *pSrc2, *Npp8u* *pDst, size_t nLength, int nScaleFactor, *NppStreamContext* nppStreamCtx)

8-bit unsigned char signal times signal, scale, then clamp to saturated value.

Parameters

- **pSrc1** – *Source Signal Pointer*.
- **pSrc2** – *Source Signal Pointer*, signal2 elements to be multiplied by signal1 elements.
- **pDst** – *Destination Signal Pointer*.
- **nLength** – *Signal Length*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsMul_16u_Sfs_Ctx**(const *Npp16u* *pSrc1, const *Npp16u* *pSrc2, *Npp16u* *pDst, size_t nLength, int nScaleFactor, *NppStreamContext* nppStreamCtx)

16-bit unsigned short signal time signal, scale, then clamp to saturated value.

Parameters

- **pSrc1** – *Source Signal Pointer*.
- **pSrc2** – *Source Signal Pointer*, signal2 elements to be multiplied by signal1 elements.
- **pDst** – *Destination Signal Pointer*.
- **nLength** – *Signal Length*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsMul_16s_Sfs_Ctx**(const *Npp16s* *pSrc1, const *Npp16s* *pSrc2, *Npp16s* *pDst, size_t nLength, int nScaleFactor, *NppStreamContext* nppStreamCtx)

16-bit signed short signal times signal, scale, then clamp to saturated value.

Parameters

- **pSrc1** – *Source Signal Pointer*.
- **pSrc2** – *Source Signal Pointer*, signal2 elements to be multiplied by signal1 elements.
- **pDst** – *Destination Signal Pointer*.
- **nLength** – *Signal Length*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsMul_32s_Sfs_Ctx**(const *Npp32s* *pSrc1, const *Npp32s* *pSrc2, *Npp32s* *pDst, size_t nLength, int nScaleFactor, *NppStreamContext* nppStreamCtx)

32-bit signed integer signal times signal, scale, then clamp to saturated value.

Parameters

- **pSrc1** – *Source Signal Pointer*.
- **pSrc2** – *Source Signal Pointer*, signal2 elements to be multiplied by signal1 elements.

- **pDst** – *Destination Signal Pointer*.
- **nLength** – *Signal Length*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsMul_16sc_Sfs_Ctx**(const *Npp16sc* *pSrc1, const *Npp16sc* *pSrc2, *Npp16sc* *pDst, size_t nLength, int nScaleFactor, *NppStreamContext* nppStreamCtx)

16-bit signed complex short signal times signal, scale, then clamp to saturated value.

Parameters

- **pSrc1** – *Source Signal Pointer*.
- **pSrc2** – *Source Signal Pointer*, signal2 elements to be multiplied by signal1 elements.
- **pDst** – *Destination Signal Pointer*.
- **nLength** – *Signal Length*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsMul_32sc_Sfs_Ctx**(const *Npp32sc* *pSrc1, const *Npp32sc* *pSrc2, *Npp32sc* *pDst, size_t nLength, int nScaleFactor, *NppStreamContext* nppStreamCtx)

32-bit signed complex integer signal times signal, scale, then clamp to saturated value.

Parameters

- **pSrc1** – *Source Signal Pointer*.
- **pSrc2** – *Source Signal Pointer*, signal2 elements to be multiplied by signal1 elements.
- **pDst** – *Destination Signal Pointer*.
- **nLength** – *Signal Length*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsMul_16u16s_Sfs_Ctx**(const *Npp16u* *pSrc1, const *Npp16s* *pSrc2, *Npp16s* *pDst, size_t nLength, int nScaleFactor, *NppStreamContext* nppStreamCtx)

16-bit unsigned short signal times 16-bit signed short signal, scale, then clamp to 16-bit signed saturated value.

Parameters

- **pSrc1** – *Source Signal Pointer*.
- **pSrc2** – *Source Signal Pointer*, signal2 elements to be multiplied by signal1 elements.
- **pDst** – *Destination Signal Pointer*.
- **nLength** – *Signal Length*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsMul_16s32s_Sfs_Ctx**(const *Npp16s* *pSrc1, const *Npp16s* *pSrc2, *Npp32s* *pDst, size_t nLength, int nScaleFactor, *NppStreamContext* nppStreamCtx)

16-bit signed short signal times signal, scale, then clamp to 32-bit signed saturated value.

Parameters

- **pSrc1** – *Source Signal Pointer*.
- **pSrc2** – *Source Signal Pointer*, signal2 elements to be multiplied by signal1 elements.
- **pDst** – *Destination Signal Pointer*.
- **nLength** – *Signal Length*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsMul_32s32sc_Sfs_Ctx**(const *Npp32s* *pSrc1, const *Npp32sc* *pSrc2, *Npp32sc* *pDst, size_t nLength, int nScaleFactor, *NppStreamContext* nppStreamCtx)

32-bit signed integer signal times 32-bit complex signed integer signal, scale, then clamp to 32-bit complex integer saturated value.

Parameters

- **pSrc1** – *Source Signal Pointer*.
- **pSrc2** – *Source Signal Pointer*, signal2 elements to be multiplied by signal1 elements.
- **pDst** – *Destination Signal Pointer*.
- **nLength** – *Signal Length*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsMul_Low_32s_Sfs_Ctx**(const *Npp32s* *pSrc1, const *Npp32s* *pSrc2, *Npp32s* *pDst, size_t nLength, int nScaleFactor, *NppStreamContext* nppStreamCtx)

32-bit signed integer signal times signal, scale, then clamp to saturated value.

Parameters

- **pSrc1** – *Source Signal Pointer*.
- **pSrc2** – *Source Signal Pointer*, signal2 elements to be multiplied by signal1 elements.
- **pDst** – *Destination Signal Pointer*.
- **nLength** – *Signal Length*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsMul_16s_I_Ctx**(const *Npp16s* *pSrc, *Npp16s* *pSrcDst, size_t nLength, *NppStreamContext* nppStreamCtx)

16-bit signed short in place signal times signal, then clamp to saturated value.

Parameters

- **pSrc** – *Source Signal Pointer*.
- **pSrcDst** – *In-Place Signal Pointer*. signal2 elements to be multiplied by signal1 elements
- **nLength** – *Signal Length*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsMul_32f_I_Ctx**(const *Npp32f* *pSrc, *Npp32f* *pSrcDst, size_t nLength, *NppStreamContext* nppStreamCtx)

32-bit floating point in place signal times signal, then clamp to saturated value.

Parameters

- **pSrc** – *Source Signal Pointer*.
- **pSrcDst** – *In-Place Signal Pointer*. signal2 elements to be multiplied by signal1 elements
- **nLength** – *Signal Length*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsMul_64f_I_Ctx**(const *Npp64f* *pSrc, *Npp64f* *pSrcDst, size_t nLength, *NppStreamContext* nppStreamCtx)

64-bit floating point in place signal times signal, then clamp to saturated value.

Parameters

- **pSrc** – *Source Signal Pointer*.
- **pSrcDst** – *In-Place Signal Pointer*. signal2 elements to be multiplied by signal1 elements
- **nLength** – *Signal Length*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsMul_32fc_I_Ctx**(const *Npp32fc* *pSrc, *Npp32fc* *pSrcDst, size_t nLength, *NppStreamContext* nppStreamCtx)

32-bit complex floating point in place signal times signal, then clamp to saturated value.

Parameters

- **pSrc** – *Source Signal Pointer*.
- **pSrcDst** – *In-Place Signal Pointer*. signal2 elements to be multiplied by signal1 elements
- **nLength** – *Signal Length*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsMul_64fc_I_Ctx**(const *Npp64fc* *pSrc, *Npp64fc* *pSrcDst, size_t nLength, *NppStreamContext* nppStreamCtx)

64-bit complex floating point in place signal times signal, then clamp to saturated value.

Parameters

- **pSrc** – *Source Signal Pointer*.
- **pSrcDst** – *In-Place Signal Pointer*. signal2 elements to be multiplied by signal1 elements
- **nLength** – *Signal Length*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsMul_32f32fc_I_Ctx**(const *Npp32f* *pSrc, *Npp32fc* *pSrcDst, size_t nLength, *NppStreamContext* nppStreamCtx)

32-bit complex floating point in place signal times 32-bit floating point signal, then clamp to 32-bit complex floating point saturated value.

Parameters

- **pSrc** – *Source Signal Pointer*.
- **pSrcDst** – *In-Place Signal Pointer*. signal2 elements to be multiplied by signal1 elements
- **nLength** – *Signal Length*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsMul_8u_ISfs_Ctx**(const *Npp8u* *pSrc, *Npp8u* *pSrcDst, size_t nLength, int nScaleFactor, *NppStreamContext* nppStreamCtx)

8-bit unsigned char in place signal times signal, with scaling, then clamp to saturated value.

Parameters

- **pSrc** – *Source Signal Pointer*.
- **pSrcDst** – *In-Place Signal Pointer*. signal2 elements to be multiplied by signal1 elements
- **nLength** – *Signal Length*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsMul_16u_ISfs_Ctx**(const *Npp16u* *pSrc, *Npp16u* *pSrcDst, size_t nLength, int nScaleFactor, *NppStreamContext* nppStreamCtx)

16-bit unsigned short in place signal times signal, with scaling, then clamp to saturated value.

Parameters

- **pSrc** – *Source Signal Pointer*.
- **pSrcDst** – *In-Place Signal Pointer*. signal2 elements to be multiplied by signal1 elements
- **nLength** – *Signal Length*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsMul_16s_ISfs_Ctx**(const *Npp16s* *pSrc, *Npp16s* *pSrcDst, size_t nLength, int nScaleFactor, *NppStreamContext* nppStreamCtx)

16-bit signed short in place signal times signal, with scaling, then clamp to saturated value.

Parameters

- **pSrc** – *Source Signal Pointer*.
- **pSrcDst** – *In-Place Signal Pointer*. signal2 elements to be multiplied by signal1 elements

- **nLength** – *Signal Length*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsMul_32s_ISfs_Ctx**(const *Npp32s* *pSrc, *Npp32s* *pSrcDst, size_t nLength, int nScaleFactor, *NppStreamContext* nppStreamCtx)

32-bit signed integer in place signal times signal, with scaling, then clamp to saturated value.

Parameters

- **pSrc** – *Source Signal Pointer*.
- **pSrcDst** – *In-Place Signal Pointer*. signal2 elements to be multiplied by signal1 elements
- **nLength** – *Signal Length*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsMul_16sc_ISfs_Ctx**(const *Npp16sc* *pSrc, *Npp16sc* *pSrcDst, size_t nLength, int nScaleFactor, *NppStreamContext* nppStreamCtx)

16-bit complex signed short in place signal times signal, with scaling, then clamp to saturated value.

Parameters

- **pSrc** – *Source Signal Pointer*.
- **pSrcDst** – *In-Place Signal Pointer*. signal2 elements to be multiplied by signal1 elements
- **nLength** – *Signal Length*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsMul_32sc_ISfs_Ctx**(const *Npp32sc* *pSrc, *Npp32sc* *pSrcDst, size_t nLength, int nScaleFactor, *NppStreamContext* nppStreamCtx)

32-bit complex signed integer in place signal times signal, with scaling, then clamp to saturated value.

Parameters

- **pSrc** – *Source Signal Pointer*.
- **pSrcDst** – *In-Place Signal Pointer*. signal2 elements to be multiplied by signal1 elements

- **nLength** – *Signal Length*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsMul_32s32sc_ISfs_Ctx**(const *Npp32s* *pSrc, *Npp32sc* *pSrcDst, size_t nLength, int nScaleFactor, *NppStreamContext* nppStreamCtx)

32-bit complex signed integer in place signal times 32-bit signed integer signal, with scaling, then clamp to saturated value.

Parameters

- **pSrc** – *Source Signal Pointer*.
- **pSrcDst** – *In-Place Signal Pointer*. signal2 elements to be multiplied by signal1 elements
- **nLength** – *Signal Length*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

1.17.1.12 Signal Sub

1.17.1.12.1 Sub

Sample by sample subtraction of the samples of two signals.

Functions

NppStatus **nppsSub_16s_Ctx**(const *Npp16s* *pSrc1, const *Npp16s* *pSrc2, *Npp16s* *pDst, size_t nLength, *NppStreamContext* nppStreamCtx)

16-bit signed short signal subtract signal, then clamp to saturated value.

Parameters

- **pSrc1** – *Source Signal Pointer*.
- **pSrc2** – *Source Signal Pointer*. signal1 elements to be subtracted from signal2 elements
- **pDst** – *Destination Signal Pointer*.
- **nLength** – *Signal Length*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsSub_32f_Ctx**(const *Npp32f* *pSrc1, const *Npp32f* *pSrc2, *Npp32f* *pDst, size_t nLength, *NppStreamContext* nppStreamCtx)

32-bit floating point signal subtract signal, then clamp to saturated value.

Parameters

- **pSrc1** – *Source Signal Pointer*.
- **pSrc2** – *Source Signal Pointer*. signal1 elements to be subtracted from signal2 elements
- **pDst** – *Destination Signal Pointer*.
- **nLength** – *Signal Length*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsSub_64f_Ctx**(const *Npp64f* *pSrc1, const *Npp64f* *pSrc2, *Npp64f* *pDst, size_t nLength, *NppStreamContext* nppStreamCtx)

64-bit floating point signal subtract signal, then clamp to saturated value.

Parameters

- **pSrc1** – *Source Signal Pointer*.
- **pSrc2** – *Source Signal Pointer*. signal1 elements to be subtracted from signal2 elements
- **pDst** – *Destination Signal Pointer*.
- **nLength** – *Signal Length*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsSub_32fc_Ctx**(const *Npp32fc* *pSrc1, const *Npp32fc* *pSrc2, *Npp32fc* *pDst, size_t nLength, *NppStreamContext* nppStreamCtx)

32-bit complex floating point signal subtract signal, then clamp to saturated value.

Parameters

- **pSrc1** – *Source Signal Pointer*.
- **pSrc2** – *Source Signal Pointer*. signal1 elements to be subtracted from signal2 elements
- **pDst** – *Destination Signal Pointer*.
- **nLength** – *Signal Length*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsSub_64fc_Ctx**(const *Npp64fc* *pSrc1, const *Npp64fc* *pSrc2, *Npp64fc* *pDst, size_t nLength, *NppStreamContext* nppStreamCtx)

64-bit complex floating point signal subtract signal, then clamp to saturated value.

Parameters

- **pSrc1** – *Source Signal Pointer*.
- **pSrc2** – *Source Signal Pointer*. signal1 elements to be subtracted from signal2 elements
- **pDst** – *Destination Signal Pointer*.
- **nLength** – *Signal Length*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsSub_16s32f_Ctx**(const *Npp16s* *pSrc1, const *Npp16s* *pSrc2, *Npp32f* *pDst, size_t nLength, *NppStreamContext* nppStreamCtx)

16-bit signed short signal subtract 16-bit signed short signal, then clamp and convert to 32-bit floating point saturated value.

Parameters

- **pSrc1** – *Source Signal Pointer*.
- **pSrc2** – *Source Signal Pointer*. signal1 elements to be subtracted from signal2 elements
- **pDst** – *Destination Signal Pointer*.
- **nLength** – *Signal Length*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsSub_8u_Sfs_Ctx**(const *Npp8u* *pSrc1, const *Npp8u* *pSrc2, *Npp8u* *pDst, size_t nLength, int nScaleFactor, *NppStreamContext* nppStreamCtx)

8-bit unsigned char signal subtract signal, scale, then clamp to saturated value.

Parameters

- **pSrc1** – *Source Signal Pointer*.
- **pSrc2** – *Source Signal Pointer*, signal1 elements to be subtracted from signal2 elements.
- **pDst** – *Destination Signal Pointer*.
- **nLength** – *Signal Length*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsSub_16u_Sfs_Ctx**(const *Npp16u* *pSrc1, const *Npp16u* *pSrc2, *Npp16u* *pDst, size_t nLength, int nScaleFactor, *NppStreamContext* nppStreamCtx)

16-bit unsigned short signal subtract signal, scale, then clamp to saturated value.

Parameters

- **pSrc1** – *Source Signal Pointer*.
- **pSrc2** – *Source Signal Pointer*, signal1 elements to be subtracted from signal2 elements.
- **pDst** – *Destination Signal Pointer*.
- **nLength** – *Signal Length*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsSub_16s_Sfs_Ctx**(const *Npp16s* *pSrc1, const *Npp16s* *pSrc2, *Npp16s* *pDst, size_t nLength, int nScaleFactor, *NppStreamContext* nppStreamCtx)

16-bit signed short signal subtract signal, scale, then clamp to saturated value.

Parameters

- **pSrc1** – *Source Signal Pointer*.
- **pSrc2** – *Source Signal Pointer*, signal1 elements to be subtracted from signal2 elements.
- **pDst** – *Destination Signal Pointer*.
- **nLength** – *Signal Length*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsSub_32s_Sfs_Ctx**(const *Npp32s* *pSrc1, const *Npp32s* *pSrc2, *Npp32s* *pDst, size_t nLength, int nScaleFactor, *NppStreamContext* nppStreamCtx)

32-bit signed integer signal subtract signal, scale, then clamp to saturated value.

Parameters

- **pSrc1** – *Source Signal Pointer*.
- **pSrc2** – *Source Signal Pointer*, signal1 elements to be subtracted from signal2 elements.
- **pDst** – *Destination Signal Pointer*.
- **nLength** – *Signal Length*.

- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsSub_16sc_Sfs_Ctx**(const *Npp16sc* *pSrc1, const *Npp16sc* *pSrc2, *Npp16sc* *pDst, size_t nLength, int nScaleFactor, *NppStreamContext* nppStreamCtx)

16-bit signed complex short signal subtract signal, scale, then clamp to saturated value.

Parameters

- **pSrc1** – *Source Signal Pointer*.
- **pSrc2** – *Source Signal Pointer*, signal1 elements to be subtracted from signal2 elements.
- **pDst** – *Destination Signal Pointer*.
- **nLength** – *Signal Length*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsSub_32sc_Sfs_Ctx**(const *Npp32sc* *pSrc1, const *Npp32sc* *pSrc2, *Npp32sc* *pDst, size_t nLength, int nScaleFactor, *NppStreamContext* nppStreamCtx)

32-bit signed complex integer signal subtract signal, scale, then clamp to saturated value.

Parameters

- **pSrc1** – *Source Signal Pointer*.
- **pSrc2** – *Source Signal Pointer*, signal1 elements to be subtracted from signal2 elements.
- **pDst** – *Destination Signal Pointer*.
- **nLength** – *Signal Length*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsSub_16s_I_Ctx**(const *Npp16s* *pSrc, *Npp16s* *pSrcDst, size_t nLength, *NppStreamContext* nppStreamCtx)

16-bit signed short in place signal subtract signal, then clamp to saturated value.

Parameters

- **pSrc** – *Source Signal Pointer*.

- **pSrcDst** – *In-Place Signal Pointer*. signal1 elements to be subtracted from signal2 elements
- **nLength** – *Signal Length*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsSub_32f_I_Ctx**(const *Npp32f* *pSrc, *Npp32f* *pSrcDst, size_t nLength, *NppStreamContext* nppStreamCtx)

32-bit floating point in place signal subtract signal, then clamp to saturated value.

Parameters

- **pSrc** – *Source Signal Pointer*.
- **pSrcDst** – *In-Place Signal Pointer*. signal1 elements to be subtracted from signal2 elements
- **nLength** – *Signal Length*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsSub_64f_I_Ctx**(const *Npp64f* *pSrc, *Npp64f* *pSrcDst, size_t nLength, *NppStreamContext* nppStreamCtx)

64-bit floating point in place signal subtract signal, then clamp to saturated value.

Parameters

- **pSrc** – *Source Signal Pointer*.
- **pSrcDst** – *In-Place Signal Pointer*. signal1 elements to be subtracted from signal2 elements
- **nLength** – *Signal Length*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsSub_32fc_I_Ctx**(const *Npp32fc* *pSrc, *Npp32fc* *pSrcDst, size_t nLength, *NppStreamContext* nppStreamCtx)

32-bit complex floating point in place signal subtract signal, then clamp to saturated value.

Parameters

- **pSrc** – *Source Signal Pointer*.
- **pSrcDst** – *In-Place Signal Pointer*. signal1 elements to be subtracted from signal2 elements
- **nLength** – *Signal Length*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsSub_64fc_I_Ctx**(const *Npp64fc* *pSrc, *Npp64fc* *pSrcDst, size_t nLength, *NppStreamContext* nppStreamCtx)

64-bit complex floating point in place signal subtract signal, then clamp to saturated value.

Parameters

- **pSrc** – *Source Signal Pointer*.
- **pSrcDst** – *In-Place Signal Pointer*. signal1 elements to be subtracted from signal2 elements
- **nLength** – *Signal Length*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsSub_8u_ISfs_Ctx**(const *Npp8u* *pSrc, *Npp8u* *pSrcDst, size_t nLength, int nScaleFactor, *NppStreamContext* nppStreamCtx)

8-bit unsigned char in place signal subtract signal, with scaling, then clamp to saturated value.

Parameters

- **pSrc** – *Source Signal Pointer*.
- **pSrcDst** – *In-Place Signal Pointer*. signal1 elements to be subtracted from signal2 elements
- **nLength** – *Signal Length*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsSub_16u_ISfs_Ctx**(const *Npp16u* *pSrc, *Npp16u* *pSrcDst, size_t nLength, int nScaleFactor, *NppStreamContext* nppStreamCtx)

16-bit unsigned short in place signal subtract signal, with scaling, then clamp to saturated value.

Parameters

- **pSrc** – *Source Signal Pointer*.
- **pSrcDst** – *In-Place Signal Pointer*. signal1 elements to be subtracted from signal2 elements
- **nLength** – *Signal Length*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsSub_16s_ISfs_Ctx**(const *Npp16s* *pSrc, *Npp16s* *pSrcDst, size_t nLength, int nScaleFactor, *NppStreamContext* nppStreamCtx)

16-bit signed short in place signal subtract signal, with scaling, then clamp to saturated value.

Parameters

- **pSrc** – *Source Signal Pointer*.
- **pSrcDst** – *In-Place Signal Pointer*. signal1 elements to be subtracted from signal2 elements
- **nLength** – *Signal Length*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsSub_32s_ISfs_Ctx**(const *Npp32s* *pSrc, *Npp32s* *pSrcDst, size_t nLength, int nScaleFactor, *NppStreamContext* nppStreamCtx)

32-bit signed integer in place signal subtract signal, with scaling, then clamp to saturated value.

Parameters

- **pSrc** – *Source Signal Pointer*.
- **pSrcDst** – *In-Place Signal Pointer*. signal1 elements to be subtracted from signal2 elements
- **nLength** – *Signal Length*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsSub_16sc_ISfs_Ctx**(const *Npp16sc* *pSrc, *Npp16sc* *pSrcDst, size_t nLength, int nScaleFactor, *NppStreamContext* nppStreamCtx)

16-bit complex signed short in place signal subtract signal, with scaling, then clamp to saturated value.

Parameters

- **pSrc** – *Source Signal Pointer*.
- **pSrcDst** – *In-Place Signal Pointer*. signal1 elements to be subtracted from signal2 elements
- **nLength** – *Signal Length*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsSub_32sc_ISfs_Ctx**(const *Npp32sc* *pSrc, *Npp32sc* *pSrcDst, size_t nLength, int nScaleFactor, *NppStreamContext* nppStreamCtx)

32-bit complex signed integer in place signal subtract signal, with scaling, then clamp to saturated value.

Parameters

- **pSrc** – *Source Signal Pointer*.
- **pSrcDst** – *In-Place Signal Pointer*. signal1 elements to be subtracted from signal2 elements
- **nLength** – *Signal Length*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Signal Data Related Error Codes, *Length Related Error Codes*.

1.17.1.13 Signal Div

1.17.1.13.1 Div

Sample by sample division of the samples of two signals.

Functions

NppStatus **nppsDiv_8u_Sfs_Ctx**(const *Npp8u* *pSrc1, const *Npp8u* *pSrc2, *Npp8u* *pDst, size_t nLength, int nScaleFactor, *NppStreamContext* nppStreamCtx)

8-bit unsigned char signal divide signal, scale, then clamp to saturated value.

Parameters

- **pSrc1** – *Source Signal Pointer*.
- **pSrc2** – *Source Signal Pointer*, signal1 divisor elements to be divided into signal2 dividend elements.
- **pDst** – *Destination Signal Pointer*.
- **nLength** – *Signal Length*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsDiv_16u_Sfs_Ctx**(const *Npp16u* *pSrc1, const *Npp16u* *pSrc2, *Npp16u* *pDst, size_t nLength, int nScaleFactor, *NppStreamContext* nppStreamCtx)

16-bit unsigned short signal divide signal, scale, then clamp to saturated value.

Parameters

- **pSrc1** – *Source Signal Pointer*.
- **pSrc2** – *Source Signal Pointer*, signal1 divisor elements to be divided into signal2 dividend elements.
- **pDst** – *Destination Signal Pointer*.
- **nLength** – *Signal Length*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsDiv_16s_Sfs_Ctx**(const *Npp16s* *pSrc1, const *Npp16s* *pSrc2, *Npp16s* *pDst, size_t nLength, int nScaleFactor, *NppStreamContext* nppStreamCtx)

16-bit signed short signal divide signal, scale, then clamp to saturated value.

Parameters

- **pSrc1** – *Source Signal Pointer*.
- **pSrc2** – *Source Signal Pointer*, signal1 divisor elements to be divided into signal2 dividend elements.
- **pDst** – *Destination Signal Pointer*.
- **nLength** – *Signal Length*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsDiv_32s_Sfs_Ctx**(const *Npp32s* *pSrc1, const *Npp32s* *pSrc2, *Npp32s* *pDst, size_t nLength, int nScaleFactor, *NppStreamContext* nppStreamCtx)

32-bit signed integer signal divide signal, scale, then clamp to saturated value.

Parameters

- **pSrc1** – *Source Signal Pointer*.
- **pSrc2** – *Source Signal Pointer*, signal1 divisor elements to be divided into signal2 dividend elements.
- **pDst** – *Destination Signal Pointer*.
- **nLength** – *Signal Length*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsDiv_16sc_Sfs_Ctx**(const *Npp16sc* *pSrc1, const *Npp16sc* *pSrc2, *Npp16sc* *pDst, size_t nLength, int nScaleFactor, *NppStreamContext* nppStreamCtx)

16-bit signed complex short signal divide signal, scale, then clamp to saturated value.

Parameters

- **pSrc1** – *Source Signal Pointer*.
- **pSrc2** – *Source Signal Pointer*, signal1 divisor elements to be divided into signal2 dividend elements.
- **pDst** – *Destination Signal Pointer*.
- **nLength** – *Signal Length*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsDiv_32s16s_Sfs_Ctx**(const *Npp16s* *pSrc1, const *Npp32s* *pSrc2, *Npp16s* *pDst, size_t nLength, int nScaleFactor, *NppStreamContext* nppStreamCtx)

32-bit signed integer signal divided by 16-bit signed short signal, scale, then clamp to 16-bit signed short saturated value.

Parameters

- **pSrc1** – *Source Signal Pointer*.
- **pSrc2** – *Source Signal Pointer*, signal1 divisor elements to be divided into signal2 dividend elements.
- **pDst** – *Destination Signal Pointer*.
- **nLength** – *Signal Length*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsDiv_32f_Ctx**(const *Npp32f* *pSrc1, const *Npp32f* *pSrc2, *Npp32f* *pDst, size_t nLength, *NppStreamContext* nppStreamCtx)

32-bit floating point signal divide signal, then clamp to saturated value.

Parameters

- **pSrc1** – *Source Signal Pointer*.
- **pSrc2** – *Source Signal Pointer*, signal1 divisor elements to be divided into signal2 dividend elements.
- **pDst** – *Destination Signal Pointer*.
- **nLength** – *Signal Length*.

- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsDiv_64f_Ctx**(const *Npp64f* *pSrc1, const *Npp64f* *pSrc2, *Npp64f* *pDst, size_t nLength, *NppStreamContext* nppStreamCtx)

64-bit floating point signal divide signal, then clamp to saturated value.

Parameters

- **pSrc1** – *Source Signal Pointer*.
- **pSrc2** – *Source Signal Pointer*, signal1 divisor elements to be divided into signal2 dividend elements.
- **pDst** – *Destination Signal Pointer*.
- **nLength** – *Signal Length*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsDiv_32fc_Ctx**(const *Npp32fc* *pSrc1, const *Npp32fc* *pSrc2, *Npp32fc* *pDst, size_t nLength, *NppStreamContext* nppStreamCtx)

32-bit complex floating point signal divide signal, then clamp to saturated value.

Parameters

- **pSrc1** – *Source Signal Pointer*.
- **pSrc2** – *Source Signal Pointer*, signal1 divisor elements to be divided into signal2 dividend elements.
- **pDst** – *Destination Signal Pointer*.
- **nLength** – *Signal Length*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsDiv_64fc_Ctx**(const *Npp64fc* *pSrc1, const *Npp64fc* *pSrc2, *Npp64fc* *pDst, size_t nLength, *NppStreamContext* nppStreamCtx)

64-bit complex floating point signal divide signal, then clamp to saturated value.

Parameters

- **pSrc1** – *Source Signal Pointer*.
- **pSrc2** – *Source Signal Pointer*, signal1 divisor elements to be divided into signal2 dividend elements.
- **pDst** – *Destination Signal Pointer*.
- **nLength** – *Signal Length*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsDiv_8u_ISfs_Ctx**(const *Npp8u* *pSrc, *Npp8u* *pSrcDst, size_t nLength, int nScaleFactor, *NppStreamContext* nppStreamCtx)

8-bit unsigned char in place signal divide signal, with scaling, then clamp to saturated value.

Parameters

- **pSrc** – *Source Signal Pointer*.
- **pSrcDst** – *In-Place Signal Pointer*. signal1 divisor elements to be divided into signal2 dividend elements
- **nLength** – *Signal Length*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsDiv_16u_ISfs_Ctx**(const *Npp16u* *pSrc, *Npp16u* *pSrcDst, size_t nLength, int nScaleFactor, *NppStreamContext* nppStreamCtx)

16-bit unsigned short in place signal divide signal, with scaling, then clamp to saturated value.

Parameters

- **pSrc** – *Source Signal Pointer*.
- **pSrcDst** – *In-Place Signal Pointer*. signal1 divisor elements to be divided into signal2 dividend elements
- **nLength** – *Signal Length*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsDiv_16s_ISfs_Ctx**(const *Npp16s* *pSrc, *Npp16s* *pSrcDst, size_t nLength, int nScaleFactor, *NppStreamContext* nppStreamCtx)

16-bit signed short in place signal divide signal, with scaling, then clamp to saturated value.

Parameters

- **pSrc** – *Source Signal Pointer*.
- **pSrcDst** – *In-Place Signal Pointer*. signal1 divisor elements to be divided into signal2 dividend elements
- **nLength** – *Signal Length*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsDiv_16sc_ISfs_Ctx**(const *Npp16sc* *pSrc, *Npp16sc* *pSrcDst, size_t nLength, int nScaleFactor, *NppStreamContext* nppStreamCtx)

16-bit complex signed short in place signal divide signal, with scaling, then clamp to saturated value.

Parameters

- **pSrc** – *Source Signal Pointer*.
- **pSrcDst** – *In-Place Signal Pointer*. signal1 divisor elements to be divided into signal2 dividend elements
- **nLength** – *Signal Length*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsDiv_32s_ISfs_Ctx**(const *Npp32s* *pSrc, *Npp32s* *pSrcDst, size_t nLength, int nScaleFactor, *NppStreamContext* nppStreamCtx)

32-bit signed integer in place signal divide signal, with scaling, then clamp to saturated value.

Parameters

- **pSrc** – *Source Signal Pointer*.
- **pSrcDst** – *In-Place Signal Pointer*. signal1 divisor elements to be divided into signal2 dividend elements
- **nLength** – *Signal Length*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsDiv_32f_I_Ctx**(const *Npp32f* *pSrc, *Npp32f* *pSrcDst, size_t nLength, *NppStreamContext* nppStreamCtx)

32-bit floating point in place signal divide signal, then clamp to saturated value.

Parameters

- **pSrc** – *Source Signal Pointer*.
- **pSrcDst** – *In-Place Signal Pointer*. signal1 divisor elements to be divided into signal2 dividend elements
- **nLength** – *Signal Length*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsDiv_64f_I_Ctx**(const *Npp64f* *pSrc, *Npp64f* *pSrcDst, size_t nLength, *NppStreamContext* nppStreamCtx)

64-bit floating point in place signal divide signal, then clamp to saturated value.

Parameters

- **pSrc** – *Source Signal Pointer*.
- **pSrcDst** – *In-Place Signal Pointer*. signal1 divisor elements to be divided into signal2 dividend elements
- **nLength** – *Signal Length*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsDiv_32fc_I_Ctx**(const *Npp32fc* *pSrc, *Npp32fc* *pSrcDst, size_t nLength, *NppStreamContext* nppStreamCtx)

32-bit complex floating point in place signal divide signal, then clamp to saturated value.

Parameters

- **pSrc** – *Source Signal Pointer*.
- **pSrcDst** – *In-Place Signal Pointer*. signal1 divisor elements to be divided into signal2 dividend elements
- **nLength** – *Signal Length*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsDiv_64fc_I_Ctx**(const *Npp64fc* *pSrc, *Npp64fc* *pSrcDst, size_t nLength, *NppStreamContext* nppStreamCtx)

64-bit complex floating point in place signal divide signal, then clamp to saturated value.

Parameters

- **pSrc** – *Source Signal Pointer*.
- **pSrcDst** – *In-Place Signal Pointer*. signal1 divisor elements to be divided into signal2 dividend elements
- **nLength** – *Signal Length*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Signal Data Related Error Codes, *Length Related Error Codes*.

1.17.1.14 Signal Div Round

1.17.1.14.1 Div_Round

Sample by sample division of the samples of two signals with rounding.

Functions

NppStatus **nppsDiv_Round_8u_Sfs_Ctx**(const *Npp8u* *pSrc1, const *Npp8u* *pSrc2, *Npp8u* *pDst, size_t nLength, *NppRoundMode* nRndMode, int nScaleFactor, *NppStreamContext* nppStreamCtx)

8-bit unsigned char signal divide signal, scale, then clamp to saturated value.

Parameters

- **pSrc1** – *Source Signal Pointer*.
- **pSrc2** – *Source Signal Pointer*, signal1 divisor elements to be divided into signal2 dividend elements.
- **pDst** – *Destination Signal Pointer*.
- **nLength** – *Signal Length*.
- **nRndMode** – various rounding modes.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsDiv_Round_16u_Sfs_Ctx**(const *Npp16u* *pSrc1, const *Npp16u* *pSrc2, *Npp16u* *pDst, size_t nLength, *NppRoundMode* nRndMode, int nScaleFactor, *NppStreamContext* nppStreamCtx)

16-bit unsigned short signal divide signal, scale, round, then clamp to saturated value.

Parameters

- **pSrc1** – *Source Signal Pointer*.
- **pSrc2** – *Source Signal Pointer*, signal1 divisor elements to be divided into signal2 dividend elements.
- **pDst** – *Destination Signal Pointer*.
- **nLength** – *Signal Length*.
- **nRndMode** – various rounding modes.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsDiv_Round_16s_Sfs_Ctx**(const *Npp16s* *pSrc1, const *Npp16s* *pSrc2, *Npp16s* *pDst, size_t nLength, *NppRoundMode* nRndMode, int nScaleFactor, *NppStreamContext* nppStreamCtx)

16-bit signed short signal divide signal, scale, round, then clamp to saturated value.

Parameters

- **pSrc1** – *Source Signal Pointer*.
- **pSrc2** – *Source Signal Pointer*, signal1 divisor elements to be divided into signal2 dividend elements.
- **pDst** – *Destination Signal Pointer*.
- **nLength** – *Signal Length*.
- **nRndMode** – various rounding modes.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsDiv_Round_8u_ISfs_Ctx**(const *Npp8u* *pSrc, *Npp8u* *pSrcDst, size_t nLength, *NppRoundMode* nRndMode, int nScaleFactor, *NppStreamContext* nppStreamCtx)

8-bit unsigned char in place signal divide signal, with scaling, rounding then clamp to saturated value.

Parameters

- **pSrc** – *Source Signal Pointer*.
- **pSrcDst** – *In-Place Signal Pointer*. signal1 divisor elements to be divided into signal2 dividend elements
- **nLength** – *Signal Length*.
- **nRndMode** – various rounding modes.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsDiv_Round_16u_ISfs_Ctx**(const *Npp16u* *pSrc, *Npp16u* *pSrcDst, size_t nLength, *NppRoundMode* nRndMode, int nScaleFactor, *NppStreamContext* nppStreamCtx)

16-bit unsigned short in place signal divide signal, with scaling, rounding then clamp to saturated value.

Parameters

- **pSrc** – *Source Signal Pointer*.
- **pSrcDst** – *In-Place Signal Pointer*. signal1 divisor elements to be divided into signal2 dividend elements

- **nLength** – *Signal Length*.
- **nRndMode** – various rounding modes.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsDiv_Round_16s_ISfs_Ctx**(const *Npp16s* *pSrc, *Npp16s* *pSrcDst, size_t nLength, *NppRoundMode* nRndMode, int nScaleFactor, *NppStreamContext* nppStreamCtx)

16-bit signed short in place signal divide signal, with scaling, rounding then clamp to saturated value.

Parameters

- **pSrc** – *Source Signal Pointer*.
- **pSrcDst** – *In-Place Signal Pointer*. signal1 divisor elements to be divided into signal2 dividend elements
- **nLength** – *Signal Length*.
- **nRndMode** – various rounding modes.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Signal Data Related Error Codes, *Length Related Error Codes*.

1.17.1.15 Signal Abs

1.17.1.15.1 Abs

Absolute value of each sample of a signal.

Functions

NppStatus **nppsAbs_16s_Ctx**(const *Npp16s* *pSrc, *Npp16s* *pDst, size_t nLength, *NppStreamContext* nppStreamCtx)

16-bit signed short signal absolute value.

Parameters

- **pSrc** – *Source Signal Pointer*.
- **pDst** – *Destination Signal Pointer*.
- **nLength** – *Signal Length*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsAbs_32s_Ctx**(const *Npp32s* *pSrc, *Npp32s* *pDst, size_t nLength, *NppStreamContext* nppStreamCtx)

32-bit signed integer signal absolute value.

Parameters

- **pSrc** – *Source Signal Pointer*.
- **pDst** – *Destination Signal Pointer*.
- **nLength** – *Signal Length*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsAbs_32f_Ctx**(const *Npp32f* *pSrc, *Npp32f* *pDst, size_t nLength, *NppStreamContext* nppStreamCtx)

32-bit floating point signal absolute value.

Parameters

- **pSrc** – *Source Signal Pointer*.
- **pDst** – *Destination Signal Pointer*.
- **nLength** – *Signal Length*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsAbs_64f_Ctx**(const *Npp64f* *pSrc, *Npp64f* *pDst, size_t nLength, *NppStreamContext* nppStreamCtx)

64-bit floating point signal absolute value.

Parameters

- **pSrc** – *Source Signal Pointer*.
- **pDst** – *Destination Signal Pointer*.
- **nLength** – *Signal Length*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsAbs_16s_I_Ctx**(*Npp16s* *pSrcDst, size_t nLength, *NppStreamContext* nppStreamCtx)

16-bit signed short signal absolute value.

Parameters

- **pSrcDst** – *In-Place Signal Pointer*.

- **nLength** – *Signal Length*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsAbs_32s_I_Ctx**(*Npp32s* *pSrcDst, size_t nLength, *NppStreamContext* nppStreamCtx)

32-bit signed integer signal absolute value.

Parameters

- **pSrcDst** – *In-Place Signal Pointer*.
- **nLength** – *Signal Length*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsAbs_32f_I_Ctx**(*Npp32f* *pSrcDst, size_t nLength, *NppStreamContext* nppStreamCtx)

32-bit floating point signal absolute value.

Parameters

- **pSrcDst** – *In-Place Signal Pointer*.
- **nLength** – *Signal Length*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsAbs_64f_I_Ctx**(*Npp64f* *pSrcDst, size_t nLength, *NppStreamContext* nppStreamCtx)

64-bit floating point signal absolute value.

Parameters

- **pSrcDst** – *In-Place Signal Pointer*.
- **nLength** – *Signal Length*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

1.17.1.16 Signal Square

1.17.1.16.1 Sqr

Squares each sample of a signal.

Functions

NppStatus **nppsSqr_32f_Ctx**(const *Npp32f* *pSrc, *Npp32f* *pDst, size_t nLength, *NppStreamContext* nppStreamCtx)

32-bit floating point signal squared.

Parameters

- **pSrc** – *Source Signal Pointer*.
- **pDst** – *Destination Signal Pointer*.
- **nLength** – *Signal Length*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsSqr_64f_Ctx**(const *Npp64f* *pSrc, *Npp64f* *pDst, size_t nLength, *NppStreamContext* nppStreamCtx)

64-bit floating point signal squared.

Parameters

- **pSrc** – *Source Signal Pointer*.
- **pDst** – *Destination Signal Pointer*.
- **nLength** – *Signal Length*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsSqr_32fc_Ctx**(const *Npp32fc* *pSrc, *Npp32fc* *pDst, size_t nLength, *NppStreamContext* nppStreamCtx)

32-bit complex floating point signal squared.

Parameters

- **pSrc** – *Source Signal Pointer*.
- **pDst** – *Destination Signal Pointer*.
- **nLength** – *Signal Length*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsSqr_64fc_Ctx**(const *Npp64fc* *pSrc, *Npp64fc* *pDst, size_t nLength, *NppStreamContext* nppStreamCtx)

64-bit complex floating point signal squared.

Parameters

- **pSrc** – *Source Signal Pointer*.
- **pDst** – *Destination Signal Pointer*.
- **nLength** – *Signal Length*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsSqr_32f_I_Ctx**(*Npp32f* *pSrcDst, size_t nLength, *NppStreamContext* nppStreamCtx)

32-bit floating point signal squared.

Parameters

- **pSrcDst** – *In-Place Signal Pointer*.
- **nLength** – *Signal Length*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsSqr_64f_I_Ctx**(*Npp64f* *pSrcDst, size_t nLength, *NppStreamContext* nppStreamCtx)

64-bit floating point signal squared.

Parameters

- **pSrcDst** – *In-Place Signal Pointer*.
- **nLength** – *Signal Length*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsSqr_32fc_I_Ctx**(*Npp32fc* *pSrcDst, size_t nLength, *NppStreamContext* nppStreamCtx)

32-bit complex floating point signal squared.

Parameters

- **pSrcDst** – *In-Place Signal Pointer*.
- **nLength** – *Signal Length*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsSqr_64fc_I_Ctx**(*Npp64fc* *pSrcDst, size_t nLength, *NppStreamContext* nppStreamCtx)

64-bit complex floating point signal squared.

Parameters

- **pSrcDst** – *In-Place Signal Pointer*.
- **nLength** – *Signal Length*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsSqr_8u_Sfs_Ctx**(const *Npp8u* *pSrc, *Npp8u* *pDst, size_t nLength, int nScaleFactor, *NppStreamContext* nppStreamCtx)

8-bit unsigned char signal squared, scale, then clamp to saturated value.

Parameters

- **pSrc** – *Source Signal Pointer*.
- **pDst** – *Destination Signal Pointer*.
- **nLength** – *Signal Length*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsSqr_16u_Sfs_Ctx**(const *Npp16u* *pSrc, *Npp16u* *pDst, size_t nLength, int nScaleFactor, *NppStreamContext* nppStreamCtx)

16-bit unsigned short signal squared, scale, then clamp to saturated value.

Parameters

- **pSrc** – *Source Signal Pointer*.
- **pDst** – *Destination Signal Pointer*.
- **nLength** – *Signal Length*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsSqr_16s_Sfs_Ctx**(const *Npp16s* *pSrc, *Npp16s* *pDst, size_t nLength, int nScaleFactor, *NppStreamContext* nppStreamCtx)

16-bit signed short signal squared, scale, then clamp to saturated value.

Parameters

- **pSrc** – *Source Signal Pointer*.

- **pDst** – *Destination Signal Pointer*.
- **nLength** – *Signal Length*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsSqr_16sc_Sfs_Ctx**(const *Npp16sc* *pSrc, *Npp16sc* *pDst, size_t nLength, int nScaleFactor, *NppStreamContext* nppStreamCtx)

16-bit complex signed short signal squared, scale, then clamp to saturated value.

Parameters

- **pSrc** – *Source Signal Pointer*.
- **pDst** – *Destination Signal Pointer*.
- **nLength** – *Signal Length*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsSqr_8u_ISfs_Ctx**(*Npp8u* *pSrcDst, size_t nLength, int nScaleFactor, *NppStreamContext* nppStreamCtx)

8-bit unsigned char signal squared, scale, then clamp to saturated value.

Parameters

- **pSrcDst** – *In-Place Signal Pointer*.
- **nLength** – *Signal Length*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsSqr_16u_ISfs_Ctx**(*Npp16u* *pSrcDst, size_t nLength, int nScaleFactor, *NppStreamContext* nppStreamCtx)

16-bit unsigned short signal squared, scale, then clamp to saturated value.

Parameters

- **pSrcDst** – *In-Place Signal Pointer*.
- **nLength** – *Signal Length*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsSqr_16s_ISfs_Ctx**(*Npp16s* *pSrcDst, size_t nLength, int nScaleFactor, *NppStreamContext* nppStreamCtx)

16-bit signed short signal squared, scale, then clamp to saturated value.

Parameters

- **pSrcDst** – *In-Place Signal Pointer*.
- **nLength** – *Signal Length*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsSqr_16sc_ISfs_Ctx**(*Npp16sc* *pSrcDst, size_t nLength, int nScaleFactor, *NppStreamContext* nppStreamCtx)

16-bit complex signed short signal squared, scale, then clamp to saturated value.

Parameters

- **pSrcDst** – *In-Place Signal Pointer*.
- **nLength** – *Signal Length*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Signal Data Related Error Codes, *Length Related Error Codes*.

1.17.1.17 Signal Square Root

1.17.1.17.1 Sqrt

Square root of each sample of a signal.

Functions

NppStatus **nppsSqrt_32f_Ctx**(const *Npp32f* *pSrc, *Npp32f* *pDst, size_t nLength, *NppStreamContext* nppStreamCtx)

32-bit floating point signal square root.

Parameters

- **pSrc** – *Source Signal Pointer*.
- **pDst** – *Destination Signal Pointer*.
- **nLength** – *Signal Length*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsSqrt_64f_Ctx**(const *Npp64f* *pSrc, *Npp64f* *pDst, size_t nLength, *NppStreamContext* nppStreamCtx)

64-bit floating point signal square root.

Parameters

- **pSrc** – *Source Signal Pointer*.
- **pDst** – *Destination Signal Pointer*.
- **nLength** – *Signal Length*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsSqrt_32fc_Ctx**(const *Npp32fc* *pSrc, *Npp32fc* *pDst, size_t nLength, *NppStreamContext* nppStreamCtx)

32-bit complex floating point signal square root.

Parameters

- **pSrc** – *Source Signal Pointer*.
- **pDst** – *Destination Signal Pointer*.
- **nLength** – *Signal Length*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsSqrt_64fc_Ctx**(const *Npp64fc* *pSrc, *Npp64fc* *pDst, size_t nLength, *NppStreamContext* nppStreamCtx)

64-bit complex floating point signal square root.

Parameters

- **pSrc** – *Source Signal Pointer*.
- **pDst** – *Destination Signal Pointer*.
- **nLength** – *Signal Length*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsSqrt_32f_I_Ctx**(*Npp32f* *pSrcDst, size_t nLength, *NppStreamContext* nppStreamCtx)

32-bit floating point signal square root.

Parameters

- **pSrcDst** – *In-Place Signal Pointer*.

- **nLength** – *Signal Length*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsSqrt_64f_I_Ctx**(*Npp64f* *pSrcDst, size_t nLength, *NppStreamContext* nppStreamCtx)

64-bit floating point signal square root.

Parameters

- **pSrcDst** – *In-Place Signal Pointer*.
- **nLength** – *Signal Length*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsSqrt_32fc_I_Ctx**(*Npp32fc* *pSrcDst, size_t nLength, *NppStreamContext* nppStreamCtx)

32-bit complex floating point signal square root.

Parameters

- **pSrcDst** – *In-Place Signal Pointer*.
- **nLength** – *Signal Length*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsSqrt_64fc_I_Ctx**(*Npp64fc* *pSrcDst, size_t nLength, *NppStreamContext* nppStreamCtx)

64-bit complex floating point signal square root.

Parameters

- **pSrcDst** – *In-Place Signal Pointer*.
- **nLength** – *Signal Length*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsSqrt_8u_Sfs_Ctx**(const *Npp8u* *pSrc, *Npp8u* *pDst, size_t nLength, int nScaleFactor, *NppStreamContext* nppStreamCtx)

8-bit unsigned char signal square root, scale, then clamp to saturated value.

Parameters

- **pSrc** – *Source Signal Pointer*.
- **pDst** – *Destination Signal Pointer*.

- **nLength** – *Signal Length*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsSqrt_16u_Sfs_Ctx**(const *Npp16u* *pSrc, *Npp16u* *pDst, size_t nLength, int nScaleFactor, *NppStreamContext* nppStreamCtx)

16-bit unsigned short signal square root, scale, then clamp to saturated value.

Parameters

- **pSrc** – *Source Signal Pointer*.
- **pDst** – *Destination Signal Pointer*.
- **nLength** – *Signal Length*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsSqrt_16s_Sfs_Ctx**(const *Npp16s* *pSrc, *Npp16s* *pDst, size_t nLength, int nScaleFactor, *NppStreamContext* nppStreamCtx)

16-bit signed short signal square root, scale, then clamp to saturated value.

Parameters

- **pSrc** – *Source Signal Pointer*.
- **pDst** – *Destination Signal Pointer*.
- **nLength** – *Signal Length*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsSqrt_16sc_Sfs_Ctx**(const *Npp16sc* *pSrc, *Npp16sc* *pDst, size_t nLength, int nScaleFactor, *NppStreamContext* nppStreamCtx)

16-bit complex signed short signal square root, scale, then clamp to saturated value.

Parameters

- **pSrc** – *Source Signal Pointer*.
- **pDst** – *Destination Signal Pointer*.
- **nLength** – *Signal Length*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsSqrt_64s_Sfs_Ctx**(const *Npp64s* *pSrc, *Npp64s* *pDst, size_t nLength, int nScaleFactor, *NppStreamContext* nppStreamCtx)

64-bit signed integer signal square root, scale, then clamp to saturated value.

Parameters

- **pSrc** – *Source Signal Pointer*.
- **pDst** – *Destination Signal Pointer*.
- **nLength** – *Signal Length*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsSqrt_32s16s_Sfs_Ctx**(const *Npp32s* *pSrc, *Npp16s* *pDst, size_t nLength, int nScaleFactor, *NppStreamContext* nppStreamCtx)

32-bit signed integer signal square root, scale, then clamp to 16-bit signed integer saturated value.

Parameters

- **pSrc** – *Source Signal Pointer*.
- **pDst** – *Destination Signal Pointer*.
- **nLength** – *Signal Length*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsSqrt_64s16s_Sfs_Ctx**(const *Npp64s* *pSrc, *Npp16s* *pDst, size_t nLength, int nScaleFactor, *NppStreamContext* nppStreamCtx)

64-bit signed integer signal square root, scale, then clamp to 16-bit signed integer saturated value.

Parameters

- **pSrc** – *Source Signal Pointer*.
- **pDst** – *Destination Signal Pointer*.
- **nLength** – *Signal Length*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsSqrt_8u_ISfs_Ctx**(*Npp8u* *pSrcDst, size_t nLength, int nScaleFactor, *NppStreamContext* nppStreamCtx)

8-bit unsigned char signal square root, scale, then clamp to saturated value.

Parameters

- **pSrcDst** – *In-Place Signal Pointer*.
- **nLength** – *Signal Length*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsSqrt_16u_ISfs_Ctx**(*Npp16u* *pSrcDst, size_t nLength, int nScaleFactor, *NppStreamContext* nppStreamCtx)

16-bit unsigned short signal square root, scale, then clamp to saturated value.

Parameters

- **pSrcDst** – *In-Place Signal Pointer*.
- **nLength** – *Signal Length*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsSqrt_16s_ISfs_Ctx**(*Npp16s* *pSrcDst, size_t nLength, int nScaleFactor, *NppStreamContext* nppStreamCtx)

16-bit signed short signal square root, scale, then clamp to saturated value.

Parameters

- **pSrcDst** – *In-Place Signal Pointer*.
- **nLength** – *Signal Length*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsSqrt_16sc_ISfs_Ctx**(*Npp16sc* *pSrcDst, size_t nLength, int nScaleFactor, *NppStreamContext* nppStreamCtx)

16-bit complex signed short signal square root, scale, then clamp to saturated value.

Parameters

- **pSrcDst** – *In-Place Signal Pointer*.
- **nLength** – *Signal Length*.

- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsSqrt_64s_ISfs_Ctx**(*Npp64s* *pSrcDst, size_t nLength, int nScaleFactor, *NppStreamContext* nppStreamCtx)

64-bit signed integer signal square root, scale, then clamp to saturated value.

Parameters

- **pSrcDst** – *In-Place Signal Pointer*.
- **nLength** – *Signal Length*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

1.17.1.18 Signal Cube Root

1.17.1.18.1 Cubrt

Cube root of each sample of a signal.

Functions

NppStatus **nppsCubrt_32f_Ctx**(const *Npp32f* *pSrc, *Npp32f* *pDst, size_t nLength, *NppStreamContext* nppStreamCtx)

32-bit floating point signal cube root.

Parameters

- **pSrc** – *Source Signal Pointer*.
- **pDst** – *Destination Signal Pointer*.
- **nLength** – *Signal Length*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsCubrt_32s16s_Sfs_Ctx**(const *Npp32s* *pSrc, *Npp16s* *pDst, size_t nLength, int nScaleFactor, *NppStreamContext* nppStreamCtx)

32-bit signed integer signal cube root, scale, then clamp to 16-bit signed integer saturated value.

Parameters

- **pSrc** – *Source Signal Pointer*.

- **pDst** – *Destination Signal Pointer*.
- **nLength** – *Signal Length*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Signal Data Related Error Codes, *Length Related Error Codes*.

1.17.1.19 Signal Exp

1.17.1.19.1 Exp

E raised to the power of each sample of a signal.

Functions

NppStatus **nppsExp_32f_Ctx**(const *Npp32f* *pSrc, *Npp32f* *pDst, size_t nLength, *NppStreamContext* nppStreamCtx)

32-bit floating point signal exponent.

Parameters

- **pSrc** – *Source Signal Pointer*.
- **pDst** – *Destination Signal Pointer*.
- **nLength** – *Signal Length*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsExp_64f_Ctx**(const *Npp64f* *pSrc, *Npp64f* *pDst, size_t nLength, *NppStreamContext* nppStreamCtx)

64-bit floating point signal exponent.

Parameters

- **pSrc** – *Source Signal Pointer*.
- **pDst** – *Destination Signal Pointer*.
- **nLength** – *Signal Length*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsExp_32f64f_Ctx**(const *Npp32f* *pSrc, *Npp64f* *pDst, size_t nLength, *NppStreamContext* nppStreamCtx)

32-bit floating point signal exponent with 64-bit floating point result.

Parameters

- **pSrc** – *Source Signal Pointer*.
- **pDst** – *Destination Signal Pointer*.
- **nLength** – *Signal Length*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsExp_32f_I_Ctx**(*Npp32f* *pSrcDst, size_t nLength, *NppStreamContext* nppStreamCtx)

32-bit floating point signal exponent.

Parameters

- **pSrcDst** – *In-Place Signal Pointer*.
- **nLength** – *Signal Length*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsExp_64f_I_Ctx**(*Npp64f* *pSrcDst, size_t nLength, *NppStreamContext* nppStreamCtx)

64-bit floating point signal exponent.

Parameters

- **pSrcDst** – *In-Place Signal Pointer*.
- **nLength** – *Signal Length*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsExp_16s_Sfs_Ctx**(const *Npp16s* *pSrc, *Npp16s* *pDst, size_t nLength, int nScaleFactor, *NppStreamContext* nppStreamCtx)

16-bit signed short signal exponent, scale, then clamp to saturated value.

Parameters

- **pSrc** – *Source Signal Pointer*.
- **pDst** – *Destination Signal Pointer*.
- **nLength** – *Signal Length*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsExp_32s_Sfs_Ctx**(const *Npp32s* *pSrc, *Npp32s* *pDst, size_t nLength, int nScaleFactor, *NppStreamContext* nppStreamCtx)

32-bit signed integer signal exponent, scale, then clamp to saturated value.

Parameters

- **pSrc** – *Source Signal Pointer*.
- **pDst** – *Destination Signal Pointer*.
- **nLength** – *Signal Length*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsExp_64s_Sfs_Ctx**(const *Npp64s* *pSrc, *Npp64s* *pDst, size_t nLength, int nScaleFactor, *NppStreamContext* nppStreamCtx)

64-bit signed integer signal exponent, scale, then clamp to saturated value.

Parameters

- **pSrc** – *Source Signal Pointer*.
- **pDst** – *Destination Signal Pointer*.
- **nLength** – *Signal Length*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsExp_16s_ISfs_Ctx**(*Npp16s* *pSrcDst, size_t nLength, int nScaleFactor, *NppStreamContext* nppStreamCtx)

16-bit signed short signal exponent, scale, then clamp to saturated value.

Parameters

- **pSrcDst** – *In-Place Signal Pointer*.
- **nLength** – *Signal Length*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsExp_32s_ISfs_Ctx**(*Npp32s* *pSrcDst, size_t nLength, int nScaleFactor, *NppStreamContext* nppStreamCtx)

32-bit signed integer signal exponent, scale, then clamp to saturated value.

Parameters

- **pSrcDst** – *In-Place Signal Pointer*.
- **nLength** – *Signal Length*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsExp_64s_ISfs_Ctx**(*Npp64s* *pSrcDst, size_t nLength, int nScaleFactor, *NppStreamContext* nppStreamCtx)

64-bit signed integer signal exponent, scale, then clamp to saturated value.

Parameters

- **pSrcDst** – *In-Place Signal Pointer*.
- **nLength** – *Signal Length*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

1.17.1.20 Signal Ln

1.17.1.20.1 Ln

Natural logarithm of each sample of a signal.

Functions

NppStatus **nppsLn_32f_Ctx**(const *Npp32f* *pSrc, *Npp32f* *pDst, size_t nLength, *NppStreamContext* nppStreamCtx)

32-bit floating point signal natural logarithm.

Parameters

- **pSrc** – *Source Signal Pointer*.
- **pDst** – *Destination Signal Pointer*.
- **nLength** – *Signal Length*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsLn_64f_Ctx**(const *Npp64f* *pSrc, *Npp64f* *pDst, size_t nLength, *NppStreamContext* nppStreamCtx)

64-bit floating point signal natural logarithm.

Parameters

- **pSrc** – *Source Signal Pointer*.
- **pDst** – *Destination Signal Pointer*.
- **nLength** – *Signal Length*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsLn_64f32f_Ctx**(const *Npp64f* *pSrc, *Npp32f* *pDst, size_t nLength, *NppStreamContext* nppStreamCtx)

64-bit floating point signal natural logarithm with 32-bit floating point result.

Parameters

- **pSrc** – *Source Signal Pointer*.
- **pDst** – *Destination Signal Pointer*.
- **nLength** – *Signal Length*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsLn_32f_I_Ctx**(*Npp32f* *pSrcDst, size_t nLength, *NppStreamContext* nppStreamCtx)

32-bit floating point signal natural logarithm.

Parameters

- **pSrcDst** – *In-Place Signal Pointer*.
- **nLength** – *Signal Length*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsLn_64f_I_Ctx**(*Npp64f* *pSrcDst, size_t nLength, *NppStreamContext* nppStreamCtx)

64-bit floating point signal natural logarithm.

Parameters

- **pSrcDst** – *In-Place Signal Pointer*.
- **nLength** – *Signal Length*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsLn_16s_Sfs_Ctx**(const *Npp16s* *pSrc, *Npp16s* *pDst, size_t nLength, int nScaleFactor, *NppStreamContext* nppStreamCtx)

16-bit signed short signal natural logarithm, scale, then clamp to saturated value.

Parameters

- **pSrc** – *Source Signal Pointer*.
- **pDst** – *Destination Signal Pointer*.
- **nLength** – *Signal Length*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsLn_32s_Sfs_Ctx**(const *Npp32s* *pSrc, *Npp32s* *pDst, size_t nLength, int nScaleFactor, *NppStreamContext* nppStreamCtx)

32-bit signed integer signal natural logarithm, scale, then clamp to saturated value.

Parameters

- **pSrc** – *Source Signal Pointer*.
- **pDst** – *Destination Signal Pointer*.
- **nLength** – *Signal Length*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsLn_32s16s_Sfs_Ctx**(const *Npp32s* *pSrc, *Npp16s* *pDst, size_t nLength, int nScaleFactor, *NppStreamContext* nppStreamCtx)

32-bit signed integer signal natural logarithm, scale, then clamp to 16-bit signed short saturated value.

Parameters

- **pSrc** – *Source Signal Pointer*.
- **pDst** – *Destination Signal Pointer*.
- **nLength** – *Signal Length*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsLn_16s_ISfs_Ctx**(*Npp16s* *pSrcDst, size_t nLength, int nScaleFactor, *NppStreamContext* nppStreamCtx)

16-bit signed short signal natural logarithm, scale, then clamp to saturated value.

Parameters

- **pSrcDst** – *In-Place Signal Pointer*.
- **nLength** – *Signal Length*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsLn_32s_ISfs_Ctx**(*Npp32s* *pSrcDst, size_t nLength, int nScaleFactor, *NppStreamContext* nppStreamCtx)

32-bit signed integer signal natural logarithm, scale, then clamp to saturated value.

Parameters

- **pSrcDst** – *In-Place Signal Pointer*.
- **nLength** – *Signal Length*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

1.17.1.21 Signal 10Log10

1.17.1.21.1 10Log10

Ten times the decimal logarithm of each sample of a signal.

Functions

NppStatus **npps10Log10_32s_Sfs_Ctx**(const *Npp32s* *pSrc, *Npp32s* *pDst, size_t nLength, int nScaleFactor, *NppStreamContext* nppStreamCtx)

32-bit signed integer signal 10 times base 10 logarithm, scale, then clamp to saturated value.

Parameters

- **pSrc** – *Source Signal Pointer*.
- **pDst** – *Destination Signal Pointer*.
- **nLength** – *Signal Length*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **npps10Log10_32s_ISfs_Ctx**(*Npp32s* *pSrcDst, size_t nLength, int nScaleFactor, *NppStreamContext* nppStreamCtx)

32-bit signed integer signal 10 times base 10 logarithm, scale, then clamp to saturated value.

Parameters

- **pSrcDst** – *In-Place Signal Pointer*.
- **nLength** – *Signal Length*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Signal Data Related Error Codes, *Length Related Error Codes*.

1.17.1.22 Signal SumLn

1.17.1.22.1 SumLn

Sums up the natural logarithm of each sample of a signal.

Functions

NppStatus **nppsSumLnGetBufferSize_32f_Ctx**(size_t nLength, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Device scratch buffer size (in bytes) for 32f SumLn.

This primitive provides the correct buffer size for nppsSumLn_32f.

Parameters

- **nLength** – *Signal Length*.
- **hpBufferSize** – Required buffer size. Important: hpBufferSize is a *host pointer. Scratch Buffer and Host Pointer*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

NPP_SUCCESS

NppStatus **nppsSumLn_32f_Ctx**(const *Npp32f* *pSrc, size_t nLength, *Npp32f* *pDst, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

32-bit floating point signal sum natural logarithm.

Parameters

- **pSrc** – *Source Signal Pointer*.
- **nLength** – *Signal Length*.
- **pDst** – Pointer to the output result.
- **pDeviceBuffer** – Pointer to the required device memory allocation.

- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsSumLnGetBufferSize_64f_Ctx**(size_t nLength, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Device scratch buffer size (in bytes) for 64f SumLn.

This primitive provides the correct buffer size for nppsSumLn_64f.

Parameters

- **nLength** – *Signal Length*.
- **hpBufferSize** – Required buffer size. Important: hpBufferSize is a *host pointer. Scratch Buffer and Host Pointer*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
NPP_SUCCESS

NppStatus **nppsSumLn_64f_Ctx**(const *Npp64f* *pSrc, size_t nLength, *Npp64f* *pDst, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

64-bit floating point signal sum natural logarithm.

Parameters

- **pSrc** – *Source Signal Pointer*.
- **nLength** – *Signal Length*.
- **pDst** – Pointer to the output result.
- **pDeviceBuffer** – Pointer to the required device memory allocation.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsSumLnGetBufferSize_32f64f_Ctx**(size_t nLength, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Device scratch buffer size (in bytes) for 32f64f SumLn.

This primitive provides the correct buffer size for nppsSumLn_32f64f.

Parameters

- **nLength** – *Signal Length*.
- **hpBufferSize** – Required buffer size. Important: hpBufferSize is a *host pointer. Scratch Buffer and Host Pointer*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
NPP_SUCCESS

NppStatus **nppsSumLn_32f64f_Ctx**(const *Npp32f* *pSrc, size_t nLength, *Npp64f* *pDst, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

32-bit flaoting point input, 64-bit floating point output signal sum natural logarithm.

Parameters

- **pSrc** – *Source Signal Pointer*.
- **nLength** – *Signal Length*.
- **pDst** – Pointer to the output result.
- **pDeviceBuffer** – Pointer to the required device memory allocation.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsSumLnGetBufferSize_16s32f_Ctx**(size_t nLength, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Device scratch buffer size (in bytes) for 16s32f SumLn.

This primitive provides the correct buffer size for nppsSumLn_16s32f.

Parameters

- **nLength** – *Signal Length*.
- **hpBufferSize** – Required buffer size. Important: hpBufferSize is a *host pointer*. *Scratch Buffer and Host Pointer*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

NPP_SUCCESS

NppStatus **nppsSumLn_16s32f_Ctx**(const *Npp16s* *pSrc, size_t nLength, *Npp32f* *pDst, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

16-bit signed short integer input, 32-bit floating point output signal sum natural logarithm.

Parameters

- **pSrc** – *Source Signal Pointer*.
- **nLength** – *Signal Length*.
- **pDst** – Pointer to the output result.
- **pDeviceBuffer** – Pointer to the required device memory allocation.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Signal Data Related Error Codes, *Length Related Error Codes*.

1.17.1.23 Signal ArcTan

1.17.1.23.1 Arctan

Inverse tangent of each sample of a signal.

Functions

NppStatus **nppsArctan_32f_Ctx**(const *Npp32f* *pSrc, *Npp32f* *pDst, size_t nLength, *NppStreamContext* nppStreamCtx)

32-bit floating point signal inverse tangent.

Parameters

- **pSrc** – *Source Signal Pointer*.
- **pDst** – *Destination Signal Pointer*.
- **nLength** – *Signal Length*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsArctan_64f_Ctx**(const *Npp64f* *pSrc, *Npp64f* *pDst, size_t nLength, *NppStreamContext* nppStreamCtx)

64-bit floating point signal inverse tangent.

Parameters

- **pSrc** – *Source Signal Pointer*.
- **pDst** – *Destination Signal Pointer*.
- **nLength** – *Signal Length*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsArctan_32f_I_Ctx**(*Npp32f* *pSrcDst, size_t nLength, *NppStreamContext* nppStreamCtx)

32-bit floating point signal inverse tangent.

Parameters

- **pSrcDst** – *In-Place Signal Pointer*.
- **nLength** – *Signal Length*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsArctan_64f_I_Ctx**(*Npp64f* *pSrcDst, size_t nLength, *NppStreamContext* nppStreamCtx)

64-bit floating point signal inverse tangent.

Parameters

- **pSrcDst** – *In-Place Signal Pointer*.
- **nLength** – *Signal Length*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Signal Data Related Error Codes, *Length Related Error Codes*.

1.17.1.24 Signal Normalize

1.17.1.24.1 Normalize

Normalize each sample of a real or complex signal using offset and division operations.

Functions

NppStatus **nppsNormalize_32f_Ctx**(const *Npp32f* *pSrc, *Npp32f* *pDst, size_t nLength, *Npp32f* vSub, *Npp32f* vDiv, *NppStreamContext* nppStreamCtx)

32-bit floating point signal normalize.

Parameters

- **pSrc** – *Source Signal Pointer*.
- **pDst** – *Destination Signal Pointer*.
- **nLength** – *Signal Length*.
- **vSub** – value subtracted from each signal element before division
- **vDiv** – divisor of post-subtracted signal element dividend
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsNormalize_32fc_Ctx**(const *Npp32fc* *pSrc, *Npp32fc* *pDst, size_t nLength, *Npp32fc* vSub, *Npp32f* vDiv, *NppStreamContext* nppStreamCtx)

32-bit complex floating point signal normalize.

Parameters

- **pSrc** – *Source Signal Pointer*.
- **pDst** – *Destination Signal Pointer*.
- **nLength** – *Signal Length*.

- **vSub** – value subtracted from each signal element before division
- **vDiv** – divisor of post-subtracted signal element dividend
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsNormalize_64f_Ctx**(const *Npp64f* *pSrc, *Npp64f* *pDst, size_t nLength, *Npp64f* vSub, *Npp64f* vDiv, *NppStreamContext* nppStreamCtx)

64-bit floating point signal normalize.

Parameters

- **pSrc** – *Source Signal Pointer*.
- **pDst** – *Destination Signal Pointer*.
- **nLength** – *Signal Length*.
- **vSub** – value subtracted from each signal element before division
- **vDiv** – divisor of post-subtracted signal element dividend
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsNormalize_64fc_Ctx**(const *Npp64fc* *pSrc, *Npp64fc* *pDst, size_t nLength, *Npp64fc* vSub, *Npp64f* vDiv, *NppStreamContext* nppStreamCtx)

64-bit complex floating point signal normalize.

Parameters

- **pSrc** – *Source Signal Pointer*.
- **pDst** – *Destination Signal Pointer*.
- **nLength** – *Signal Length*.
- **vSub** – value subtracted from each signal element before division
- **vDiv** – divisor of post-subtracted signal element dividend
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsNormalize_16s_Sfs_Ctx**(const *Npp16s* *pSrc, *Npp16s* *pDst, size_t nLength, *Npp16s* vSub, int vDiv, int nScaleFactor, *NppStreamContext* nppStreamCtx)

16-bit signed short signal normalize, scale, then clamp to saturated value.

Parameters

- **pSrc** – *Source Signal Pointer*.
- **pDst** – *Destination Signal Pointer*.

- **nLength** – *Signal Length*.
- **vSub** – value subtracted from each signal element before division
- **vDiv** – divisor of post-subtracted signal element dividend
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsNormalize_16sc_Sfs_Ctx**(const *Npp16sc* *pSrc, *Npp16sc* *pDst, size_t nLength, *Npp16sc* vSub, int vDiv, int nScaleFactor, *NppStreamContext* nppStreamCtx)

16-bit complex signed short signal normalize, scale, then clamp to saturated value.

Parameters

- **pSrc** – *Source Signal Pointer*.
- **pDst** – *Destination Signal Pointer*.
- **nLength** – *Signal Length*.
- **vSub** – value subtracted from each signal element before division
- **vDiv** – divisor of post-subtracted signal element dividend
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

1.17.1.25 Signal Cauchy, CouchyD, And CouchyDD2

1.17.1.25.1 Cauchy, CauchyD, and CauchyDD2

Determine Cauchy robust error function and its first and second derivatives for each sample of a signal.

Functions

NppStatus **nppsCauchy_32f_I_Ctx**(*Npp32f* *pSrcDst, size_t nLength, *Npp32f* nParam, *NppStreamContext* nppStreamCtx)

32-bit floating point signal Cauchy error calculation.

Parameters

- **pSrcDst** – *In-Place Signal Pointer*.
- **nLength** – *Signal Length*.
- **nParam** – constant used in Cauchy formula
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsCauchyD_32f_I_Ctx**(*Npp32f* *pSrcDst, size_t nLength, *Npp32f* nParam, *NppStreamContext* nppStreamCtx)

32-bit floating point signal Cauchy first derivative.

Parameters

- **pSrcDst** – *In-Place Signal Pointer*.
- **nLength** – *Signal Length*.
- **nParam** – constant used in Cauchy formula
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsCauchyDD2_32f_I_Ctx**(*Npp32f* *pSrcDst, *Npp32f* *pD2FVal, size_t nLength, *Npp32f* nParam, *NppStreamContext* nppStreamCtx)

32-bit floating point signal Cauchy first and second derivatives.

Parameters

- **pSrcDst** – *In-Place Signal Pointer*.
- **pD2FVal** – *Source Signal Pointer*. This signal contains the second derivative of the source signal.
- **nLength** – *Signal Length*.
- **nParam** – constant used in Cauchy formula
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

1.17.2. Logical And Shift Operations

1.17.2.1 Logical And Shift Operations

The set of logical and shift operations for signal processing available in the library.

1.17.2.2 Signal AndC

1.17.2.2.1 AndC

Bitwise AND of a constant and each sample of a signal.

Functions

NppStatus **nppsAndC_8u_Ctx**(const *Npp8u* *pSrc, *Npp8u* nValue, *Npp8u* *pDst, size_t nLength, *NppStreamContext* nppStreamCtx)

8-bit unsigned char signal and with constant.

Parameters

- **pSrc** – *Source Signal Pointer*.
- **nValue** – Constant value to be anded with each vector element
- **pDst** – *Destination Signal Pointer*.
- **nLength** – *Signal Length*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsAndC_16u_Ctx**(const *Npp16u* *pSrc, *Npp16u* nValue, *Npp16u* *pDst, size_t nLength, *NppStreamContext* nppStreamCtx)

16-bit unsigned short signal and with constant.

Parameters

- **pSrc** – *Source Signal Pointer*.
- **nValue** – Constant value to be anded with each vector element
- **pDst** – *Destination Signal Pointer*.
- **nLength** – *Signal Length*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsAndC_32u_Ctx**(const *Npp32u* *pSrc, *Npp32u* nValue, *Npp32u* *pDst, size_t nLength, *NppStreamContext* nppStreamCtx)

32-bit unsigned integer signal and with constant.

Parameters

- **pSrc** – *Source Signal Pointer*.
- **nValue** – Constant value to be anded with each vector element
- **pDst** – *Destination Signal Pointer*.
- **nLength** – *Signal Length*.

- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsAndC_8u_I_Ctx**(*Npp8u* nValue, *Npp8u* *pSrcDst, size_t nLength, *NppStreamContext* nppStreamCtx)

8-bit unsigned char in place signal and with constant.

Parameters

- **pSrcDst** – *In-Place Signal Pointer*.
- **nValue** – Constant value to be anded with each vector element
- **nLength** – *Signal Length*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsAndC_16u_I_Ctx**(*Npp16u* nValue, *Npp16u* *pSrcDst, size_t nLength, *NppStreamContext* nppStreamCtx)

16-bit unsigned short in place signal and with constant.

Parameters

- **pSrcDst** – *In-Place Signal Pointer*.
- **nValue** – Constant value to be anded with each vector element
- **nLength** – *Signal Length*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsAndC_32u_I_Ctx**(*Npp32u* nValue, *Npp32u* *pSrcDst, size_t nLength, *NppStreamContext* nppStreamCtx)

32-bit unsigned signed integer in place signal and with constant.

Parameters

- **pSrcDst** – *In-Place Signal Pointer*.
- **nValue** – Constant value to be anded with each vector element
- **nLength** – *Signal Length*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

1.17.2.3 Signal And

1.17.2.3.1 And

Sample by sample bitwise AND of samples from two signals.

Functions

NppStatus **nppsAnd_8u_Ctx**(const *Npp8u* *pSrc1, const *Npp8u* *pSrc2, *Npp8u* *pDst, size_t nLength, *NppStreamContext* nppStreamCtx)

8-bit unsigned char signal and with signal.

Parameters

- **pSrc1** – *Source Signal Pointer*.
- **pSrc2** – *Source Signal Pointer*. signal2 elements to be anded with signal1 elements
- **pDst** – *Destination Signal Pointer*.
- **nLength** – *Signal Length*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsAnd_16u_Ctx**(const *Npp16u* *pSrc1, const *Npp16u* *pSrc2, *Npp16u* *pDst, size_t nLength, *NppStreamContext* nppStreamCtx)

16-bit unsigned short signal and with signal.

Parameters

- **pSrc1** – *Source Signal Pointer*.
- **pSrc2** – *Source Signal Pointer*. signal2 elements to be anded with signal1 elements
- **pDst** – *Destination Signal Pointer*.
- **nLength** – *Signal Length*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsAnd_32u_Ctx**(const *Npp32u* *pSrc1, const *Npp32u* *pSrc2, *Npp32u* *pDst, size_t nLength, *NppStreamContext* nppStreamCtx)

32-bit unsigned integer signal and with signal.

Parameters

- **pSrc1** – *Source Signal Pointer*.
- **pSrc2** – *Source Signal Pointer*. signal2 elements to be anded with signal1 elements

- **pDst** – *Destination Signal Pointer*.
- **nLength** – *Signal Length*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsAnd_8u_I_Ctx**(const *Npp8u* *pSrc, *Npp8u* *pSrcDst, size_t nLength, *NppStreamContext* nppStreamCtx)

8-bit unsigned char in place signal and with signal.

Parameters

- **pSrc** – *Source Signal Pointer*.
- **pSrcDst** – *In-Place Signal Pointer*. signal2 elements to be anded with signal1 elements
- **nLength** – *Signal Length*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsAnd_16u_I_Ctx**(const *Npp16u* *pSrc, *Npp16u* *pSrcDst, size_t nLength, *NppStreamContext* nppStreamCtx)

16-bit unsigned short in place signal and with signal.

Parameters

- **pSrc** – *Source Signal Pointer*.
- **pSrcDst** – *In-Place Signal Pointer*. signal2 elements to be anded with signal1 elements
- **nLength** – *Signal Length*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsAnd_32u_I_Ctx**(const *Npp32u* *pSrc, *Npp32u* *pSrcDst, size_t nLength, *NppStreamContext* nppStreamCtx)

32-bit unsigned integer in place signal and with signal.

Parameters

- **pSrc** – *Source Signal Pointer*.
- **pSrcDst** – *In-Place Signal Pointer*. signal2 elements to be anded with signal1 elements
- **nLength** – *Signal Length*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

1.17.2.4 Signal OrC

1.17.2.4.1 OrC

Bitwise OR of a constant and each sample of a signal.

Functions

NppStatus **nppsOrC_8u_Ctx**(const *Npp8u* *pSrc, *Npp8u* nValue, *Npp8u* *pDst, size_t nLength, *NppStreamContext* nppStreamCtx)

8-bit unsigned char signal or with constant.

Parameters

- **pSrc** – *Source Signal Pointer*.
- **nValue** – Constant value to be ored with each vector element
- **pDst** – *Destination Signal Pointer*.
- **nLength** – *Signal Length*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsOrC_16u_Ctx**(const *Npp16u* *pSrc, *Npp16u* nValue, *Npp16u* *pDst, size_t nLength, *NppStreamContext* nppStreamCtx)

16-bit unsigned short signal or with constant.

Parameters

- **pSrc** – *Source Signal Pointer*.
- **nValue** – Constant value to be ored with each vector element
- **pDst** – *Destination Signal Pointer*.
- **nLength** – *Signal Length*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsOrC_32u_Ctx**(const *Npp32u* *pSrc, *Npp32u* nValue, *Npp32u* *pDst, size_t nLength, *NppStreamContext* nppStreamCtx)

32-bit unsigned integer signal or with constant.

Parameters

- **pSrc** – *Source Signal Pointer*.
- **nValue** – Constant value to be ored with each vector element
- **pDst** – *Destination Signal Pointer*.
- **nLength** – *Signal Length*.

- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsOrC_8u_I_Ctx**(*Npp8u* nValue, *Npp8u* *pSrcDst, size_t nLength, *NppStreamContext* nppStreamCtx)

8-bit unsigned char in place signal or with constant.

Parameters

- **pSrcDst** – *In-Place Signal Pointer*.
- **nValue** – Constant value to be ored with each vector element
- **nLength** – *Signal Length*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsOrC_16u_I_Ctx**(*Npp16u* nValue, *Npp16u* *pSrcDst, size_t nLength, *NppStreamContext* nppStreamCtx)

16-bit unsigned short in place signal or with constant.

Parameters

- **pSrcDst** – *In-Place Signal Pointer*.
- **nValue** – Constant value to be ored with each vector element
- **nLength** – *Signal Length*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsOrC_32u_I_Ctx**(*Npp32u* nValue, *Npp32u* *pSrcDst, size_t nLength, *NppStreamContext* nppStreamCtx)

32-bit unsigned signed integer in place signal or with constant.

Parameters

- **pSrcDst** – *In-Place Signal Pointer*.
- **nValue** – Constant value to be ored with each vector element
- **nLength** – *Signal Length*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

1.17.2.5 Signal Or

1.17.2.5.1 Or

Sample by sample bitwise OR of the samples from two signals.

Functions

NppStatus **nppsOr_8u_Ctx**(const *Npp8u* *pSrc1, const *Npp8u* *pSrc2, *Npp8u* *pDst, size_t nLength, *NppStreamContext* nppStreamCtx)

8-bit unsigned char signal or with signal.

Parameters

- **pSrc1** – *Source Signal Pointer*.
- **pSrc2** – *Source Signal Pointer*. signal2 elements to be ored with signal1 elements
- **pDst** – *Destination Signal Pointer*.
- **nLength** – *Signal Length*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsOr_16u_Ctx**(const *Npp16u* *pSrc1, const *Npp16u* *pSrc2, *Npp16u* *pDst, size_t nLength, *NppStreamContext* nppStreamCtx)

16-bit unsigned short signal or with signal.

Parameters

- **pSrc1** – *Source Signal Pointer*.
- **pSrc2** – *Source Signal Pointer*. signal2 elements to be ored with signal1 elements
- **pDst** – *Destination Signal Pointer*.
- **nLength** – *Signal Length*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsOr_32u_Ctx**(const *Npp32u* *pSrc1, const *Npp32u* *pSrc2, *Npp32u* *pDst, size_t nLength, *NppStreamContext* nppStreamCtx)

32-bit unsigned integer signal or with signal.

Parameters

- **pSrc1** – *Source Signal Pointer*.
- **pSrc2** – *Source Signal Pointer*. signal2 elements to be ored with signal1 elements

- **pDst** – *Destination Signal Pointer*.
- **nLength** – *Signal Length*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsOr_8u_I_Ctx**(const *Npp8u* *pSrc, *Npp8u* *pSrcDst, size_t nLength, *NppStreamContext* nppStreamCtx)

8-bit unsigned char in place signal or with signal.

Parameters

- **pSrc** – *Source Signal Pointer*.
- **pSrcDst** – *In-Place Signal Pointer*. signal2 elements to be ored with signal1 elements
- **nLength** – *Signal Length*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsOr_16u_I_Ctx**(const *Npp16u* *pSrc, *Npp16u* *pSrcDst, size_t nLength, *NppStreamContext* nppStreamCtx)

16-bit unsigned short in place signal or with signal.

Parameters

- **pSrc** – *Source Signal Pointer*.
- **pSrcDst** – *In-Place Signal Pointer*. signal2 elements to be ored with signal1 elements
- **nLength** – *Signal Length*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsOr_32u_I_Ctx**(const *Npp32u* *pSrc, *Npp32u* *pSrcDst, size_t nLength, *NppStreamContext* nppStreamCtx)

32-bit unsigned integer in place signal or with signal.

Parameters

- **pSrc** – *Source Signal Pointer*.
- **pSrcDst** – *In-Place Signal Pointer*. signal2 elements to be ored with signal1 elements
- **nLength** – *Signal Length*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

1.17.2.6 Signal XorC

1.17.2.6.1 XorC

Bitwise XOR of a constant and each sample of a signal.

Functions

NppStatus **nppsXorC_8u_Ctx**(const *Npp8u* *pSrc, *Npp8u* nValue, *Npp8u* *pDst, size_t nLength, *NppStreamContext* nppStreamCtx)

8-bit unsigned char signal exclusive or with constant.

Parameters

- **pSrc** – *Source Signal Pointer*.
- **nValue** – Constant value to be exclusive ored with each vector element
- **pDst** – *Destination Signal Pointer*.
- **nLength** – *Signal Length*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsXorC_16u_Ctx**(const *Npp16u* *pSrc, *Npp16u* nValue, *Npp16u* *pDst, size_t nLength, *NppStreamContext* nppStreamCtx)

16-bit unsigned short signal exclusive or with constant.

Parameters

- **pSrc** – *Source Signal Pointer*.
- **nValue** – Constant value to be exclusive ored with each vector element
- **pDst** – *Destination Signal Pointer*.
- **nLength** – *Signal Length*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsXorC_32u_Ctx**(const *Npp32u* *pSrc, *Npp32u* nValue, *Npp32u* *pDst, size_t nLength, *NppStreamContext* nppStreamCtx)

32-bit unsigned integer signal exclusive or with constant.

Parameters

- **pSrc** – *Source Signal Pointer*.
- **nValue** – Constant value to be exclusive ored with each vector element
- **pDst** – *Destination Signal Pointer*.
- **nLength** – *Signal Length*.

- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsXorC_8u_I_Ctx**(*Npp8u* nValue, *Npp8u* *pSrcDst, size_t nLength, *NppStreamContext* nppStreamCtx)

8-bit unsigned char in place signal exclusive or with constant.

Parameters

- **pSrcDst** – *In-Place Signal Pointer*.
- **nValue** – Constant value to be exclusive ored with each vector element
- **nLength** – *Signal Length*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsXorC_16u_I_Ctx**(*Npp16u* nValue, *Npp16u* *pSrcDst, size_t nLength, *NppStreamContext* nppStreamCtx)

16-bit unsigned short in place signal exclusive or with constant.

Parameters

- **pSrcDst** – *In-Place Signal Pointer*.
- **nValue** – Constant value to be exclusive ored with each vector element
- **nLength** – *Signal Length*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsXorC_32u_I_Ctx**(*Npp32u* nValue, *Npp32u* *pSrcDst, size_t nLength, *NppStreamContext* nppStreamCtx)

32-bit unsigned signed integer in place signal exclusive or with constant.

Parameters

- **pSrcDst** – *In-Place Signal Pointer*.
- **nValue** – Constant value to be exclusive ored with each vector element
- **nLength** – *Signal Length*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

1.17.2.7 Signal Xor

1.17.2.7.1 Xor

Sample by sample bitwise XOR of the samples from two signals.

Functions

NppStatus **nppsXor_8u_Ctx**(const *Npp8u* *pSrc1, const *Npp8u* *pSrc2, *Npp8u* *pDst, size_t nLength, *NppStreamContext* nppStreamCtx)

8-bit unsigned char signal exclusive or with signal.

Parameters

- **pSrc1** – *Source Signal Pointer*.
- **pSrc2** – *Source Signal Pointer*. signal2 elements to be exclusive ored with signal1 elements
- **pDst** – *Destination Signal Pointer*.
- **nLength** – *Signal Length*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsXor_16u_Ctx**(const *Npp16u* *pSrc1, const *Npp16u* *pSrc2, *Npp16u* *pDst, size_t nLength, *NppStreamContext* nppStreamCtx)

16-bit unsigned short signal exclusive or with signal.

Parameters

- **pSrc1** – *Source Signal Pointer*.
- **pSrc2** – *Source Signal Pointer*. signal2 elements to be exclusive ored with signal1 elements
- **pDst** – *Destination Signal Pointer*.
- **nLength** – *Signal Length*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsXor_32u_Ctx**(const *Npp32u* *pSrc1, const *Npp32u* *pSrc2, *Npp32u* *pDst, size_t nLength, *NppStreamContext* nppStreamCtx)

32-bit unsigned integer signal exclusive or with signal.

Parameters

- **pSrc1** – *Source Signal Pointer*.
- **pSrc2** – *Source Signal Pointer*. signal2 elements to be exclusive ored with signal1 elements

- **pDst** – *Destination Signal Pointer*.
- **nLength** – *Signal Length*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsXor_8u_I_Ctx**(const *Npp8u* *pSrc, *Npp8u* *pSrcDst, size_t nLength, *NppStreamContext* nppStreamCtx)

8-bit unsigned char in place signal exclusive or with signal.

Parameters

- **pSrc** – *Source Signal Pointer*.
- **pSrcDst** – *In-Place Signal Pointer*. signal2 elements to be exclusive ored with signal1 elements
- **nLength** – *Signal Length*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsXor_16u_I_Ctx**(const *Npp16u* *pSrc, *Npp16u* *pSrcDst, size_t nLength, *NppStreamContext* nppStreamCtx)

16-bit unsigned short in place signal exclusive or with signal.

Parameters

- **pSrc** – *Source Signal Pointer*.
- **pSrcDst** – *In-Place Signal Pointer*. signal2 elements to be exclusive ored with signal1 elements
- **nLength** – *Signal Length*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsXor_32u_I_Ctx**(const *Npp32u* *pSrc, *Npp32u* *pSrcDst, size_t nLength, *NppStreamContext* nppStreamCtx)

32-bit unsigned integer in place signal exclusive or with signal.

Parameters

- **pSrc** – *Source Signal Pointer*.
- **pSrcDst** – *In-Place Signal Pointer*. signal2 elements to be exclusive ored with signal1 elements
- **nLength** – *Signal Length*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

1.17.2.8 Signal Not

1.17.2.8.1 Not

Bitwise NOT of each sample of a signal.

Functions

NppStatus **nppsNot_8u_Ctx**(const *Npp8u* *pSrc, *Npp8u* *pDst, size_t nLength, *NppStreamContext* nppStreamCtx)

8-bit unsigned char not signal.

Parameters

- **pSrc** – *Source Signal Pointer*.
- **pDst** – *Destination Signal Pointer*.
- **nLength** – *Signal Length*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsNot_16u_Ctx**(const *Npp16u* *pSrc, *Npp16u* *pDst, size_t nLength, *NppStreamContext* nppStreamCtx)

16-bit unsigned short not signal.

Parameters

- **pSrc** – *Source Signal Pointer*.
- **pDst** – *Destination Signal Pointer*.
- **nLength** – *Signal Length*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsNot_32u_Ctx**(const *Npp32u* *pSrc, *Npp32u* *pDst, size_t nLength, *NppStreamContext* nppStreamCtx)

32-bit unsigned integer not signal.

Parameters

- **pSrc** – *Source Signal Pointer*.
- **pDst** – *Destination Signal Pointer*.
- **nLength** – *Signal Length*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsNot_8u_I_Ctx**(*Npp8u* *pSrcDst, size_t nLength, *NppStreamContext* nppStreamCtx)

8-bit unsigned char in place not signal.

Parameters

- **pSrcDst** – *In-Place Signal Pointer*.
- **nLength** – *Signal Length*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsNot_16u_I_Ctx**(*Npp16u* *pSrcDst, size_t nLength, *NppStreamContext* nppStreamCtx)

16-bit unsigned short in place not signal.

Parameters

- **pSrcDst** – *In-Place Signal Pointer*.
- **nLength** – *Signal Length*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsNot_32u_I_Ctx**(*Npp32u* *pSrcDst, size_t nLength, *NppStreamContext* nppStreamCtx)

32-bit unsigned signed integer in place not signal.

Parameters

- **pSrcDst** – *In-Place Signal Pointer*.
- **nLength** – *Signal Length*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Signal Data Related Error Codes, *Length Related Error Codes*.

1.17.2.9 Signal LShiftC

1.17.2.9.1 LShiftC

Left shifts the bits of each sample of a signal by a constant amount.

Functions

NppStatus **nppsLShiftC_8u_Ctx**(const *Npp8u* *pSrc, int nValue, *Npp8u* *pDst, size_t nLength, *NppStreamContext* nppStreamCtx)

8-bit unsigned char signal left shift with constant.

Parameters

- **pSrc** – *Source Signal Pointer*.
- **nValue** – Constant value to be used to left shift each vector element
- **pDst** – *Destination Signal Pointer*.
- **nLength** – *Signal Length*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsLShiftC_16u_Ctx**(const *Npp16u* *pSrc, int nValue, *Npp16u* *pDst, size_t nLength, *NppStreamContext* nppStreamCtx)

16-bit unsigned short signal left shift with constant.

Parameters

- **pSrc** – *Source Signal Pointer*.
- **nValue** – Constant value to be used to left shift each vector element
- **pDst** – *Destination Signal Pointer*.
- **nLength** – *Signal Length*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsLShiftC_16s_Ctx**(const *Npp16s* *pSrc, int nValue, *Npp16s* *pDst, size_t nLength, *NppStreamContext* nppStreamCtx)

16-bit signed short signal left shift with constant.

Parameters

- **pSrc** – *Source Signal Pointer*.
- **nValue** – Constant value to be used to left shift each vector element
- **pDst** – *Destination Signal Pointer*.
- **nLength** – *Signal Length*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsLShiftC_32u_Ctx**(const *Npp32u* *pSrc, int nValue, *Npp32u* *pDst, size_t nLength, *NppStreamContext* nppStreamCtx)

32-bit unsigned integer signal left shift with constant.

Parameters

- **pSrc** – *Source Signal Pointer*.
- **nValue** – Constant value to be used to left shift each vector element
- **pDst** – *Destination Signal Pointer*.
- **nLength** – *Signal Length*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsLShiftC_32s_Ctx**(const *Npp32s* *pSrc, int nValue, *Npp32s* *pDst, size_t nLength, *NppStreamContext* nppStreamCtx)

32-bit signed integer signal left shift with constant.

Parameters

- **pSrc** – *Source Signal Pointer*.
- **nValue** – Constant value to be used to left shift each vector element
- **pDst** – *Destination Signal Pointer*.
- **nLength** – *Signal Length*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsLShiftC_8u_I_Ctx**(int nValue, *Npp8u* *pSrcDst, size_t nLength, *NppStreamContext* nppStreamCtx)

8-bit unsigned char in place signal left shift with constant.

Parameters

- **pSrcDst** – *In-Place Signal Pointer*.
- **nValue** – Constant value to be used to left shift each vector element
- **nLength** – *Signal Length*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsLShiftC_16u_I_Ctx**(int nValue, *Npp16u* *pSrcDst, size_t nLength, *NppStreamContext* nppStreamCtx)

16-bit unsigned short in place signal left shift with constant.

Parameters

- **pSrcDst** – *In-Place Signal Pointer*.
- **nValue** – Constant value to be used to left shift each vector element
- **nLength** – *Signal Length*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsLShiftC_16s_I_Ctx**(int nValue, *Npp16s* *pSrcDst, size_t nLength, *NppStreamContext* nppStreamCtx)

16-bit signed short in place signal left shift with constant.

Parameters

- **pSrcDst** – *In-Place Signal Pointer*.
- **nValue** – Constant value to be used to left shift each vector element
- **nLength** – *Signal Length*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsLShiftC_32u_I_Ctx**(int nValue, *Npp32u* *pSrcDst, size_t nLength, *NppStreamContext* nppStreamCtx)

32-bit unsigned signed integer in place signal left shift with constant.

Parameters

- **pSrcDst** – *In-Place Signal Pointer*.
- **nValue** – Constant value to be used to left shift each vector element
- **nLength** – *Signal Length*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsLShiftC_32s_I_Ctx**(int nValue, *Npp32s* *pSrcDst, size_t nLength, *NppStreamContext* nppStreamCtx)

32-bit signed signed integer in place signal left shift with constant.

Parameters

- **pSrcDst** – *In-Place Signal Pointer*.
- **nValue** – Constant value to be used to left shift each vector element
- **nLength** – *Signal Length*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

1.17.2.10 Signal RShiftC

1.17.2.10.1 RShiftC

Right shifts the bits of each sample of a signal by a constant amount.

Functions

NppStatus **nppsRShiftC_8u_Ctx**(const *Npp8u* *pSrc, int nValue, *Npp8u* *pDst, size_t nLength, *NppStreamContext* nppStreamCtx)

8-bit unsigned char signal right shift with constant.

Parameters

- **pSrc** – *Source Signal Pointer*.
- **nValue** – Constant value to be used to right shift each vector element
- **pDst** – *Destination Signal Pointer*.
- **nLength** – *Signal Length*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsRShiftC_16u_Ctx**(const *Npp16u* *pSrc, int nValue, *Npp16u* *pDst, size_t nLength, *NppStreamContext* nppStreamCtx)

16-bit unsigned short signal right shift with constant.

Parameters

- **pSrc** – *Source Signal Pointer*.
- **nValue** – Constant value to be used to right shift each vector element
- **pDst** – *Destination Signal Pointer*.
- **nLength** – *Signal Length*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsRShiftC_16s_Ctx**(const *Npp16s* *pSrc, int nValue, *Npp16s* *pDst, size_t nLength, *NppStreamContext* nppStreamCtx)

16-bit signed short signal right shift with constant.

Parameters

- **pSrc** – *Source Signal Pointer*.
- **nValue** – Constant value to be used to right shift each vector element
- **pDst** – *Destination Signal Pointer*.
- **nLength** – *Signal Length*.

- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsRShiftC_32u_Ctx**(const *Npp32u* *pSrc, int nValue, *Npp32u* *pDst, size_t nLength, *NppStreamContext* nppStreamCtx)

32-bit unsigned integer signal right shift with constant.

Parameters

- **pSrc** – *Source Signal Pointer*.
- **nValue** – Constant value to be used to right shift each vector element
- **pDst** – *Destination Signal Pointer*.
- **nLength** – *Signal Length*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsRShiftC_32s_Ctx**(const *Npp32s* *pSrc, int nValue, *Npp32s* *pDst, size_t nLength, *NppStreamContext* nppStreamCtx)

32-bit signed integer signal right shift with constant.

Parameters

- **pSrc** – *Source Signal Pointer*.
- **nValue** – Constant value to be used to right shift each vector element
- **pDst** – *Destination Signal Pointer*.
- **nLength** – *Signal Length*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsRShiftC_8u_I_Ctx**(int nValue, *Npp8u* *pSrcDst, size_t nLength, *NppStreamContext* nppStreamCtx)

8-bit unsigned char in place signal right shift with constant.

Parameters

- **pSrcDst** – *In-Place Signal Pointer*.
- **nValue** – Constant value to be used to right shift each vector element
- **nLength** – *Signal Length*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsRShiftC_16u_I_Ctx**(int nValue, *Npp16u* *pSrcDst, size_t nLength, *NppStreamContext* nppStreamCtx)

16-bit unsigned short in place signal right shift with constant.

Parameters

- **pSrcDst** – *In-Place Signal Pointer*.
- **nValue** – Constant value to be used to right shift each vector element
- **nLength** – *Signal Length*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsRShiftC_16s_I_Ctx**(int nValue, *Npp16s* *pSrcDst, size_t nLength, *NppStreamContext* nppStreamCtx)

16-bit signed short in place signal right shift with constant.

Parameters

- **pSrcDst** – *In-Place Signal Pointer*.
- **nValue** – Constant value to be used to right shift each vector element
- **nLength** – *Signal Length*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsRShiftC_32u_I_Ctx**(int nValue, *Npp32u* *pSrcDst, size_t nLength, *NppStreamContext* nppStreamCtx)

32-bit unsigned signed integer in place signal right shift with constant.

Parameters

- **pSrcDst** – *In-Place Signal Pointer*.
- **nValue** – Constant value to be used to right shift each vector element
- **nLength** – *Signal Length*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsRShiftC_32s_I_Ctx**(int nValue, *Npp32s* *pSrcDst, size_t nLength, *NppStreamContext* nppStreamCtx)

32-bit signed signed integer in place signal right shift with constant.

Parameters

- **pSrcDst** – *In-Place Signal Pointer*.
- **nValue** – Constant value to be used to right shift each vector element

- **nLength** – *Signal Length*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Signal Data Related Error Codes, *Length Related Error Codes*.

1.18. Signal Conversion Functions

Functions that provide conversion and threshold operations.

1.18.1. Signal Convert

1.18.1.1 Convert

The set of conversion operations available in the library

Convert

Routines for converting the sample-data type of signals.

NppStatus **nppsConvert_8s16s_Ctx**(const *Npp8s* *pSrc, *Npp16s* *pDst, size_t nLength, *NppStreamContext* nppStreamCtx)

8-bit signed byte to 16-bit signed short conversion

Parameters

- **pSrc** – *Source Signal Pointer*.
- **pDst** – *Destination Signal Pointer*.
- **nLength** – *Signal Length*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsConvert_8s32f_Ctx**(const *Npp8s* *pSrc, *Npp32f* *pDst, size_t nLength, *NppStreamContext* nppStreamCtx)

8-bit signed byte to 32-bit floating point number conversion

Parameters

- **pSrc** – *Source Signal Pointer*.
- **pDst** – *Destination Signal Pointer*.
- **nLength** – *Signal Length*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsConvert_8u32f_Ctx**(const *Npp8u* *pSrc, *Npp32f* *pDst, size_t nLength, *NppStreamContext* nppStreamCtx)

8-bit unsigned byte to 32-bit floating point number conversion

Parameters

- **pSrc** – *Source Signal Pointer*.
- **pDst** – *Destination Signal Pointer*.
- **nLength** – *Signal Length*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsConvert_16s8s_Sfs_Ctx**(const *Npp16s* *pSrc, *Npp8s* *pDst, *Npp32u* nLength, *NppRoundMode* eRoundMode, int nScaleFactor, *NppStreamContext* nppStreamCtx)

16-bit signed short to 8-bit signed byte conversion

Parameters

- **pSrc** – *Source Signal Pointer*.
- **pDst** – *Destination Signal Pointer*.
- **nLength** – *Signal Length*.
- **eRoundMode** – *Rounding Mode Parameter*.
- **nScaleFactor** – nScaleFactor
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsConvert_16s32s_Ctx**(const *Npp16s* *pSrc, *Npp32s* *pDst, size_t nLength, *NppStreamContext* nppStreamCtx)

16-bit signed short to 32-bit signed integer conversion

Parameters

- **pSrc** – *Source Signal Pointer*.
- **pDst** – *Destination Signal Pointer*.
- **nLength** – *Signal Length*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsConvert_16s32f_Ctx**(const *Npp16s* *pSrc, *Npp32f* *pDst, size_t nLength, *NppStreamContext* nppStreamCtx)

16-bit signed short to 32-bit floating point number conversion

Parameters

- **pSrc** – *Source Signal Pointer*.
- **pDst** – *Destination Signal Pointer*.
- **nLength** – *Signal Length*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsConvert_16u32f_Ctx**(const *Npp16u* *pSrc, *Npp32f* *pDst, size_t nLength, *NppStreamContext* nppStreamCtx)

16-bit unsigned short to 32-bit floating point number conversion

Parameters

- **pSrc** – *Source Signal Pointer*.
- **pDst** – *Destination Signal Pointer*.
- **nLength** – *Signal Length*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsConvert_32s16s_Ctx**(const *Npp32s* *pSrc, *Npp16s* *pDst, size_t nLength, *NppStreamContext* nppStreamCtx)

32-bit signed integer to 16-bit signed short conversion

Parameters

- **pSrc** – *Source Signal Pointer*.
- **pDst** – *Destination Signal Pointer*.
- **nLength** – *Signal Length*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsConvert_32s32f_Ctx**(const *Npp32s* *pSrc, *Npp32f* *pDst, size_t nLength, *NppStreamContext* nppStreamCtx)

32-bit signed integer to 32-bit floating point number conversion

Parameters

- **pSrc** – *Source Signal Pointer*.
- **pDst** – *Destination Signal Pointer*.

- **nLength** – *Signal Length*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsConvert_32s64f_Ctx**(const *Npp32s* *pSrc, *Npp64f* *pDst, size_t nLength, *NppStreamContext* nppStreamCtx)

32-bit signed integer to 64-bit floating point number conversion

Parameters

- **pSrc** – *Source Signal Pointer*.
- **pDst** – *Destination Signal Pointer*.
- **nLength** – *Signal Length*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsConvert_32f64f_Ctx**(const *Npp32f* *pSrc, *Npp64f* *pDst, size_t nLength, *NppStreamContext* nppStreamCtx)

32-bit floating point number to 64-bit floating point number conversion

Parameters

- **pSrc** – *Source Signal Pointer*.
- **pDst** – *Destination Signal Pointer*.
- **nLength** – *Signal Length*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsConvert_64s64f_Ctx**(const *Npp64s* *pSrc, *Npp64f* *pDst, size_t nLength, *NppStreamContext* nppStreamCtx)

64-bit signed integer to 64-bit floating point number conversion

Parameters

- **pSrc** – *Source Signal Pointer*.
- **pDst** – *Destination Signal Pointer*.
- **nLength** – *Signal Length*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsConvert_64f32f_Ctx**(const *Npp64f* *pSrc, *Npp32f* *pDst, size_t nLength, *NppStreamContext* nppStreamCtx)

64-bit floating point number to 32-bit floating point number conversion

Parameters

- **pSrc** – *Source Signal Pointer*.
- **pDst** – *Destination Signal Pointer*.
- **nLength** – *Signal Length*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsConvert_16s32f_Sfs_Ctx**(const *Npp16s* *pSrc, *Npp32f* *pDst, size_t nLength, int nScaleFactor, *NppStreamContext* nppStreamCtx)

16-bit signed short to 32-bit floating point number conversion with scaling

Parameters

- **pSrc** – *Source Signal Pointer*.
- **pDst** – *Destination Signal Pointer*.
- **nLength** – *Signal Length*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsConvert_16s64f_Sfs_Ctx**(const *Npp16s* *pSrc, *Npp64f* *pDst, size_t nLength, int nScaleFactor, *NppStreamContext* nppStreamCtx)

16-bit signed short to 64-bit floating point number conversion with scaling

Parameters

- **pSrc** – *Source Signal Pointer*.
- **pDst** – *Destination Signal Pointer*.
- **nLength** – *Signal Length*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsConvert_32s16s_Sfs_Ctx**(const *Npp32s* *pSrc, *Npp16s* *pDst, size_t nLength, int nScaleFactor, *NppStreamContext* nppStreamCtx)

32-bit signed integer to 16-bit signed short conversion with scaling

Parameters

- **pSrc** – *Source Signal Pointer*.
- **pDst** – *Destination Signal Pointer*.
- **nLength** – *Signal Length*.

- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsConvert_32s32f_Sfs_Ctx**(const *Npp32s* *pSrc, *Npp32f* *pDst, size_t nLength, int nScaleFactor, *NppStreamContext* nppStreamCtx)

32-bit signed integer to 32-bit floating point number conversion with scaling

Parameters

- **pSrc** – *Source Signal Pointer*.
- **pDst** – *Destination Signal Pointer*.
- **nLength** – *Signal Length*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsConvert_32s64f_Sfs_Ctx**(const *Npp32s* *pSrc, *Npp64f* *pDst, size_t nLength, int nScaleFactor, *NppStreamContext* nppStreamCtx)

32-bit signed integer to 64-bit floating point number conversion with scaling

Parameters

- **pSrc** – *Source Signal Pointer*.
- **pDst** – *Destination Signal Pointer*.
- **nLength** – *Signal Length*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsConvert_32f8s_Sfs_Ctx**(const *Npp32f* *pSrc, *Npp8s* *pDst, size_t nLength, *NppRoundMode* eRoundMode, int nScaleFactor, *NppStreamContext* nppStreamCtx)

32-bit signed integer to 8-bit signed byte conversion with scaling

Parameters

- **pSrc** – *Source Signal Pointer*.
- **pDst** – *Destination Signal Pointer*.
- **nLength** – *Signal Length*.
- **eRoundMode** – *Rounding Mode Parameter*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsConvert_32f8u_Sfs_Ctx**(const *Npp32f* *pSrc, *Npp8u* *pDst, size_t nLength, *NppRoundMode* eRoundMode, int nScaleFactor, *NppStreamContext* nppStreamCtx)

32-bit floating point number to 8-bit unsigned byte conversion with scaling

Parameters

- **pSrc** – *Source Signal Pointer*.
- **pDst** – *Destination Signal Pointer*.
- **nLength** – *Signal Length*.
- **eRoundMode** – *Rounding Mode Parameter*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsConvert_32f16s_Sfs_Ctx**(const *Npp32f* *pSrc, *Npp16s* *pDst, size_t nLength, *NppRoundMode* eRoundMode, int nScaleFactor, *NppStreamContext* nppStreamCtx)

32-bit floating point number to 16-bit signed short conversion with scaling

Parameters

- **pSrc** – *Source Signal Pointer*.
- **pDst** – *Destination Signal Pointer*.
- **nLength** – *Signal Length*.
- **eRoundMode** – *Rounding Mode Parameter*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsConvert_32f16u_Sfs_Ctx**(const *Npp32f* *pSrc, *Npp16u* *pDst, size_t nLength, *NppRoundMode* eRoundMode, int nScaleFactor, *NppStreamContext* nppStreamCtx)

32-bit floating point number to 16-bit unsigned short conversion with scaling

Parameters

- **pSrc** – *Source Signal Pointer*.
- **pDst** – *Destination Signal Pointer*.
- **nLength** – *Signal Length*.
- **eRoundMode** – *Rounding Mode Parameter*.

- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsConvert_32f32s_Sfs_Ctx**(const *Npp32f* *pSrc, *Npp32s* *pDst, size_t nLength, *NppRoundMode* eRoundMode, int nScaleFactor, *NppStreamContext* nppStreamCtx)

32-bit floating point number to 32-bit signed integer conversion with scaling

Parameters

- **pSrc** – *Source Signal Pointer*.
- **pDst** – *Destination Signal Pointer*.
- **nLength** – *Signal Length*.
- **eRoundMode** – *Rounding Mode Parameter*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsConvert_64s32s_Sfs_Ctx**(const *Npp64s* *pSrc, *Npp32s* *pDst, size_t nLength, *NppRoundMode* eRoundMode, int nScaleFactor, *NppStreamContext* nppStreamCtx)

64-bit signed integer to 32-bit signed integer conversion with scaling

Parameters

- **pSrc** – *Source Signal Pointer*.
- **pDst** – *Destination Signal Pointer*.
- **nLength** – *Signal Length*.
- **eRoundMode** – *Rounding Mode Parameter*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsConvert_64f16s_Sfs_Ctx**(const *Npp64f* *pSrc, *Npp16s* *pDst, size_t nLength, *NppRoundMode* eRoundMode, int nScaleFactor, *NppStreamContext* nppStreamCtx)

64-bit floating point number to 16-bit signed short conversion with scaling

Parameters

- **pSrc** – *Source Signal Pointer*.
- **pDst** – *Destination Signal Pointer*.

- **nLength** – *Signal Length*.
- **eRoundMode** – *Rounding Mode Parameter*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsConvert_64f32s_Sfs_Ctx**(const *Npp64f* *pSrc, *Npp32s* *pDst, size_t nLength, *NppRoundMode* eRoundMode, int nScaleFactor, *NppStreamContext* nppStreamCtx)

64-bit floating point number to 32-bit signed integer conversion with scaling

Parameters

- **pSrc** – *Source Signal Pointer*.
- **pDst** – *Destination Signal Pointer*.
- **nLength** – *Signal Length*.
- **eRoundMode** – *Rounding Mode Parameter*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsConvert_64f64s_Sfs_Ctx**(const *Npp64f* *pSrc, *Npp64s* *pDst, size_t nLength, *NppRoundMode* eRoundMode, int nScaleFactor, *NppStreamContext* nppStreamCtx)

64-bit floating point number to 64-bit signed integer conversion with scaling

Parameters

- **pSrc** – *Source Signal Pointer*.
- **pDst** – *Destination Signal Pointer*.
- **nLength** – *Signal Length*.
- **eRoundMode** – *Rounding Mode Parameter*.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Signal Data Related Error Codes, *Length Related Error Codes*.

1.18.2. Signal Threshold

1.18.2.1 Threshold

The set of threshold operations available in the library.

Threshold Functions

Performs the threshold operation on the samples of a signal by limiting the sample values by a specified constant value.

NppStatus **nppsThreshold_16s_Ctx**(const *Npp16s* *pSrc, *Npp16s* *pDst, size_t nLength, *Npp16s* nLevel, *NppCmpOp* nRelOp, *NppStreamContext* nppStreamCtx)

16-bit signed short signal threshold with constant level.

Parameters

- **pSrc** – *Source Signal Pointer*.
- **pDst** – *Destination Signal Pointer*.
- **nLength** – *Signal Length*.
- **nLevel** – Constant threshold value to be used to limit each signal sample
- **nRelOp** – NppCmpOp type of thresholding operation (NPP_CMP_LESS or NPP_CMP_GREATER only).
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsThreshold_16s_I_Ctx**(*Npp16s* *pSrcDst, size_t nLength, *Npp16s* nLevel, *NppCmpOp* nRelOp, *NppStreamContext* nppStreamCtx)

16-bit in place signed short signal threshold with constant level.

Parameters

- **pSrcDst** – *In-Place Signal Pointer*.
- **nLength** – *Signal Length*.
- **nLevel** – Constant threshold value to be used to limit each signal sample
- **nRelOp** – NppCmpOp type of thresholding operation (NPP_CMP_LESS or NPP_CMP_GREATER only).
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsThreshold_16sc_Ctx**(const *Npp16sc* *pSrc, *Npp16sc* *pDst, size_t nLength, *Npp16s* nLevel, *NppCmpOp* nRelOp, *NppStreamContext* nppStreamCtx)

16-bit signed short complex number signal threshold with constant level.

Parameters

- **pSrc** – *Source Signal Pointer*.
- **pDst** – *Destination Signal Pointer*.
- **nLength** – *Signal Length*.
- **nLevel** – Constant threshold value (real part only and must be greater than 0) to be used to limit each signal sample
- **nRelOp** – NppCmpOp type of thresholding operation (NPP_CMP_LESS or NPP_CMP_GREATER only).
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsThreshold_16sc_I_Ctx**(*Npp16sc* *pSrcDst, size_t nLength, *Npp16s* nLevel, *NppCmpOp* nRelOp, *NppStreamContext* nppStreamCtx)

16-bit in place signed short complex number signal threshold with constant level.

Parameters

- **pSrcDst** – *In-Place Signal Pointer*.
- **nLength** – *Signal Length*.
- **nLevel** – Constant threshold value (real part only and must be greater than 0) to be used to limit each signal sample
- **nRelOp** – NppCmpOp type of thresholding operation (NPP_CMP_LESS or NPP_CMP_GREATER only).
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsThreshold_32f_Ctx**(const *Npp32f* *pSrc, *Npp32f* *pDst, size_t nLength, *Npp32f* nLevel, *NppCmpOp* nRelOp, *NppStreamContext* nppStreamCtx)

32-bit floating point signal threshold with constant level.

Parameters

- **pSrc** – *Source Signal Pointer*.
- **pDst** – *Destination Signal Pointer*.
- **nLength** – *Signal Length*.
- **nLevel** – Constant threshold value to be used to limit each signal sample
- **nRelOp** – NppCmpOp type of thresholding operation (NPP_CMP_LESS or NPP_CMP_GREATER only).
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsThreshold_32f_I_Ctx**(*Npp32f* *pSrcDst, size_t nLength, *Npp32f* nLevel, *NppCmpOp* nRelOp, *NppStreamContext* nppStreamCtx)

32-bit in place floating point signal threshold with constant level.

Parameters

- **pSrcDst** – *In-Place Signal Pointer*.
- **nLength** – *Signal Length*.
- **nLevel** – Constant threshold value to be used to limit each signal sample
- **nRelOp** – NppCmpOp type of thresholding operation (NPP_CMP_LESS or NPP_CMP_GREATER only).
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsThreshold_32fc_Ctx**(const *Npp32fc* *pSrc, *Npp32fc* *pDst, size_t nLength, *Npp32f* nLevel, *NppCmpOp* nRelOp, *NppStreamContext* nppStreamCtx)

32-bit floating point complex number signal threshold with constant level.

Parameters

- **pSrc** – *Source Signal Pointer*.
- **pDst** – *Destination Signal Pointer*.
- **nLength** – *Signal Length*.
- **nLevel** – Constant threshold value (real part only and must be greater than 0) to be used to limit each signal sample
- **nRelOp** – NppCmpOp type of thresholding operation (NPP_CMP_LESS or NPP_CMP_GREATER only).
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsThreshold_32fc_I_Ctx**(*Npp32fc* *pSrcDst, size_t nLength, *Npp32f* nLevel, *NppCmpOp* nRelOp, *NppStreamContext* nppStreamCtx)

32-bit in place floating point complex number signal threshold with constant level.

Parameters

- **pSrcDst** – *In-Place Signal Pointer*.
- **nLength** – *Signal Length*.
- **nLevel** – Constant threshold value (real part only and must be greater than 0) to be used to limit each signal sample
- **nRelOp** – NppCmpOp type of thresholding operation (NPP_CMP_LESS or NPP_CMP_GREATER only).
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsThreshold_64f_Ctx**(const *Npp64f* *pSrc, *Npp64f* *pDst, size_t nLength, *Npp64f* nLevel, *NppCmpOp* nRelOp, *NppStreamContext* nppStreamCtx)

64-bit floating point signal threshold with constant level.

Parameters

- **pSrc** – *Source Signal Pointer*.
- **pDst** – *Destination Signal Pointer*.
- **nLength** – *Signal Length*.
- **nLevel** – Constant threshold value to be used to limit each signal sample
- **nRelOp** – NppCmpOp type of thresholding operation (NPP_CMP_LESS or NPP_CMP_GREATER only).
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsThreshold_64f_I_Ctx**(*Npp64f* *pSrcDst, size_t nLength, *Npp64f* nLevel, *NppCmpOp* nRelOp, *NppStreamContext* nppStreamCtx)

64-bit in place floating point signal threshold with constant level.

Parameters

- **pSrcDst** – *In-Place Signal Pointer*.
- **nLength** – *Signal Length*.
- **nLevel** – Constant threshold value to be used to limit each signal sample
- **nRelOp** – NppCmpOp type of thresholding operation (NPP_CMP_LESS or NPP_CMP_GREATER only).
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsThreshold_64fc_Ctx**(const *Npp64fc* *pSrc, *Npp64fc* *pDst, size_t nLength, *Npp64f* nLevel, *NppCmpOp* nRelOp, *NppStreamContext* nppStreamCtx)

64-bit floating point complex number signal threshold with constant level.

Parameters

- **pSrc** – *Source Signal Pointer*.
- **pDst** – *Destination Signal Pointer*.
- **nLength** – *Signal Length*.
- **nLevel** – Constant threshold value (real part only and must be greater than 0) to be used to limit each signal sample

- **nRelOp** – NppCmpOp type of thresholding operation (NPP_CMP_LESS or NPP_CMP_GREATER only).
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsThreshold_64fc_I_Ctx**(*Npp64fc* *pSrcDst, size_t nLength, *Npp64f* nLevel, *NppCmpOp* nRelOp, *NppStreamContext* nppStreamCtx)

64-bit in place floating point complex number signal threshold with constant level.

Parameters

- **pSrcDst** – *In-Place Signal Pointer*.
- **nLength** – *Signal Length*.
- **nLevel** – Constant threshold value (real part only and must be greater than 0) to be used to limit each signal sample
- **nRelOp** – NppCmpOp type of thresholding operation (NPP_CMP_LESS or NPP_CMP_GREATER only).
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsThreshold_LT_16s_Ctx**(const *Npp16s* *pSrc, *Npp16s* *pDst, size_t nLength, *Npp16s* nLevel, *NppStreamContext* nppStreamCtx)

16-bit signed short signal NPP_CMP_LESS threshold with constant level.

Parameters

- **pSrc** – *Source Signal Pointer*.
- **pDst** – *Destination Signal Pointer*.
- **nLength** – *Signal Length*.
- **nLevel** – Constant threshold value to be used to limit each signal sample
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsThreshold_LT_16s_I_Ctx**(*Npp16s* *pSrcDst, size_t nLength, *Npp16s* nLevel, *NppStreamContext* nppStreamCtx)

16-bit in place signed short signal NPP_CMP_LESS threshold with constant level.

Parameters

- **pSrcDst** – *In-Place Signal Pointer*.
- **nLength** – *Signal Length*.
- **nLevel** – Constant threshold value to be used to limit each signal sample
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsThreshold_LT_16sc_Ctx**(const *Npp16sc* *pSrc, *Npp16sc* *pDst, size_t nLength, *Npp16s* nLevel, *NppStreamContext* nppStreamCtx)

16-bit signed short complex number signal NPP_CMP_LESS threshold with constant level.

Parameters

- **pSrc** – *Source Signal Pointer*.
- **pDst** – *Destination Signal Pointer*.
- **nLength** – *Signal Length*.
- **nLevel** – Constant threshold value (real part only and must be greater than 0) to be used to limit each signal sample
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsThreshold_LT_16sc_I_Ctx**(*Npp16sc* *pSrcDst, size_t nLength, *Npp16s* nLevel, *NppStreamContext* nppStreamCtx)

16-bit in place signed short complex number signal NPP_CMP_LESS threshold with constant level.

Parameters

- **pSrcDst** – *In-Place Signal Pointer*.
- **nLength** – *Signal Length*.
- **nLevel** – Constant threshold value (real part only and must be greater than 0) to be used to limit each signal sample
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsThreshold_LT_32f_Ctx**(const *Npp32f* *pSrc, *Npp32f* *pDst, size_t nLength, *Npp32f* nLevel, *NppStreamContext* nppStreamCtx)

32-bit floating point signal NPP_CMP_LESS threshold with constant level.

Parameters

- **pSrc** – *Source Signal Pointer*.
- **pDst** – *Destination Signal Pointer*.
- **nLength** – *Signal Length*.
- **nLevel** – Constant threshold value to be used to limit each signal sample
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsThreshold_LT_32f_I_Ctx**(*Npp32f* *pSrcDst, size_t nLength, *Npp32f* nLevel, *NppStreamContext* nppStreamCtx)

32-bit in place floating point signal NPP_CMP_LESS threshold with constant level.

Parameters

- **pSrcDst** – *In-Place Signal Pointer*.
- **nLength** – *Signal Length*.
- **nLevel** – Constant threshold value to be used to limit each signal sample
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsThreshold_LT_32fc_Ctx**(const *Npp32fc* *pSrc, *Npp32fc* *pDst, size_t nLength, *Npp32f* nLevel, *NppStreamContext* nppStreamCtx)

32-bit floating point complex number signal NPP_CMP_LESS threshold with constant level.

Parameters

- **pSrc** – *Source Signal Pointer*.
- **pDst** – *Destination Signal Pointer*.
- **nLength** – *Signal Length*.
- **nLevel** – Constant threshold value (real part only and must be greater than 0) to be used to limit each signal sample
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsThreshold_LT_32fc_I_Ctx**(*Npp32fc* *pSrcDst, size_t nLength, *Npp32f* nLevel, *NppStreamContext* nppStreamCtx)

32-bit in place floating point complex number signal NPP_CMP_LESS threshold with constant level.

Parameters

- **pSrcDst** – *In-Place Signal Pointer*.
- **nLength** – *Signal Length*.
- **nLevel** – Constant threshold value (real part only and must be greater than 0) to be used to limit each signal sample
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsThreshold_LT_64f_Ctx**(const *Npp64f* *pSrc, *Npp64f* *pDst, size_t nLength, *Npp64f* nLevel, *NppStreamContext* nppStreamCtx)

64-bit floating point signal NPP_CMP_LESS threshold with constant level.

Parameters

- **pSrc** – *Source Signal Pointer*.
- **pDst** – *Destination Signal Pointer*.
- **nLength** – *Signal Length*.
- **nLevel** – Constant threshold value to be used to limit each signal sample
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsThreshold_LT_64f_I_Ctx**(*Npp64f* *pSrcDst, size_t nLength, *Npp64f* nLevel, *NppStreamContext* nppStreamCtx)

64-bit in place floating point signal NPP_CMP_LESS threshold with constant level.

Parameters

- **pSrcDst** – *In-Place Signal Pointer*.
- **nLength** – *Signal Length*.
- **nLevel** – Constant threshold value to be used to limit each signal sample
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsThreshold_LT_64fc_Ctx**(const *Npp64fc* *pSrc, *Npp64fc* *pDst, size_t nLength, *Npp64f* nLevel, *NppStreamContext* nppStreamCtx)

64-bit floating point complex number signal NPP_CMP_LESS threshold with constant level.

Parameters

- **pSrc** – *Source Signal Pointer*.
- **pDst** – *Destination Signal Pointer*.
- **nLength** – *Signal Length*.
- **nLevel** – Constant threshold value (real part only and must be greater than 0) to be used to limit each signal sample
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsThreshold_LT_64fc_I_Ctx**(*Npp64fc* *pSrcDst, size_t nLength, *Npp64f* nLevel, *NppStreamContext* nppStreamCtx)

64-bit in place floating point complex number signal NPP_CMP_LESS threshold with constant level.

Parameters

- **pSrcDst** – *In-Place Signal Pointer*.

- **nLength** – *Signal Length*.
- **nLevel** – Constant threshold value (real part only and must be greater than 0) to be used to limit each signal sample
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsThreshold_GT_16s_Ctx**(const *Npp16s* *pSrc, *Npp16s* *pDst, size_t nLength, *Npp16s* nLevel, *NppStreamContext* nppStreamCtx)

16-bit signed short signal NPP_CMP_GREATER threshold with constant level.

Parameters

- **pSrc** – *Source Signal Pointer*.
- **pDst** – *Destination Signal Pointer*.
- **nLength** – *Signal Length*.
- **nLevel** – Constant threshold value to be used to limit each signal sample
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsThreshold_GT_16s_I_Ctx**(*Npp16s* *pSrcDst, size_t nLength, *Npp16s* nLevel, *NppStreamContext* nppStreamCtx)

16-bit in place signed short signal NPP_CMP_GREATER threshold with constant level.

Parameters

- **pSrcDst** – *In-Place Signal Pointer*.
- **nLength** – *Signal Length*.
- **nLevel** – Constant threshold value to be used to limit each signal sample
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsThreshold_GT_16sc_Ctx**(const *Npp16sc* *pSrc, *Npp16sc* *pDst, size_t nLength, *Npp16s* nLevel, *NppStreamContext* nppStreamCtx)

16-bit signed short complex number signal NPP_CMP_GREATER threshold with constant level.

Parameters

- **pSrc** – *Source Signal Pointer*.
- **pDst** – *Destination Signal Pointer*.
- **nLength** – *Signal Length*.
- **nLevel** – Constant threshold value (real part only and must be greater than 0) to be used to limit each signal sample
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsThreshold_GT_16sc_I_Ctx**(*Npp16sc* *pSrcDst, size_t nLength, *Npp16s* nLevel, *NppStreamContext* nppStreamCtx)

16-bit in place signed short complex number signal NPP_CMP_GREATER threshold with constant level.

Parameters

- **pSrcDst** – *In-Place Signal Pointer*.
- **nLength** – *Signal Length*.
- **nLevel** – Constant threshold value (real part only and must be greater than 0) to be used to limit each signal sample
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsThreshold_GT_32f_Ctx**(const *Npp32f* *pSrc, *Npp32f* *pDst, size_t nLength, *Npp32f* nLevel, *NppStreamContext* nppStreamCtx)

32-bit floating point signal NPP_CMP_GREATER threshold with constant level.

Parameters

- **pSrc** – *Source Signal Pointer*.
- **pDst** – *Destination Signal Pointer*.
- **nLength** – *Signal Length*.
- **nLevel** – Constant threshold value to be used to limit each signal sample
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsThreshold_GT_32f_I_Ctx**(*Npp32f* *pSrcDst, size_t nLength, *Npp32f* nLevel, *NppStreamContext* nppStreamCtx)

32-bit in place floating point signal NPP_CMP_GREATER threshold with constant level.

Parameters

- **pSrcDst** – *In-Place Signal Pointer*.
- **nLength** – *Signal Length*.
- **nLevel** – Constant threshold value to be used to limit each signal sample
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsThreshold_GT_32fc_Ctx**(const *Npp32fc* *pSrc, *Npp32fc* *pDst, size_t nLength, *Npp32f* nLevel, *NppStreamContext* nppStreamCtx)

32-bit floating point complex number signal NPP_CMP_GREATER threshold with constant level.

Parameters

- **pSrc** – *Source Signal Pointer*.
- **pDst** – *Destination Signal Pointer*.
- **nLength** – *Signal Length*.
- **nLevel** – Constant threshold value (real part only and must be greater than 0) to be used to limit each signal sample
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsThreshold_GT_32fc_I_Ctx**(*Npp32fc* *pSrcDst, size_t nLength, *Npp32f* nLevel, *NppStreamContext* nppStreamCtx)

32-bit in place floating point complex number signal NPP_CMP_GREATER threshold with constant level.

Parameters

- **pSrcDst** – *In-Place Signal Pointer*.
- **nLength** – *Signal Length*.
- **nLevel** – Constant threshold value (real part only and must be greater than 0) to be used to limit each signal sample
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsThreshold_GT_64f_Ctx**(const *Npp64f* *pSrc, *Npp64f* *pDst, size_t nLength, *Npp64f* nLevel, *NppStreamContext* nppStreamCtx)

64-bit floating point signal NPP_CMP_GREATER threshold with constant level.

Parameters

- **pSrc** – *Source Signal Pointer*.
- **pDst** – *Destination Signal Pointer*.
- **nLength** – *Signal Length*.
- **nLevel** – Constant threshold value to be used to limit each signal sample
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsThreshold_GT_64f_I_Ctx**(*Npp64f* *pSrcDst, size_t nLength, *Npp64f* nLevel, *NppStreamContext* nppStreamCtx)

64-bit in place floating point signal NPP_CMP_GREATER threshold with constant level.

Parameters

- **pSrcDst** – *In-Place Signal Pointer*.

- **nLength** – *Signal Length*.
- **nLevel** – Constant threshold value to be used to limit each signal sample
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsThreshold_GT_64fc_Ctx**(const *Npp64fc* *pSrc, *Npp64fc* *pDst, size_t nLength, *Npp64f* nLevel, *NppStreamContext* nppStreamCtx)

64-bit floating point complex number signal NPP_CMP_GREATER threshold with constant level.

Parameters

- **pSrc** – *Source Signal Pointer*.
- **pDst** – *Destination Signal Pointer*.
- **nLength** – *Signal Length*.
- **nLevel** – Constant threshold value (real part only and must be greater than 0) to be used to limit each signal sample
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsThreshold_GT_64fc_I_Ctx**(*Npp64fc* *pSrcDst, size_t nLength, *Npp64f* nLevel, *NppStreamContext* nppStreamCtx)

64-bit in place floating point complex number signal NPP_CMP_GREATER threshold with constant level.

Parameters

- **pSrcDst** – *In-Place Signal Pointer*.
- **nLength** – *Signal Length*.
- **nLevel** – Constant threshold value (real part only and must be greater than 0) to be used to limit each signal sample
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsThreshold_LTVal_16s_Ctx**(const *Npp16s* *pSrc, *Npp16s* *pDst, size_t nLength, *Npp16s* nLevel, *Npp16s* nValue, *NppStreamContext* nppStreamCtx)

16-bit signed short signal NPP_CMP_LESS threshold with constant level.

Parameters

- **pSrc** – *Source Signal Pointer*.
- **pDst** – *Destination Signal Pointer*.
- **nLength** – *Signal Length*.
- **nLevel** – Constant threshold value to be used to limit each signal sample

- **nValue** – Constant value to replace source value when threshold test is true.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsThreshold_LTVal_16s_I_Ctx**(*Npp16s* *pSrcDst, size_t nLength, *Npp16s* nLevel, *Npp16s* nValue, *NppStreamContext* nppStreamCtx)

16-bit in place signed short signal NPP_CMP_LESS threshold with constant level.

Parameters

- **pSrcDst** – *In-Place Signal Pointer*.
- **nLength** – *Signal Length*.
- **nLevel** – Constant threshold value to be used to limit each signal sample
- **nValue** – Constant value to replace source value when threshold test is true.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsThreshold_LTVal_16sc_Ctx**(const *Npp16sc* *pSrc, *Npp16sc* *pDst, size_t nLength, *Npp16s* nLevel, *Npp16sc* nValue, *NppStreamContext* nppStreamCtx)

16-bit signed short complex number signal NPP_CMP_LESS threshold with constant level.

Parameters

- **pSrc** – *Source Signal Pointer*.
- **pDst** – *Destination Signal Pointer*.
- **nLength** – *Signal Length*.
- **nLevel** – Constant threshold value (real part only and must be greater than 0) to be used to limit each signal sample
- **nValue** – Constant value to replace source value when threshold test is true.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsThreshold_LTVal_16sc_I_Ctx**(*Npp16sc* *pSrcDst, size_t nLength, *Npp16s* nLevel, *Npp16sc* nValue, *NppStreamContext* nppStreamCtx)

16-bit in place signed short complex number signal NPP_CMP_LESS threshold with constant level.

Parameters

- **pSrcDst** – *In-Place Signal Pointer*.
- **nLength** – *Signal Length*.

- **nLevel** – Constant threshold value (real part only and must be greater than 0) to be used to limit each signal sample
- **nValue** – Constant value to replace source value when threshold test is true.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsThreshold_LTVal_32f_Ctx**(const *Npp32f* *pSrc, *Npp32f* *pDst, size_t nLength, *Npp32f* nLevel, *Npp32f* nValue, *NppStreamContext* nppStreamCtx)

32-bit floating point signal NPP_CMP_LESS threshold with constant level.

Parameters

- **pSrc** – *Source Signal Pointer*.
- **pDst** – *Destination Signal Pointer*.
- **nLength** – *Signal Length*.
- **nLevel** – Constant threshold value to be used to limit each signal sample
- **nValue** – Constant value to replace source value when threshold test is true.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsThreshold_LTVal_32f_I_Ctx**(*Npp32f* *pSrcDst, size_t nLength, *Npp32f* nLevel, *Npp32f* nValue, *NppStreamContext* nppStreamCtx)

32-bit in place floating point signal NPP_CMP_LESS threshold with constant level.

Parameters

- **pSrcDst** – *In-Place Signal Pointer*.
- **nLength** – *Signal Length*.
- **nLevel** – Constant threshold value to be used to limit each signal sample
- **nValue** – Constant value to replace source value when threshold test is true.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsThreshold_LTVal_32fc_Ctx**(const *Npp32fc* *pSrc, *Npp32fc* *pDst, size_t nLength, *Npp32f* nLevel, *Npp32fc* nValue, *NppStreamContext* nppStreamCtx)

32-bit floating point complex number signal NPP_CMP_LESS threshold with constant level.

Parameters

- **pSrc** – *Source Signal Pointer*.
- **pDst** – *Destination Signal Pointer*.

- **nLength** – *Signal Length*.
- **nLevel** – Constant threshold value (real part only and must be greater than 0) to be used to limit each signal sample
- **nValue** – Constant value to replace source value when threshold test is true.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsThreshold_LTVal_32fc_I_Ctx**(*Npp32fc* *pSrcDst, size_t nLength, *Npp32f* nLevel, *Npp32fc* nValue, *NppStreamContext* nppStreamCtx)

32-bit in place floating point complex number signal NPP_CMP_LESS threshold with constant level.

Parameters

- **pSrcDst** – *In-Place Signal Pointer*.
- **nLength** – *Signal Length*.
- **nLevel** – Constant threshold value (real part only and must be greater than 0) to be used to limit each signal sample
- **nValue** – Constant value to replace source value when threshold test is true.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsThreshold_LTVal_64f_Ctx**(const *Npp64f* *pSrc, *Npp64f* *pDst, size_t nLength, *Npp64f* nLevel, *Npp64f* nValue, *NppStreamContext* nppStreamCtx)

64-bit floating point signal NPP_CMP_LESS threshold with constant level.

Parameters

- **pSrc** – *Source Signal Pointer*.
- **pDst** – *Destination Signal Pointer*.
- **nLength** – *Signal Length*.
- **nLevel** – Constant threshold value to be used to limit each signal sample
- **nValue** – Constant value to replace source value when threshold test is true.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsThreshold_LTVal_64f_I_Ctx**(*Npp64f* *pSrcDst, size_t nLength, *Npp64f* nLevel, *Npp64f* nValue, *NppStreamContext* nppStreamCtx)

64-bit in place floating point signal NPP_CMP_LESS threshold with constant level.

Parameters

- **pSrcDst** – *In-Place Signal Pointer*.
- **nLength** – *Signal Length*.
- **nLevel** – Constant threshold value to be used to limit each signal sample
- **nValue** – Constant value to replace source value when threshold test is true.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsThreshold_LTVal_64fc_Ctx**(const *Npp64fc* *pSrc, *Npp64fc* *pDst, size_t nLength, *Npp64f* nLevel, *Npp64fc* nValue, *NppStreamContext* nppStreamCtx)

64-bit floating point complex number signal NPP_CMP_LESS threshold with constant level.

Parameters

- **pSrc** – *Source Signal Pointer*.
- **pDst** – *Destination Signal Pointer*.
- **nLength** – *Signal Length*.
- **nLevel** – Constant threshold value (real part only and must be greater than 0) to be used to limit each signal sample
- **nValue** – Constant value to replace source value when threshold test is true.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsThreshold_LTVal_64fc_I_Ctx**(*Npp64fc* *pSrcDst, size_t nLength, *Npp64f* nLevel, *Npp64fc* nValue, *NppStreamContext* nppStreamCtx)

64-bit in place floating point complex number signal NPP_CMP_LESS threshold with constant level.

Parameters

- **pSrcDst** – *In-Place Signal Pointer*.
- **nLength** – *Signal Length*.
- **nLevel** – Constant threshold value (real part only and must be greater than 0) to be used to limit each signal sample
- **nValue** – Constant value to replace source value when threshold test is true.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsThreshold_GTVal_16s_Ctx**(const *Npp16s* *pSrc, *Npp16s* *pDst, size_t nLength, *Npp16s* nLevel, *Npp16s* nValue, *NppStreamContext* nppStreamCtx)

16-bit signed short signal NPP_CMP_GREATER threshold with constant level.

Parameters

- **pSrc** – *Source Signal Pointer*.
- **pDst** – *Destination Signal Pointer*.
- **nLength** – *Signal Length*.
- **nLevel** – Constant threshold value to be used to limit each signal sample
- **nValue** – Constant value to replace source value when threshold test is true.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsThreshold_GTVal_16s_I_Ctx**(*Npp16s* *pSrcDst, size_t nLength, *Npp16s* nLevel, *Npp16s* nValue, *NppStreamContext* nppStreamCtx)

16-bit in place signed short signal NPP_CMP_GREATER threshold with constant level.

Parameters

- **pSrcDst** – *In-Place Signal Pointer*.
- **nLength** – *Signal Length*.
- **nLevel** – Constant threshold value to be used to limit each signal sample
- **nValue** – Constant value to replace source value when threshold test is true.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsThreshold_GTVal_16sc_Ctx**(const *Npp16sc* *pSrc, *Npp16sc* *pDst, size_t nLength, *Npp16s* nLevel, *Npp16sc* nValue, *NppStreamContext* nppStreamCtx)

16-bit signed short complex number signal NPP_CMP_GREATER threshold with constant level.

Parameters

- **pSrc** – *Source Signal Pointer*.
- **pDst** – *Destination Signal Pointer*.
- **nLength** – *Signal Length*.
- **nLevel** – Constant threshold value (real part only and must be greater than 0) to be used to limit each signal sample
- **nValue** – Constant value to replace source value when threshold test is true.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsThreshold_GTVal_16sc_I_Ctx**(*Npp16sc* *pSrcDst, size_t nLength, *Npp16s* nLevel, *Npp16sc* nValue, *NppStreamContext* nppStreamCtx)

16-bit in place signed short complex number signal NPP_CMP_GREATER threshold with constant level.

Parameters

- **pSrcDst** – *In-Place Signal Pointer*.
- **nLength** – *Signal Length*.
- **nLevel** – Constant threshold value (real part only and must be greater than 0) to be used to limit each signal sample
- **nValue** – Constant value to replace source value when threshold test is true.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsThreshold_GTVal_32f_Ctx**(const *Npp32f* *pSrc, *Npp32f* *pDst, size_t nLength, *Npp32f* nLevel, *Npp32f* nValue, *NppStreamContext* nppStreamCtx)

32-bit floating point signal NPP_CMP_GREATER threshold with constant level.

Parameters

- **pSrc** – *Source Signal Pointer*.
- **pDst** – *Destination Signal Pointer*.
- **nLength** – *Signal Length*.
- **nLevel** – Constant threshold value to be used to limit each signal sample
- **nValue** – Constant value to replace source value when threshold test is true.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsThreshold_GTVal_32f_I_Ctx**(*Npp32f* *pSrcDst, size_t nLength, *Npp32f* nLevel, *Npp32f* nValue, *NppStreamContext* nppStreamCtx)

32-bit in place floating point signal NPP_CMP_GREATER threshold with constant level.

Parameters

- **pSrcDst** – *In-Place Signal Pointer*.
- **nLength** – *Signal Length*.
- **nLevel** – Constant threshold value to be used to limit each signal sample
- **nValue** – Constant value to replace source value when threshold test is true.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsThreshold_GTVal_32fc_Ctx**(const *Npp32fc* *pSrc, *Npp32fc* *pDst, size_t nLength, *Npp32f* nLevel, *Npp32fc* nValue, *NppStreamContext* nppStreamCtx)

32-bit floating point complex number signal NPP_CMP_GREATER threshold with constant level.

Parameters

- **pSrc** – *Source Signal Pointer*.
- **pDst** – *Destination Signal Pointer*.
- **nLength** – *Signal Length*.
- **nLevel** – Constant threshold value (real part only and must be greater than 0) to be used to limit each signal sample
- **nValue** – Constant value to replace source value when threshold test is true.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsThreshold_GTVal_32fc_I_Ctx**(*Npp32fc* *pSrcDst, size_t nLength, *Npp32f* nLevel, *Npp32fc* nValue, *NppStreamContext* nppStreamCtx)

32-bit in place floating point complex number signal NPP_CMP_GREATER threshold with constant level.

Parameters

- **pSrcDst** – *In-Place Signal Pointer*.
- **nLength** – *Signal Length*.
- **nLevel** – Constant threshold value (real part only and must be greater than 0) to be used to limit each signal sample
- **nValue** – Constant value to replace source value when threshold test is true.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsThreshold_GTVal_64f_Ctx**(const *Npp64f* *pSrc, *Npp64f* *pDst, size_t nLength, *Npp64f* nLevel, *Npp64f* nValue, *NppStreamContext* nppStreamCtx)

64-bit floating point signal NPP_CMP_GREATER threshold with constant level.

Parameters

- **pSrc** – *Source Signal Pointer*.
- **pDst** – *Destination Signal Pointer*.
- **nLength** – *Signal Length*.

- **nLevel** – Constant threshold value to be used to limit each signal sample
- **nValue** – Constant value to replace source value when threshold test is true.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsThreshold_GTVal_64f_I_Ctx**(*Npp64f* *pSrcDst, size_t nLength, *Npp64f* nLevel, *Npp64f* nValue, *NppStreamContext* nppStreamCtx)

64-bit in place floating point signal NPP_CMP_GREATER threshold with constant level.

Parameters

- **pSrcDst** – *In-Place Signal Pointer*.
- **nLength** – *Signal Length*.
- **nLevel** – Constant threshold value to be used to limit each signal sample
- **nValue** – Constant value to replace source value when threshold test is true.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsThreshold_GTVal_64fc_Ctx**(const *Npp64fc* *pSrc, *Npp64fc* *pDst, size_t nLength, *Npp64f* nLevel, *Npp64fc* nValue, *NppStreamContext* nppStreamCtx)

64-bit floating point complex number signal NPP_CMP_GREATER threshold with constant level.

Parameters

- **pSrc** – *Source Signal Pointer*.
- **pDst** – *Destination Signal Pointer*.
- **nLength** – *Signal Length*.
- **nLevel** – Constant threshold value (real part only and must be greater than 0) to be used to limit each signal sample
- **nValue** – Constant value to replace source value when threshold test is true.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsThreshold_GTVal_64fc_I_Ctx**(*Npp64fc* *pSrcDst, size_t nLength, *Npp64f* nLevel, *Npp64fc* nValue, *NppStreamContext* nppStreamCtx)

64-bit in place floating point complex number signal NPP_CMP_GREATER threshold with constant level.

Parameters

- **pSrcDst** – *In-Place Signal Pointer*.

- **nLength** – *Signal Length*.
- **nLevel** – Constant threshold value (real part only and must be greater than 0) to be used to limit each signal sample
- **nValue** – Constant value to replace source value when threshold test is true.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Signal Data Related Error Codes, *Length Related Error Codes*.

1.19. Signal Filtering Functions

Functions that provide functionality of generating output signal based on the input signal like signal integral, etc.

1.19.1. Integral

Compute the indefinite integral of a given signal. The i-th element is computed to be

$$s'_i = \sum_0^i s_j$$

Functions

NppStatus **nppsIntegralGetBufferSize_32s**(size_t nLength, size_t *hpBufferSize)

Device scratch buffer size (in bytes) for 32s nppsIntegral.

This primitive provides the correct buffer size for nppsIntegral_32s.

Parameters

- **nLength** – *Signal Length*.
- **hpBufferSize** – Required buffer size. Important: hpBufferSize is a *host pointer. Scratch Buffer and Host Pointer*.

NppStatus **nppsIntegral_32s_Ctx**(const *Npp32s* *pSrc, *Npp32s* *pDst, size_t nLength, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Compute cumulative sum of 32-bit signed integer signal.

Parameters

- **pSrc** – *Source Signal Pointer*.
- **pDst** – Pointer to the output result.
- **nLength** – *Signal Length*.
- **pDeviceBuffer** – Pointer to the required device memory allocation.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

1.20. Signal Initialization Functions

Functions that provide functionality of initialization signal like: set, zero or copy other signal.

1.20.1. Signal Set

1.20.1.1 Set

The set of set initialization operations available in the library.

Set

Set methods for 1D vectors of various types.

The copy methods operate on vector data given as a pointer to the underlying data-type (e.g. 8-bit vectors would be passed as pointers to Npp8u type) and length of the vectors, i.e. the number of items.

NppStatus **nppsSet_8u_Ctx**(*Npp8u* nValue, *Npp8u* *pDst, size_t nLength, *NppStreamContext* nppStreamCtx)

8-bit unsigned char, vector set method.

Parameters

- **nValue** – Value used to initialize the vector pDst.
- **pDst** – *Destination Signal Pointer*.
- **nLength** – *Signal Length*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsSet_8s_Ctx**(*Npp8s* nValue, *Npp8s* *pDst, size_t nLength, *NppStreamContext* nppStreamCtx)

8-bit signed char, vector set method.

Parameters

- **nValue** – Value used to initialize the vector pDst.
- **pDst** – *Destination Signal Pointer*.
- **nLength** – *Signal Length*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsSet_16u_Ctx**(*Npp16u* nValue, *Npp16u* *pDst, size_t nLength, *NppStreamContext* nppStreamCtx)

16-bit unsigned integer, vector set method.

Parameters

- **nValue** – Value used to initialize the vector pDst.
- **pDst** – *Destination Signal Pointer*.
- **nLength** – *Signal Length*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsSet_16s_Ctx**(*Npp16s* nValue, *Npp16s* *pDst, size_t nLength, *NppStreamContext* nppStreamCtx)

16-bit signed integer, vector set method.

Parameters

- **nValue** – Value used to initialize the vector pDst.
- **pDst** – *Destination Signal Pointer*.
- **nLength** – *Signal Length*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsSet_16sc_Ctx**(*Npp16sc* nValue, *Npp16sc* *pDst, size_t nLength, *NppStreamContext* nppStreamCtx)

16-bit integer complex, vector set method.

Parameters

- **nValue** – Value used to initialize the vector pDst.
- **pDst** – *Destination Signal Pointer*.
- **nLength** – *Signal Length*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsSet_32u_Ctx**(*Npp32u* nValue, *Npp32u* *pDst, size_t nLength, *NppStreamContext* nppStreamCtx)

32-bit unsigned integer, vector set method.

Parameters

- **nValue** – Value used to initialize the vector pDst.

- **pDst** – *Destination Signal Pointer*.
- **nLength** – *Signal Length*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsSet_32s_Ctx**(*Npp32s* nValue, *Npp32s* *pDst, size_t nLength, *NppStreamContext* nppStreamCtx)

32-bit signed integer, vector set method.

Parameters

- **nValue** – Value used to initialize the vector pDst.
- **pDst** – *Destination Signal Pointer*.
- **nLength** – *Signal Length*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsSet_32sc_Ctx**(*Npp32sc* nValue, *Npp32sc* *pDst, size_t nLength, *NppStreamContext* nppStreamCtx)

32-bit integer complex, vector set method.

Parameters

- **nValue** – Value used to initialize the vector pDst.
- **pDst** – *Destination Signal Pointer*.
- **nLength** – *Signal Length*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsSet_32f_Ctx**(*Npp32f* nValue, *Npp32f* *pDst, size_t nLength, *NppStreamContext* nppStreamCtx)

32-bit float, vector set method.

Parameters

- **nValue** – Value used to initialize the vector pDst.
- **pDst** – *Destination Signal Pointer*.
- **nLength** – *Signal Length*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsSet_32fc_Ctx**(*Npp32fc* nValue, *Npp32fc* *pDst, size_t nLength, *NppStreamContext* nppStreamCtx)

32-bit float complex, vector set method.

Parameters

- **nValue** – Value used to initialize the vector pDst.
- **pDst** – *Destination Signal Pointer*.
- **nLength** – *Signal Length*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsSet_64s_Ctx**(*Npp64s* nValue, *Npp64s* *pDst, size_t nLength, *NppStreamContext* nppStreamCtx)

64-bit long long integer, vector set method.

Parameters

- **nValue** – Value used to initialize the vector pDst.
- **pDst** – *Destination Signal Pointer*.
- **nLength** – *Signal Length*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsSet_64sc_Ctx**(*Npp64sc* nValue, *Npp64sc* *pDst, size_t nLength, *NppStreamContext* nppStreamCtx)

64-bit long long integer complex, vector set method.

Parameters

- **nValue** – Value used to initialize the vector pDst.
- **pDst** – *Destination Signal Pointer*.
- **nLength** – *Signal Length*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsSet_64f_Ctx**(*Npp64f* nValue, *Npp64f* *pDst, size_t nLength, *NppStreamContext* nppStreamCtx)

64-bit double, vector set method.

Parameters

- **nValue** – Value used to initialize the vector pDst.
- **pDst** – *Destination Signal Pointer*.

- **nLength** – *Signal Length*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsSet_64fc_Ctx**(*Npp64fc* nValue, *Npp64fc* *pDst, size_t nLength, *NppStreamContext* nppStreamCtx)

64-bit double complex, vector set method.

Parameters

- **nValue** – Value used to initialize the vector pDst.
- **pDst** – *Destination Signal Pointer*.
- **nLength** – *Signal Length*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

1.20.2. Signal Zero

1.20.2.1 Zero

The set of zero initialization operations available in the library.

Zero

Set signals to zero.

NppStatus **nppsZero_8u_Ctx**(*Npp8u* *pDst, size_t nLength, *NppStreamContext* nppStreamCtx)

8-bit unsigned char, vector zero method.

Parameters

- **pDst** – *Destination Signal Pointer*.
- **nLength** – *Signal Length*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsZero_16s_Ctx**(*Npp16s* *pDst, size_t nLength, *NppStreamContext* nppStreamCtx)

16-bit integer, vector zero method.

Parameters

- **pDst** – *Destination Signal Pointer*.
- **nLength** – *Signal Length*.

- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsZero_16sc_Ctx**(*Npp16sc* *pDst, size_t nLength, *NppStreamContext* nppStreamCtx)

16-bit integer complex, vector zero method.

Parameters

- **pDst** – *Destination Signal Pointer*.
- **nLength** – *Signal Length*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsZero_32s_Ctx**(*Npp32s* *pDst, size_t nLength, *NppStreamContext* nppStreamCtx)

32-bit integer, vector zero method.

Parameters

- **pDst** – *Destination Signal Pointer*.
- **nLength** – *Signal Length*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsZero_32sc_Ctx**(*Npp32sc* *pDst, size_t nLength, *NppStreamContext* nppStreamCtx)

32-bit integer complex, vector zero method.

Parameters

- **pDst** – *Destination Signal Pointer*.
- **nLength** – *Signal Length*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsZero_32f_Ctx**(*Npp32f* *pDst, size_t nLength, *NppStreamContext* nppStreamCtx)

32-bit float, vector zero method.

Parameters

- **pDst** – *Destination Signal Pointer*.
- **nLength** – *Signal Length*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsZero_32fc_Ctx**(*Npp32fc* *pDst, size_t nLength, *NppStreamContext* nppStreamCtx)

32-bit float complex, vector zero method.

Parameters

- **pDst** – *Destination Signal Pointer*.
- **nLength** – *Signal Length*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsZero_64s_Ctx**(*Npp64s* *pDst, size_t nLength, *NppStreamContext* nppStreamCtx)

64-bit long long integer, vector zero method.

Parameters

- **pDst** – *Destination Signal Pointer*.
- **nLength** – *Signal Length*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsZero_64sc_Ctx**(*Npp64sc* *pDst, size_t nLength, *NppStreamContext* nppStreamCtx)

64-bit long long integer complex, vector zero method.

Parameters

- **pDst** – *Destination Signal Pointer*.
- **nLength** – *Signal Length*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsZero_64f_Ctx**(*Npp64f* *pDst, size_t nLength, *NppStreamContext* nppStreamCtx)

64-bit double, vector zero method.

Parameters

- **pDst** – *Destination Signal Pointer*.
- **nLength** – *Signal Length*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsZero_64fc_Ctx**(*Npp64fc* *pDst, size_t nLength, *NppStreamContext* nppStreamCtx)

64-bit double complex, vector zero method.

Parameters

- **pDst** – *Destination Signal Pointer*.
- **nLength** – *Signal Length*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Signal Data Related Error Codes, *Length Related Error Codes*.

1.20.3. Signal Copy

1.20.3.1 Copy

The set of copy initialization operations available in the library.

Copy

Copy methods for various type signals.

Copy methods operate on signal data given as a pointer to the underlying data-type (e.g. 8-bit vectors would be passed as pointers to Npp8u type) and length of the vectors, i.e. the number of items.

NppStatus **nppsCopy_8u_Ctx**(const *Npp8u* *pSrc, *Npp8u* *pDst, size_t nLength, *NppStreamContext* nppStreamCtx)

8-bit unsigned char, vector copy method

Parameters

- **pSrc** – *Source Signal Pointer*.
- **pDst** – *Destination Signal Pointer*.
- **nLength** – *Signal Length*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsCopy_16s_Ctx**(const *Npp16s* *pSrc, *Npp16s* *pDst, size_t nLength, *NppStreamContext* nppStreamCtx)

16-bit signed short, vector copy method.

Parameters

- **pSrc** – *Source Signal Pointer*.
- **pDst** – *Destination Signal Pointer*.
- **nLength** – *Signal Length*.

- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsCopy_32s_Ctx**(const *Npp32s* *pSrc, *Npp32s* *pDst, size_t nLength, *NppStreamContext* nppStreamCtx)

32-bit signed integer, vector copy method.

Parameters

- **pSrc** – *Source Signal Pointer*.
- **pDst** – *Destination Signal Pointer*.
- **nLength** – *Signal Length*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsCopy_32f_Ctx**(const *Npp32f* *pSrc, *Npp32f* *pDst, size_t nLength, *NppStreamContext* nppStreamCtx)

32-bit float, vector copy method.

Parameters

- **pSrc** – *Source Signal Pointer*.
- **pDst** – *Destination Signal Pointer*.
- **nLength** – *Signal Length*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsCopy_64s_Ctx**(const *Npp64s* *pSrc, *Npp64s* *pDst, size_t nLength, *NppStreamContext* nppStreamCtx)

64-bit signed integer, vector copy method.

Parameters

- **pSrc** – *Source Signal Pointer*.
- **pDst** – *Destination Signal Pointer*.
- **nLength** – *Signal Length*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsCopy_16sc_Ctx**(const *Npp16sc* *pSrc, *Npp16sc* *pDst, size_t nLength, *NppStreamContext* nppStreamCtx)

16-bit complex short, vector copy method.

Parameters

- **pSrc** – *Source Signal Pointer*.
- **pDst** – *Destination Signal Pointer*.
- **nLength** – *Signal Length*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsCopy_32sc_Ctx**(const *Npp32sc* *pSrc, *Npp32sc* *pDst, size_t nLength, *NppStreamContext* nppStreamCtx)

32-bit complex signed integer, vector copy method.

Parameters

- **pSrc** – *Source Signal Pointer*.
- **pDst** – *Destination Signal Pointer*.
- **nLength** – *Signal Length*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsCopy_32fc_Ctx**(const *Npp32fc* *pSrc, *Npp32fc* *pDst, size_t nLength, *NppStreamContext* nppStreamCtx)

32-bit complex float, vector copy method.

Parameters

- **pSrc** – *Source Signal Pointer*.
- **pDst** – *Destination Signal Pointer*.
- **nLength** – *Signal Length*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsCopy_64sc_Ctx**(const *Npp64sc* *pSrc, *Npp64sc* *pDst, size_t nLength, *NppStreamContext* nppStreamCtx)

64-bit complex signed integer, vector copy method.

Parameters

- **pSrc** – *Source Signal Pointer*.
- **pDst** – *Destination Signal Pointer*.
- **nLength** – *Signal Length*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsCopy_64fc_Ctx**(const *Npp64fc* *pSrc, *Npp64fc* *pDst, size_t nLength, *NppStreamContext* nppStreamCtx)

64-bit complex double, vector copy method.

Parameters

- **pSrc** – *Source Signal Pointer*.
- **pDst** – *Destination Signal Pointer*.
- **nLength** – *Signal Length*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Signal Data Related Error Codes, *Length Related Error Codes*.

1.21. Signal Statistical Functions

Functions that provide global signal statistics like: sum, mean, standard deviation, min, max, etc.

1.21.1. Signal Min Every Or Max Every

1.21.1.1 MinEvery And MaxEvery Functions

Performs the min or max operation on the samples of a signal.

Functions

NppStatus **nppsMinEvery_8u_I_Ctx**(const *Npp8u* *pSrc, *Npp8u* *pSrcDst, size_t nLength, *NppStreamContext* nppStreamCtx)

8-bit in place min value for each pair of elements.

Parameters

- **pSrc** – *Source Signal Pointer*.
- **pSrcDst** – *In-Place Signal Pointer*.
- **nLength** – *Signal Length*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsMinEvery_16u_I_Ctx**(const *Npp16u* *pSrc, *Npp16u* *pSrcDst, size_t nLength, *NppStreamContext* nppStreamCtx)

16-bit unsigned short integer in place min value for each pair of elements.

Parameters

- **pSrc** – *Source Signal Pointer*.
- **pSrcDst** – *In-Place Signal Pointer*.
- **nLength** – *Signal Length*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsMinEvery_16s_I_Ctx**(const *Npp16s* *pSrc, *Npp16s* *pSrcDst, size_t nLength, *NppStreamContext* nppStreamCtx)

16-bit signed short integer in place min value for each pair of elements.

Parameters

- **pSrc** – *Source Signal Pointer*.
- **pSrcDst** – *In-Place Signal Pointer*.
- **nLength** – *Signal Length*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsMinEvery_32s_I_Ctx**(const *Npp32s* *pSrc, *Npp32s* *pSrcDst, size_t nLength, *NppStreamContext* nppStreamCtx)

32-bit signed integer in place min value for each pair of elements.

Parameters

- **pSrc** – *Source Signal Pointer*.
- **pSrcDst** – *In-Place Signal Pointer*.
- **nLength** – *Signal Length*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsMinEvery_32f_I_Ctx**(const *Npp32f* *pSrc, *Npp32f* *pSrcDst, size_t nLength, *NppStreamContext* nppStreamCtx)

32-bit floating point in place min value for each pair of elements.

Parameters

- **pSrc** – *Source Signal Pointer*.
- **pSrcDst** – *In-Place Signal Pointer*.
- **nLength** – *Signal Length*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsMinEvery_64f_I_Ctx**(const *Npp64f* *pSrc, *Npp64f* *pSrcDst, size_t nLength, *NppStreamContext* nppStreamCtx)

64-bit floating point in place min value for each pair of elements.

Parameters

- **pSrc** – *Source Signal Pointer*.
- **pSrcDst** – *In-Place Signal Pointer*.
- **nLength** – *Signal Length*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsMaxEvery_8u_I_Ctx**(const *Npp8u* *pSrc, *Npp8u* *pSrcDst, size_t nLength, *NppStreamContext* nppStreamCtx)

8-bit in place max value for each pair of elements.

Parameters

- **pSrc** – *Source Signal Pointer*.
- **pSrcDst** – *In-Place Signal Pointer*.
- **nLength** – *Signal Length*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsMaxEvery_16u_I_Ctx**(const *Npp16u* *pSrc, *Npp16u* *pSrcDst, size_t nLength, *NppStreamContext* nppStreamCtx)

16-bit unsigned short integer in place max value for each pair of elements.

Parameters

- **pSrc** – *Source Signal Pointer*.
- **pSrcDst** – *In-Place Signal Pointer*.
- **nLength** – *Signal Length*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsMaxEvery_16s_I_Ctx**(const *Npp16s* *pSrc, *Npp16s* *pSrcDst, size_t nLength, *NppStreamContext* nppStreamCtx)

16-bit signed short integer in place max value for each pair of elements.

Parameters

- **pSrc** – *Source Signal Pointer*.

- **pSrcDst** – *In-Place Signal Pointer*.
- **nLength** – *Signal Length*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsMaxEvery_32s_I_Ctx**(const *Npp32s* *pSrc, *Npp32s* *pSrcDst, size_t nLength, *NppStreamContext* nppStreamCtx)

32-bit signed integer in place max value for each pair of elements.

Parameters

- **pSrc** – *Source Signal Pointer*.
- **pSrcDst** – *In-Place Signal Pointer*.
- **nLength** – *Signal Length*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsMaxEvery_32f_I_Ctx**(const *Npp32f* *pSrc, *Npp32f* *pSrcDst, size_t nLength, *NppStreamContext* nppStreamCtx)

32-bit floating point in place max value for each pair of elements.

Parameters

- **pSrc** – *Source Signal Pointer*.
- **pSrcDst** – *In-Place Signal Pointer*.
- **nLength** – *Signal Length*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

1.21.2. Signal Sum

signal_min_every_or_max_every

1.21.2.1 Sum

Performs the sum operation on the samples of a signal.

Functions

NppStatus **nppsSumGetBufferSize_32f_Ctx**(size_t nLength, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Device scratch buffer size (in bytes) for nppsSum_32f.

Parameters

- **nLength** – *Signal Length*.
- **hpBufferSize** – Required buffer size. Important: hpBufferSize is a *host pointer. Scratch Buffer and Host Pointer*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
NPP_SUCCESS

NppStatus **nppsSumGetBufferSize_32fc_Ctx**(size_t nLength, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Device scratch buffer size (in bytes) for nppsSum_32fc.

Parameters

- **nLength** – *Signal Length*.
- **hpBufferSize** – Required buffer size. Important: hpBufferSize is a *host pointer. Scratch Buffer and Host Pointer*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
NPP_SUCCESS

NppStatus **nppsSumGetBufferSize_64f_Ctx**(size_t nLength, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Device scratch buffer size (in bytes) for nppsSum_64f.

Parameters

- **nLength** – *Signal Length*.
- **hpBufferSize** – Required buffer size. Important: hpBufferSize is a *host pointer. Scratch Buffer and Host Pointer*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
NPP_SUCCESS

NppStatus **nppsSumGetBufferSize_64fc_Ctx**(size_t nLength, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Device scratch buffer size (in bytes) for nppsSum_64fc.

Parameters

- **nLength** – *Signal Length*.

- **hpBufferSize** – Required buffer size. Important: hpBufferSize is a *host pointer. Scratch Buffer and Host Pointer*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
NPP_SUCCESS

NppStatus **nppsSumGetBufferSize_16s_Sfs_Ctx**(size_t nLength, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Device scratch buffer size (in bytes) for nppsSum_16s_Sfs_Ctx.

Parameters

- **nLength** – *Signal Length*.
- **hpBufferSize** – Required buffer size. Important: hpBufferSize is a *host pointer. Scratch Buffer and Host Pointer*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
NPP_SUCCESS

NppStatus **nppsSumGetBufferSize_16sc_Sfs_Ctx**(size_t nLength, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Device scratch buffer size (in bytes) for nppsSum_16sc_Sfs_Ctx.

Parameters

- **nLength** – *Signal Length*.
- **hpBufferSize** – Required buffer size. Important: hpBufferSize is a *host pointer. Scratch Buffer and Host Pointer*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
NPP_SUCCESS

NppStatus **nppsSumGetBufferSize_16sc32sc_Sfs_Ctx**(size_t nLength, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Device scratch buffer size (in bytes) for nppsSum_16sc32sc_Sfs_Ctx.

Parameters

- **nLength** – *Signal Length*.
- **hpBufferSize** – Required buffer size. Important: hpBufferSize is a *host pointer. Scratch Buffer and Host Pointer*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
NPP_SUCCESS

NppStatus **nppsSumGetBufferSize_32s_Sfs_Ctx**(size_t nLength, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Device scratch buffer size (in bytes) for nppsSum_32s_Sfs_Ctx.

Parameters

- **nLength** – *Signal Length*.
- **hpBufferSize** – Required buffer size. Important: hpBufferSize is a *host pointer. Scratch Buffer and Host Pointer*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
NPP_SUCCESS

NppStatus **nppsSumGetBufferSize_16s32s_Sfs_Ctx**(size_t nLength, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Device scratch buffer size (in bytes) for nppsSum_16s32s_Sfs_Ctx.

Parameters

- **nLength** – *Signal Length*.
- **hpBufferSize** – Required buffer size. Important: hpBufferSize is a *host pointer. Scratch Buffer and Host Pointer*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
NPP_SUCCESS

NppStatus **nppsSum_32f_Ctx**(const *Npp32f* *pSrc, size_t nLength, *Npp32f* *pSum, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

32-bit float vector sum method

Parameters

- **pSrc** – *Source Signal Pointer*.
- **nLength** – *Signal Length*.
- **pSum** – Device memory pointer to the output result.
- **pDeviceBuffer** – Pointer to the required device memory allocation, *Scratch Buffer and Host Pointer*. Use *nppsSumGetBufferSize_32f_Ctx* to determine the minimum number of bytes required.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsSum_32fc_Ctx**(const *Npp32fc* *pSrc, size_t nLength, *Npp32fc* *pSum, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

32-bit float complex vector sum method

Parameters

- **pSrc** – *Source Signal Pointer*.
- **nLength** – *Signal Length*.
- **pSum** – Device memory pointer to the output result.

- **pDeviceBuffer** – Pointer to the required device memory allocation, *Scratch Buffer and Host Pointer*. Use *nppsSumGetBufferSize_32fc_Ctx* to determine the minimum number of bytes required.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsSum_64f_Ctx**(const *Npp64f* *pSrc, size_t nLength, *Npp64f* *pSum, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

64-bit double vector sum method

Parameters

- **pSrc** – *Source Signal Pointer*.
- **nLength** – *Signal Length*.
- **pSum** – Device memory pointer to the output result.
- **pDeviceBuffer** – Pointer to the required device memory allocation, *Scratch Buffer and Host Pointer*. Use *nppsSumGetBufferSize_64f_Ctx* to determine the minimum number of bytes required.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsSum_64fc_Ctx**(const *Npp64fc* *pSrc, size_t nLength, *Npp64fc* *pSum, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

64-bit double complex vector sum method

Parameters

- **pSrc** – *Source Signal Pointer*.
- **nLength** – *Signal Length*.
- **pSum** – Device memory pointer to the output result.
- **pDeviceBuffer** – Pointer to the required device memory allocation, *Scratch Buffer and Host Pointer*. Use *nppsSumGetBufferSize_64fc_Ctx* to determine the minimum number of bytes required.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsSum_16s_Sfs_Ctx**(const *Npp16s* *pSrc, size_t nLength, *Npp16s* *pSum, int nScaleFactor, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

16-bit short vector sum with integer scaling method

Parameters

- **pSrc** – *Source Signal Pointer*.
- **nLength** – *Signal Length*.

- **pSum** – Device memory pointer to the output result.
- **pDeviceBuffer** – Pointer to the required device memory allocation, *Scratch Buffer and Host Pointer*. Use *nppsSumGetBufferSize_16s_Sfs_Ctx* to determine the minimum number of bytes required.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsSum_32s_Sfs_Ctx**(const *Npp32s* *pSrc, size_t nLength, *Npp32s* *pSum, int nScaleFactor, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

32-bit integer vector sum with integer scaling method

Parameters

- **pSrc** – *Source Signal Pointer*.
- **nLength** – *Signal Length*.
- **pSum** – Device memory pointer to the output result.
- **pDeviceBuffer** – Pointer to the required device memory allocation, *Scratch Buffer and Host Pointer*. Use *nppsSumGetBufferSize_32s_Sfs_Ctx* to determine the minimum number of bytes required.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsSum_16sc_Sfs_Ctx**(const *Npp16sc* *pSrc, size_t nLength, *Npp16sc* *pSum, int nScaleFactor, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

16-bit short complex vector sum with integer scaling method

Parameters

- **pSrc** – *Source Signal Pointer*.
- **nLength** – *Signal Length*.
- **pSum** – Device memory pointer to the output result.
- **pDeviceBuffer** – Pointer to the required device memory allocation, *Scratch Buffer and Host Pointer*. Use *nppsSumGetBufferSize_16sc_Sfs_Ctx* to determine the minimum number of bytes required.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsSum_16sc32sc_Sfs_Ctx**(const *Npp16sc* *pSrc, size_t nLength, *Npp32sc* *pSum, int nScaleFactor, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

16-bit short complex vector sum (32bit int complex) with integer scaling method

Parameters

- **pSrc** – *Source Signal Pointer*.
- **nLength** – *Signal Length*.
- **pSum** – Device memory pointer to the output result.
- **pDeviceBuffer** – Pointer to the required device memory allocation, *Scratch Buffer and Host Pointer*. Use *nppsSumGetBufferSize_16sc32sc_Sfs_Ctx* to determine the minimum number of bytes required.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsSum_16s32s_Sfs_Ctx**(const *Npp16s* *pSrc, size_t nLength, *Npp32s* *pSum, int nScaleFactor, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

16-bit integer vector sum (32bit) with integer scaling method

Parameters

- **pSrc** – *Source Signal Pointer*.
- **nLength** – *Signal Length*.
- **pSum** – Device memory pointer to the output result.
- **pDeviceBuffer** – Pointer to the required device memory allocation, *Scratch Buffer and Host Pointer*. Use *nppsSumGetBufferSize_16s32s_Sfs_Ctx* to determine the minimum number of bytes required.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Signal Data Related Error Codes, *Length Related Error Codes*.

1.21.3. Signal Maximum

1.21.3.1 Maximum

Performs the maximum operation on the samples of a signal.

Functions

NppStatus **nppsMaxGetBufferSize_16s_Ctx**(size_t nLength, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Device scratch buffer size (in bytes) for nppsMax_16s.

Parameters

- **nLength** – *Signal Length*.
- **hpBufferSize** – Required buffer size. Important: hpBufferSize is a *host pointer. Scratch Buffer and Host Pointer*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
NPP_SUCCESS

NppStatus **nppsMaxGetBufferSize_32s_Ctx**(size_t nLength, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Device scratch buffer size (in bytes) for nppsMax_32s.

Parameters

- **nLength** – *Signal Length*.
- **hpBufferSize** – Required buffer size. Important: hpBufferSize is a *host pointer. Scratch Buffer and Host Pointer*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
NPP_SUCCESS

NppStatus **nppsMaxGetBufferSize_32f_Ctx**(size_t nLength, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Device scratch buffer size (in bytes) for nppsMax_32f.

Parameters

- **nLength** – *Signal Length*.
- **hpBufferSize** – Required buffer size. Important: hpBufferSize is a *host pointer. Scratch Buffer and Host Pointer*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
NPP_SUCCESS

NppStatus **nppsMaxGetBufferSize_64f_Ctx**(size_t nLength, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Device scratch buffer size (in bytes) for nppsMax_64f.

Parameters

- **nLength** – *Signal Length*.

- **hpBufferSize** – Required buffer size. Important: hpBufferSize is a *host pointer. Scratch Buffer and Host Pointer*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
NPP_SUCCESS

NppStatus **nppsMax_16s_Ctx**(const *Npp16s* *pSrc, size_t nLength, *Npp16s* *pMax, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

16-bit integer vector max method

Parameters

- **pSrc** – *Source Signal Pointer*.
- **nLength** – *Signal Length*.
- **pMax** – Device memory pointer to the output result.
- **pDeviceBuffer** – Pointer to the required device memory allocation, *Scratch Buffer and Host Pointer*. Use *nppsMaxGetBufferSize_16s_Ctx* to determine the minimum number of bytes required.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsMax_32s_Ctx**(const *Npp32s* *pSrc, size_t nLength, *Npp32s* *pMax, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

32-bit integer vector max method

Parameters

- **pSrc** – *Source Signal Pointer*.
- **nLength** – *Signal Length*.
- **pMax** – Device memory pointer to the output result.
- **pDeviceBuffer** – Pointer to the required device memory allocation, *Scratch Buffer and Host Pointer*. Use *nppsMaxGetBufferSize_32s_Ctx* to determine the minimum number of bytes required.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsMax_32f_Ctx**(const *Npp32f* *pSrc, size_t nLength, *Npp32f* *pMax, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

32-bit float vector max method

Parameters

- **pSrc** – *Source Signal Pointer*.
- **nLength** – *Signal Length*.
- **pMax** – Device memory pointer to the output result.

- **pDeviceBuffer** – Pointer to the required device memory allocation, *Scratch Buffer and Host Pointer*. Use *nppsMaxGetBufferSize_32f_Ctx* to determine the minimum number of bytes required.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsMax_64f_Ctx**(const *Npp64f* *pSrc, size_t nLength, *Npp64f* *pMax, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

64-bit float vector max method

Parameters

- **pSrc** – *Source Signal Pointer*.
- **nLength** – *Signal Length*.
- **pMax** – Device memory pointer to the output result.
- **pDeviceBuffer** – Pointer to the required device memory allocation, *Scratch Buffer and Host Pointer*. Use *nppsMaxGetBufferSize_64f_Ctx* to determine the minimum number of bytes required.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsMaxIndxGetBufferSize_16s_Ctx**(size_t nLength, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Device scratch buffer size (in bytes) for nppsMaxIndx_16s.

Parameters

- **nLength** – *Signal Length*.
- **hpBufferSize** – Required buffer size. Important: hpBufferSize is a *host pointer. Scratch Buffer and Host Pointer*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
NPP_SUCCESS

NppStatus **nppsMaxIndxGetBufferSize_32s_Ctx**(size_t nLength, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Device scratch buffer size (in bytes) for nppsMaxIndx_32s.

Parameters

- **nLength** – *Signal Length*.
- **hpBufferSize** – Required buffer size. Important: hpBufferSize is a *host pointer. Scratch Buffer and Host Pointer*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
NPP_SUCCESS

NppStatus **nppsMaxIndxGetBufferSize_32f_Ctx**(size_t nLength, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Device scratch buffer size (in bytes) for nppsMaxIndx_32f.

Parameters

- **nLength** – *Signal Length*.
- **hpBufferSize** – Required buffer size. Important: hpBufferSize is a *host pointer. Scratch Buffer and Host Pointer*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
NPP_SUCCESS

NppStatus **nppsMaxIndxGetBufferSize_64f_Ctx**(size_t nLength, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Device scratch buffer size (in bytes) for nppsMaxIndx_64f.

Parameters

- **nLength** – *Signal Length*.
- **hpBufferSize** – Required buffer size. Important: hpBufferSize is a *host pointer. Scratch Buffer and Host Pointer*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
NPP_SUCCESS

NppStatus **nppsMaxIndx_16s_Ctx**(const *Npp16s* *pSrc, size_t nLength, *Npp16s* *pMax, int *pIndx, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

16-bit integer vector max index method

Parameters

- **pSrc** – *Source Signal Pointer*.
- **nLength** – *Signal Length*.
- **pMax** – Device memory pointer to the output result.
- **pIndx** – Device memory pointer to the index value of the first maximum element.
- **pDeviceBuffer** – Pointer to the required device memory allocation, *Scratch Buffer and Host Pointer*. Use *nppsMaxIndxGetBufferSize_16s_Ctx* to determine the minimum number of bytes required.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsMaxIndx_32s_Ctx**(const *Npp32s* *pSrc, size_t nLength, *Npp32s* *pMax, int *pIndx, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

32-bit integer vector max index method

Parameters

- **pSrc** – *Source Signal Pointer*.
- **nLength** – *Signal Length*.
- **pMax** – Device memory pointer to the output result.
- **pIndx** – Device memory pointer to the index value of the first maximum element.
- **pDeviceBuffer** – Pointer to the required device memory allocation, *Scratch Buffer and Host Pointer*. Use *nppsMaxIndxGetBufferSize_32s_Ctx* to determine the minimum number of bytes required.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsMaxIndx_32f_Ctx**(const *Npp32f* *pSrc, size_t nLength, *Npp32f* *pMax, int *pIndx, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

32-bit float vector max index method

Parameters

- **pSrc** – *Source Signal Pointer*.
- **nLength** – *Signal Length*.
- **pMax** – Device memory pointer to the output result.
- **pIndx** – Device memory pointer to the index value of the first maximum element.
- **pDeviceBuffer** – Pointer to the required device memory allocation, *Scratch Buffer and Host Pointer*. Use *nppsMaxIndxGetBufferSize_32f_Ctx* to determine the minimum number of bytes required.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsMaxIndx_64f_Ctx**(const *Npp64f* *pSrc, size_t nLength, *Npp64f* *pMax, int *pIndx, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

64-bit float vector max index method

Parameters

- **pSrc** – *Source Signal Pointer*.
- **nLength** – *Signal Length*.
- **pMax** – Device memory pointer to the output result.
- **pIndx** – Device memory pointer to the index value of the first maximum element.
- **pDeviceBuffer** – Pointer to the required device memory allocation, *Scratch Buffer and Host Pointer*. Use *nppsMaxIndxGetBufferSize_64f_Ctx* to determine the minimum number of bytes required.

- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsMaxAbsGetBufferSize_16s_Ctx**(size_t nLength, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Device scratch buffer size (in bytes) for nppsMaxAbs_16s_Ctx.

Parameters

- **nLength** – *Signal Length*.
- **hpBufferSize** – Required buffer size. Important: hpBufferSize is a *host pointer. Scratch Buffer and Host Pointer*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
NPP_SUCCESS

NppStatus **nppsMaxAbsGetBufferSize_32s_Ctx**(size_t nLength, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Device scratch buffer size (in bytes) for nppsMaxAbs_32s.

Parameters

- **nLength** – *Signal Length*.
- **hpBufferSize** – Required buffer size. Important: hpBufferSize is a *host pointer. Scratch Buffer and Host Pointer*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
NPP_SUCCESS

NppStatus **nppsMaxAbs_16s_Ctx**(const *Npp16s* *pSrc, size_t nLength, *Npp16s* *pMaxAbs, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

16-bit integer vector max absolute method

Parameters

- **pSrc** – *Source Signal Pointer*.
- **nLength** – *Signal Length*.
- **pMaxAbs** – Device memory pointer to the output result.
- **pDeviceBuffer** – Pointer to the required device memory allocation, *Scratch Buffer and Host Pointer*. Use *nppsMaxAbsGetBufferSize_16s_Ctx* to determine the minimum number of bytes required.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsMaxAbs_32s_Ctx**(const *Npp32s* *pSrc, size_t nLength, *Npp32s* *pMaxAbs, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

32-bit integer vector max absolute method

Parameters

- **pSrc** – *Source Signal Pointer*.
- **nLength** – *Signal Length*.
- **pMaxAbs** – Device memory pointer to the output result.
- **pDeviceBuffer** – Pointer to the required device memory allocation, *Scratch Buffer and Host Pointer*. Use *nppsMaxAbsGetBufferSize_32s_Ctx* to determine the minimum number of bytes required.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsMaxAbsIndxGetBufferSize_16s_Ctx**(size_t nLength, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Device scratch buffer size (in bytes) for nppsMaxAbsIndx_16s.

Parameters

- **nLength** – *Signal Length*.
- **hpBufferSize** – Required buffer size. Important: hpBufferSize is a *host pointer. Scratch Buffer and Host Pointer*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

NPP_SUCCESS

NppStatus **nppsMaxAbsIndxGetBufferSize_32s_Ctx**(size_t nLength, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Device scratch buffer size (in bytes) for nppsMaxAbsIndx_32s.

Parameters

- **nLength** – *Signal Length*.
- **hpBufferSize** – Required buffer size. Important: hpBufferSize is a *host pointer. Scratch Buffer and Host Pointer*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

NPP_SUCCESS

NppStatus **nppsMaxAbsIndx_16s_Ctx**(const *Npp16s* *pSrc, size_t nLength, *Npp16s* *pMaxAbs, int *pIndx, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

16-bit integer vector max absolute index method

Parameters

- **pSrc** – *Source Signal Pointer*.
- **nLength** – *Signal Length*.

- **pMaxAbs** – Device memory pointer to the output result.
- **pIndx** – Device memory pointer to the index value of the first maximum element.
- **pDeviceBuffer** – Pointer to the required device memory allocation, *Scratch Buffer and Host Pointer*. Use *nppsMaxAbsIndxGetBufferSize_16s_Ctx* to determine the minimum number of bytes required.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsMaxAbsIndx_32s_Ctx**(const *Npp32s* *pSrc, size_t nLength, *Npp32s* *pMaxAbs, int *pIndx, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

32-bit integer vector max absolute index method

Parameters

- **pSrc** – *Source Signal Pointer*.
- **nLength** – *Signal Length*.
- **pMaxAbs** – Device memory pointer to the output result.
- **pIndx** – Device memory pointer to the index value of the first maximum element.
- **pDeviceBuffer** – Pointer to the required device memory allocation, *Scratch Buffer and Host Pointer*. Use *nppsMaxAbsIndxGetBufferSize_32s_Ctx* to determine the minimum number of bytes required.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Signal Data Related Error Codes, *Length Related Error Codes*.

1.21.4. Signal Minimum

1.21.4.1 Minimum

Performs the minimum operation on the samples of a signal.

Functions

NppStatus **nppsMinGetBufferSize_16s_Ctx**(size_t nLength, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Device scratch buffer size (in bytes) for nppsMin_16s.

Parameters

- **nLength** – *Signal Length*.

- **hpBufferSize** – Required buffer size. Important: hpBufferSize is a *host pointer. Scratch Buffer and Host Pointer*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
NPP_SUCCESS

NppStatus **nppsMinGetBufferSize_32s_Ctx**(size_t nLength, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Device scratch buffer size (in bytes) for nppsMin_32s.

Parameters

- **nLength** – *Signal Length*.
- **hpBufferSize** – Required buffer size. Important: hpBufferSize is a *host pointer. Scratch Buffer and Host Pointer*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
NPP_SUCCESS

NppStatus **nppsMinGetBufferSize_32f_Ctx**(size_t nLength, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Device scratch buffer size (in bytes) for nppsMin_32f.

Parameters

- **nLength** – *Signal Length*.
- **hpBufferSize** – Required buffer size. Important: hpBufferSize is a *host pointer. Scratch Buffer and Host Pointer*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
NPP_SUCCESS

NppStatus **nppsMinGetBufferSize_64f_Ctx**(size_t nLength, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Device scratch buffer size (in bytes) for nppsMin_64f.

Parameters

- **nLength** – *Signal Length*.
- **hpBufferSize** – Required buffer size. Important: hpBufferSize is a *host pointer. Scratch Buffer and Host Pointer*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
NPP_SUCCESS

NppStatus **nppsMin_16s_Ctx**(const *Npp16s* *pSrc, size_t nLength, *Npp16s* *pMin, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

16-bit integer vector min method

Parameters

- **pSrc** – *Source Signal Pointer*.
- **nLength** – *Signal Length*.
- **pMin** – Device memory pointer to the output result.
- **pDeviceBuffer** – Pointer to the required device memory allocation, *Scratch Buffer and Host Pointer*. Use *nppsMinGetBufferSize_16s_Ctx* to determine the minimum number of bytes required.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsMin_32s_Ctx**(const *Npp32s* *pSrc, size_t nLength, *Npp32s* *pMin, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

32-bit integer vector min method

Parameters

- **pSrc** – *Source Signal Pointer*.
- **nLength** – *Signal Length*.
- **pMin** – Device memory pointer to the output result.
- **pDeviceBuffer** – Pointer to the required device memory allocation, *Scratch Buffer and Host Pointer*. Use *nppsMinGetBufferSize_32s_Ctx* to determine the minimum number of bytes required.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsMin_32f_Ctx**(const *Npp32f* *pSrc, size_t nLength, *Npp32f* *pMin, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

32-bit integer vector min method

Parameters

- **pSrc** – *Source Signal Pointer*.
- **nLength** – *Signal Length*.
- **pMin** – Device memory pointer to the output result.
- **pDeviceBuffer** – Pointer to the required device memory allocation, *Scratch Buffer and Host Pointer*. Use *nppsMinGetBufferSize_32f_Ctx* to determine the minimum number of bytes required.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsMin_64f_Ctx**(const *Npp64f* *pSrc, size_t nLength, *Npp64f* *pMin, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

64-bit integer vector min method

Parameters

- **pSrc** – *Source Signal Pointer*.
- **nLength** – *Signal Length*.
- **pMin** – Device memory pointer to the output result.
- **pDeviceBuffer** – Pointer to the required device memory allocation, *Scratch Buffer and Host Pointer*. Use *nppsMinGetBufferSize_64f_Ctx* to determine the minimum number of bytes required.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsMinIndxGetBufferSize_16s_Ctx**(size_t nLength, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Device scratch buffer size (in bytes) for nppsMinIndx_16s.

Parameters

- **nLength** – *Signal Length*.
- **hpBufferSize** – Required buffer size. Important: hpBufferSize is a *host pointer. Scratch Buffer and Host Pointer*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

NPP_SUCCESS

NppStatus **nppsMinIndxGetBufferSize_32s_Ctx**(size_t nLength, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Device scratch buffer size (in bytes) for nppsMinIndx_32s.

Parameters

- **nLength** – *Signal Length*.
- **hpBufferSize** – Required buffer size. Important: hpBufferSize is a *host pointer. Scratch Buffer and Host Pointer*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

NPP_SUCCESS

NppStatus **nppsMinIndxGetBufferSize_32f_Ctx**(size_t nLength, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Device scratch buffer size (in bytes) for nppsMinIndx_32f.

Parameters

- **nLength** – *Signal Length*.

- **hpBufferSize** – Required buffer size. Important: hpBufferSize is a *host pointer. Scratch Buffer and Host Pointer*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
NPP_SUCCESS

NppStatus **nppsMinIndxGetBufferSize_64f_Ctx**(size_t nLength, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Device scratch buffer size (in bytes) for nppsMinIndx_64f.

Parameters

- **nLength** – *Signal Length*.
- **hpBufferSize** – Required buffer size. Important: hpBufferSize is a *host pointer. Scratch Buffer and Host Pointer*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
NPP_SUCCESS

NppStatus **nppsMinIndx_16s_Ctx**(const *Npp16s* *pSrc, size_t nLength, *Npp16s* *pMin, int *pIndx, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

16-bit integer vector min index method

Parameters

- **pSrc** – *Source Signal Pointer*.
- **nLength** – *Signal Length*.
- **pMin** – Device memory pointer to the output result.
- **pIndx** – Device memory pointer to the index value of the first minimum element.
- **pDeviceBuffer** – Pointer to the required device memory allocation, *Scratch Buffer and Host Pointer*. Use *nppsMinIndxGetBufferSize_16s_Ctx* to determine the minimum number of bytes required.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsMinIndx_32s_Ctx**(const *Npp32s* *pSrc, size_t nLength, *Npp32s* *pMin, int *pIndx, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

32-bit integer vector min index method

Parameters

- **pSrc** – *Source Signal Pointer*.
- **nLength** – *Signal Length*.
- **pMin** – Device memory pointer to the output result.
- **pIndx** – Device memory pointer to the index value of the first minimum element.

- **pDeviceBuffer** – Pointer to the required device memory allocation, *Scratch Buffer and Host Pointer*. Use *nppsMinIndxGetBufferSize_32s_Ctx* to determine the minimum number of bytes required.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsMinIndx_32f_Ctx**(const *Npp32f* *pSrc, size_t nLength, *Npp32f* *pMin, int *pIndx, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

32-bit float vector min index method

Parameters

- **pSrc** – *Source Signal Pointer*.
- **nLength** – *Signal Length*.
- **pMin** – Device memory pointer to the output result.
- **pIndx** – Device memory pointer to the index value of the first minimum element.
- **pDeviceBuffer** – Pointer to the required device memory allocation, *Scratch Buffer and Host Pointer*. Use *nppsMinIndxGetBufferSize_32f_Ctx* to determine the minimum number of bytes required.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsMinIndx_64f_Ctx**(const *Npp64f* *pSrc, size_t nLength, *Npp64f* *pMin, int *pIndx, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

64-bit float vector min index method

Parameters

- **pSrc** – *Source Signal Pointer*.
- **nLength** – *Signal Length*.
- **pMin** – Device memory pointer to the output result.
- **pIndx** – Device memory pointer to the index value of the first minimum element.
- **pDeviceBuffer** – Pointer to the required device memory allocation, *Scratch Buffer and Host Pointer*. Use *nppsMinIndxGetBufferSize_64f_Ctx* to determine the minimum number of bytes required.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsMinAbsGetBufferSize_16s_Ctx**(size_t nLength, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Device scratch buffer size (in bytes) for nppsMinAbs_16s.

Parameters

- **nLength** – *Signal Length*.
- **hpBufferSize** – Required buffer size. Important: hpBufferSize is a *host pointer. Scratch Buffer and Host Pointer*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
NPP_SUCCESS

NppStatus **nppsMinAbsGetBufferSize_32s_Ctx**(size_t nLength, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Device scratch buffer size (in bytes) for nppsMinAbs_32s.

Parameters

- **nLength** – *Signal Length*.
- **hpBufferSize** – Required buffer size. Important: hpBufferSize is a *host pointer. Scratch Buffer and Host Pointer*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
NPP_SUCCESS

NppStatus **nppsMinAbs_16s_Ctx**(const *Npp16s* *pSrc, size_t nLength, *Npp16s* *pMinAbs, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

16-bit integer vector min absolute method

Parameters

- **pSrc** – *Source Signal Pointer*.
- **nLength** – *Signal Length*.
- **pMinAbs** – Device memory pointer to the output result.
- **pDeviceBuffer** – Pointer to the required device memory allocation, *Scratch Buffer and Host Pointer*. Use *nppsMinAbsGetBufferSize_16s_Ctx* to determine the minimum number of bytes required.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsMinAbs_32s_Ctx**(const *Npp32s* *pSrc, size_t nLength, *Npp32s* *pMinAbs, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

32-bit integer vector min absolute method

Parameters

- **pSrc** – *Source Signal Pointer*.
- **nLength** – *Signal Length*.
- **pMinAbs** – Device memory pointer to the output result.
- **pDeviceBuffer** – Pointer to the required device memory allocation, *Scratch Buffer and Host Pointer*. Use *nppsMinAbsGetBufferSize_16s_Ctx* to determine the minimum number of bytes required.

- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsMinAbsIndxGetBufferSize_16s_Ctx**(size_t nLength, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Device scratch buffer size (in bytes) for nppsMinAbsIndx_16s.

Parameters

- **nLength** – *Signal Length*.
- **hpBufferSize** – Required buffer size. Important: hpBufferSize is a *host pointer. Scratch Buffer and Host Pointer*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
NPP_SUCCESS

NppStatus **nppsMinAbsIndxGetBufferSize_32s_Ctx**(size_t nLength, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Device scratch buffer size (in bytes) for nppsMinAbsIndx_32s.

Parameters

- **nLength** – *Signal Length*.
- **hpBufferSize** – Required buffer size. Important: hpBufferSize is a *host pointer. Scratch Buffer and Host Pointer*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
NPP_SUCCESS

NppStatus **nppsMinAbsIndx_16s_Ctx**(const *Npp16s* *pSrc, size_t nLength, *Npp16s* *pMinAbs, int *pIndx, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

16-bit integer vector min absolute index method

Parameters

- **pSrc** – *Source Signal Pointer*.
- **nLength** – *Signal Length*.
- **pMinAbs** – Device memory pointer to the output result.
- **pIndx** – Device memory pointer to the index value of the first minimum element.
- **pDeviceBuffer** – Pointer to the required device memory allocation, *Scratch Buffer and Host Pointer*. Use *nppsMinAbsIndxGetBufferSize_16s_Ctx* to determine the minimum number of bytes required.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsMinAbsIndx_32s_Ctx**(const *Npp32s* *pSrc, size_t nLength, *Npp32s* *pMinAbs, int *pIndx, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

32-bit integer vector min absolute index method

Parameters

- **pSrc** – *Source Signal Pointer*.
- **nLength** – *Signal Length*.
- **pMinAbs** – Device memory pointer to the output result.
- **pIndx** – Device memory pointer to the index value of the first minimum element.
- **pDeviceBuffer** – Pointer to the required device memory allocation, *Scratch Buffer and Host Pointer*. Use *nppsMinAbsIndxGetBufferSize_32s_Ctx* to determine the minimum number of bytes required.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Signal Data Related Error Codes, *Length Related Error Codes*.

1.21.5. Signal Mean

1.21.5.1 Mean

Performs the mean operation on the samples of a signal.

Functions

NppStatus **nppsMeanGetBufferSize_32f_Ctx**(size_t nLength, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Device scratch buffer size (in bytes) for nppsMean_32f.

Parameters

- **nLength** – *Signal Length*.
- **hpBufferSize** – Required buffer size. Important: hpBufferSize is a *host pointer. Scratch Buffer and Host Pointer*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

NPP_SUCCESS

NppStatus **nppsMeanGetBufferSize_32fc_Ctx**(size_t nLength, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Device scratch buffer size (in bytes) for nppsMean_32fc.

Parameters

- **nLength** – *Signal Length*.

- **hpBufferSize** – Required buffer size. Important: hpBufferSize is a *host pointer*. *Scratch Buffer and Host Pointer*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
NPP_SUCCESS

NppStatus **nppsMeanGetBufferSize_64f_Ctx**(size_t nLength, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Device scratch buffer size (in bytes) for nppsMean_64f.

Parameters

- **nLength** – *Signal Length*.
- **hpBufferSize** – Required buffer size. Important: hpBufferSize is a *host pointer*. *Scratch Buffer and Host Pointer*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
NPP_SUCCESS

NppStatus **nppsMeanGetBufferSize_64fc_Ctx**(size_t nLength, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Device scratch buffer size (in bytes) for nppsMean_64fc.

Parameters

- **nLength** – *Signal Length*.
- **hpBufferSize** – Required buffer size. Important: hpBufferSize is a *host pointer*. *Scratch Buffer and Host Pointer*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
NPP_SUCCESS

NppStatus **nppsMeanGetBufferSize_16s_Sfs_Ctx**(size_t nLength, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Device scratch buffer size (in bytes) for nppsMean_16s_Sfs_Ctx.

Parameters

- **nLength** – *Signal Length*.
- **hpBufferSize** – Required buffer size. Important: hpBufferSize is a *host pointer*. *Scratch Buffer and Host Pointer*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
NPP_SUCCESS

NppStatus **nppsMeanGetBufferSize_32s_Sfs_Ctx**(size_t nLength, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Device scratch buffer size (in bytes) for nppsMean_32s_Sfs_Ctx.

Parameters

- **nLength** – *Signal Length*.
- **hpBufferSize** – Required buffer size. Important: hpBufferSize is a *host pointer. Scratch Buffer and Host Pointer*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
NPP_SUCCESS

NppStatus **nppsMeanGetBufferSize_16sc_Sfs_Ctx**(size_t nLength, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Device scratch buffer size (in bytes) for nppsMean_16sc_Sfs_Ctx.

Parameters

- **nLength** – *Signal Length*.
- **hpBufferSize** – Required buffer size. Important: hpBufferSize is a *host pointer. Scratch Buffer and Host Pointer*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
NPP_SUCCESS

NppStatus **nppsMean_32f_Ctx**(const *Npp32f* *pSrc, size_t nLength, *Npp32f* *pMean, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

32-bit float vector mean method

Parameters

- **pSrc** – *Source Signal Pointer*.
- **nLength** – *Signal Length*.
- **pMean** – Device memory pointer to the output result.
- **pDeviceBuffer** – Pointer to the required device memory allocation, *Scratch Buffer and Host Pointer*. Use *nppsMeanGetBufferSize_32f_Ctx* to determine the minimum number of bytes required.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsMean_32fc_Ctx**(const *Npp32fc* *pSrc, size_t nLength, *Npp32fc* *pMean, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

32-bit float complex vector mean method

Parameters

- **pSrc** – *Source Signal Pointer*.
- **nLength** – *Signal Length*.
- **pMean** – Device memory pointer to the output result.

- **pDeviceBuffer** – Pointer to the required device memory allocation, *Scratch Buffer and Host Pointer*. Use *nppsMeanGetBufferSize_32fc_Ctx* to determine the minimum number of bytes required.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsMean_64f_Ctx**(const *Npp64f* *pSrc, size_t nLength, *Npp64f* *pMean, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

64-bit double vector mean method

Parameters

- **pSrc** – *Source Signal Pointer*.
- **nLength** – *Signal Length*.
- **pMean** – Device memory pointer to the output result.
- **pDeviceBuffer** – Pointer to the required device memory allocation, *Scratch Buffer and Host Pointer*. Use *nppsMeanGetBufferSize_64f_Ctx* to determine the minimum number of bytes required.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsMean_64fc_Ctx**(const *Npp64fc* *pSrc, size_t nLength, *Npp64fc* *pMean, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

64-bit double complex vector mean method

Parameters

- **pSrc** – *Source Signal Pointer*.
- **nLength** – *Signal Length*.
- **pMean** – Device memory pointer to the output result.
- **pDeviceBuffer** – Pointer to the required device memory allocation, *Scratch Buffer and Host Pointer*. Use *nppsMeanGetBufferSize_64fc_Ctx* to determine the minimum number of bytes required.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsMean_16s_Sfs_Ctx**(const *Npp16s* *pSrc, size_t nLength, *Npp16s* *pMean, int nScaleFactor, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

16-bit short vector mean with integer scaling method

Parameters

- **pSrc** – *Source Signal Pointer*.
- **nLength** – *Signal Length*.

- **pMean** – Device memory pointer to the output result.
- **pDeviceBuffer** – Pointer to the required device memory allocation, *Scratch Buffer and Host Pointer*. Use *nppsMeanGetBufferSize_16s_Sfs_Ctx* to determine the minimum number of bytes required.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsMean_32s_Sfs_Ctx**(const *Npp32s* *pSrc, size_t nLength, *Npp32s* *pMean, int nScaleFactor, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

32-bit integer vector mean with integer scaling method

Parameters

- **pSrc** – *Source Signal Pointer*.
- **nLength** – *Signal Length*.
- **pMean** – Device memory pointer to the output result.
- **pDeviceBuffer** – Pointer to the required device memory allocation, *Scratch Buffer and Host Pointer*. Use *nppsMeanGetBufferSize_32s_Sfs_Ctx* to determine the minimum number of bytes required.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsMean_16sc_Sfs_Ctx**(const *Npp16sc* *pSrc, size_t nLength, *Npp16sc* *pMean, int nScaleFactor, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

16-bit short complex vector mean with integer scaling method

Parameters

- **pSrc** – *Source Signal Pointer*.
- **nLength** – *Signal Length*.
- **pMean** – Device memory pointer to the output result.
- **pDeviceBuffer** – Pointer to the required device memory allocation, *Scratch Buffer and Host Pointer*. Use *nppsMeanGetBufferSize_16sc_Sfs_Ctx* to determine the minimum number of bytes required.
- **nScaleFactor** – *Integer Result Scaling*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Signal Data Related Error Codes, *Length Related Error Codes*.

1.21.6. Signal StdDev

1.21.6.1 Standard Deviation

Calculates the standard deviation for the samples of a signal.

Functions

NppStatus **nppsStdDevGetBufferSize_32f_Ctx**(size_t nLength, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Device scratch buffer size (in bytes) for nppsStdDev_32f.

Parameters

- **nLength** – *Signal Length*.
- **hpBufferSize** – Required buffer size. Important: hpBufferSize is a *host pointer. Scratch Buffer and Host Pointer*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
NPP_SUCCESS

NppStatus **nppsStdDevGetBufferSize_64f_Ctx**(size_t nLength, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Device scratch buffer size (in bytes) for nppsStdDev_64f.

Parameters

- **nLength** – *Signal Length*.
- **hpBufferSize** – Required buffer size. Important: hpBufferSize is a *host pointer. Scratch Buffer and Host Pointer*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
NPP_SUCCESS

NppStatus **nppsStdDevGetBufferSize_16s32s_Sfs_Ctx**(size_t nLength, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Device scratch buffer size (in bytes) for nppsStdDev_16s32s_Sfs_Ctx.

Parameters

- **nLength** – *Signal Length*.
- **hpBufferSize** – Required buffer size. Important: hpBufferSize is a *host pointer. Scratch Buffer and Host Pointer*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
NPP_SUCCESS

NppStatus **nppsStdDevGetBufferSize_16s_Sfs_Ctx**(size_t nLength, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Device scratch buffer size (in bytes) for nppsStdDev_16s_Sfs_Ctx.

Parameters

- **nLength** – *Signal Length*.
- **hpBufferSize** – Required buffer size. Important: hpBufferSize is a *host pointer. Scratch Buffer and Host Pointer*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

NPP_SUCCESS

NppStatus **nppsStdDev_32f_Ctx**(const *Npp32f* *pSrc, size_t nLength, *Npp32f* *pStdDev, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

32-bit float vector standard deviation method

Parameters

- **pSrc** – *Source Signal Pointer*.
- **nLength** – *Signal Length*.
- **pStdDev** – Device memory pointer to the output result.
- **pDeviceBuffer** – Pointer to the required device memory allocation, *Scratch Buffer and Host Pointer*. Use *nppsStdDevGetBufferSize_32f_Ctx* to determine the minimum number of bytes required.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsStdDev_64f_Ctx**(const *Npp64f* *pSrc, size_t nLength, *Npp64f* *pStdDev, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

64-bit float vector standard deviation method

Parameters

- **pSrc** – *Source Signal Pointer*.
- **nLength** – *Signal Length*.
- **pStdDev** – Device memory pointer to the output result.
- **pDeviceBuffer** – Pointer to the required device memory allocation, *Scratch Buffer and Host Pointer*. Use *nppsStdDevGetBufferSize_64f_Ctx* to determine the minimum number of bytes required.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsStdDev_16s32s_Sfs_Ctx**(const *Npp16s* *pSrc, size_t nLength, *Npp32s* *pStdDev, int nScaleFactor, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

16-bit float vector standard deviation method (return value is 32-bit)

Parameters

- **pSrc** – *Source Signal Pointer*.
- **nLength** – *Signal Length*.
- **pStdDev** – Device memory pointer to the output result.
- **nScaleFactor** – *Integer Result Scaling*.
- **pDeviceBuffer** – Pointer to the required device memory allocation, *Scratch Buffer and Host Pointer*. Use *nppsStdDevGetBufferSize_16s32s_Sfs_Ctx* to determine the minimum number of bytes required.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsStdDev_16s_Sfs_Ctx**(const *Npp16s* *pSrc, size_t nLength, *Npp16s* *pStdDev, int nScaleFactor, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

16-bit float vector standard deviation method (return value is also 16-bit)

Parameters

- **pSrc** – *Source Signal Pointer*.
- **nLength** – *Signal Length*.
- **pStdDev** – Device memory pointer to the output result.
- **nScaleFactor** – *Integer Result Scaling*.
- **pDeviceBuffer** – Pointer to the required device memory allocation, *Scratch Buffer and Host Pointer*. Use *nppsStdDevGetBufferSize_16s_Sfs_Ctx* to determine the minimum number of bytes required.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Signal Data Related Error Codes, *Length Related Error Codes*.

1.21.7. Signal Mean And StdDev

1.21.7.1 Mean And Standard Deviation

Performs the mean and calculates the standard deviation for the samples of a signal.

Functions

NppStatus **nppsMeanStdDevGetBufferSize_32f_Ctx**(size_t nLength, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Device scratch buffer size (in bytes) for nppsMeanStdDev_32f.

Parameters

- **nLength** – *Signal Length*.
- **hpBufferSize** – Required buffer size. Important: hpBufferSize is a *host pointer. Scratch Buffer and Host Pointer*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
NPP_SUCCESS

NppStatus **nppsMeanStdDevGetBufferSize_64f_Ctx**(size_t nLength, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Device scratch buffer size (in bytes) for nppsMeanStdDev_64f.

Parameters

- **nLength** – *Signal Length*.
- **hpBufferSize** – Required buffer size. Important: hpBufferSize is a *host pointer. Scratch Buffer and Host Pointer*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
NPP_SUCCESS

NppStatus **nppsMeanStdDevGetBufferSize_16s32s_Sfs_Ctx**(size_t nLength, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Device scratch buffer size (in bytes) for nppsMeanStdDev_16s32s_Sfs_Ctx.

Parameters

- **nLength** – *Signal Length*.
- **hpBufferSize** – Required buffer size. Important: hpBufferSize is a *host pointer. Scratch Buffer and Host Pointer*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
NPP_SUCCESS

NppStatus **nppsMeanStdDevGetBufferSize_16s_Sfs_Ctx**(size_t nLength, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Device scratch buffer size (in bytes) for nppsMeanStdDev_16s_Sfs_Ctx.

Parameters

- **nLength** – *Signal Length*.

- **hpBufferSize** – Required buffer size. Important: hpBufferSize is a *host pointer.* *Scratch Buffer and Host Pointer*.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
NPP_SUCCESS

NppStatus **nppsMeanStdDev_32f_Ctx**(const *Npp32f* *pSrc, size_t nLength, *Npp32f* *pMean, *Npp32f* *pStdDev, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

32-bit float vector mean and standard deviation method

Parameters

- **pSrc** – *Source Signal Pointer*.
- **nLength** – *Signal Length*.
- **pMean** – Device memory pointer to the output mean value.
- **pStdDev** – Device memory pointer to the output standard deviation value.
- **pDeviceBuffer** – Pointer to the required device memory allocation, *Scratch Buffer and Host Pointer*. Use *nppsMeanStdDevGetBufferSize_32f_Ctx* to determine the minimum number of bytes required.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsMeanStdDev_64f_Ctx**(const *Npp64f* *pSrc, size_t nLength, *Npp64f* *pMean, *Npp64f* *pStdDev, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

64-bit float vector mean and standard deviation method

Parameters

- **pSrc** – *Source Signal Pointer*.
- **nLength** – *Signal Length*.
- **pMean** – Device memory pointer to the output mean value.
- **pStdDev** – Device memory pointer to the output standard deviation value.
- **pDeviceBuffer** – Pointer to the required device memory allocation, *Scratch Buffer and Host Pointer*. Use *nppsMeanStdDevGetBufferSize_64f_Ctx* to determine the minimum number of bytes required.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsMeanStdDev_16s32s_Sfs_Ctx**(const *Npp16s* *pSrc, size_t nLength, *Npp32s* *pMean, *Npp32s* *pStdDev, int nScaleFactor, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

16-bit float vector mean and standard deviation method (return values are 32-bit)

Parameters

- **pSrc** – *Source Signal Pointer*.
- **nLength** – *Signal Length*.
- **pMean** – Device memory pointer to the output mean value.
- **pStdDev** – Device memory pointer to the output standard deviation value.
- **nScaleFactor** – *Integer Result Scaling*.
- **pDeviceBuffer** – Pointer to the required device memory allocation, *Scratch Buffer and Host Pointer*. Use *nppsMeanStdDevGetBufferSize_16s32s_Sfs_Ctx* to determine the minimum number of bytes required.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsMeanStdDev_16s_Sfs_Ctx**(const *Npp16s* *pSrc, size_t nLength, *Npp16s* *pMean, *Npp16s* *pStdDev, int nScaleFactor, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

16-bit float vector mean and standard deviation method (return values are also 16-bit)

Parameters

- **pSrc** – *Source Signal Pointer*.
- **nLength** – *Signal Length*.
- **pMean** – Device memory pointer to the output mean value.
- **pStdDev** – Device memory pointer to the output standard deviation value.
- **nScaleFactor** – *Integer Result Scaling*.
- **pDeviceBuffer** – Pointer to the required device memory allocation, *Scratch Buffer and Host Pointer*. Use *nppsMeanStdDevGetBufferSize_16s_Sfs_Ctx* to determine the minimum number of bytes required.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Signal Data Related Error Codes, *Length Related Error Codes*.

1.21.8. Signal MinMax

1.21.8.1 Minimum Maximum

Performs the maximum and the minimum operation on the samples of a signal.

Functions

NppStatus **nppsMinMaxGetBufferSize_8u_Ctx**(size_t nLength, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Device-buffer size (in bytes) for nppsMinMax_8u.

Parameters

- **nLength** – *Signal Length*.
- **hpBufferSize** – Required buffer size. Important: hpBufferSize is a *host pointer.*
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
NPP_SUCCESS

NppStatus **nppsMinMaxGetBufferSize_16s_Ctx**(size_t nLength, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Device-buffer size (in bytes) for nppsMinMax_16s.

Parameters

- **nLength** – *Signal Length*.
- **hpBufferSize** – Required buffer size. Important: hpBufferSize is a *host pointer.*
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
NPP_SUCCESS

NppStatus **nppsMinMaxGetBufferSize_16u_Ctx**(size_t nLength, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Device-buffer size (in bytes) for nppsMinMax_16u.

Parameters

- **nLength** – *Signal Length*.
- **hpBufferSize** – Required buffer size. Important: hpBufferSize is a *host pointer.*
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
NPP_SUCCESS

NppStatus **nppsMinMaxGetBufferSize_32s_Ctx**(size_t nLength, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Device-buffer size (in bytes) for nppsMinMax_32s.

Parameters

- **nLength** – *Signal Length*.
- **hpBufferSize** – Required buffer size. Important: hpBufferSize is a *host pointer.*
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
NPP_SUCCESS

NppStatus **nppsMinMaxGetBufferSize_32u_Ctx**(size_t nLength, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Device-buffer size (in bytes) for nppsMinMax_32u.

Parameters

- **nLength** – *Signal Length*.
- **hpBufferSize** – Required buffer size. Important: hpBufferSize is a *host pointer.*
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
NPP_SUCCESS

NppStatus **nppsMinMaxGetBufferSize_32f_Ctx**(size_t nLength, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Device-buffer size (in bytes) for nppsMinMax_32f.

Parameters

- **nLength** – *Signal Length*.
- **hpBufferSize** – Required buffer size. Important: hpBufferSize is a *host pointer.*
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
NPP_SUCCESS

NppStatus **nppsMinMaxGetBufferSize_64f_Ctx**(size_t nLength, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Device-buffer size (in bytes) for nppsMinMax_64f.

Parameters

- **nLength** – *Signal Length*.
- **hpBufferSize** – Required buffer size. Important: hpBufferSize is a *host pointer.*
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
NPP_SUCCESS

NppStatus **nppsMinMax_8u_Ctx**(const *Npp8u* *pSrc, size_t nLength, *Npp8u* *pMin, *Npp8u* *pMax, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

8-bit char vector min and max method

Parameters

- **pSrc** – *Source Signal Pointer*.
- **nLength** – *Signal Length*.
- **pMin** – Device memory pointer to the min output result.
- **pMax** – Device memory pointer to the max output result.

- **pDeviceBuffer** – Pointer to the required device memory allocation, *Scratch Buffer and Host Pointer*. Use *nppsMinMaxGetBufferSize_8u_Ctx* to determine the minimum number of bytes required.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsMinMax_16s_Ctx**(const *Npp16s* *pSrc, size_t nLength, *Npp16s* *pMin, *Npp16s* *pMax, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

16-bit signed short vector min and max method

Parameters

- **pSrc** – *Source Signal Pointer*.
- **nLength** – *Signal Length*.
- **pMin** – Device memory pointer to the min output result.
- **pMax** – Device memory pointer to the max output result.
- **pDeviceBuffer** – Pointer to the required device memory allocation, *Scratch Buffer and Host Pointer*. Use *nppsMinMaxGetBufferSize_16s_Ctx* to determine the minimum number of bytes required.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsMinMax_16u_Ctx**(const *Npp16u* *pSrc, size_t nLength, *Npp16u* *pMin, *Npp16u* *pMax, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

16-bit unsigned short vector min and max method

Parameters

- **pSrc** – *Source Signal Pointer*.
- **nLength** – *Signal Length*.
- **pMin** – Device memory pointer to the min output result.
- **pMax** – Device memory pointer to the max output result.
- **pDeviceBuffer** – Pointer to the required device memory allocation, *Scratch Buffer and Host Pointer*. Use *nppsMinMaxGetBufferSize_16u_Ctx* to determine the minimum number of bytes required.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsMinMax_32u_Ctx**(const *Npp32u* *pSrc, size_t nLength, *Npp32u* *pMin, *Npp32u* *pMax, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

32-bit unsigned int vector min and max method

Parameters

- **pSrc** – *Source Signal Pointer*.
- **nLength** – *Signal Length*.
- **pMin** – Device memory pointer to the min output result.
- **pMax** – Device memory pointer to the max output result.
- **pDeviceBuffer** – Pointer to the required device memory allocation, *Scratch Buffer and Host Pointer*. Use *nppsMinMaxGetBufferSize_32u_Ctx* to determine the minimum number of bytes required.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsMinMax_32s_Ctx**(const *Npp32s* *pSrc, size_t nLength, *Npp32s* *pMin, *Npp32s* *pMax, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

32-bit signed int vector min and max method

Parameters

- **pSrc** – *Source Signal Pointer*.
- **nLength** – *Signal Length*.
- **pMin** – Device memory pointer to the min output result.
- **pMax** – Device memory pointer to the max output result.
- **pDeviceBuffer** – Pointer to the required device memory allocation, *Scratch Buffer and Host Pointer*. Use *nppsMinMaxGetBufferSize_32s_Ctx* to determine the minimum number of bytes required.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsMinMax_32f_Ctx**(const *Npp32f* *pSrc, size_t nLength, *Npp32f* *pMin, *Npp32f* *pMax, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

32-bit float vector min and max method

Parameters

- **pSrc** – *Source Signal Pointer*.
- **nLength** – *Signal Length*.
- **pMin** – Device memory pointer to the min output result.
- **pMax** – Device memory pointer to the max output result.
- **pDeviceBuffer** – Pointer to the required device memory allocation, *Scratch Buffer and Host Pointer*. Use *nppsMinMaxGetBufferSize_32f_Ctx* to determine the minimum number of bytes required.

- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsMinMax_64f_Ctx**(const *Npp64f* *pSrc, size_t nLength, *Npp64f* *pMin, *Npp64f* *pMax, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

64-bit double vector min and max method

Parameters

- **pSrc** – *Source Signal Pointer*.
- **nLength** – *Signal Length*.
- **pMin** – Device memory pointer to the min output result.
- **pMax** – Device memory pointer to the max output result.
- **pDeviceBuffer** – Pointer to the required device memory allocation, *Scratch Buffer and Host Pointer*. Use *nppsMinMaxGetBufferSize_64f_Ctx* to determine the minimum number of bytes required.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsMinMaxIndxGetBufferSize_8u_Ctx**(size_t nLength, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Device-buffer size (in bytes) for nppsMinMaxIndx_8u.

Parameters

- **nLength** – *Signal Length*.
- **hpBufferSize** – Required buffer size. Important: hpBufferSize is a *host pointer.*
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
NPP_SUCCESS

NppStatus **nppsMinMaxIndxGetBufferSize_16s_Ctx**(size_t nLength, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Device-buffer size (in bytes) for nppsMinMaxIndx_16s.

Parameters

- **nLength** – *Signal Length*.
- **hpBufferSize** – Required buffer size. Important: hpBufferSize is a *host pointer.*
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
NPP_SUCCESS

NppStatus **nppsMinMaxIndxGetBufferSize_16u_Ctx**(size_t nLength, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Device-buffer size (in bytes) for nppsMinMaxIndx_16u.

Parameters

- **nLength** – *Signal Length*.
- **hpBufferSize** – Required buffer size. Important: hpBufferSize is a *host pointer.*
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
NPP_SUCCESS

NppStatus **nppsMinMaxIndxGetBufferSize_32s_Ctx**(size_t nLength, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Device-buffer size (in bytes) for nppsMinMaxIndx_32s.

Parameters

- **nLength** – *Signal Length*.
- **hpBufferSize** – Required buffer size. Important: hpBufferSize is a *host pointer.*
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
NPP_SUCCESS

NppStatus **nppsMinMaxIndxGetBufferSize_32u_Ctx**(size_t nLength, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Device-buffer size (in bytes) for nppsMinMaxIndx_32u.

Parameters

- **nLength** – *Signal Length*.
- **hpBufferSize** – Required buffer size. Important: hpBufferSize is a *host pointer.*
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
NPP_SUCCESS

NppStatus **nppsMinMaxIndxGetBufferSize_32f_Ctx**(size_t nLength, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Device-buffer size (in bytes) for nppsMinMaxIndx_32f.

Parameters

- **nLength** – *Signal Length*.
- **hpBufferSize** – Required buffer size. Important: hpBufferSize is a *host pointer.*
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
NPP_SUCCESS

NppStatus **nppsMinMaxIndxGetBufferSize_64f_Ctx**(size_t nLength, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Device-buffer size (in bytes) for nppsMinMaxIndx_64f.

Parameters

- **nLength** – *Signal Length*.
- **hpBufferSize** – Required buffer size. Important: hpBufferSize is a *host pointer.*
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
NPP_SUCCESS

NppStatus **nppsMinMaxIndx_8u_Ctx**(const *Npp8u* *pSrc, size_t nLength, *Npp8u* *pMin, int *pMinIndx, *Npp8u* *pMax, int *pMaxIndx, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

8-bit char vector min and max with indices method

Parameters

- **pSrc** – *Source Signal Pointer*.
- **nLength** – *Signal Length*.
- **pMin** – Device memory pointer to the min output result.
- **pMinIndx** – Device memory pointer to the index of the first min value.
- **pMax** – Device memory pointer to the max output result.
- **pMaxIndx** – Device memory pointer to the index of the first max value.
- **pDeviceBuffer** – Pointer to the required device memory allocation, *Scratch Buffer and Host Pointer*. Use *nppsMinMaxIndxGetBufferSize_8u_Ctx* to determine the minimum number of bytes required.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsMinMaxIndx_16s_Ctx**(const *Npp16s* *pSrc, size_t nLength, *Npp16s* *pMin, int *pMinIndx, *Npp16s* *pMax, int *pMaxIndx, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

16-bit signed short vector min and max with indices method

Parameters

- **pSrc** – *Source Signal Pointer*.
- **nLength** – *Signal Length*.
- **pMin** – Device memory pointer to the min output result.
- **pMinIndx** – Device memory pointer to the index of the first min value.
- **pMax** – Device memory pointer to the max output result.
- **pMaxIndx** – Device memory pointer to the index of the first max value.

- **pDeviceBuffer** – Pointer to the required device memory allocation, *Scratch Buffer and Host Pointer*. Use *nppsMinMaxIndxGetBufferSize_16s_Ctx* to determine the minimum number of bytes required.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsMinMaxIndx_16u_Ctx**(const *Npp16u* *pSrc, size_t nLength, *Npp16u* *pMin, int *pMinIndx, *Npp16u* *pMax, int *pMaxIndx, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

16-bit unsigned short vector min and max with indices method

Parameters

- **pSrc** – *Source Signal Pointer*.
- **nLength** – *Signal Length*.
- **pMin** – Device memory pointer to the min output result.
- **pMinIndx** – Device memory pointer to the index of the first min value.
- **pMax** – Device memory pointer to the max output result.
- **pMaxIndx** – Device memory pointer to the index of the first max value.
- **pDeviceBuffer** – Pointer to the required device memory allocation, *Scratch Buffer and Host Pointer*. Use *nppsMinMaxIndxGetBufferSize_16u_Ctx* to determine the minimum number of bytes required.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsMinMaxIndx_32s_Ctx**(const *Npp32s* *pSrc, size_t nLength, *Npp32s* *pMin, int *pMinIndx, *Npp32s* *pMax, int *pMaxIndx, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

32-bit signed short vector min and max with indices method

Parameters

- **pSrc** – *Source Signal Pointer*.
- **nLength** – *Signal Length*.
- **pMin** – Device memory pointer to the min output result.
- **pMinIndx** – Device memory pointer to the index of the first min value.
- **pMax** – Device memory pointer to the max output result.
- **pMaxIndx** – Device memory pointer to the index of the first max value.
- **pDeviceBuffer** – Pointer to the required device memory allocation, *Scratch Buffer and Host Pointer*. Use *nppsMinMaxIndxGetBufferSize_32s_Ctx* to determine the minimum number of bytes required.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsMinMaxIndx_32u_Ctx**(const *Npp32u* *pSrc, size_t nLength, *Npp32u* *pMin, int *pMinIndx, *Npp32u* *pMax, int *pMaxIndx, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

32-bit unsigned short vector min and max with indices method

Parameters

- **pSrc** – *Source Signal Pointer*.
- **nLength** – *Signal Length*.
- **pMin** – Device memory pointer to the min output result.
- **pMinIndx** – Device memory pointer to the index of the first min value.
- **pMax** – Device memory pointer to the max output result.
- **pMaxIndx** – Device memory pointer to the index of the first max value.
- **pDeviceBuffer** – Pointer to the required device memory allocation, *Scratch Buffer and Host Pointer*. Use *nppsMinMaxIndxGetBufferSize_32u_Ctx* to determine the minimum number of bytes required.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsMinMaxIndx_32f_Ctx**(const *Npp32f* *pSrc, size_t nLength, *Npp32f* *pMin, int *pMinIndx, *Npp32f* *pMax, int *pMaxIndx, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

32-bit float vector min and max with indices method

Parameters

- **pSrc** – *Source Signal Pointer*.
- **nLength** – *Signal Length*.
- **pMin** – Device memory pointer to the min output result.
- **pMinIndx** – Device memory pointer to the index of the first min value.
- **pMax** – Device memory pointer to the max output result.
- **pMaxIndx** – Device memory pointer to the index of the first max value.
- **pDeviceBuffer** – Pointer to the required device memory allocation, *Scratch Buffer and Host Pointer*. Use *nppsMinMaxIndxGetBufferSize_32f_Ctx* to determine the minimum number of bytes required.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsMinMaxIndx_64f_Ctx**(const *Npp64f* *pSrc, size_t nLength, *Npp64f* *pMin, int *pMinIndx, *Npp64f* *pMax, int *pMaxIndx, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

64-bit float vector min and max with indices method

Parameters

- **pSrc** – *Source Signal Pointer*.
- **nLength** – *Signal Length*.
- **pMin** – Device memory pointer to the min output result.
- **pMinIndx** – Device memory pointer to the index of the first min value.
- **pMax** – Device memory pointer to the max output result.
- **pMaxIndx** – Device memory pointer to the index of the first max value.
- **pDeviceBuffer** – Pointer to the required device memory allocation, *Scratch Buffer and Host Pointer*. Use *nppsMinMaxIndxGetBufferSize_64f_Ctx* to determine the minimum number of bytes required.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Signal Data Related Error Codes, *Length Related Error Codes*.

1.21.9. Signal Norms

1.21.9.1 Signal Norm Inf

1.21.9.1.1 Infinity Norm

Performs the infinity norm on the samples of a signal.

Functions

NppStatus **nppsNormInfGetBufferSize_32f_Ctx**(size_t nLength, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Device-buffer size (in bytes) for nppsNorm_Inf_32f.

Parameters

- **nLength** – *Signal Length*.
- **hpBufferSize** – Required buffer size. Important: hpBufferSize is a *host pointer.*
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

NPP_SUCCESS

NppStatus **nppsNorm_Inf_32f_Ctx**(const *Npp32f* *pSrc, size_t nLength, *Npp32f* *pNorm, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

32-bit float vector C norm method

Parameters

- **pSrc** – *Source Signal Pointer*.
- **nLength** – *Signal Length*.
- **pNorm** – Device memory pointer to the norm result.
- **pDeviceBuffer** – Pointer to the required device memory allocation, *Scratch Buffer and Host Pointer*. Use *nppsNormInfGetBufferSize_32f_Ctx* to determine the minimum number of bytes required.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsNormInfGetBufferSize_64f_Ctx**(size_t nLength, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Device-buffer size (in bytes) for nppsNorm_Inf_64f_Ctx.

Parameters

- **nLength** – *Signal Length*.
- **hpBufferSize** – Required buffer size. Important: hpBufferSize is a *host pointer.*
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

NPP_SUCCESS

NppStatus **nppsNorm_Inf_64f_Ctx**(const *Npp64f* *pSrc, size_t nLength, *Npp64f* *pNorm, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

64-bit float vector C norm method

Parameters

- **pSrc** – *Source Signal Pointer*.
- **nLength** – *Signal Length*.
- **pNorm** – Device memory pointer to the norm result.
- **pDeviceBuffer** – Pointer to the required device memory allocation, *Scratch Buffer and Host Pointer*. Use *nppsNormInfGetBufferSize_64f_Ctx* to determine the minimum number of bytes required.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsNormInfGetBufferSize_16s32f_Ctx**(size_t nLength, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Device-buffer size (in bytes) for nppsNorm_Inf_16s32f_Ctx.

Parameters

- **nLength** – *Signal Length*.

- **hpBufferSize** – Required buffer size. Important: hpBufferSize is a *host pointer.*
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
NPP_SUCCESS

NppStatus **nppsNorm_Inf_16s32f_Ctx**(const *Npp16s* *pSrc, size_t nLength, *Npp32f* *pNorm, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

16-bit signed short integer vector C norm method, return value is 32-bit float.

Parameters

- **pSrc** – *Source Signal Pointer*.
- **nLength** – *Signal Length*.
- **pNorm** – Device memory pointer to the norm result.
- **pDeviceBuffer** – Pointer to the required device memory allocation, *Scratch Buffer and Host Pointer*. Use *nppsNormInfGetBufferSize_16s32f_Ctx* to determine the minimum number of bytes required.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsNormInfGetBufferSize_32fc32f_Ctx**(size_t nLength, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Device-buffer size (in bytes) for nppsNorm_Inf_32fc32f_Ctx.

Parameters

- **nLength** – *Signal Length*.
- **hpBufferSize** – Required buffer size. Important: hpBufferSize is a *host pointer.*
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
NPP_SUCCESS

NppStatus **nppsNorm_Inf_32fc32f_Ctx**(const *Npp32fc* *pSrc, size_t nLength, *Npp32f* *pNorm, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

32-bit float complex vector C norm method, return value is 32-bit float.

Parameters

- **pSrc** – *Source Signal Pointer*.
- **nLength** – *Signal Length*.
- **pNorm** – Device memory pointer to the norm result.
- **pDeviceBuffer** – Pointer to the required device memory allocation, *Scratch Buffer and Host Pointer*. Use *nppsNormInfGetBufferSize_32fc32f_Ctx* to determine the minimum number of bytes required.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsNormInfGetBufferSize_64fc64f_Ctx**(size_t nLength, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Device-buffer size (in bytes) for nppsNorm_Inf_64fc64f.

Parameters

- **nLength** – *Signal Length*.
- **hpBufferSize** – Required buffer size. Important: hpBufferSize is a *host pointer.*
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
NPP_SUCCESS

NppStatus **nppsNorm_Inf_64fc64f_Ctx**(const *Npp64fc* *pSrc, size_t nLength, *Npp64f* *pNorm, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

64-bit float complex vector C norm method, return value is 64-bit float.

Parameters

- **pSrc** – *Source Signal Pointer*.
- **nLength** – *Signal Length*.
- **pNorm** – Device memory pointer to the norm result.
- **pDeviceBuffer** – Pointer to the required device memory allocation, *Scratch Buffer and Host Pointer*. Use *nppsNormInfGetBufferSize_64fc64f_Ctx* to determine the minimum number of bytes required.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsNormInfGetBufferSize_16s32s_Sfs_Ctx**(size_t nLength, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Device-buffer size (in bytes) for nppsNorm_Inf_16s32s_Sfs_Ctx.

Parameters

- **nLength** – *Signal Length*.
- **hpBufferSize** – Required buffer size. Important: hpBufferSize is a *host pointer.*
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
NPP_SUCCESS

NppStatus **nppsNorm_Inf_16s32s_Sfs_Ctx**(const *Npp16s* *pSrc, size_t nLength, *Npp32s* *pNorm, int nScaleFactor, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

16-bit signed short integer vector C norm method, return value is 32-bit signed integer.

Parameters

- **pSrc** – *Source Signal Pointer*.
- **nLength** – *Signal Length*.
- **pNorm** – Device memory pointer to the norm result.
- **nScaleFactor** – *Integer Result Scaling*.
- **pDeviceBuffer** – Pointer to the required device memory allocation, *Scratch Buffer and Host Pointer*. Use *nppsNormInfGetBufferSize_16s32s_Sfs_Ctx* to determine the minimum number of bytes required.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Signal Data Related Error Codes, *Length Related Error Codes*.

1.21.9.2 Signal Norm L1

1.21.9.2.1 L1 Norm

Performs the L1 norm on the samples of a signal.

Functions

NppStatus **nppsNormL1GetBufferSize_32f_Ctx**(size_t nLength, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Device-buffer size (in bytes) for nppsNorm_L1_32f.

Parameters

- **nLength** – *Signal Length*.
- **hpBufferSize** – Required buffer size. Important: hpBufferSize is a *host pointer.*
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

NPP_SUCCESS

NppStatus **nppsNorm_L1_32f_Ctx**(const *Npp32f* *pSrc, size_t nLength, *Npp32f* *pNorm, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

32-bit float vector L1 norm method

Parameters

- **pSrc** – *Source Signal Pointer*.
- **nLength** – *Signal Length*.
- **pNorm** – Device memory pointer to the norm result.
- **pDeviceBuffer** – Pointer to the required device memory allocation, *Scratch Buffer and Host Pointer*. Use *nppsNormL1GetBufferSize_32f_Ctx* to determine the minimum number of bytes required.

- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsNormL1GetBufferSize_64f_Ctx**(size_t nLength, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Device-buffer size (in bytes) for nppsNorm_L1_64f_Ctx.

Parameters

- **nLength** – *Signal Length*.
- **hpBufferSize** – Required buffer size. Important: hpBufferSize is a *host pointer.*
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
NPP_SUCCESS

NppStatus **nppsNorm_L1_64f_Ctx**(const *Npp64f* *pSrc, size_t nLength, *Npp64f* *pNorm, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

64-bit float vector L1 norm method

Parameters

- **pSrc** – *Source Signal Pointer*.
- **nLength** – *Signal Length*.
- **pNorm** – Device memory pointer to the norm result.
- **pDeviceBuffer** – Pointer to the required device memory allocation, *Scratch Buffer and Host Pointer*. Use *nppsNormL1GetBufferSize_64f_Ctx* to determine the minimum number of bytes required.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsNormL1GetBufferSize_16s32f_Ctx**(size_t nLength, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Device-buffer size (in bytes) for nppsNorm_L1_16s32f_Ctx.

Parameters

- **nLength** – *Signal Length*.
- **hpBufferSize** – Required buffer size. Important: hpBufferSize is a *host pointer.*
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
NPP_SUCCESS

NppStatus **nppsNorm_L1_16s32f_Ctx**(const *Npp16s* *pSrc, size_t nLength, *Npp32f* *pNorm, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

16-bit signed short integer vector L1 norm method, return value is 32-bit float.

Parameters

- **pSrc** – *Source Signal Pointer*.
- **nLength** – *Signal Length*.
- **pNorm** – Device memory pointer to the L1 norm result.
- **pDeviceBuffer** – Pointer to the required device memory allocation, *Scratch Buffer and Host Pointer*. Use *nppsNormL1GetBufferSize_16s32f_Ctx* to determine the minimum number of bytes required.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsNormL1GetBufferSize_32fc64f_Ctx**(size_t nLength, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Device-buffer size (in bytes) for nppsNorm_L1_32fc64f_Ctx.

Parameters

- **nLength** – *Signal Length*.
- **hpBufferSize** – Required buffer size. Important: hpBufferSize is a *host pointer.*
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

NPP_SUCCESS

NppStatus **nppsNorm_L1_32fc64f_Ctx**(const *Npp32fc* *pSrc, size_t nLength, *Npp64f* *pNorm, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

32-bit float complex vector L1 norm method, return value is 64-bit float.

Parameters

- **pSrc** – *Source Signal Pointer*.
- **nLength** – *Signal Length*.
- **pNorm** – Device memory pointer to the norm result.
- **pDeviceBuffer** – Pointer to the required device memory allocation, *Scratch Buffer and Host Pointer*. Use *nppsNormL1GetBufferSize_32fc64f_Ctx* to determine the minimum number of bytes required.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsNormL1GetBufferSize_64fc64f_Ctx**(size_t nLength, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Device-buffer size (in bytes) for nppsNorm_L1_64fc64f.

Parameters

- **nLength** – *Signal Length*.

- **hpBufferSize** – Required buffer size. Important: hpBufferSize is a *host pointer.*
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
NPP_SUCCESS

NppStatus **nppsNorm_L1_64fc64f_Ctx**(const *Npp64fc* *pSrc, size_t nLength, *Npp64f* *pNorm, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

64-bit float complex vector L1 norm method, return value is 64-bit float.

Parameters

- **pSrc** – *Source Signal Pointer*.
- **nLength** – *Signal Length*.
- **pNorm** – Device memory pointer to the norm result.
- **pDeviceBuffer** – Pointer to the required device memory allocation, *Scratch Buffer and Host Pointer*. Use *nppsNormL1GetBufferSize_64fc64f_Ctx* to determine the minimum number of bytes required.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsNormL1GetBufferSize_16s32s_Sfs_Ctx**(size_t nLength, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Device-buffer size (in bytes) for nppsNorm_L1_16s32s_Sfs_Ctx.

Parameters

- **nLength** – *Signal Length*.
- **hpBufferSize** – Required buffer size. Important: hpBufferSize is a *host pointer.*
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
NPP_SUCCESS

NppStatus **nppsNorm_L1_16s32s_Sfs_Ctx**(const *Npp16s* *pSrc, size_t nLength, *Npp32s* *pNorm, int nScaleFactor, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

16-bit signed short integer vector L1 norm method, return value is 32-bit signed integer.

Parameters

- **pSrc** – *Source Signal Pointer*.
- **nLength** – *Signal Length*.
- **pNorm** – Device memory pointer to the norm result.
- **nScaleFactor** – *Integer Result Scaling*.
- **pDeviceBuffer** – Pointer to the required device memory allocation, *Scratch Buffer and Host Pointer*. Use *nppsNormL1GetBufferSize_16s32s_Sfs_Ctx* to determine the minimum number of bytes required.

- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsNormL1GetBufferSize_16s64s_Sfs_Ctx**(size_t nLength, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Device-buffer size (in bytes) for nppsNorm_L1_16s64s_Sfs_Ctx.

Parameters

- **nLength** – *Signal Length*.
- **hpBufferSize** – Required buffer size. Important: hpBufferSize is a *host pointer.*
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
NPP_SUCCESS

NppStatus **nppsNorm_L1_16s64s_Sfs_Ctx**(const *Npp16s* *pSrc, size_t nLength, *Npp64s* *pNorm, int nScaleFactor, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

16-bit signed short integer vector L1 norm method, return value is 64-bit signed integer.

Parameters

- **pSrc** – *Source Signal Pointer*.
- **nLength** – *Signal Length*.
- **pNorm** – Device memory pointer to the norm result.
- **nScaleFactor** – *Integer Result Scaling*.
- **pDeviceBuffer** – Pointer to the required device memory allocation, *Scratch Buffer and Host Pointer*. Use *nppsNormL1GetBufferSize_16s64s_Sfs_Ctx* to determine the minimum number of bytes required.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

1.21.9.3 Signal Norm L2

1.21.9.3.1 L2 Norm

Performs the L2 norm on the samples of a signal.

Functions

NppStatus **nppsNormL2GetBufferSize_32f_Ctx**(size_t nLength, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Device-buffer size (in bytes) for nppsNorm_L2_32f_Ctx.

Parameters

- **nLength** – *Signal Length*.
- **hpBufferSize** – Required buffer size. Important: hpBufferSize is a *host pointer.*
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
NPP_SUCCESS

NppStatus **nppsNorm_L2_32f_Ctx**(const *Npp32f* *pSrc, size_t nLength, *Npp32f* *pNorm, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

32-bit float vector L2 norm method

Parameters

- **pSrc** – *Source Signal Pointer*.
- **nLength** – *Signal Length*.
- **pNorm** – Device memory pointer to the norm result.
- **pDeviceBuffer** – Pointer to the required device memory allocation, *Scratch Buffer and Host Pointer*. Use *nppsNormL2GetBufferSize_32f_Ctx* to determine the minimum number of bytes required.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsNormL2GetBufferSize_64f_Ctx**(size_t nLength, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Device-buffer size (in bytes) for nppsNorm_L2_64f_Ctx.

Parameters

- **nLength** – *Signal Length*.
- **hpBufferSize** – Required buffer size. Important: hpBufferSize is a *host pointer.*
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
NPP_SUCCESS

NppStatus **nppsNorm_L2_64f_Ctx**(const *Npp64f* *pSrc, size_t nLength, *Npp64f* *pNorm, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

64-bit float vector L2 norm method

Parameters

- **pSrc** – *Source Signal Pointer*.

- **nLength** – *Signal Length*.
- **pNorm** – Device memory pointer to the norm result.
- **pDeviceBuffer** – Pointer to the required device memory allocation, *Scratch Buffer and Host Pointer*. Use *nppsNormL2GetBufferSize_64f_Ctx* to determine the minimum number of bytes required.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsNormL2GetBufferSize_16s32f_Ctx**(size_t nLength, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Device-buffer size (in bytes) for nppsNorm_L2_16s32f_Ctx.

Parameters

- **nLength** – *Signal Length*.
- **hpBufferSize** – Required buffer size. Important: hpBufferSize is a *host pointer.*
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
NPP_SUCCESS

NppStatus **nppsNorm_L2_16s32f_Ctx**(const *Npp16s* *pSrc, size_t nLength, *Npp32f* *pNorm, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

16-bit signed short integer vector L2 norm method, return value is 32-bit float.

Parameters

- **pSrc** – *Source Signal Pointer*.
- **nLength** – *Signal Length*.
- **pNorm** – Device memory pointer to the norm result.
- **pDeviceBuffer** – Pointer to the required device memory allocation, *Scratch Buffer and Host Pointer*. Use *nppsNormL2GetBufferSize_16s32f_Ctx* to determine the minimum number of bytes required.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsNormL2GetBufferSize_32fc64f_Ctx**(size_t nLength, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Device-buffer size (in bytes) for nppsNorm_L2_32fc64f_Ctx.

Parameters

- **nLength** – *Signal Length*.
- **hpBufferSize** – Required buffer size. Important: hpBufferSize is a *host pointer.*
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
NPP_SUCCESS

NppStatus **nppsNorm_L2_32fc64f_Ctx**(const *Npp32fc* *pSrc, size_t nLength, *Npp64f* *pNorm, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

32-bit float complex vector L2 norm method, return value is 64-bit float.

Parameters

- **pSrc** – *Source Signal Pointer*.
- **nLength** – *Signal Length*.
- **pNorm** – Device memory pointer to the norm result.
- **pDeviceBuffer** – Pointer to the required device memory allocation, *Scratch Buffer and Host Pointer*. Use *nppsNormL2GetBufferSize_32fc64f_Ctx* to determine the minimum number of bytes required.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsNormL2GetBufferSize_64fc64f_Ctx**(size_t nLength, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Device-buffer size (in bytes) for nppsNorm_L2_64fc64f_Ctx.

Parameters

- **nLength** – *Signal Length*.
- **hpBufferSize** – Required buffer size. Important: hpBufferSize is a *host pointer.*
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
NPP_SUCCESS

NppStatus **nppsNorm_L2_64fc64f_Ctx**(const *Npp64fc* *pSrc, size_t nLength, *Npp64f* *pNorm, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

64-bit float complex vector L2 norm method, return value is 64-bit float.

Parameters

- **pSrc** – *Source Signal Pointer*.
- **nLength** – *Signal Length*.
- **pNorm** – Device memory pointer to the norm result.
- **pDeviceBuffer** – Pointer to the required device memory allocation, *Scratch Buffer and Host Pointer*. Use *nppsNormL2GetBufferSize_64fc64f_Ctx* to determine the minimum number of bytes required.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsNormL2GetBufferSize_16s32s_Sfs_Ctx**(size_t nLength, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Device-buffer size (in bytes) for nppsNorm_L2_16s32s_Sfs_Ctx.

Parameters

- **nLength** – *Signal Length*.
- **hpBufferSize** – Required buffer size. Important: hpBufferSize is a *host pointer.*
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
NPP_SUCCESS

NppStatus **nppsNorm_L2_16s32s_Sfs_Ctx**(const *Npp16s* *pSrc, size_t nLength, *Npp32s* *pNorm, int nScaleFactor, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

16-bit signed short integer vector L2 norm method, return value is 32-bit signed integer.

Parameters

- **pSrc** – *Source Signal Pointer*.
- **nLength** – *Signal Length*.
- **pNorm** – Device memory pointer to the norm result.
- **nScaleFactor** – *Integer Result Scaling*.
- **pDeviceBuffer** – Pointer to the required device memory allocation, *Scratch Buffer and Host Pointer*. Use *nppsNormL2GetBufferSize_16s32s_Sfs_Ctx* to determine the minimum number of bytes required.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsNormL2SqrGetBufferSize_16s64s_Sfs_Ctx**(size_t nLength, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Device-buffer size (in bytes) for nppsNorm_L2Sqr_16s64s_Sfs_Ctx.

Parameters

- **nLength** – *Signal Length*.
- **hpBufferSize** – Required buffer size. Important: hpBufferSize is a *host pointer.*
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
NPP_SUCCESS

NppStatus **nppsNorm_L2Sqr_16s64s_Sfs_Ctx**(const *Npp16s* *pSrc, size_t nLength, *Npp64s* *pNorm, int nScaleFactor, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

16-bit signed short integer vector L2 Square norm method, return value is 64-bit signed integer.

Parameters

- **pSrc** – *Source Signal Pointer*.
- **nLength** – *Signal Length*.
- **pNorm** – Device memory pointer to the norm result.
- **nScaleFactor** – *Integer Result Scaling*.
- **pDeviceBuffer** – Pointer to the required device memory allocation, *Scratch Buffer and Host Pointer*. Use *nppsNormL2SqrGetBufferSize_16s64s_Sfs_Ctx* to determine the minimum number of bytes required.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Signal Data Related Error Codes, *Length Related Error Codes*.

1.21.9.4 Signal Norm Inf NormDiff

1.21.9.4.1 Infinity Norm Diff

Performs the infinity norm on the samples of two input signals' difference.

Functions

NppStatus **nppsNormDiffInfGetBufferSize_32f_Ctx**(size_t nLength, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Device-buffer size (in bytes) for nppsNormDiff_Inf_32f.

Parameters

- **nLength** – *Signal Length*.
- **hpBufferSize** – Required buffer size. Important: hpBufferSize is a *host pointer.*
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

NPP_SUCCESS

NppStatus **nppsNormDiff_Inf_32f_Ctx**(const *Npp32f* *pSrc1, const *Npp32f* *pSrc2, size_t nLength, *Npp32f* *pNorm, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

32-bit float C norm method on two vectors' difference

Parameters

- **pSrc1** – *Source Signal Pointer*.
- **pSrc2** – *Source Signal Pointer*.
- **nLength** – *Signal Length*.
- **pNorm** – Device memory pointer to the norm result.

- **pDeviceBuffer** – Pointer to the required device memory allocation, *Scratch Buffer and Host Pointer*. Use *nppsNormDiffInfGetBufferSize_32f_Ctx* to determine the minimum number of bytes required.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsNormDiffInfGetBufferSize_64f_Ctx**(size_t nLength, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Device-buffer size (in bytes) for nppsNormDiff_Inf_64f_Ctx.

Parameters

- **nLength** – *Signal Length*.
- **hpBufferSize** – Required buffer size. Important: hpBufferSize is a *host pointer.*
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
NPP_SUCCESS

NppStatus **nppsNormDiff_Inf_64f_Ctx**(const *Npp64f* *pSrc1, const *Npp64f* *pSrc2, size_t nLength, *Npp64f* *pNorm, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

64-bit float C norm method on two vectors' difference

Parameters

- **pSrc1** – *Source Signal Pointer*.
- **pSrc2** – *Source Signal Pointer*.
- **nLength** – *Signal Length*.
- **pNorm** – Device memory pointer to the norm result.
- **pDeviceBuffer** – Pointer to the required device memory allocation, *Scratch Buffer and Host Pointer*. Use *nppsNormDiffInfGetBufferSize_64f_Ctx* to determine the minimum number of bytes required.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsNormDiffInfGetBufferSize_16s32f_Ctx**(size_t nLength, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Device-buffer size (in bytes) for nppsNormDiff_Inf_16s32f_Ctx.

Parameters

- **nLength** – *Signal Length*.
- **hpBufferSize** – Required buffer size. Important: hpBufferSize is a *host pointer.*
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
NPP_SUCCESS

NppStatus **nppsNormDiff_Inf_16s32f_Ctx**(const *Npp16s* *pSrc1, const *Npp16s* *pSrc2, size_t nLength, *Npp32f* *pNorm, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

16-bit signed short integer C norm method on two vectors' difference, return value is 32-bit float.

Parameters

- **pSrc1** – *Source Signal Pointer*.
- **pSrc2** – *Source Signal Pointer*.
- **nLength** – *Signal Length*.
- **pNorm** – Device memory pointer to the norm result.
- **pDeviceBuffer** – Pointer to the required device memory allocation, *Scratch Buffer and Host Pointer*. Use *nppsNormDiffInfGetBufferSize_16s32f_Ctx* to determine the minimum number of bytes required.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsNormDiffInfGetBufferSize_32fc32f_Ctx**(size_t nLength, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Device-buffer size (in bytes) for nppsNormDiff_Inf_32fc32f_Ctx.

Parameters

- **nLength** – *Signal Length*.
- **hpBufferSize** – Required buffer size. Important: hpBufferSize is a *host pointer.*
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

NPP_SUCCESS

NppStatus **nppsNormDiff_Inf_32fc32f_Ctx**(const *Npp32fc* *pSrc1, const *Npp32fc* *pSrc2, size_t nLength, *Npp32f* *pNorm, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

32-bit float complex C norm method on two vectors' difference, return value is 32-bit float.

Parameters

- **pSrc1** – *Source Signal Pointer*.
- **pSrc2** – *Source Signal Pointer*.
- **nLength** – *Signal Length*.
- **pNorm** – Device memory pointer to the norm result.
- **pDeviceBuffer** – Pointer to the required device memory allocation, *Scratch Buffer and Host Pointer*. Use *nppsNormDiffInfGetBufferSize_32fc32f_Ctx* to determine the minimum number of bytes required.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsNormDiffInfGetBufferSize_64fc64f_Ctx**(size_t nLength, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Device-buffer size (in bytes) for nppsNormDiff_Inf_64fc64f_Ctx.

Parameters

- **nLength** – *Signal Length*.
- **hpBufferSize** – Required buffer size. Important: hpBufferSize is a *host pointer.*
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
NPP_SUCCESS

NppStatus **nppsNormDiff_Inf_64fc64f_Ctx**(const *Npp64fc* *pSrc1, const *Npp64fc* *pSrc2, size_t nLength, *Npp64f* *pNorm, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

64-bit float complex C norm method on two vectors' difference, return value is 64-bit float.

Parameters

- **pSrc1** – *Source Signal Pointer*.
- **pSrc2** – *Source Signal Pointer*.
- **nLength** – *Signal Length*.
- **pNorm** – Device memory pointer to the norm result.
- **pDeviceBuffer** – Pointer to the required device memory allocation, *Scratch Buffer and Host Pointer*. Use *nppsNormDiffInfGetBufferSize_64fc64f_Ctx* to determine the minimum number of bytes required.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsNormDiffInfGetBufferSize_16s32s_Sfs_Ctx**(size_t nLength, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Device-buffer size (in bytes) for nppsNormDiff_Inf_16s32s_Sfs_Ctx.

Parameters

- **nLength** – *Signal Length*.
- **hpBufferSize** – Required buffer size. Important: hpBufferSize is a *host pointer.*
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
NPP_SUCCESS

NppStatus **nppsNormDiff_Inf_16s32s_Sfs_Ctx**(const *Npp16s* *pSrc1, const *Npp16s* *pSrc2, size_t nLength, *Npp32s* *pNorm, int nScaleFactor, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

16-bit signed short integer C norm method on two vectors' difference, return value is 32-bit signed integer.

Parameters

- **pSrc1** – *Source Signal Pointer*.
- **pSrc2** – *Source Signal Pointer*.
- **nLength** – *Signal Length*.
- **pNorm** – Device memory pointer to the norm result.
- **nScaleFactor** – *Integer Result Scaling*.
- **pDeviceBuffer** – Pointer to the required device memory allocation, *Scratch Buffer and Host Pointer*. Use *nppsNormDiffInfGetBufferSize_16s32s_Sfs_Ctx* to determine the minimum number of bytes required.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Signal Data Related Error Codes, *Length Related Error Codes*.

1.21.9.5 Signal Norm L1 NormDiff

1.21.9.5.1 L1 Norm Diff

Performs the L1 norm on the samples of two input signals' difference.

Functions

NppStatus **nppsNormDiffL1GetBufferSize_32f_Ctx**(size_t nLength, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Device-buffer size (in bytes) for nppsNormDiff_L1_32f.

Parameters

- **nLength** – *Signal Length*.
- **hpBufferSize** – Required buffer size. Important: hpBufferSize is a *host pointer.*
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

NPP_SUCCESS

NppStatus **nppsNormDiff_L1_32f_Ctx**(const *Npp32f* *pSrc1, const *Npp32f* *pSrc2, size_t nLength, *Npp32f* *pNorm, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

32-bit float L1 norm method on two vectors' difference

Parameters

- **pSrc1** – *Source Signal Pointer*.

- **pSrc2** – *Source Signal Pointer*.
- **nLength** – *Signal Length*.
- **pNorm** – Device memory pointer to the norm result.
- **pDeviceBuffer** – Pointer to the required device memory allocation, *Scratch Buffer and Host Pointer*. Use *nppsNormDiffL1GetBufferSize_32f_Ctx* to determine the minimum number of bytes required.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsNormDiffL1GetBufferSize_64f_Ctx**(size_t nLength, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Device-buffer size (in bytes) for nppsNormDiff_L1_64f_Ctx.

Parameters

- **nLength** – *Signal Length*.
- **hpBufferSize** – Required buffer size. Important: hpBufferSize is a *host pointer.*
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

NPP_SUCCESS

NppStatus **nppsNormDiff_L1_64f_Ctx**(const *Npp64f* *pSrc1, const *Npp64f* *pSrc2, size_t nLength, *Npp64f* *pNorm, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

64-bit float L1 norm method on two vectors' difference

Parameters

- **pSrc1** – *Source Signal Pointer*.
- **pSrc2** – *Source Signal Pointer*.
- **nLength** – *Signal Length*.
- **pNorm** – Device memory pointer to the norm result.
- **pDeviceBuffer** – Pointer to the required device memory allocation, *Scratch Buffer and Host Pointer*. Use *nppsNormDiffL1GetBufferSize_64f_Ctx* to determine the minimum number of bytes required.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsNormDiffL1GetBufferSize_16s32f_Ctx**(size_t nLength, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Device-buffer size (in bytes) for nppsNormDiff_L1_16s32f_Ctx.

Parameters

- **nLength** – *Signal Length*.

- **hpBufferSize** – Required buffer size. Important: hpBufferSize is a *host pointer.*
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
NPP_SUCCESS

NppStatus **nppsNormDiff_L1_16s32f_Ctx**(const *Npp16s* *pSrc1, const *Npp16s* *pSrc2, size_t nLength, *Npp32f* *pNorm, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

16-bit signed short integer L1 norm method on two vectors' difference, return value is 32-bit float.

Parameters

- **pSrc1** – *Source Signal Pointer*.
- **pSrc2** – *Source Signal Pointer*.
- **nLength** – *Signal Length*.
- **pNorm** – Device memory pointer to the L1 norm result.
- **pDeviceBuffer** – Pointer to the required device memory allocation, *Scratch Buffer and Host Pointer*. Use *nppsNormDiffL1GetBufferSize_16s32f_Ctx* to determine the minimum number of bytes required.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsNormDiffL1GetBufferSize_32fc64f_Ctx**(size_t nLength, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Device-buffer size (in bytes) for nppsNormDiff_L1_32fc64f_Ctx.

Parameters

- **nLength** – *Signal Length*.
- **hpBufferSize** – Required buffer size. Important: hpBufferSize is a *host pointer.*
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
NPP_SUCCESS

NppStatus **nppsNormDiff_L1_32fc64f_Ctx**(const *Npp32fc* *pSrc1, const *Npp32fc* *pSrc2, size_t nLength, *Npp64f* *pNorm, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

32-bit float complex L1 norm method on two vectors' difference, return value is 64-bit float.

Parameters

- **pSrc1** – *Source Signal Pointer*.
- **pSrc2** – *Source Signal Pointer*.
- **nLength** – *Signal Length*.
- **pNorm** – Device memory pointer to the norm result.

- **pDeviceBuffer** – Pointer to the required device memory allocation, *Scratch Buffer and Host Pointer*. Use *nppsNormDiffL1GetBufferSize_32fc64f_Ctx* to determine the minimum number of bytes required.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsNormDiffL1GetBufferSize_64fc64f_Ctx**(size_t nLength, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Device-buffer size (in bytes) for nppsNormDiff_L1_64fc64f_Ctx.

Parameters

- **nLength** – *Signal Length*.
- **hpBufferSize** – Required buffer size. Important: hpBufferSize is a *host pointer.*
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
NPP_SUCCESS

NppStatus **nppsNormDiff_L1_64fc64f_Ctx**(const *Npp64fc* *pSrc1, const *Npp64fc* *pSrc2, size_t nLength, *Npp64f* *pNorm, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

64-bit float complex L1 norm method on two vectors' difference, return value is 64-bit float.

Parameters

- **pSrc1** – *Source Signal Pointer*.
- **pSrc2** – *Source Signal Pointer*.
- **nLength** – *Signal Length*.
- **pNorm** – Device memory pointer to the norm result.
- **pDeviceBuffer** – Pointer to the required device memory allocation, *Scratch Buffer and Host Pointer*. Use *nppsNormDiffL1GetBufferSize_64fc64f_Ctx* to determine the minimum number of bytes required.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsNormDiffL1GetBufferSize_16s32s_Sfs_Ctx**(size_t nLength, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Device-buffer size (in bytes) for nppsNormDiff_L1_16s32s_Sfs_Ctx.

Parameters

- **nLength** – *Signal Length*.
- **hpBufferSize** – Required buffer size. Important: hpBufferSize is a *host pointer.*
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
NPP_SUCCESS

NppStatus **nppsNormDiff_L1_16s32s_Sfs_Ctx**(const *Npp16s* *pSrc1, const *Npp16s* *pSrc2, size_t nLength, *Npp32s* *pNorm, int nScaleFactor, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

16-bit signed short integer L1 norm method on two vectors' difference, return value is 32-bit signed integer.

Parameters

- **pSrc1** – *Source Signal Pointer*.
- **pSrc2** – *Source Signal Pointer*..
- **nLength** – *Signal Length*.
- **pNorm** – Device memory pointer to the norm result.
- **nScaleFactor** – *Integer Result Scaling*.
- **pDeviceBuffer** – Pointer to the required device memory allocation, *Scratch Buffer and Host Pointer*. Use *nppsNormDiffL1GetBufferSize_16s32s_Sfs_Ctx* to determine the minimum number of bytes required.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsNormDiffL1GetBufferSize_16s64s_Sfs_Ctx**(size_t nLength, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Device-buffer size (in bytes) for nppsNormDiff_L1_16s64s_Sfs_Ctx.

Parameters

- **nLength** – *Signal Length*.
- **hpBufferSize** – Required buffer size. Important: hpBufferSize is a *host pointer.*
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
NPP_SUCCESS

NppStatus **nppsNormDiff_L1_16s64s_Sfs_Ctx**(const *Npp16s* *pSrc1, const *Npp16s* *pSrc2, size_t nLength, *Npp64s* *pNorm, int nScaleFactor, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

16-bit signed short integer L1 norm method on two vectors' difference, return value is 64-bit signed integer.

Parameters

- **pSrc1** – *Source Signal Pointer*.
- **pSrc2** – *Source Signal Pointer*.

- **nLength** – *Signal Length*.
- **pNorm** – Device memory pointer to the norm result.
- **nScaleFactor** – *Integer Result Scaling*.
- **pDeviceBuffer** – Pointer to the required device memory allocation, *Scratch Buffer and Host Pointer*. Use *nppsNormDiffL1GetBufferSize_16s64s_Sfs_Ctx* to determine the minimum number of bytes required.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

1.21.9.6 Signal Norm L2 NormDiff

1.21.9.6.1 L2 Norm Diff

Performs the L2 norm on the samples of two input signals' difference.

Functions

NppStatus **nppsNormDiffL2GetBufferSize_32f_Ctx**(size_t nLength, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Device-buffer size (in bytes) for nppsNormDiff_L2_32f_Ctx.

Parameters

- **nLength** – *Signal Length*.
- **hpBufferSize** – Required buffer size. Important: hpBufferSize is a *host pointer.*
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
NPP_SUCCESS

NppStatus **nppsNormDiff_L2_32f_Ctx**(const *Npp32f* *pSrc1, const *Npp32f* *pSrc2, size_t nLength, *Npp32f* *pNorm, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

32-bit float L2 norm method on two vectors' difference

Parameters

- **pSrc1** – *Source Signal Pointer*.
- **pSrc2** – *Source Signal Pointer*.
- **nLength** – *Signal Length*.
- **pNorm** – Device memory pointer to the norm result.
- **pDeviceBuffer** – Pointer to the required device memory allocation, *Scratch Buffer and Host Pointer*. Use *nppsNormDiffL2GetBufferSize_32f_Ctx* to determine the minimum number of bytes required.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsNormDiffL2GetBufferSize_64f_Ctx**(size_t nLength, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Device-buffer size (in bytes) for nppsNormDiff_L2_64f_Ctx.

Parameters

- **nLength** – *Signal Length*.
- **hpBufferSize** – Required buffer size. Important: hpBufferSize is a *host pointer.*
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
NPP_SUCCESS

NppStatus **nppsNormDiff_L2_64f_Ctx**(const *Npp64f* *pSrc1, const *Npp64f* *pSrc2, size_t nLength, *Npp64f* *pNorm, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

64-bit float L2 norm method on two vectors' difference

Parameters

- **pSrc1** – *Source Signal Pointer*.
- **pSrc2** – *Source Signal Pointer*.
- **nLength** – *Signal Length*.
- **pNorm** – Device memory pointer to the norm result.
- **pDeviceBuffer** – Pointer to the required device memory allocation, *Scratch Buffer and Host Pointer*. Use *nppsNormDiffL2GetBufferSize_64f_Ctx* to determine the minimum number of bytes required.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsNormDiffL2GetBufferSize_16s32f_Ctx**(size_t nLength, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Device-buffer size (in bytes) for nppsNormDiff_L2_16s32f_Ctx.

Parameters

- **nLength** – *Signal Length*.
- **hpBufferSize** – Required buffer size. Important: hpBufferSize is a *host pointer.*
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
NPP_SUCCESS

NppStatus **nppsNormDiff_L2_16s32f_Ctx**(const *Npp16s* *pSrc1, const *Npp16s* *pSrc2, size_t nLength, *Npp32f* *pNorm, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

16-bit signed short integer L2 norm method on two vectors' difference, return value is 32-bit float.

Parameters

- **pSrc1** – *Source Signal Pointer*.
- **pSrc2** – *Source Signal Pointer*.
- **nLength** – *Signal Length*.
- **pNorm** – Device memory pointer to the norm result.
- **pDeviceBuffer** – Pointer to the required device memory allocation, *Scratch Buffer and Host Pointer*. Use *nppsNormDiffL2GetBufferSize_16s32f_Ctx* to determine the minimum number of bytes required.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsNormDiffL2GetBufferSize_32fc64f_Ctx**(size_t nLength, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Device-buffer size (in bytes) for nppsNormDiff_L2_32fc64f_Ctx.

Parameters

- **nLength** – *Signal Length*.
- **hpBufferSize** – Required buffer size. Important: hpBufferSize is a *host pointer.*
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

NPP_SUCCESS

NppStatus **nppsNormDiff_L2_32fc64f_Ctx**(const *Npp32fc* *pSrc1, const *Npp32fc* *pSrc2, size_t nLength, *Npp64f* *pNorm, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

32-bit float complex L2 norm method on two vectors' difference, return value is 64-bit float.

Parameters

- **pSrc1** – *Source Signal Pointer*.
- **pSrc2** – *Source Signal Pointer*.
- **nLength** – *Signal Length*.
- **pNorm** – Device memory pointer to the norm result.
- **pDeviceBuffer** – Pointer to the required device memory allocation, *Scratch Buffer and Host Pointer*. Use *nppsNormDiffL2GetBufferSize_32fc64f_Ctx* to determine the minimum number of bytes required.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsNormDiffL2GetBufferSize_64fc64f_Ctx**(size_t nLength, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Device-buffer size (in bytes) for nppsNormDiff_L2_64fc64f_Ctx.

Parameters

- **nLength** – *Signal Length*.
- **hpBufferSize** – Required buffer size. Important: hpBufferSize is a *host pointer.*
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
NPP_SUCCESS

NppStatus **nppsNormDiff_L2_64fc64f_Ctx**(const *Npp64fc* *pSrc1, const *Npp64fc* *pSrc2, size_t nLength, *Npp64f* *pNorm, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

64-bit float complex L2 norm method on two vectors' difference, return value is 64-bit float.

Parameters

- **pSrc1** – *Source Signal Pointer*.
- **pSrc2** – *Source Signal Pointer*.
- **nLength** – *Signal Length*.
- **pNorm** – Device memory pointer to the norm result.
- **pDeviceBuffer** – Pointer to the required device memory allocation, *Scratch Buffer and Host Pointer*. Use *nppsNormDiffL2GetBufferSize_64fc64f_Ctx* to determine the minimum number of bytes required.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsNormDiffL2GetBufferSize_16s32s_Sfs_Ctx**(size_t nLength, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Device-buffer size (in bytes) for nppsNormDiff_L2_16s32s_Sfs_Ctx.

Parameters

- **nLength** – *Signal Length*.
- **hpBufferSize** – Required buffer size. Important: hpBufferSize is a *host pointer.*
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
NPP_SUCCESS

NppStatus **nppsNormDiff_L2_16s32s_Sfs_Ctx**(const *Npp16s* *pSrc1, const *Npp16s* *pSrc2, size_t nLength, *Npp32s* *pNorm, int nScaleFactor, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

16-bit signed short integer L2 norm method on two vectors' difference, return value is 32-bit signed integer.

Parameters

- **pSrc1** – *Source Signal Pointer*.
- **pSrc2** – *Source Signal Pointer*.
- **nLength** – *Signal Length*.
- **pNorm** – Device memory pointer to the norm result.
- **nScaleFactor** – *Integer Result Scaling*.
- **pDeviceBuffer** – Pointer to the required device memory allocation, *Scratch Buffer and Host Pointer*. Use *nppsNormDiffL2GetBufferSize_16s32s_Sfs_Ctx* to determine the minimum number of bytes required.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsNormDiffL2SqrGetBufferSize_16s64s_Sfs_Ctx**(size_t nLength, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Device-buffer size (in bytes) for nppsNormDiff_L2Sqr_16s64s_Sfs_Ctx.

Parameters

- **nLength** – *Signal Length*.
- **hpBufferSize** – Required buffer size. Important: hpBufferSize is a *host pointer.*
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

NPP_SUCCESS

NppStatus **nppsNormDiff_L2Sqr_16s64s_Sfs_Ctx**(const *Npp16s* *pSrc1, const *Npp16s* *pSrc2, size_t nLength, *Npp64s* *pNorm, int nScaleFactor, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

16-bit signed short integer L2 Square norm method on two vectors' difference, return value is 64-bit signed integer.

Parameters

- **pSrc1** – *Source Signal Pointer*.
- **pSrc2** – *Source Signal Pointer*.
- **nLength** – *Signal Length*.
- **pNorm** – Device memory pointer to the norm result.
- **nScaleFactor** – *Integer Result Scaling*.

- **pDeviceBuffer** – Pointer to the required device memory allocation, *Scratch Buffer and Host Pointer*. Use *nppsNormDiffL2SqrGetBufferSize_16s64s_Sfs_Ctx* to determine the minimum number of bytes required.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Signal Data Related Error Codes, *Length Related Error Codes*.

1.21.10. Signal Dot Product

1.21.10.1 Dot Product

Performs the dot product operation on the samples of two input signals.

Functions

NppStatus **nppsDotProdGetBufferSize_32f_Ctx**(size_t nLength, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Device-buffer size (in bytes) for nppsDotProd_32f_Ctx.

Parameters

- **nLength** – *Signal Length*.
- **hpBufferSize** – Required buffer size. Important: hpBufferSize is a *host pointer.*
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

NPP_SUCCESS

NppStatus **nppsDotProd_32f_Ctx**(const *Npp32f* *pSrc1, const *Npp32f* *pSrc2, size_t nLength, *Npp32f* *pDp, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

32-bit float dot product method, return value is 32-bit float.

Parameters

- **pSrc1** – *Source Signal Pointer*.
- **pSrc2** – *Source Signal Pointer*.
- **nLength** – *Signal Length*.
- **pDp** – Device memory pointer to the dot product result.
- **pDeviceBuffer** – Pointer to the required device memory allocation, *Scratch Buffer and Host Pointer*. Use *nppsDotProdGetBufferSize_32f_Ctx* to determine the minimum number of bytes required.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsDotProdGetBufferSize_32fc_Ctx**(size_t nLength, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Device-buffer size (in bytes) for nppsDotProd_32fc_Ctx.

Parameters

- **nLength** – *Signal Length*.
- **hpBufferSize** – Required buffer size. Important: hpBufferSize is a *host pointer.*
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
NPP_SUCCESS

NppStatus **nppsDotProd_32fc_Ctx**(const *Npp32fc* *pSrc1, const *Npp32fc* *pSrc2, size_t nLength, *Npp32fc* *pDp, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

32-bit float complex dot product method, return value is 32-bit float complex.

Parameters

- **pSrc1** – *Source Signal Pointer*.
- **pSrc2** – *Source Signal Pointer*.
- **nLength** – *Signal Length*.
- **pDp** – Device memory pointer to the dot product result.
- **pDeviceBuffer** – Pointer to the required device memory allocation, *Scratch Buffer and Host Pointer*. Use *nppsDotProdGetBufferSize_32fc_Ctx* to determine the minimum number of bytes required.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsDotProdGetBufferSize_32f32fc_Ctx**(size_t nLength, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Device-buffer size (in bytes) for nppsDotProd_32f32fc_Ctx.

Parameters

- **nLength** – *Signal Length*.
- **hpBufferSize** – Required buffer size. Important: hpBufferSize is a *host pointer.*
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
NPP_SUCCESS

NppStatus **nppsDotProd_32f32fc_Ctx**(const *Npp32f* *pSrc1, const *Npp32fc* *pSrc2, size_t nLength, *Npp32fc* *pDp, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

32-bit float and 32-bit float complex dot product method, return value is 32-bit float complex.

Parameters

- **pSrc1** – *Source Signal Pointer*.
- **pSrc2** – *Source Signal Pointer*.
- **nLength** – *Signal Length*.
- **pDp** – Device memory pointer to the dot product result.
- **pDeviceBuffer** – Pointer to the required device memory allocation, *Scratch Buffer and Host Pointer*. Use *nppsDotProdGetBufferSize_32f32fc_Ctx* to determine the minimum number of bytes required.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsDotProdGetBufferSize_32f64f_Ctx**(size_t nLength, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Device-buffer size (in bytes) for nppsDotProd_32f64f_Ctx.

Parameters

- **nLength** – *Signal Length*.
- **hpBufferSize** – Required buffer size. Important: hpBufferSize is a *host pointer.*
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
NPP_SUCCESS

NppStatus **nppsDotProd_32f64f_Ctx**(const *Npp32f* *pSrc1, const *Npp32f* *pSrc2, size_t nLength, *Npp64f* *pDp, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

32-bit float dot product method, return value is 64-bit float.

Parameters

- **pSrc1** – *Source Signal Pointer*.
- **pSrc2** – *Source Signal Pointer*.
- **nLength** – *Signal Length*.
- **pDp** – Device memory pointer to the dot product result.
- **pDeviceBuffer** – Pointer to the required device memory allocation, *Scratch Buffer and Host Pointer*. Use *nppsDotProdGetBufferSize_32f64f_Ctx* to determine the minimum number of bytes required.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsDotProdGetBufferSize_32fc64fc_Ctx**(size_t nLength, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Device-buffer size (in bytes) for nppsDotProd_32fc64fc_Ctx.

Parameters

- **nLength** – *Signal Length*.
- **hpBufferSize** – Required buffer size. Important: hpBufferSize is a *host pointer.*
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
NPP_SUCCESS

NppStatus **nppsDotProd_32fc64fc_Ctx**(const *Npp32fc* *pSrc1, const *Npp32fc* *pSrc2, size_t nLength, *Npp64fc* *pDp, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

32-bit float complex dot product method, return value is 64-bit float complex.

Parameters

- **pSrc1** – *Source Signal Pointer*.
- **pSrc2** – *Source Signal Pointer*.
- **nLength** – *Signal Length*.
- **pDp** – Device memory pointer to the dot product result.
- **pDeviceBuffer** – Pointer to the required device memory allocation, *Scratch Buffer and Host Pointer*. Use *nppsDotProdGetBufferSize_32fc64fc_Ctx* to determine the minimum number of bytes required.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsDotProdGetBufferSize_32f32fc64fc_Ctx**(size_t nLength, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Device-buffer size (in bytes) for nppsDotProd_32f32fc64fc_Ctx.

Parameters

- **nLength** – *Signal Length*.
- **hpBufferSize** – Required buffer size. Important: hpBufferSize is a *host pointer.*
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
NPP_SUCCESS

NppStatus **nppsDotProd_32f32fc64fc_Ctx**(const *Npp32f* *pSrc1, const *Npp32fc* *pSrc2, size_t nLength, *Npp64fc* *pDp, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

32-bit float and 32-bit float complex dot product method, return value is 64-bit float complex.

Parameters

- **pSrc1** – *Source Signal Pointer*.
- **pSrc2** – *Source Signal Pointer*.
- **nLength** – *Signal Length*.
- **pDp** – Device memory pointer to the dot product result.

- **pDeviceBuffer** – Pointer to the required device memory allocation, *Scratch Buffer and Host Pointer*. Use *nppsDotProdGetBufferSize_32f32fc64fc_Ctx* to determine the minimum number of bytes required.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsDotProdGetBufferSize_64f_Ctx**(size_t nLength, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Device-buffer size (in bytes) for nppsDotProd_64f_Ctx.

Parameters

- **nLength** – *Signal Length*.
- **hpBufferSize** – Required buffer size. Important: hpBufferSize is a *host pointer.*
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
NPP_SUCCESS

NppStatus **nppsDotProd_64f_Ctx**(const *Npp64f* *pSrc1, const *Npp64f* *pSrc2, size_t nLength, *Npp64f* *pDp, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

64-bit float dot product method, return value is 64-bit float.

Parameters

- **pSrc1** – *Source Signal Pointer*.
- **pSrc2** – *Source Signal Pointer*.
- **nLength** – *Signal Length*.
- **pDp** – Device memory pointer to the dot product result.
- **pDeviceBuffer** – Pointer to the required device memory allocation, *Scratch Buffer and Host Pointer*. Use *nppsDotProdGetBufferSize_64f_Ctx* to determine the minimum number of bytes required.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsDotProdGetBufferSize_64fc_Ctx**(size_t nLength, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Device-buffer size (in bytes) for nppsDotProd_64fc_Ctx.

Parameters

- **nLength** – *Signal Length*.
- **hpBufferSize** – Required buffer size. Important: hpBufferSize is a *host pointer.*
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
NPP_SUCCESS

NppStatus **nppsDotProd_64fc_Ctx**(const *Npp64fc* *pSrc1, const *Npp64fc* *pSrc2, size_t nLength, *Npp64fc* *pDp, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

64-bit float complex dot product method, return value is 64-bit float complex.

Parameters

- **pSrc1** – *Source Signal Pointer*.
- **pSrc2** – *Source Signal Pointer*.
- **nLength** – *Signal Length*.
- **pDp** – Device memory pointer to the dot product result.
- **pDeviceBuffer** – Pointer to the required device memory allocation, *Scratch Buffer and Host Pointer*. Use *nppsDotProdGetBufferSize_64fc_Ctx* to determine the minimum number of bytes required.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsDotProdGetBufferSize_64f64fc_Ctx**(size_t nLength, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Device-buffer size (in bytes) for nppsDotProd_64f64fc_Ctx.

Parameters

- **nLength** – *Signal Length*.
- **hpBufferSize** – Required buffer size. Important: hpBufferSize is a *host pointer.*
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

NPP_SUCCESS

NppStatus **nppsDotProd_64f64fc_Ctx**(const *Npp64f* *pSrc1, const *Npp64fc* *pSrc2, size_t nLength, *Npp64fc* *pDp, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

64-bit float and 64-bit float complex dot product method, return value is 64-bit float complex.

Parameters

- **pSrc1** – *Source Signal Pointer*.
- **pSrc2** – *Source Signal Pointer*.
- **nLength** – *Signal Length*.
- **pDp** – Device memory pointer to the dot product result.
- **pDeviceBuffer** – Pointer to the required device memory allocation, *Scratch Buffer and Host Pointer*. Use *nppsDotProdGetBufferSize_64f64fc_Ctx* to determine the minimum number of bytes required.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsDotProdGetBufferSize_16s64s_Ctx**(size_t nLength, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Device-buffer size (in bytes) for nppsDotProd_16s64s_Ctx.

Parameters

- **nLength** – *Signal Length*.
- **hpBufferSize** – Required buffer size. Important: hpBufferSize is a *host pointer.*
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
NPP_SUCCESS

NppStatus **nppsDotProd_16s64s_Ctx**(const *Npp16s* *pSrc1, const *Npp16s* *pSrc2, size_t nLength, *Npp64s* *pDp, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

16-bit signed short integer dot product method, return value is 64-bit signed integer.

Parameters

- **pSrc1** – *Source Signal Pointer*.
- **pSrc2** – *Source Signal Pointer*.
- **nLength** – *Signal Length*.
- **pDp** – Device memory pointer to the dot product result.
- **pDeviceBuffer** – Pointer to the required device memory allocation, *Scratch Buffer and Host Pointer*. Use *nppsDotProdGetBufferSize_16s64s_Ctx* to determine the minimum number of bytes required.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsDotProdGetBufferSize_16sc64sc_Ctx**(size_t nLength, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Device-buffer size (in bytes) for nppsDotProd_16sc64sc_Ctx.

Parameters

- **nLength** – *Signal Length*.
- **hpBufferSize** – Required buffer size. Important: hpBufferSize is a *host pointer.*
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
NPP_SUCCESS

NppStatus **nppsDotProd_16sc64sc_Ctx**(const *Npp16sc* *pSrc1, const *Npp16sc* *pSrc2, size_t nLength, *Npp64sc* *pDp, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

16-bit signed short integer complex dot product method, return value is 64-bit signed integer complex.

Parameters

- **pSrc1** – *Source Signal Pointer*.
- **pSrc2** – *Source Signal Pointer*.
- **nLength** – *Signal Length*.
- **pDp** – Device memory pointer to the dot product result.
- **pDeviceBuffer** – Pointer to the required device memory allocation, *Scratch Buffer and Host Pointer*. Use *nppsDotProdGetBufferSize_16sc64sc_Ctx* to determine the minimum number of bytes required.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsDotProdGetBufferSize_16s16sc64sc_Ctx**(size_t nLength, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Device-buffer size (in bytes) for nppsDotProd_16s16sc64sc_Ctx.

Parameters

- **nLength** – *Signal Length*.
- **hpBufferSize** – Required buffer size. Important: hpBufferSize is a *host pointer.*
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

NPP_SUCCESS

NppStatus **nppsDotProd_16s16sc64sc_Ctx**(const *Npp16s* *pSrc1, const *Npp16sc* *pSrc2, size_t nLength, *Npp64sc* *pDp, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

16-bit signed short integer and 16-bit signed short integer short dot product method, return value is 64-bit signed integer complex.

Parameters

- **pSrc1** – *Source Signal Pointer*.
- **pSrc2** – *Source Signal Pointer*.
- **nLength** – *Signal Length*.
- **pDp** – Device memory pointer to the dot product result.
- **pDeviceBuffer** – Pointer to the required device memory allocation, *Scratch Buffer and Host Pointer*. Use *nppsDotProdGetBufferSize_16s16sc64sc_Ctx* to determine the minimum number of bytes required.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsDotProdGetBufferSize_16s32f_Ctx**(size_t nLength, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Device-buffer size (in bytes) for nppsDotProd_16s32f_Ctx.

Parameters

- **nLength** – *Signal Length*.
- **hpBufferSize** – Required buffer size. Important: hpBufferSize is a *host pointer.*
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
NPP_SUCCESS

NppStatus **nppsDotProd_16s32f_Ctx**(const *Npp16s* *pSrc1, const *Npp16s* *pSrc2, size_t nLength, *Npp32f* *pDp, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

16-bit signed short integer dot product method, return value is 32-bit float.

Parameters

- **pSrc1** – *Source Signal Pointer*.
- **pSrc2** – *Source Signal Pointer*.
- **nLength** – *Signal Length*.
- **pDp** – Device memory pointer to the dot product result.
- **pDeviceBuffer** – Pointer to the required device memory allocation, *Scratch Buffer and Host Pointer*. Use *nppsDotProdGetBufferSize_16s32f_Ctx* to determine the minimum number of bytes required.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsDotProdGetBufferSize_16sc32fc_Ctx**(size_t nLength, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Device-buffer size (in bytes) for nppsDotProd_16sc32fc_Ctx.

Parameters

- **nLength** – *Signal Length*.
- **hpBufferSize** – Required buffer size. Important: hpBufferSize is a *host pointer.*
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
NPP_SUCCESS

NppStatus **nppsDotProd_16sc32fc_Ctx**(const *Npp16sc* *pSrc1, const *Npp16sc* *pSrc2, size_t nLength, *Npp32fc* *pDp, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

16-bit signed short integer complex dot product method, return value is 32-bit float complex.

Parameters

- **pSrc1** – *Source Signal Pointer*.
- **pSrc2** – *Source Signal Pointer*.
- **nLength** – *Signal Length*.
- **pDp** – Device memory pointer to the dot product result.
- **pDeviceBuffer** – Pointer to the required device memory allocation, *Scratch Buffer and Host Pointer*. Use *nppsDotProdGetBufferSize_16sc32fc_Ctx* to determine the minimum number of bytes required.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsDotProdGetBufferSize_16s16sc32fc_Ctx**(size_t nLength, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Device-buffer size (in bytes) for nppsDotProd_16s16sc32fc_Ctx.

Parameters

- **nLength** – *Signal Length*.
- **hpBufferSize** – Required buffer size. Important: hpBufferSize is a *host pointer.*
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
NPP_SUCCESS

NppStatus **nppsDotProd_16s16sc32fc_Ctx**(const *Npp16s* *pSrc1, const *Npp16sc* *pSrc2, size_t nLength, *Npp32fc* *pDp, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

16-bit signed short integer and 16-bit signed short integer complex dot product method, return value is 32-bit float complex.

Parameters

- **pSrc1** – *Source Signal Pointer*.
- **pSrc2** – *Source Signal Pointer*.
- **nLength** – *Signal Length*.
- **pDp** – Device memory pointer to the dot product result.
- **pDeviceBuffer** – Pointer to the required device memory allocation, *Scratch Buffer and Host Pointer*. Use *nppsDotProdGetBufferSize_16s16sc32fc_Ctx* to determine the minimum number of bytes required.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsDotProdGetBufferSize_16s_Sfs_Ctx**(size_t nLength, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Device-buffer size (in bytes) for nppsDotProd_16s_Sfs_Ctx.

Parameters

- **nLength** – *Signal Length*.
- **hpBufferSize** – Required buffer size. Important: hpBufferSize is a *host pointer.*
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
NPP_SUCCESS

NppStatus **nppsDotProd_16s_Sfs_Ctx**(const *Npp16s* *pSrc1, const *Npp16s* *pSrc2, size_t nLength, *Npp16s* *pDp, int nScaleFactor, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

16-bit signed short integer dot product method, return value is 16-bit signed short integer.

Parameters

- **pSrc1** – *Source Signal Pointer*.
- **pSrc2** – *Source Signal Pointer*.
- **nLength** – *Signal Length*.
- **pDp** – Device memory pointer to the dot product result.
- **nScaleFactor** – *Integer Result Scaling*.
- **pDeviceBuffer** – Pointer to the required device memory allocation, *Scratch Buffer and Host Pointer*. Use *nppsDotProdGetBufferSize_16s_Sfs_Ctx* to determine the minimum number of bytes required.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsDotProdGetBufferSize_16sc_Sfs_Ctx**(size_t nLength, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Device-buffer size (in bytes) for nppsDotProd_16sc_Sfs_Ctx.

Parameters

- **nLength** – *Signal Length*.
- **hpBufferSize** – Required buffer size. Important: hpBufferSize is a *host pointer.*
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
NPP_SUCCESS

NppStatus **nppsDotProd_16sc_Sfs_Ctx**(const *Npp16sc* *pSrc1, const *Npp16sc* *pSrc2, size_t nLength, *Npp16sc* *pDp, int nScaleFactor, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

16-bit signed short integer complex dot product method, return value is 16-bit signed short integer complex.

Parameters

- **pSrc1** – *Source Signal Pointer*.
- **pSrc2** – *Source Signal Pointer*.

- **nLength** – *Signal Length*.
- **pDp** – Device memory pointer to the dot product result.
- **nScaleFactor** – *Integer Result Scaling*.
- **pDeviceBuffer** – Pointer to the required device memory allocation, *Scratch Buffer and Host Pointer*. Use *nppsDotProdGetBufferSize_16sc_Sfs_Ctx* to determine the minimum number of bytes required.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsDotProdGetBufferSize_32s_Sfs_Ctx**(size_t nLength, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Device-buffer size (in bytes) for nppsDotProd_32s_Sfs_Ctx.

Parameters

- **nLength** – *Signal Length*.
- **hpBufferSize** – Required buffer size. Important: hpBufferSize is a *host pointer.*
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
NPP_SUCCESS

NppStatus **nppsDotProd_32s_Sfs_Ctx**(const *Npp32s* *pSrc1, const *Npp32s* *pSrc2, size_t nLength, *Npp32s* *pDp, int nScaleFactor, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

32-bit signed integer dot product method, return value is 32-bit signed integer.

Parameters

- **pSrc1** – *Source Signal Pointer*.
- **pSrc2** – *Source Signal Pointer*.
- **nLength** – *Signal Length*.
- **pDp** – Device memory pointer to the dot product result.
- **nScaleFactor** – *Integer Result Scaling*.
- **pDeviceBuffer** – Pointer to the required device memory allocation, *Scratch Buffer and Host Pointer*. Use *nppsDotProdGetBufferSize_32s_Sfs_Ctx* to determine the minimum number of bytes required.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsDotProdGetBufferSize_32sc_Sfs_Ctx**(size_t nLength, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Device-buffer size (in bytes) for nppsDotProd_32sc_Sfs_Ctx.

Parameters

- **nLength** – *Signal Length*.
- **hpBufferSize** – Required buffer size. Important: hpBufferSize is a *host pointer.*
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
NPP_SUCCESS

NppStatus **nppsDotProd_32sc_Sfs_Ctx**(const *Npp32sc* *pSrc1, const *Npp32sc* *pSrc2, size_t nLength, *Npp32sc* *pDp, int nScaleFactor, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

32-bit signed integer complex dot product method, return value is 32-bit signed integer complex.

Parameters

- **pSrc1** – *Source Signal Pointer*.
- **pSrc2** – *Source Signal Pointer*.
- **nLength** – *Signal Length*.
- **pDp** – Device memory pointer to the dot product result.
- **nScaleFactor** – *Integer Result Scaling*.
- **pDeviceBuffer** – Pointer to the required device memory allocation, *Scratch Buffer and Host Pointer*. Use *nppsDotProdGetBufferSize_32sc_Sfs_Ctx* to determine the minimum number of bytes required.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsDotProdGetBufferSize_16s32s_Sfs_Ctx**(size_t nLength, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Device-buffer size (in bytes) for nppsDotProd_16s32s_Sfs_Ctx.

Parameters

- **nLength** – *Signal Length*.
- **hpBufferSize** – Required buffer size. Important: hpBufferSize is a *host pointer.*
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
NPP_SUCCESS

NppStatus **nppsDotProd_16s32s_Sfs_Ctx**(const *Npp16s* *pSrc1, const *Npp16s* *pSrc2, size_t nLength, *Npp32s* *pDp, int nScaleFactor, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

16-bit signed short integer dot product method, return value is 32-bit signed integer.

Parameters

- **pSrc1** – *Source Signal Pointer*.
- **pSrc2** – *Source Signal Pointer*.
- **nLength** – *Signal Length*.

- **pDp** – Device memory pointer to the dot product result.
- **nScaleFactor** – *Integer Result Scaling*.
- **pDeviceBuffer** – Pointer to the required device memory allocation, *Scratch Buffer and Host Pointer*. Use *nppsDotProdGetBufferSize_16s32s_Sfs_Ctx* to determine the minimum number of bytes required.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsDotProdGetBufferSize_16s16sc32sc_Sfs_Ctx**(size_t nLength, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Device-buffer size (in bytes) for nppsDotProd_16s16sc32sc_Sfs_Ctx.

Parameters

- **nLength** – *Signal Length*.
- **hpBufferSize** – Required buffer size. Important: hpBufferSize is a *host pointer.*
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
NPP_SUCCESS

NppStatus **nppsDotProd_16s16sc32sc_Sfs_Ctx**(const *Npp16s* *pSrc1, const *Npp16sc* *pSrc2, size_t nLength, *Npp32sc* *pDp, int nScaleFactor, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

16-bit signed short integer and 16-bit signed short integer complex dot product method, return value is 32-bit signed integer complex.

Parameters

- **pSrc1** – *Source Signal Pointer*.
- **pSrc2** – *Source Signal Pointer*.
- **nLength** – *Signal Length*.
- **pDp** – Device memory pointer to the dot product result.
- **nScaleFactor** – *Integer Result Scaling*.
- **pDeviceBuffer** – Pointer to the required device memory allocation, *Scratch Buffer and Host Pointer*. Use *nppsDotProdGetBufferSize_16s16sc32sc_Sfs_Ctx* to determine the minimum number of bytes required.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsDotProdGetBufferSize_16s32s32s_Sfs_Ctx**(size_t nLength, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Device-buffer size (in bytes) for nppsDotProd_16s32s32s_Sfs_Ctx.

Parameters

- **nLength** – *Signal Length*.
- **hpBufferSize** – Required buffer size. Important: hpBufferSize is a *host pointer.*
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
NPP_SUCCESS

NppStatus **nppsDotProd_16s32s32s_Sfs_Ctx**(const *Npp16s* *pSrc1, const *Npp32s* *pSrc2, size_t nLength, *Npp32s* *pDp, int nScaleFactor, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

16-bit signed short integer and 32-bit signed integer dot product method, return value is 32-bit signed integer.

Parameters

- **pSrc1** – *Source Signal Pointer*.
- **pSrc2** – *Source Signal Pointer*.
- **nLength** – *Signal Length*.
- **pDp** – Device memory pointer to the dot product result.
- **nScaleFactor** – *Integer Result Scaling*.
- **pDeviceBuffer** – Pointer to the required device memory allocation, *Scratch Buffer and Host Pointer*. Use *nppsDotProdGetBufferSize_16s32s32s_Sfs_Ctx* to determine the minimum number of bytes required.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsDotProdGetBufferSize_16s16sc_Sfs_Ctx**(size_t nLength, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Device-buffer size (in bytes) for nppsDotProd_16s16sc_Sfs_Ctx.

Parameters

- **nLength** – *Signal Length*.
- **hpBufferSize** – Required buffer size. Important: hpBufferSize is a *host pointer.*
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
NPP_SUCCESS

NppStatus **nppsDotProd_16s16sc_Sfs_Ctx**(const *Npp16s* *pSrc1, const *Npp16sc* *pSrc2, size_t nLength, *Npp16sc* *pDp, int nScaleFactor, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

16-bit signed short integer and 16-bit signed short integer complex dot product method, return value is 16-bit signed short integer complex.

Parameters

- **pSrc1** – *Source Signal Pointer*.
- **pSrc2** – *Source Signal Pointer*.
- **nLength** – *Signal Length*.
- **pDp** – Device memory pointer to the dot product result.
- **nScaleFactor** – *Integer Result Scaling*.
- **pDeviceBuffer** – Pointer to the required device memory allocation, *Scratch Buffer and Host Pointer*. Use *nppsDotProdGetBufferSize_16s16sc_Sfs_Ctx* to determine the minimum number of bytes required.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsDotProdGetBufferSize_16sc32sc_Sfs_Ctx**(size_t nLength, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Device-buffer size (in bytes) for nppsDotProd_16sc32sc_Sfs_Ctx.

Parameters

- **nLength** – *Signal Length*.
- **hpBufferSize** – Required buffer size. Important: hpBufferSize is a *host pointer.*
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

NPP_SUCCESS

NppStatus **nppsDotProd_16sc32sc_Sfs_Ctx**(const *Npp16sc* *pSrc1, const *Npp16sc* *pSrc2, size_t nLength, *Npp32sc* *pDp, int nScaleFactor, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

16-bit signed short integer complex dot product method, return value is 32-bit signed integer complex.

Parameters

- **pSrc1** – *Source Signal Pointer*.
- **pSrc2** – *Source Signal Pointer*.
- **nLength** – *Signal Length*.
- **pDp** – Device memory pointer to the dot product result.
- **nScaleFactor** – *Integer Result Scaling*.
- **pDeviceBuffer** – Pointer to the required device memory allocation, *Scratch Buffer and Host Pointer*. Use *nppsDotProdGetBufferSize_16sc32sc_Sfs_Ctx* to determine the minimum number of bytes required.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsDotProdGetBufferSize_32s32sc_Sfs_Ctx**(size_t nLength, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Device-buffer size (in bytes) for nppsDotProd_32s32sc_Sfs_Ctx.

Parameters

- **nLength** – *Signal Length*.
- **hpBufferSize** – Required buffer size. Important: hpBufferSize is a *host pointer.*
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
NPP_SUCCESS

NppStatus **nppsDotProd_32s32sc_Sfs_Ctx**(const *Npp32s* *pSrc1, const *Npp32sc* *pSrc2, size_t nLength, *Npp32sc* *pDp, int nScaleFactor, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

32-bit signed short integer and 32-bit signed short integer complex dot product method, return value is 32-bit signed integer complex.

Parameters

- **pSrc1** – *Source Signal Pointer*.
- **pSrc2** – *Source Signal Pointer*.
- **nLength** – *Signal Length*.
- **pDp** – Device memory pointer to the dot product result.
- **nScaleFactor** – *Integer Result Scaling*.
- **pDeviceBuffer** – Pointer to the required device memory allocation, *Scratch Buffer and Host Pointer*. Use *nppsDotProdGetBufferSize_32s32sc_Sfs_Ctx* to determine the minimum number of bytes required.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

1.21.11. Signal Count In Range

1.21.11.1 Count In Range

Calculates the number of elements from specified range in the samples of a signal.

Functions

NppStatus **nppsCountInRangeGetBufferSize_32s_Ctx**(size_t nLength, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Device-buffer size (in bytes) for nppsCountInRange_32s.

Parameters

- **nLength** – *Signal Length*.
- **hpBufferSize** – Required buffer size. Important: hpBufferSize is a *host pointer.*
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
NPP_SUCCESS

NppStatus **nppsCountInRange_32s_Ctx**(const *Npp32s* *pSrc, size_t nLength, int *pCounts, *Npp32s* nLowerBound, *Npp32s* nUpperBound, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

Computes the number of elements whose values fall into the specified range on a 32-bit signed integer array.

Parameters

- **pSrc** – *Source Signal Pointer*.
- **nLength** – *Signal Length*.
- **pCounts** – Device memory pointer to the number of elements.
- **nLowerBound** – Lower bound of the specified range.
- **nUpperBound** – Upper bound of the specified range.
- **pDeviceBuffer** – Pointer to the required device memory allocation, *Scratch Buffer and Host Pointer*. Use *nppsCountInRangeGetBufferSize_32s_Ctx* to determine the minimum number of bytes required.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

1.21.12. Signal Count Zero Crossings

1.21.12.1 Count Zero Crossings

Calculates the number of zero crossings in a signal.

Functions

NppStatus **nppsZeroCrossingGetBufferSize_16s32f_Ctx**(size_t nLength, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Device-buffer size (in bytes) for nppsZeroCrossing_16s32f_Ctx.

Parameters

- **nLength** – *Signal Length*.
- **hpBufferSize** – Required buffer size. Important: hpBufferSize is a *host pointer.*
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
NPP_SUCCESS

NppStatus **nppsZeroCrossing_16s32f_Ctx**(const *Npp16s* *pSrc, size_t nLength, *Npp32f* *pValZC, *NppsZCType* tZCType, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

16-bit signed short integer zero crossing method, return value is 32-bit floating point.

Parameters

- **pSrc** – *Source Signal Pointer*.
- **nLength** – *Signal Length*.
- **pValZC** – Device memory pointer to the output result.
- **tZCType** – Type of the zero crossing measure: nppZCR, nppZCXor or nppZCC.
- **pDeviceBuffer** – Pointer to the required device memory allocation, *Scratch Buffer and Host Pointer*. Use *nppsZeroCrossingGetBufferSize_16s32f_Ctx* to determine the minimum number of bytes required.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsZeroCrossingGetBufferSize_32f_Ctx**(size_t nLength, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Device-buffer size (in bytes) for nppsZeroCrossing_32f_Ctx.

Parameters

- **nLength** – *Signal Length*.
- **hpBufferSize** – Required buffer size. Important: hpBufferSize is a *host pointer.*
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
NPP_SUCCESS

NppStatus **nppsZeroCrossing_32f_Ctx**(const *Npp32f* *pSrc, size_t nLength, *Npp32f* *pValZC, *NppsZCType* tZCType, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

32-bit floating-point zero crossing method, return value is 32-bit floating point.

Parameters

- **pSrc** – *Source Signal Pointer*.
- **nLength** – *Signal Length*.
- **pValZC** – Device memory pointer to the output result.
- **tZCType** – Type of the zero crossing measure: nppZCR, nppZCXor or nppZCC.
- **pDeviceBuffer** – Pointer to the required device memory allocation, *Scratch Buffer and Host Pointer*. Use *nppsZeroCrossingGetBufferSize_32f_Ctx* to determine the minimum number of bytes required.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Signal Data Related Error Codes, *Length Related Error Codes*.

1.21.13. Signal Maximum Error

1.21.13.1 MaximumError

Primitives for computing the maximum error between two signals. Given two signals $pSrc1$ and $pSrc2$ both with length N, the maximum error is defined as the largest absolute difference between the corresponding elements of two signals.

If the signal is in complex format, the absolute value of the complex number is used.

Functions

NppStatus **nppsMaximumError_8u_Ctx**(const *Npp8u* *pSrc1, const *Npp8u* *pSrc2, size_t nLength, *Npp64f* *pDst, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

8-bit unsigned char maximum method.

Parameters

- **pSrc1** – *Source Signal Pointer*.
- **pSrc2** – *Source Signal Pointer*.
- **nLength** – *Signal Length*.
- **pDst** – Device memory pointer to the error result.
- **pDeviceBuffer** – Pointer to the required device memory allocation, *Scratch Buffer and Host Pointer*. Use *nppsMaximumErrorGetBufferSize_8u_Ctx* to determine the minimum number of bytes required.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsMaximumError_8s_Ctx**(const *Npp8s* *pSrc1, const *Npp8s* *pSrc2, size_t nLength, *Npp64f* *pDst, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

8-bit signed char maximum method.

Parameters

- **pSrc1** – *Source Signal Pointer*.
- **pSrc2** – *Source Signal Pointer*.
- **nLength** – *Signal Length*.
- **pDst** – Device memory pointer to the error result.
- **pDeviceBuffer** – Pointer to the required device memory allocation, *Scratch Buffer and Host Pointer*. Use *nppsMaximumErrorGetBufferSize_8s_Ctx* to determine the minimum number of bytes required.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsMaximumError_16u_Ctx**(const *Npp16u* *pSrc1, const *Npp16u* *pSrc2, size_t nLength, *Npp64f* *pDst, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

16-bit unsigned short integer maximum method.

Parameters

- **pSrc1** – *Source Signal Pointer*.
- **pSrc2** – *Source Signal Pointer*.
- **nLength** – *Signal Length*.
- **pDst** – Device memory pointer to the error result.
- **pDeviceBuffer** – Pointer to the required device memory allocation, *Scratch Buffer and Host Pointer*. Use *nppsMaximumErrorGetBufferSize_16u_Ctx* to determine the minimum number of bytes required.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsMaximumError_16s_Ctx**(const *Npp16s* *pSrc1, const *Npp16s* *pSrc2, size_t nLength, *Npp64f* *pDst, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

16-bit signed short integer maximum method.

Parameters

- **pSrc1** – *Source Signal Pointer*.
- **pSrc2** – *Source Signal Pointer*.
- **nLength** – *Signal Length*.

- **pDst** – Device memory pointer to the error result.
- **pDeviceBuffer** – Pointer to the required device memory allocation, *Scratch Buffer and Host Pointer*. Use *nppsMaximumErrorGetBufferSize_16s_Ctx* to determine the minimum number of bytes required.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsMaximumError_16sc_Ctx**(const *Npp16sc* *pSrc1, const *Npp16sc* *pSrc2, size_t nLength, *Npp64f* *pDst, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

16-bit unsigned short complex integer maximum method.

Parameters

- **pSrc1** – *Source Signal Pointer*.
- **pSrc2** – *Source Signal Pointer*.
- **nLength** – *Signal Length*.
- **pDst** – Device memory pointer to the error result.
- **pDeviceBuffer** – Pointer to the required device memory allocation, *Scratch Buffer and Host Pointer*. Use *nppsMaximumErrorGetBufferSize_16sc_Ctx* to determine the minimum number of bytes required.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsMaximumError_32u_Ctx**(const *Npp32u* *pSrc1, const *Npp32u* *pSrc2, size_t nLength, *Npp64f* *pDst, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

32-bit unsigned short integer maximum method.

Parameters

- **pSrc1** – *Source Signal Pointer*.
- **pSrc2** – *Source Signal Pointer*.
- **nLength** – *Signal Length*.
- **pDst** – Device memory pointer to the error result.
- **pDeviceBuffer** – Pointer to the required device memory allocation, *Scratch Buffer and Host Pointer*. Use *nppsMaximumErrorGetBufferSize_32u_Ctx* to determine the minimum number of bytes required.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsMaximumError_32s_Ctx**(const *Npp32s* *pSrc1, const *Npp32s* *pSrc2, size_t nLength, *Npp64f* *pDst, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

32-bit signed short integer maximum method.

Parameters

- **pSrc1** – *Source Signal Pointer*.
- **pSrc2** – *Source Signal Pointer*.
- **nLength** – *Signal Length*.
- **pDst** – Device memory pointer to the error result.
- **pDeviceBuffer** – Pointer to the required device memory allocation, *Scratch Buffer and Host Pointer*. Use *nppsMaximumErrorGetBufferSize_32s_Ctx* to determine the minimum number of bytes required.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsMaximumError_32sc_Ctx**(const *Npp32sc* *pSrc1, const *Npp32sc* *pSrc2, size_t nLength, *Npp64f* *pDst, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

32-bit unsigned short complex integer maximum method.

Parameters

- **pSrc1** – *Source Signal Pointer*.
- **pSrc2** – *Source Signal Pointer*.
- **nLength** – *Signal Length*.
- **pDst** – Device memory pointer to the error result.
- **pDeviceBuffer** – Pointer to the required device memory allocation, *Scratch Buffer and Host Pointer*. Use *nppsMaximumErrorGetBufferSize_32sc_Ctx* to determine the minimum number of bytes required.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsMaximumError_64s_Ctx**(const *Npp64s* *pSrc1, const *Npp64s* *pSrc2, size_t nLength, *Npp64f* *pDst, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

64-bit signed short integer maximum method.

Parameters

- **pSrc1** – *Source Signal Pointer*.
- **pSrc2** – *Source Signal Pointer*.
- **nLength** – *Signal Length*.
- **pDst** – Device memory pointer to the error result.

- **pDeviceBuffer** – Pointer to the required device memory allocation, *Scratch Buffer and Host Pointer*. Use *nppsMaximumErrorGetBufferSize_64s_Ctx* to determine the minimum number of bytes required.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsMaximumError_64sc_Ctx**(const *Npp64sc* *pSrc1, const *Npp64sc* *pSrc2, size_t nLength, *Npp64f* *pDst, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

64-bit unsigned short complex integer maximum method.

Parameters

- **pSrc1** – *Source Signal Pointer*.
- **pSrc2** – *Source Signal Pointer*.
- **nLength** – *Signal Length*.
- **pDst** – Device memory pointer to the error result.
- **pDeviceBuffer** – Pointer to the required device memory allocation, *Scratch Buffer and Host Pointer*. Use *nppsMaximumErrorGetBufferSize_64sc_Ctx* to determine the minimum number of bytes required.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsMaximumError_32f_Ctx**(const *Npp32f* *pSrc1, const *Npp32f* *pSrc2, size_t nLength, *Npp64f* *pDst, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

32-bit floating point maximum method.

Parameters

- **pSrc1** – *Source Signal Pointer*.
- **pSrc2** – *Source Signal Pointer*.
- **nLength** – *Signal Length*.
- **pDst** – Device memory pointer to the error result.
- **pDeviceBuffer** – Pointer to the required device memory allocation, *Scratch Buffer and Host Pointer*. Use *nppsMaximumErrorGetBufferSize_32f_Ctx* to determine the minimum number of bytes required.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsMaximumError_32fc_Ctx**(const *Npp32fc* *pSrc1, const *Npp32fc* *pSrc2, size_t nLength, *Npp64f* *pDst, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

32-bit floating point complex maximum method.

Parameters

- **pSrc1** – *Source Signal Pointer*.
- **pSrc2** – *Source Signal Pointer*.
- **nLength** – *Signal Length*.
- **pDst** – Device memory pointer to the error result.
- **pDeviceBuffer** – Pointer to the required device memory allocation, *Scratch Buffer and Host Pointer*. Use *nppsMaximumErrorGetBufferSize_32fc_Ctx* to determine the minimum number of bytes required.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsMaximumError_64f_Ctx**(const *Npp64f* *pSrc1, const *Npp64f* *pSrc2, size_t nLength, *Npp64f* *pDst, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

64-bit floating point maximum method.

Parameters

- **pSrc1** – *Source Signal Pointer*.
- **pSrc2** – *Source Signal Pointer*.
- **nLength** – *Signal Length*.
- **pDst** – Device memory pointer to the error result.
- **pDeviceBuffer** – Pointer to the required device memory allocation, *Scratch Buffer and Host Pointer*. Use *nppsMaximumErrorGetBufferSize_64f_Ctx* to determine the minimum number of bytes required.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsMaximumError_64fc_Ctx**(const *Npp64fc* *pSrc1, const *Npp64fc* *pSrc2, size_t nLength, *Npp64f* *pDst, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

64-bit floating point complex maximum method.

Parameters

- **pSrc1** – *Source Signal Pointer*.
- **pSrc2** – *Source Signal Pointer*.
- **nLength** – *Signal Length*.
- **pDst** – Device memory pointer to the error result.
- **pDeviceBuffer** – Pointer to the required device memory allocation, *Scratch Buffer and Host Pointer*. Use *nppsMaximumErrorGetBufferSize_64fc_Ctx* to determine the minimum number of bytes required.

- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsMaximumErrorGetBufferSize_8u_Ctx**(size_t nLength, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Device-buffer size (in bytes) for nppsMaximumError_8u.

Parameters

- **nLength** – *Signal Length*.
- **hpBufferSize** – Required buffer size. Important: hpBufferSize is a *host pointer.*
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
NPP_SUCCESS

NppStatus **nppsMaximumErrorGetBufferSize_8s_Ctx**(size_t nLength, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Device-buffer size (in bytes) for nppsMaximumError_8s.

Parameters

- **nLength** – *Signal Length*.
- **hpBufferSize** – Required buffer size. Important: hpBufferSize is a *host pointer.*
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
NPP_SUCCESS

NppStatus **nppsMaximumErrorGetBufferSize_16u_Ctx**(size_t nLength, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Device-buffer size (in bytes) for nppsMaximumError_16u.

Parameters

- **nLength** – *Signal Length*.
- **hpBufferSize** – Required buffer size. Important: hpBufferSize is a *host pointer.*
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
NPP_SUCCESS

NppStatus **nppsMaximumErrorGetBufferSize_16s_Ctx**(size_t nLength, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Device-buffer size (in bytes) for nppsMaximumError_16s.

Parameters

- **nLength** – *Signal Length*.
- **hpBufferSize** – Required buffer size. Important: hpBufferSize is a *host pointer.*
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
NPP_SUCCESS

NppStatus **nppsMaximumErrorGetBufferSize_16sc_Ctx**(size_t nLength, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Device-buffer size (in bytes) for nppsMaximumError_16sc.

Parameters

- **nLength** – *Signal Length*.
- **hpBufferSize** – Required buffer size. Important: hpBufferSize is a *host pointer.*
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
NPP_SUCCESS

NppStatus **nppsMaximumErrorGetBufferSize_32u_Ctx**(size_t nLength, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Device-buffer size (in bytes) for nppsMaximumError_32u.

Parameters

- **nLength** – *Signal Length*.
- **hpBufferSize** – Required buffer size. Important: hpBufferSize is a *host pointer.*
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
NPP_SUCCESS

NppStatus **nppsMaximumErrorGetBufferSize_32s_Ctx**(size_t nLength, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Device-buffer size (in bytes) for nppsMaximumError_32s.

Parameters

- **nLength** – *Signal Length*.
- **hpBufferSize** – Required buffer size. Important: hpBufferSize is a *host pointer.*
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
NPP_SUCCESS

NppStatus **nppsMaximumErrorGetBufferSize_32sc_Ctx**(size_t nLength, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Device-buffer size (in bytes) for nppsMaximumError_32sc.

Parameters

- **nLength** – *Signal Length*.
- **hpBufferSize** – Required buffer size. Important: hpBufferSize is a *host pointer.*
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
NPP_SUCCESS

NppStatus **nppsMaximumErrorGetBufferSize_64s_Ctx**(size_t nLength, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Device-buffer size (in bytes) for nppsMaximumError_64s.

Parameters

- **nLength** – *Signal Length*.
- **hpBufferSize** – Required buffer size. Important: hpBufferSize is a *host pointer.*
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
NPP_SUCCESS

NppStatus **nppsMaximumErrorGetBufferSize_64sc_Ctx**(size_t nLength, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Device-buffer size (in bytes) for nppsMaximumError_64sc.

Parameters

- **nLength** – *Signal Length*.
- **hpBufferSize** – Required buffer size. Important: hpBufferSize is a *host pointer.*
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
NPP_SUCCESS

NppStatus **nppsMaximumErrorGetBufferSize_32f_Ctx**(size_t nLength, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Device-buffer size (in bytes) for nppsMaximumError_32f.

Parameters

- **nLength** – *Signal Length*.
- **hpBufferSize** – Required buffer size. Important: hpBufferSize is a *host pointer.*
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
NPP_SUCCESS

NppStatus **nppsMaximumErrorGetBufferSize_32fc_Ctx**(size_t nLength, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Device-buffer size (in bytes) for nppsMaximumError_32fc.

Parameters

- **nLength** – *Signal Length*.
- **hpBufferSize** – Required buffer size. Important: hpBufferSize is a *host pointer.*
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
NPP_SUCCESS

NppStatus **nppsMaximumErrorGetBufferSize_64f_Ctx**(size_t nLength, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Device-buffer size (in bytes) for nppsMaximumError_64f.

Parameters

- **nLength** – *Signal Length*.
- **hpBufferSize** – Required buffer size. Important: hpBufferSize is a *host pointer.*
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
NPP_SUCCESS

NppStatus **nppsMaximumErrorGetBufferSize_64fc_Ctx**(size_t nLength, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Device-buffer size (in bytes) for nppsMaximumError_64fc.

Parameters

- **nLength** – *Signal Length*.
- **hpBufferSize** – Required buffer size. Important: hpBufferSize is a *host pointer.*
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
NPP_SUCCESS

1.21.14. Signal Average Error

1.21.14.1 AverageError

Primitives for computing the Average error between two signals. Given two signals $pSrc1$ and $pSrc2$ both with length N, the average error is defined as

$$AverageError = \frac{1}{N}\sum_{n=0}^{N-1}|pSrc1(n) - pSrc2(n)|$$

If the signal is in complex format, the absolute value of the complex number is used.

Functions

NppStatus **nppsAverageError_8u_Ctx**(const *Npp8u* *pSrc1, const *Npp8u* *pSrc2, size_t nLength, *Npp64f* *pDst, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

8-bit unsigned char Average method.

Parameters

- **pSrc1** – *Source Signal Pointer*.
- **pSrc2** – *Source Signal Pointer*.
- **nLength** – *Signal Length*.
- **pDst** – Device memory pointer to the error result.
- **pDeviceBuffer** – Pointer to the required device memory allocation, *Scratch Buffer and Host Pointer*. Use *nppsAverageErrorGetBufferSize_8u_Ctx* to determine the minimum number of bytes required.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsAverageError_8s_Ctx**(const *Npp8s* *pSrc1, const *Npp8s* *pSrc2, size_t nLength, *Npp64f* *pDst, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

8-bit signed char Average method.

Parameters

- **pSrc1** – *Source Signal Pointer*.
- **pSrc2** – *Source Signal Pointer*.
- **nLength** – *Signal Length*.
- **pDst** – Device memory pointer to the error result.
- **pDeviceBuffer** – Pointer to the required device memory allocation, *Scratch Buffer and Host Pointer*. Use *nppsAverageErrorGetBufferSize_8s_Ctx* to determine the minimum number of bytes required.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsAverageError_16u_Ctx**(const *Npp16u* *pSrc1, const *Npp16u* *pSrc2, size_t nLength, *Npp64f* *pDst, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

16-bit unsigned short integer Average method.

Parameters

- **pSrc1** – *Source Signal Pointer*.
- **pSrc2** – *Source Signal Pointer*.

- **nLength** – *Signal Length*.
- **pDst** – Device memory pointer to the error result.
- **pDeviceBuffer** – Pointer to the required device memory allocation, *Scratch Buffer and Host Pointer*. Use *nppsAverageErrorGetBufferSize_16u_Ctx* to determine the minimum number of bytes required.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsAverageError_16s_Ctx**(const *Npp16s* *pSrc1, const *Npp16s* *pSrc2, size_t nLength, *Npp64f* *pDst, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

16-bit signed short integer Average method.

Parameters

- **pSrc1** – *Source Signal Pointer*.
- **pSrc2** – *Source Signal Pointer*.
- **nLength** – *Signal Length*.
- **pDst** – Device memory pointer to the error result.
- **pDeviceBuffer** – Pointer to the required device memory allocation, *Scratch Buffer and Host Pointer*. Use *nppsAverageErrorGetBufferSize_16s_Ctx* to determine the minimum number of bytes required.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsAverageError_16sc_Ctx**(const *Npp16sc* *pSrc1, const *Npp16sc* *pSrc2, size_t nLength, *Npp64f* *pDst, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

16-bit unsigned short complex integer Average method.

Parameters

- **pSrc1** – *Source Signal Pointer*.
- **pSrc2** – *Source Signal Pointer*.
- **nLength** – *Signal Length*.
- **pDst** – Device memory pointer to the error result.
- **pDeviceBuffer** – Pointer to the required device memory allocation, *Scratch Buffer and Host Pointer*. Use *nppsAverageErrorGetBufferSize_16sc_Ctx* to determine the minimum number of bytes required.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsAverageError_32u_Ctx**(const *Npp32u* *pSrc1, const *Npp32u* *pSrc2, size_t nLength, *Npp64f* *pDst, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

32-bit unsigned short integer Average method.

Parameters

- **pSrc1** – *Source Signal Pointer*.
- **pSrc2** – *Source Signal Pointer*.
- **nLength** – *Signal Length*.
- **pDst** – Device memory pointer to the error result.
- **pDeviceBuffer** – Pointer to the required device memory allocation, *Scratch Buffer and Host Pointer*. Use *nppsAverageErrorGetBufferSize_32u_Ctx* to determine the minimum number of bytes required.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsAverageError_32s_Ctx**(const *Npp32s* *pSrc1, const *Npp32s* *pSrc2, size_t nLength, *Npp64f* *pDst, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

32-bit signed short integer Average method.

Parameters

- **pSrc1** – *Source Signal Pointer*.
- **pSrc2** – *Source Signal Pointer*.
- **nLength** – *Signal Length*.
- **pDst** – Device memory pointer to the error result.
- **pDeviceBuffer** – Pointer to the required device memory allocation, *Scratch Buffer and Host Pointer*. Use *nppsAverageErrorGetBufferSize_32s_Ctx* to determine the minimum number of bytes required.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsAverageError_32sc_Ctx**(const *Npp32sc* *pSrc1, const *Npp32sc* *pSrc2, size_t nLength, *Npp64f* *pDst, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

32-bit unsigned short complex integer Average method.

Parameters

- **pSrc1** – *Source Signal Pointer*.
- **pSrc2** – *Source Signal Pointer*.
- **nLength** – *Signal Length*.

- **pDst** – Device memory pointer to the error result.
- **pDeviceBuffer** – Pointer to the required device memory allocation, *Scratch Buffer and Host Pointer*. Use *nppsAverageErrorGetBufferSize_32sc_Ctx* to determine the minimum number of bytes required.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsAverageError_64s_Ctx**(const *Npp64s* *pSrc1, const *Npp64s* *pSrc2, size_t nLength, *Npp64f* *pDst, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

64-bit signed short integer Average method.

Parameters

- **pSrc1** – *Source Signal Pointer*.
- **pSrc2** – *Source Signal Pointer*.
- **nLength** – *Signal Length*.
- **pDst** – Device memory pointer to the error result.
- **pDeviceBuffer** – Pointer to the required device memory allocation, *Scratch Buffer and Host Pointer*. Use *nppsAverageErrorGetBufferSize_64s_Ctx* to determine the minimum number of bytes required.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsAverageError_64sc_Ctx**(const *Npp64sc* *pSrc1, const *Npp64sc* *pSrc2, size_t nLength, *Npp64f* *pDst, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

64-bit unsigned short complex integer Average method.

Parameters

- **pSrc1** – *Source Signal Pointer*.
- **pSrc2** – *Source Signal Pointer*.
- **nLength** – *Signal Length*.
- **pDst** – Device memory pointer to the error result.
- **pDeviceBuffer** – Pointer to the required device memory allocation, *Scratch Buffer and Host Pointer*. Use *nppsAverageErrorGetBufferSize_64sc_Ctx* to determine the minimum number of bytes required.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsAverageError_32f_Ctx**(const *Npp32f* *pSrc1, const *Npp32f* *pSrc2, size_t nLength, *Npp64f* *pDst, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

32-bit floating point Average method.

Parameters

- **pSrc1** – *Source Signal Pointer*.
- **pSrc2** – *Source Signal Pointer*.
- **nLength** – *Signal Length*.
- **pDst** – Device memory pointer to the error result.
- **pDeviceBuffer** – Pointer to the required device memory allocation, *Scratch Buffer and Host Pointer*. Use *nppsAverageErrorGetBufferSize_32f_Ctx* to determine the minimum number of bytes required.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsAverageError_32fc_Ctx**(const *Npp32fc* *pSrc1, const *Npp32fc* *pSrc2, size_t nLength, *Npp64f* *pDst, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

32-bit floating point complex Average method.

Parameters

- **pSrc1** – *Source Signal Pointer*.
- **pSrc2** – *Source Signal Pointer*.
- **nLength** – *Signal Length*.
- **pDst** – Device memory pointer to the error result.
- **pDeviceBuffer** – Pointer to the required device memory allocation, *Scratch Buffer and Host Pointer*. Use *nppsAverageErrorGetBufferSize_32fc_Ctx* to determine the minimum number of bytes required.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsAverageError_64f_Ctx**(const *Npp64f* *pSrc1, const *Npp64f* *pSrc2, size_t nLength, *Npp64f* *pDst, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

64-bit floating point Average method.

Parameters

- **pSrc1** – *Source Signal Pointer*.
- **pSrc2** – *Source Signal Pointer*.
- **nLength** – *Signal Length*.
- **pDst** – Device memory pointer to the error result.

- **pDeviceBuffer** – Pointer to the required device memory allocation, *Scratch Buffer and Host Pointer*. Use *nppsAverageErrorGetBufferSize_64f_Ctx* to determine the minimum number of bytes required.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsAverageError_64fc_Ctx**(const *Npp64fc* *pSrc1, const *Npp64fc* *pSrc2, size_t nLength, *Npp64f* *pDst, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

64-bit floating point complex Average method.

Parameters

- **pSrc1** – *Source Signal Pointer*.
- **pSrc2** – *Source Signal Pointer*.
- **nLength** – *Signal Length*.
- **pDst** – Device memory pointer to the error result.
- **pDeviceBuffer** – Pointer to the required device memory allocation, *Scratch Buffer and Host Pointer*. Use *nppsAverageErrorGetBufferSize_64fc_Ctx* to determine the minimum number of bytes required.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsAverageErrorGetBufferSize_8u_Ctx**(size_t nLength, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Device-buffer size (in bytes) for nppsAverageError_8u.

Parameters

- **nLength** – *Signal Length*.
- **hpBufferSize** – Required buffer size. Important: hpBufferSize is a *host pointer.*
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
NPP_SUCCESS

NppStatus **nppsAverageErrorGetBufferSize_8s_Ctx**(size_t nLength, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Device-buffer size (in bytes) for nppsAverageError_8s.

Parameters

- **nLength** – *Signal Length*.
- **hpBufferSize** – Required buffer size. Important: hpBufferSize is a *host pointer.*
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
NPP_SUCCESS

NppStatus **nppsAverageErrorGetBufferSize_16u_Ctx**(size_t nLength, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Device-buffer size (in bytes) for nppsAverageError_16u.

Parameters

- **nLength** – *Signal Length*.
- **hpBufferSize** – Required buffer size. Important: hpBufferSize is a *host pointer.*
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
NPP_SUCCESS

NppStatus **nppsAverageErrorGetBufferSize_16s_Ctx**(size_t nLength, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Device-buffer size (in bytes) for nppsAverageError_16s.

Parameters

- **nLength** – *Signal Length*.
- **hpBufferSize** – Required buffer size. Important: hpBufferSize is a *host pointer.*
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
NPP_SUCCESS

NppStatus **nppsAverageErrorGetBufferSize_16sc_Ctx**(size_t nLength, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Device-buffer size (in bytes) for nppsAverageError_16sc.

Parameters

- **nLength** – *Signal Length*.
- **hpBufferSize** – Required buffer size. Important: hpBufferSize is a *host pointer.*
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
NPP_SUCCESS

NppStatus **nppsAverageErrorGetBufferSize_32u_Ctx**(size_t nLength, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Device-buffer size (in bytes) for nppsAverageError_32u.

Parameters

- **nLength** – *Signal Length*.
- **hpBufferSize** – Required buffer size. Important: hpBufferSize is a *host pointer.*
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
NPP_SUCCESS

NppStatus **nppsAverageErrorGetBufferSize_32s_Ctx**(size_t nLength, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Device-buffer size (in bytes) for nppsAverageError_32s.

Parameters

- **nLength** – *Signal Length*.
- **hpBufferSize** – Required buffer size. Important: hpBufferSize is a *host pointer.*
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
NPP_SUCCESS

NppStatus **nppsAverageErrorGetBufferSize_32sc_Ctx**(size_t nLength, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Device-buffer size (in bytes) for nppsAverageError_32sc.

Parameters

- **nLength** – *Signal Length*.
- **hpBufferSize** – Required buffer size. Important: hpBufferSize is a *host pointer.*
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
NPP_SUCCESS

NppStatus **nppsAverageErrorGetBufferSize_64s_Ctx**(size_t nLength, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Device-buffer size (in bytes) for nppsAverageError_64s.

Parameters

- **nLength** – *Signal Length*.
- **hpBufferSize** – Required buffer size. Important: hpBufferSize is a *host pointer.*
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
NPP_SUCCESS

NppStatus **nppsAverageErrorGetBufferSize_64sc_Ctx**(size_t nLength, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Device-buffer size (in bytes) for nppsAverageError_64sc.

Parameters

- **nLength** – *Signal Length*.
- **hpBufferSize** – Required buffer size. Important: hpBufferSize is a *host pointer.*
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
NPP_SUCCESS

NppStatus **nppsAverageErrorGetBufferSize_32f_Ctx**(size_t nLength, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Device-buffer size (in bytes) for nppsAverageError_32f.

Parameters

- **nLength** – *Signal Length*.
- **hpBufferSize** – Required buffer size. Important: hpBufferSize is a *host pointer.*
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
NPP_SUCCESS

NppStatus **nppsAverageErrorGetBufferSize_32fc_Ctx**(size_t nLength, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Device-buffer size (in bytes) for nppsAverageError_32fc.

Parameters

- **nLength** – *Signal Length*.
- **hpBufferSize** – Required buffer size. Important: hpBufferSize is a *host pointer.*
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
NPP_SUCCESS

NppStatus **nppsAverageErrorGetBufferSize_64f_Ctx**(size_t nLength, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Device-buffer size (in bytes) for nppsAverageError_64f.

Parameters

- **nLength** – *Signal Length*.
- **hpBufferSize** – Required buffer size. Important: hpBufferSize is a *host pointer.*
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
NPP_SUCCESS

NppStatus **nppsAverageErrorGetBufferSize_64fc_Ctx**(size_t nLength, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Device-buffer size (in bytes) for nppsAverageError_64fc.

Parameters

- **nLength** – *Signal Length*.
- **hpBufferSize** – Required buffer size. Important: hpBufferSize is a *host pointer.*
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
NPP_SUCCESS

1.21.15. Signal Maximum Relative Error

1.21.15.1 MaximumRelativeError

Primitives for computing the MaximumRelative error between two signals. Given two signals $pSrc1$ and $pSrc2$ both with length N, the maximum relative error is defined as

$$MaximumRelativeError = max\frac{|pSrc1(n) - pSrc2(n)|}{max(|pSrc1(n)|, |pSrc2(n)|)}$$

If the signal is in complex format, the absolute value of the complex number is used.

Functions

NppStatus **nppsMaximumRelativeError_8u_Ctx**(const *Npp8u* *pSrc1, const *Npp8u* *pSrc2, size_t nLength, *Npp64f* *pDst, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

8-bit unsigned char MaximumRelative method.

Parameters

- **pSrc1** – *Source Signal Pointer*.
- **pSrc2** – *Source Signal Pointer*.
- **nLength** – *Signal Length*.
- **pDst** – Device memory pointer to the error result.
- **pDeviceBuffer** – Pointer to the required device memory allocation, *Scratch Buffer and Host Pointer*. Use *nppsMaximumRelativeErrorGetBufferSize_8u_Ctx* to determine the minimum number of bytes required.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsMaximumRelativeError_8s_Ctx**(const *Npp8s* *pSrc1, const *Npp8s* *pSrc2, size_t nLength, *Npp64f* *pDst, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

8-bit signed char MaximumRelative method.

Parameters

- **pSrc1** – *Source Signal Pointer*.
- **pSrc2** – *Source Signal Pointer*.
- **nLength** – *Signal Length*.
- **pDst** – Device memory pointer to the error result.
- **pDeviceBuffer** – Pointer to the required device memory allocation, *Scratch Buffer and Host Pointer*. Use *nppsMaximumRelativeErrorGetBufferSize_8s_Ctx* to determine the minimum number of bytes required.

- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsMaximumRelativeError_16u_Ctx**(const *Npp16u* *pSrc1, const *Npp16u* *pSrc2, size_t nLength, *Npp64f* *pDst, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

16-bit unsigned short integer MaximumRelative method.

Parameters

- **pSrc1** – *Source Signal Pointer*.
- **pSrc2** – *Source Signal Pointer*.
- **nLength** – *Signal Length*.
- **pDst** – Device memory pointer to the error result.
- **pDeviceBuffer** – Pointer to the required device memory allocation, *Scratch Buffer and Host Pointer*. Use *nppsMaximumRelativeErrorGetBufferSize_16u_Ctx* to determine the minimum number of bytes required.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsMaximumRelativeError_16s_Ctx**(const *Npp16s* *pSrc1, const *Npp16s* *pSrc2, size_t nLength, *Npp64f* *pDst, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

16-bit signed short integer MaximumRelative method.

Parameters

- **pSrc1** – *Source Signal Pointer*.
- **pSrc2** – *Source Signal Pointer*.
- **nLength** – *Signal Length*.
- **pDst** – Device memory pointer to the error result.
- **pDeviceBuffer** – Pointer to the required device memory allocation, *Scratch Buffer and Host Pointer*. Use *nppsMaximumRelativeErrorGetBufferSize_16s_Ctx* to determine the minimum number of bytes required.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsMaximumRelativeError_16sc_Ctx**(const *Npp16sc* *pSrc1, const *Npp16sc* *pSrc2, size_t nLength, *Npp64f* *pDst, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

16-bit unsigned short complex integer MaximumRelative method.

Parameters

- **pSrc1** – *Source Signal Pointer*.
- **pSrc2** – *Source Signal Pointer*.
- **nLength** – *Signal Length*.
- **pDst** – Device memory pointer to the error result.
- **pDeviceBuffer** – Pointer to the required device memory allocation, *Scratch Buffer and Host Pointer*. Use *nppsMaximumRelativeErrorGetBufferSize_16sc_Ctx* to determine the minimum number of bytes required.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsMaximumRelativeError_32u_Ctx**(const *Npp32u* *pSrc1, const *Npp32u* *pSrc2, size_t nLength, *Npp64f* *pDst, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

32-bit unsigned short integer MaximumRelative method.

Parameters

- **pSrc1** – *Source Signal Pointer*.
- **pSrc2** – *Source Signal Pointer*.
- **nLength** – *Signal Length*.
- **pDst** – Device memory pointer to the error result.
- **pDeviceBuffer** – Pointer to the required device memory allocation, *Scratch Buffer and Host Pointer*. Use *nppsMaximumRelativeErrorGetBufferSize_32u_Ctx* to determine the minimum number of bytes required.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsMaximumRelativeError_32s_Ctx**(const *Npp32s* *pSrc1, const *Npp32s* *pSrc2, size_t nLength, *Npp64f* *pDst, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

32-bit signed short integer MaximumRelative method.

Parameters

- **pSrc1** – *Source Signal Pointer*.
- **pSrc2** – *Source Signal Pointer*.
- **nLength** – *Signal Length*.
- **pDst** – Device memory pointer to the error result.

- **pDeviceBuffer** – Pointer to the required device memory allocation, *Scratch Buffer and Host Pointer*. Use *nppsMaximumRelativeErrorGetBufferSize_32s_Ctx* to determine the minimum number of bytes required.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsMaximumRelativeError_32sc_Ctx**(const *Npp32sc* *pSrc1, const *Npp32sc* *pSrc2, size_t nLength, *Npp64f* *pDst, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

32-bit unsigned short complex integer MaximumRelative method.

Parameters

- **pSrc1** – *Source Signal Pointer*.
- **pSrc2** – *Source Signal Pointer*.
- **nLength** – *Signal Length*.
- **pDst** – Device memory pointer to the error result.
- **pDeviceBuffer** – Pointer to the required device memory allocation, *Scratch Buffer and Host Pointer*. Use *nppsMaximumRelativeErrorGetBufferSize_32sc_Ctx* to determine the minimum number of bytes required.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsMaximumRelativeError_64s_Ctx**(const *Npp64s* *pSrc1, const *Npp64s* *pSrc2, size_t nLength, *Npp64f* *pDst, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

64-bit signed short integer MaximumRelative method.

Parameters

- **pSrc1** – *Source Signal Pointer*.
- **pSrc2** – *Source Signal Pointer*.
- **nLength** – *Signal Length*.
- **pDst** – Device memory pointer to the error result.
- **pDeviceBuffer** – Pointer to the required device memory allocation, *Scratch Buffer and Host Pointer*. Use *nppsMaximumRelativeErrorGetBufferSize_64s_Ctx* to determine the minimum number of bytes required.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsMaximumRelativeError_64sc_Ctx**(const *Npp64sc* *pSrc1, const *Npp64sc* *pSrc2, size_t nLength, *Npp64f* *pDst, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

64-bit unsigned short complex integer MaximumRelative method.

Parameters

- **pSrc1** – *Source Signal Pointer*.
- **pSrc2** – *Source Signal Pointer*.
- **nLength** – *Signal Length*.
- **pDst** – Device memory pointer to the error result.
- **pDeviceBuffer** – Pointer to the required device memory allocation, *Scratch Buffer and Host Pointer*. Use *nppsMaximumRelativeErrorGetBufferSize_64sc_Ctx* to determine the minimum number of bytes required.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsMaximumRelativeError_32f_Ctx**(const *Npp32f* *pSrc1, const *Npp32f* *pSrc2, size_t nLength, *Npp64f* *pDst, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

32-bit floating point MaximumRelative method.

Parameters

- **pSrc1** – *Source Signal Pointer*.
- **pSrc2** – *Source Signal Pointer*.
- **nLength** – *Signal Length*.
- **pDst** – Device memory pointer to the error result.
- **pDeviceBuffer** – Pointer to the required device memory allocation, *Scratch Buffer and Host Pointer*. Use *nppsMaximumRelativeErrorGetBufferSize_32f_Ctx* to determine the minimum number of bytes required.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsMaximumRelativeError_32fc_Ctx**(const *Npp32fc* *pSrc1, const *Npp32fc* *pSrc2, size_t nLength, *Npp64f* *pDst, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

32-bit floating point complex MaximumRelative method.

Parameters

- **pSrc1** – *Source Signal Pointer*.

- **pSrc2** – *Source Signal Pointer*.
- **nLength** – *Signal Length*.
- **pDst** – Device memory pointer to the error result.
- **pDeviceBuffer** – Pointer to the required device memory allocation, *Scratch Buffer and Host Pointer*. Use *nppsMaximumRelativeErrorGetBufferSize_32fc_Ctx* to determine the minimum number of bytes required.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsMaximumRelativeError_64f_Ctx**(const *Npp64f* *pSrc1, const *Npp64f* *pSrc2, size_t nLength, *Npp64f* *pDst, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

64-bit floating point MaximumRelative method.

Parameters

- **pSrc1** – *Source Signal Pointer*.
- **pSrc2** – *Source Signal Pointer*.
- **nLength** – *Signal Length*.
- **pDst** – Device memory pointer to the error result.
- **pDeviceBuffer** – Pointer to the required device memory allocation, *Scratch Buffer and Host Pointer*. Use *nppsMaximumRelativeErrorGetBufferSize_64f_Ctx* to determine the minimum number of bytes required.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsMaximumRelativeError_64fc_Ctx**(const *Npp64fc* *pSrc1, const *Npp64fc* *pSrc2, size_t nLength, *Npp64f* *pDst, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

64-bit floating point complex MaximumRelative method.

Parameters

- **pSrc1** – *Source Signal Pointer*.
- **pSrc2** – *Source Signal Pointer*.
- **nLength** – *Signal Length*.
- **pDst** – Device memory pointer to the error result.
- **pDeviceBuffer** – Pointer to the required device memory allocation, *Scratch Buffer and Host Pointer*. Use *nppsMaximumRelativeErrorGetBufferSize_64fc_Ctx* to determine the minimum number of bytes required.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsMaximumRelativeErrorGetBufferSize_8u_Ctx**(size_t nLength, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Device-buffer size (in bytes) for nppsMaximumRelativeError_8u.

Parameters

- **nLength** – *Signal Length*.
- **hpBufferSize** – Required buffer size. Important: hpBufferSize is a *host pointer.*
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
NPP_SUCCESS

NppStatus **nppsMaximumRelativeErrorGetBufferSize_8s_Ctx**(size_t nLength, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Device-buffer size (in bytes) for nppsMaximumRelativeError_8s.

Parameters

- **nLength** – *Signal Length*.
- **hpBufferSize** – Required buffer size. Important: hpBufferSize is a *host pointer.*
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
NPP_SUCCESS

NppStatus **nppsMaximumRelativeErrorGetBufferSize_16u_Ctx**(size_t nLength, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Device-buffer size (in bytes) for nppsMaximumRelativeError_16u.

Parameters

- **nLength** – *Signal Length*.
- **hpBufferSize** – Required buffer size. Important: hpBufferSize is a *host pointer.*
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
NPP_SUCCESS

NppStatus **nppsMaximumRelativeErrorGetBufferSize_16s_Ctx**(size_t nLength, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Device-buffer size (in bytes) for nppsMaximumRelativeError_16s.

Parameters

- **nLength** – *Signal Length*.
- **hpBufferSize** – Required buffer size. Important: hpBufferSize is a *host pointer.*
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
NPP_SUCCESS

NppStatus **nppsMaximumRelativeErrorGetBufferSize_16sc_Ctx**(size_t nLength, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Device-buffer size (in bytes) for nppsMaximumRelativeError_16sc.

Parameters

- **nLength** – *Signal Length*.
- **hpBufferSize** – Required buffer size. Important: hpBufferSize is a *host pointer.*
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
NPP_SUCCESS

NppStatus **nppsMaximumRelativeErrorGetBufferSize_32u_Ctx**(size_t nLength, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Device-buffer size (in bytes) for nppsMaximumRelativeError_32u.

Parameters

- **nLength** – *Signal Length*.
- **hpBufferSize** – Required buffer size. Important: hpBufferSize is a *host pointer.*
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
NPP_SUCCESS

NppStatus **nppsMaximumRelativeErrorGetBufferSize_32s_Ctx**(size_t nLength, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Device-buffer size (in bytes) for nppsMaximumRelativeError_32s.

Parameters

- **nLength** – *Signal Length*.
- **hpBufferSize** – Required buffer size. Important: hpBufferSize is a *host pointer.*
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
NPP_SUCCESS

NppStatus **nppsMaximumRelativeErrorGetBufferSize_32sc_Ctx**(size_t nLength, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Device-buffer size (in bytes) for nppsMaximumRelativeError_32sc.

Parameters

- **nLength** – *Signal Length*.
- **hpBufferSize** – Required buffer size. Important: hpBufferSize is a *host pointer.*
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
NPP_SUCCESS

NppStatus **nppsMaximumRelativeErrorGetBufferSize_64s_Ctx**(size_t nLength, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Device-buffer size (in bytes) for nppsMaximumRelativeError_64s.

Parameters

- **nLength** – *Signal Length*.
- **hpBufferSize** – Required buffer size. Important: hpBufferSize is a *host pointer.*
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
NPP_SUCCESS

NppStatus **nppsMaximumRelativeErrorGetBufferSize_64sc_Ctx**(size_t nLength, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Device-buffer size (in bytes) for nppsMaximumRelativeError_64sc.

Parameters

- **nLength** – *Signal Length*.
- **hpBufferSize** – Required buffer size. Important: hpBufferSize is a *host pointer.*
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
NPP_SUCCESS

NppStatus **nppsMaximumRelativeErrorGetBufferSize_32f_Ctx**(size_t nLength, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Device-buffer size (in bytes) for nppsMaximumRelativeError_32f.

Parameters

- **nLength** – *Signal Length*.
- **hpBufferSize** – Required buffer size. Important: hpBufferSize is a *host pointer.*
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
NPP_SUCCESS

NppStatus **nppsMaximumRelativeErrorGetBufferSize_32fc_Ctx**(size_t nLength, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Device-buffer size (in bytes) for nppsMaximumRelativeError_32fc.

Parameters

- **nLength** – *Signal Length*.
- **hpBufferSize** – Required buffer size. Important: hpBufferSize is a *host pointer.*
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
NPP_SUCCESS

NppStatus **nppsMaximumRelativeErrorGetBufferSize_64f_Ctx**(size_t nLength, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Device-buffer size (in bytes) for nppsMaximumRelativeError_64f.

Parameters

- **nLength** – *Signal Length*.
- **hpBufferSize** – Required buffer size. Important: hpBufferSize is a *host pointer.*
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
NPP_SUCCESS

NppStatus **nppsMaximumRelativeErrorGetBufferSize_64fc_Ctx**(size_t nLength, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Device-buffer size (in bytes) for nppsMaximumRelativeError_64fc.

Parameters

- **nLength** – *Signal Length*.
- **hpBufferSize** – Required buffer size. Important: hpBufferSize is a *host pointer.*
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
NPP_SUCCESS

1.21.16. Signal Average Relative Error

1.21.16.1 AverageRelativeError

Primitives for computing the AverageRelative error between two signals. Given two signals $pSrc1$ and $pSrc2$ both with length N, the average relative error is defined as

$$AverageRelativeError = \frac{1}{N}\sum_{n=0}^{N-1}\frac{|pSrc1(n) - pSrc2(n)|}{max(|pSrc1(n)|, |pSrc2(n)|)}$$

If the signal is in complex format, the absolute value of the complex number is used.

Functions

NppStatus **nppsAverageRelativeError_8u_Ctx**(const *Npp8u* *pSrc1, const *Npp8u* *pSrc2, size_t nLength, *Npp64f* *pDst, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

8-bit unsigned char AverageRelative method.

Parameters

- **pSrc1** – *Source Signal Pointer*.
- **pSrc2** – *Source Signal Pointer*.
- **nLength** – *Signal Length*.
- **pDst** – Device memory pointer to the error result.
- **pDeviceBuffer** – Pointer to the required device memory allocation, *Scratch Buffer and Host Pointer*. Use *nppsAverageRelativeErrorGetBufferSize_8u_Ctx* to determine the minimum number of bytes required.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsAverageRelativeError_8s_Ctx**(const *Npp8s* *pSrc1, const *Npp8s* *pSrc2, size_t nLength, *Npp64f* *pDst, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

8-bit signed char AverageRelative method.

Parameters

- **pSrc1** – *Source Signal Pointer*.
- **pSrc2** – *Source Signal Pointer*.
- **nLength** – *Signal Length*.

- **pDst** – Device memory pointer to the error result.
- **pDeviceBuffer** – Pointer to the required device memory allocation, *Scratch Buffer and Host Pointer*. Use *nppsAverageRelativeErrorGetBufferSize_8s_Ctx* to determine the minimum number of bytes required.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsAverageRelativeError_16u_Ctx**(const *Npp16u* *pSrc1, const *Npp16u* *pSrc2, size_t nLength, *Npp64f* *pDst, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

16-bit unsigned short integer AverageRelative method.

Parameters

- **pSrc1** – *Source Signal Pointer*.
- **pSrc2** – *Source Signal Pointer*.
- **nLength** – *Signal Length*.
- **pDst** – Device memory pointer to the error result.
- **pDeviceBuffer** – Pointer to the required device memory allocation, *Scratch Buffer and Host Pointer*. Use *nppsAverageRelativeErrorGetBufferSize_16u_Ctx* to determine the minimum number of bytes required.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsAverageRelativeError_16s_Ctx**(const *Npp16s* *pSrc1, const *Npp16s* *pSrc2, size_t nLength, *Npp64f* *pDst, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

16-bit signed short integer AverageRelative method.

Parameters

- **pSrc1** – *Source Signal Pointer*.
- **pSrc2** – *Source Signal Pointer*.
- **nLength** – *Signal Length*.
- **pDst** – Device memory pointer to the error result.
- **pDeviceBuffer** – Pointer to the required device memory allocation, *Scratch Buffer and Host Pointer*. Use *nppsAverageRelativeErrorGetBufferSize_16s_Ctx* to determine the minimum number of bytes required.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsAverageRelativeError_16sc_Ctx**(const *Npp16sc* *pSrc1, const *Npp16sc* *pSrc2, size_t nLength, *Npp64f* *pDst, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

16-bit unsigned short complex integer AverageRelative method.

Parameters

- **pSrc1** – *Source Signal Pointer*.
- **pSrc2** – *Source Signal Pointer*.
- **nLength** – *Signal Length*.
- **pDst** – Device memory pointer to the error result.
- **pDeviceBuffer** – Pointer to the required device memory allocation, *Scratch Buffer and Host Pointer*. Use *nppsAverageRelativeErrorGetBufferSize_16sc_Ctx* to determine the minimum number of bytes required.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsAverageRelativeError_32u_Ctx**(const *Npp32u* *pSrc1, const *Npp32u* *pSrc2, size_t nLength, *Npp64f* *pDst, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

32-bit unsigned short integer AverageRelative method.

Parameters

- **pSrc1** – *Source Signal Pointer*.
- **pSrc2** – *Source Signal Pointer*.
- **nLength** – *Signal Length*.
- **pDst** – Device memory pointer to the error result.
- **pDeviceBuffer** – Pointer to the required device memory allocation, *Scratch Buffer and Host Pointer*. Use *nppsAverageRelativeErrorGetBufferSize_32u_Ctx* to determine the minimum number of bytes required.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsAverageRelativeError_32s_Ctx**(const *Npp32s* *pSrc1, const *Npp32s* *pSrc2, size_t nLength, *Npp64f* *pDst, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

32-bit signed short integer AverageRelative method.

Parameters

- **pSrc1** – *Source Signal Pointer*.

- **pSrc2** – *Source Signal Pointer*.
- **nLength** – *Signal Length*.
- **pDst** – Device memory pointer to the error result.
- **pDeviceBuffer** – Pointer to the required device memory allocation, *Scratch Buffer and Host Pointer*. Use *nppsAverageRelativeErrorGetBufferSize_32s_Ctx* to determine the minimum number of bytes required.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsAverageRelativeError_32sc_Ctx**(const *Npp32sc* *pSrc1, const *Npp32sc* *pSrc2, size_t nLength, *Npp64f* *pDst, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

32-bit unsigned short complex integer AverageRelative method.

Parameters

- **pSrc1** – *Source Signal Pointer*.
- **pSrc2** – *Source Signal Pointer*.
- **nLength** – *Signal Length*.
- **pDst** – Device memory pointer to the error result.
- **pDeviceBuffer** – Pointer to the required device memory allocation, *Scratch Buffer and Host Pointer*. Use *nppsAverageRelativeErrorGetBufferSize_32sc_Ctx* to determine the minimum number of bytes required.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsAverageRelativeError_64s_Ctx**(const *Npp64s* *pSrc1, const *Npp64s* *pSrc2, size_t nLength, *Npp64f* *pDst, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

64-bit signed short integer AverageRelative method.

Parameters

- **pSrc1** – *Source Signal Pointer*.
- **pSrc2** – *Source Signal Pointer*.
- **nLength** – *Signal Length*.
- **pDst** – Device memory pointer to the error result.
- **pDeviceBuffer** – Pointer to the required device memory allocation, *Scratch Buffer and Host Pointer*. Use *nppsAverageRelativeErrorGetBufferSize_64s_Ctx* to determine the minimum number of bytes required.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsAverageRelativeError_64sc_Ctx**(const *Npp64sc* *pSrc1, const *Npp64sc* *pSrc2, size_t nLength, *Npp64f* *pDst, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

64-bit unsigned short complex integer AverageRelative method.

Parameters

- **pSrc1** – *Source Signal Pointer*.
- **pSrc2** – *Source Signal Pointer*.
- **nLength** – *Signal Length*.
- **pDst** – Device memory pointer to the error result.
- **pDeviceBuffer** – Pointer to the required device memory allocation, *Scratch Buffer and Host Pointer*. Use *nppsAverageRelativeErrorGetBufferSize_64sc_Ctx* to determine the minimum number of bytes required.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsAverageRelativeError_32f_Ctx**(const *Npp32f* *pSrc1, const *Npp32f* *pSrc2, size_t nLength, *Npp64f* *pDst, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

32-bit floating point AverageRelative method.

Parameters

- **pSrc1** – *Source Signal Pointer*.
- **pSrc2** – *Source Signal Pointer*.
- **nLength** – *Signal Length*.
- **pDst** – Device memory pointer to the error result.
- **pDeviceBuffer** – Pointer to the required device memory allocation, *Scratch Buffer and Host Pointer*. Use *nppsAverageRelativeErrorGetBufferSize_32f_Ctx* to determine the minimum number of bytes required.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsAverageRelativeError_32fc_Ctx**(const *Npp32fc* *pSrc1, const *Npp32fc* *pSrc2, size_t nLength, *Npp64f* *pDst, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

32-bit floating point complex AverageRelative method.

Parameters

- **pSrc1** – *Source Signal Pointer*.
- **pSrc2** – *Source Signal Pointer*.
- **nLength** – *Signal Length*.
- **pDst** – Device memory pointer to the error result.
- **pDeviceBuffer** – Pointer to the required device memory allocation, *Scratch Buffer and Host Pointer*. Use *nppsAverageRelativeErrorGetBufferSize_32fc_Ctx* to determine the minimum number of bytes required.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsAverageRelativeError_64f_Ctx**(const *Npp64f* *pSrc1, const *Npp64f* *pSrc2, size_t nLength, *Npp64f* *pDst, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

64-bit floating point AverageRelative method.

Parameters

- **pSrc1** – *Source Signal Pointer*.
- **pSrc2** – *Source Signal Pointer*.
- **nLength** – *Signal Length*.
- **pDst** – Device memory pointer to the error result.
- **pDeviceBuffer** – Pointer to the required device memory allocation, *Scratch Buffer and Host Pointer*. Use *nppsAverageRelativeErrorGetBufferSize_64f_Ctx* to determine the minimum number of bytes required.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns

Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsAverageRelativeError_64fc_Ctx**(const *Npp64fc* *pSrc1, const *Npp64fc* *pSrc2, size_t nLength, *Npp64f* *pDst, *Npp8u* *pDeviceBuffer, *NppStreamContext* nppStreamCtx)

64-bit floating point complex AverageRelative method.

Parameters

- **pSrc1** – *Source Signal Pointer*.
- **pSrc2** – *Source Signal Pointer*.
- **nLength** – *Signal Length*.
- **pDst** – Device memory pointer to the error result.
- **pDeviceBuffer** – Pointer to the required device memory allocation, *Scratch Buffer and Host Pointer*. Use *nppsAverageRelativeErrorGetBufferSize_64fc_Ctx* to determine the minimum number of bytes required.
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
Signal Data Related Error Codes, *Length Related Error Codes*.

NppStatus **nppsAverageRelativeErrorGetBufferSize_8u_Ctx**(size_t nLength, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Device-buffer size (in bytes) for nppsAverageRelativeError_8u_Ctx.

Parameters

- **nLength** – *Signal Length*.
- **hpBufferSize** – Required buffer size. Important: hpBufferSize is a *host pointer.*
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
NPP_SUCCESS

NppStatus **nppsAverageRelativeErrorGetBufferSize_8s_Ctx**(size_t nLength, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Device-buffer size (in bytes) for nppsAverageRelativeError_8s_Ctx.

Parameters

- **nLength** – *Signal Length*.
- **hpBufferSize** – Required buffer size. Important: hpBufferSize is a *host pointer.*
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
NPP_SUCCESS

NppStatus **nppsAverageRelativeErrorGetBufferSize_16u_Ctx**(size_t nLength, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Device-buffer size (in bytes) for nppsAverageRelativeError_16u_Ctx.

Parameters

- **nLength** – *Signal Length*.
- **hpBufferSize** – Required buffer size. Important: hpBufferSize is a *host pointer.*
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
NPP_SUCCESS

NppStatus **nppsAverageRelativeErrorGetBufferSize_16s_Ctx**(size_t nLength, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Device-buffer size (in bytes) for nppsAverageRelativeError_16s_Ctx.

Parameters

- **nLength** – *Signal Length*.
- **hpBufferSize** – Required buffer size. Important: hpBufferSize is a *host pointer.*
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
NPP_SUCCESS

NppStatus **nppsAverageRelativeErrorGetBufferSize_16sc_Ctx**(size_t nLength, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Device-buffer size (in bytes) for nppsAverageRelativeError_16sc_Ctx.

Parameters

- **nLength** – *Signal Length*.
- **hpBufferSize** – Required buffer size. Important: hpBufferSize is a *host pointer.*
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
NPP_SUCCESS

NppStatus **nppsAverageRelativeErrorGetBufferSize_32u_Ctx**(size_t nLength, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Device-buffer size (in bytes) for nppsAverageRelativeError_32u_Ctx.

Parameters

- **nLength** – *Signal Length*.
- **hpBufferSize** – Required buffer size. Important: hpBufferSize is a *host pointer.*
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
NPP_SUCCESS

NppStatus **nppsAverageRelativeErrorGetBufferSize_32s_Ctx**(size_t nLength, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Device-buffer size (in bytes) for nppsAverageRelativeError_32s_Ctx.

Parameters

- **nLength** – *Signal Length*.
- **hpBufferSize** – Required buffer size. Important: hpBufferSize is a *host pointer.*
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
NPP_SUCCESS

NppStatus **nppsAverageRelativeErrorGetBufferSize_32sc_Ctx**(size_t nLength, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Device-buffer size (in bytes) for nppsAverageRelativeError_32sc_Ctx.

Parameters

- **nLength** – *Signal Length*.
- **hpBufferSize** – Required buffer size. Important: hpBufferSize is a *host pointer.*
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
NPP_SUCCESS

NppStatus **nppsAverageRelativeErrorGetBufferSize_64s_Ctx**(size_t nLength, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Device-buffer size (in bytes) for nppsAverageRelativeError_64s_Ctx.

Parameters

- **nLength** – *Signal Length*.
- **hpBufferSize** – Required buffer size. Important: hpBufferSize is a *host pointer.*
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
NPP_SUCCESS

NppStatus **nppsAverageRelativeErrorGetBufferSize_64sc_Ctx**(size_t nLength, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Device-buffer size (in bytes) for nppsAverageRelativeError_64sc_Ctx.

Parameters

- **nLength** – *Signal Length*.
- **hpBufferSize** – Required buffer size. Important: hpBufferSize is a *host pointer.*
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
NPP_SUCCESS

NppStatus **nppsAverageRelativeErrorGetBufferSize_32f_Ctx**(size_t nLength, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Device-buffer size (in bytes) for nppsAverageRelativeError_32f_Ctx.

Parameters

- **nLength** – *Signal Length*.
- **hpBufferSize** – Required buffer size. Important: hpBufferSize is a *host pointer.*
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
NPP_SUCCESS

NppStatus **nppsAverageRelativeErrorGetBufferSize_32fc_Ctx**(size_t nLength, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Device-buffer size (in bytes) for nppsAverageRelativeError_32fc_Ctx.

Parameters

- **nLength** – *Signal Length*.
- **hpBufferSize** – Required buffer size. Important: hpBufferSize is a *host pointer.*
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
NPP_SUCCESS

NppStatus **nppsAverageRelativeErrorGetBufferSize_64f_Ctx**(size_t nLength, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Device-buffer size (in bytes) for nppsAverageRelativeError_64f_Ctx.

Parameters

- **nLength** – *Signal Length*.
- **hpBufferSize** – Required buffer size. Important: hpBufferSize is a *host pointer.*
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
NPP_SUCCESS

NppStatus **nppsAverageRelativeErrorGetBufferSize_64fc_Ctx**(size_t nLength, size_t *hpBufferSize, *NppStreamContext* nppStreamCtx)

Device-buffer size (in bytes) for nppsAverageRelativeError_64fc_Ctx.

Parameters

- **nLength** – *Signal Length*.
- **hpBufferSize** – Required buffer size. Important: hpBufferSize is a *host pointer.*
- **nppStreamCtx** – *Application Managed Stream Context*.

Returns
NPP_SUCCESS

1.22. Signal Memory Management Functions

Functions that provide memory management functionality like malloc and free.

1.22.1. Malloc

Signal-allocator methods for allocating 1D arrays of data in device memory. All allocators have size parameters to specify the size of the signal (1D array) being allocated.

The allocator methods return a pointer to the newly allocated memory of appropriate type. If device-memory allocation is not possible due to resource constraints the allocators return 0 (i.e. NULL pointer).

All signal allocators allocate memory aligned such that it is beneficial to the performance of the majority of the signal-processing primitives. It is no mandatory however to use these allocators. Any valid CUDA device-memory pointers can be passed to NPP primitives.

Functions

Npp8u ***nppsMalloc_8u**(size_t nSize)
8-bit unsigned signal allocator.

Parameters

- **nSize** – Number of unsigned chars in the new signal.

Returns
A pointer to the new signal. 0 (NULL-pointer) indicates that an error occurred during allocation.

Npp8s ***nppsMalloc_8s**(size_t nSize)
8-bit signed signal allocator.

Parameters

- **nSize** – Number of (signed) chars in the new signal.

Returns
A pointer to the new signal. 0 (NULL-pointer) indicates that an error occurred during allocation.

Npp16u ***nppsMalloc_16u**(size_t nSize)
16-bit unsigned signal allocator.

Parameters

- **nSize** – Number of unsigned shorts in the new signal.

Returns
A pointer to the new signal. 0 (NULL-pointer) indicates that an error occurred during allocation.

Npp16s ***nppsMalloc_16s**(size_t nSize)*

16-bit signal allocator.

Parameters

- **nSize** – Number of shorts in the new signal.

Returns
A pointer to the new signal. 0 (NULL-pointer) indicates that an error occurred during allocation.

Npp16sc ***nppsMalloc_16sc**(size_t nSize)*

16-bit complex-value signal allocator.

Parameters

- **nSize** – Number of 16-bit complex numbers in the new signal.

Returns
A pointer to the new signal. 0 (NULL-pointer) indicates that an error occurred during allocation.

Npp32u ***nppsMalloc_32u**(size_t nSize)*

32-bit unsigned signal allocator.

Parameters

- **nSize** – Number of unsigned ints in the new signal.

Returns
A pointer to the new signal. 0 (NULL-pointer) indicates that an error occurred during allocation.

Npp32s ***nppsMalloc_32s**(size_t nSize)*

32-bit integer signal allocator.

Parameters

- **nSize** – Number of ints in the new signal.

Returns
A pointer to the new signal. 0 (NULL-pointer) indicates that an error occurred during allocation.

Npp32sc ***nppsMalloc_32sc**(size_t nSize)*

32-bit complex integer signal allocator.

Parameters

- **nSize** – Number of complex integer values in the new signal.

Returns
A pointer to the new signal. 0 (NULL-pointer) indicates that an error occurred during allocation.

Npp32f ***nppsMalloc_32f***(size_t nSize)

32-bit float signal allocator.

Parameters

- **nSize** – Number of floats in the new signal.

Returns

A pointer to the new signal. 0 (NULL-pointer) indicates that an error occurred during allocation.

Npp32fc ***nppsMalloc_32fc***(size_t nSize)

32-bit complex float signal allocator.

Parameters

- **nSize** – Number of complex float values in the new signal.

Returns

A pointer to the new signal. 0 (NULL-pointer) indicates that an error occurred during allocation.

Npp64s ***nppsMalloc_64s***(size_t nSize)

64-bit long integer signal allocator.

Parameters

- **nSize** – Number of long ints in the new signal.

Returns

A pointer to the new signal. 0 (NULL-pointer) indicates that an error occurred during allocation.

Npp64sc ***nppsMalloc_64sc***(size_t nSize)

64-bit complex long integer signal allocator.

Parameters

- **nSize** – Number of complex long int values in the new signal.

Returns

A pointer to the new signal. 0 (NULL-pointer) indicates that an error occurred during allocation.

Npp64f ***nppsMalloc_64f***(size_t nSize)

64-bit float (double) signal allocator.

Parameters

- **nSize** – Number of doubles in the new signal.

Returns

A pointer to the new signal. 0 (NULL-pointer) indicates that an error occurred during allocation.

Npp64fc ***nppsMalloc_64fc***(size_t nSize)

64-bit complex complex signal allocator.

Parameters

- **nSize** – Number of complex double values in the new signal.

Returns

A pointer to the new signal. 0 (NULL-pointer) indicates that an error occurred during allocation.

1.22.2. Free

Free signal memory.

Functions

void **nppsFree**(void *pValues)

Free method for any signal memory.

Parameters

- **pValues** – A pointer to memory allocated using nppiMalloc_<modifier>.

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