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Chapter 1.
ABSTRACT

The NVIDIA® DIGITS DevBox Software Image is tuned and optimized to deliver maximum performance of the deep learning frameworks on the DIGITS DevBox system, built and shipped by NVIDIA® Corporation.
Chapter 2.
UPDATES IN REFRESH 3 (MAY 2017)

This section lists the changes in the NVIDIA® DIGITS™ DevBox software, Refresh 3 (May 2017):

- NVIDIA DIGITS Software updated to version 5.0
- NVIDIA Linux Display Driver updated to version 375.26
- NVIDIA CUDA toolkit updated to CUDA 8.0.61
- NVIDIA cuDNN updated to cuDNN v5 (version 5.1.10)
- NVIDIA Caffe updated to version 0.15.13 https://github.com/NVIDIA/caffe/releases/tag/v0.15.13
- NVIDIA Torch7 is updated to version 0.9.99
- Theano is updated to version 0.9.0

See the DIGITS DevBox Update Guide for instructions on how to perform an over-the-network update.
Chapter 3.
UPDATES IN REFRESH 2 (FEB 2016)

This section lists the changes in the NVIDIA DIGITS DevBox software, Refresh 2 (Sept 2016):

- NVIDIA DIGITS Software updated to version 3.0.0-1
- NVIDIA cuDNN library updated to libcuDNN v4 (version 4.0.7)
- NVIDIA Caffe updated to version 0.14.2-1 https://github.com/NVIDIA/caffe/releases/tag/v0.14.2
- NVIDIA Torch7 is updated to version 0.9.92
This section lists the changes in the NVIDIA DIGITS DevBox software, Refresh 1 (Sept 2015):

- NVIDIA DIGITS Software updated to version 2.0
- NVIDIA Linux Display Driver updated to version 352.41
- NVIDIA CUDA toolkit updated to CUDA 7.5
- NVIDIA cuDNN updated to cuDNN v3 (version 7.0.64)
- Caffe updated to version 0.13.1 https://github.com/NVIDIA/caffe/releases/tag/v0.13.1
- Theano updated to version 0.7.1 https://github.com/Theano/Theano/releases/tag/rel-0.7.1a1
Chapter 5.
IN-THE-BOX SOFTWARE COMPONENTS

This section provides a list of all software components included in the in-the-box package with the associated installation locations:

- Ubuntu 14.04.2 [http://releases.ubuntu.com/14.04/] from Canonical Ltd. Ubuntu and Canonical are registered trademarks of Canonical Ltd.
- NVIDIA Linux Display Driver version 346.63.
- NVIDIA CUDA toolkit versions 7.0 and 6.5. Production toolkit release notes can be found at: [http://docs.nvidia.com/cuda/index.html] The CUDA toolkits are installed under /usr/local/cuda-7.0/ and /usr/local/cuda-6.5/ folders.
- NVIDIA cuDNN v2 production (version 6.5.48) GPU-accelerated library of primitives for deep neural networks.
- NVIDIA DIGITS which is an interactive environment for training, evaluating, and experimenting with neural networks. Version 1.0.3 is installed under /usr/share/digits, with a web interface accessible at http://localhost. The packaged version of DIGITS is from: [https://github.com/NVIDIA/DIGITS/releases/tag/v1.0.3]
- Caffe is installed under /usr/bin and the Caffe python interface is under /usr/lib/python2.7/dist-packages. This installation of Caffe is built from source at: [https://github.com/NVIDIA/caffe/releases/tag/v0.10.0]
- Torch is installed system-wide, with the Torch Lua modules under /usr/local. Torch is packaged from the following commit: [https://github.com/torch/distro/commit/e0c565120622f99ef6e1ca7fccca66cfe2da34fc]
- Theano 0.7.0 is installed under /usr/lib/python2.7/dist-packages. The packaged Theano is from [https://pypi.python.org/pypi/Theano/0.7.0]
- BIDMach version 1.0.0 is installed under /usr/share/bidmach and the ‘bidmach’ helper script is located in /usr/bin. The packaged BIDMach is from the 1.0.0 release tarball at: [http://bid2.berkeley.edu/bid-data-project/download/]
At the time of the release no known defects have been found that affect the use of this software.
Chapter 7.
ACKNOWLEDGEMENTS

**MNIST DATA**: The DIGITS tutorial uses the "MNIST" dataset from: [http://yann.lecun.com/exdb/mnist/](http://yann.lecun.com/exdb/mnist/)

The original MNIST dataset was transformed by computing $\text{pixel\_value} = 255 - \text{pixel\_value}$ to convert from black background to white background, and encoded in PNG format. During training in DIGITS, each pixel is normalized as follows: $\text{normalized\_pixel} = (\text{original\_pixel} - m)/255$ where $m$ is the global mean across all the pixels in the training set, and 255 is the range of pixel values.
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