

GPU Server Cheat Sheet

MA-INF 2313: Deep Learning for Visual Recognition

Presentation Dates: Mid-january, exact dates TBD

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1 Accessing the GPU Server - SSH

You can ssh from your linux, windows or macOS to get access to the server. You have to be within the Informatik network to get access to `teufelskapelle`. Students with SGN account can ssh into `zeus` and then ssh into `teufelskapelle`. Use the `'- C'` flag for a bit more responsive terminal.

```
user@somepc:~$ ssh -C your_uni_id@zeus.informatik.uni-bonn.de
ui@zeus:~$ ssh -XC groupname@teufelskapelle
groupname@teufelskapelle:~$ export CUDA_DEVICE_ORDER=PCI_BUS_ID; export
CUDA_VISIBLE_DEVICES=my_gpu_id; python mycode.py
```

It is advised to use Anaconda or Miniconda (more preferable option, saves disk space) to setup your code. You can navigate the file system using `thunar`. For cuda toolkit installations within Anaconda/Miniconda, please make sure the version you are installing is compatible with the driver version (currently at 418.87.01). Additionally, always use `tmux` to ensure that your code runs seamlessly in an event of terminated connection. If you issues with xauthority, try logging out and logging in. If the issue persists, please write us an email. `my_gpu_id` can be found on the drive document where you selected the gpu slots. Without `export CUDA_DEVICE_ORDER=PCI_BUS_ID`, your job might be assigned to different gpus. Occupying other gpus repeatedly will lead to a ban from the server.

2 Software Packages and Datasets

`teufelskapelle` comes with CUDA 9.0, CUDA 10.1 and cuDNN v6.0.21. The datasets can be found at `/home/data`. If you find any dataset missing, please email the tutor. Please refer to installation of other cuda toolkit versions and cudnn versions in the previous section.

```
user@teufelskapelle:~$ nvcc --version
nvcc:  NVIDIA (R) Cuda compiler driver
Copyright (c) 2005-2017 NVIDIA Corporation
Built on Fri_Sep__1_21:08:03_CDT_2017
Cuda compilation tools, release 9.0, V9.0.176
```

Caffe : Perform the following steps to install Caffe.

```
user@teufelskapelle:~$ cd ~/; git clone https://github.com/BVLC/caffe.git
user@teufelskapelle:~$ cd ~/caffe
user@teufelskapelle:~$ cp Makefile.config.example Makefile.config
user@teufelskapelle:~$ # Adjust Makefile.config, uncomment the USE_CUDNN:=1
user@teufelskapelle:~$ make all
user@teufelskapelle:~$ make test
user@teufelskapelle:~$ make runtest
```

If you receive the following error during ‘make all’, you can fix it by following the instructions provided here.

```
src/caffe/layers/hdf5_output_layer.cpp:3:18:  fatal error:  hdf5.h:  No such
file or directory
```

Torch : You can install Torch within your home directory by following the instructions here. The dependencies have been pre-installed so you can skip the `bash install-deps` step.

```
user@teufelskapelle:~$ git clone https://github.com/torch/distro.git
~/torch --recursive
user@teufelskapelle:~$ cd path-to-torch
user@teufelskapelle:~/my-torch-directory$
export PATH=/usr/local/cuda-9.0/bin:$PATH;
export LD_LIBRARY_PATH=/usr/local/cuda-9.0/lib64:$PATH;
export TORCH_NVCC_FLAGS="-D__CUDA_NO_HALF_OPERATORS__";
./install.sh./install.sh
user@teufelskapelle:~/my-torch-directory$ source ~/.bashrc
```

You can then install necessary packages using **luarocks**. If you receive the following error during installation, you can fix it by entering the following command (*should no longer be necessary*):

```
/pkgbuild/torch/torch/extra/cutorch/lib/THC/generic/THCTensorMath.cu(393):  
error: more than one operator "==" matches these operands:  
function "operator==(const __half &, const __half &)"  
function "operator==(half, half)"  
operand types are: half == half  
  
Solution: export TORCH_NVCC_FLAGS="-D__CUDA_NO_HALF_OPERATORS__"
```

Tensorflow, PyTorch & Theano: You can setup your preferred deep learning frameworks within your home directories using Anaconda/Miniconda. Make sure you install the GPU-enabled version. Always make sure that the library version you are using is compatible with your code (Tf2.0 can cause trouble).