链滴

矩池云上安装 caffe gpu 教程

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原文链接：https://ld246.com/article/1628058809414

来源网站：链滴

选用CUDA10.0镜像

添加nvidia-cuda和修改apt源

```
curl -fsSL https://mirrors.aliyun.com/nvidia-cuda/ubuntu1804/x86_64/7fa2af80.pub | apt-key add - && \
echo "deb https://mirrors.aliyun.com/nvidia-cuda/ubuntu1804/x86_64/ /" > /etc/apt/sources.list.d/cuda.list && \
bash /public/script/switch_apt_source.sh
```

```
(myconda) root@a688d840812b:/# curl -fsSL https://mirrors.aliyun.com/nvidia-cuda/ubuntu1804/x86_64/7fa2af80.pub | apt-key add - && \
> echo "deb https://mirrors.aliyun.com/nvidia-cuda/ubuntu1804/x86_64/ /" > /etc/apt/sources.list.d/cuda.list && \
> bash /public/script/switch_apt_source.sh
OK
请选择您要切换的源的数字编号，然后按回车
(0) 阿里云(aliyun)
(1) 中国科技大学(ustc)
(2) 163源(163)
(3) 清华大学(tsinghua)
(4) 浙江大学(zju)
(5) 腾讯云(tencent)
(6) 华为云(huawei)
6
写入apt镜像源完成
Ign:1 https://mirrors.aliyun.com/nvidia-cuda/ubuntu1804/x86_64  InRelease
Get:2 https://mirrors.aliyun.com/nvidia-cuda/ubuntu1804/x86_64  Release [697 B]
Get:3 https://mirrors.aliyun.com/nvidia-cuda/ubuntu1804/x86_64  Release.gpg [836 B]
Get:4 https://repo.huaweicloud.com/ubuntu bionic InRelease [242 kB]
```

安装curand

```
apt install cuda-curand-dev-10-0
```

修改conda源

```
bash /public/script/switch_conda_source.sh
```

```
(myconda) root@a688d840812b:/# bash /public/script/switch_conda_source.sh
请选择您要切换的源的数字编号，然后按回车
(0) 清华大学(tsinghua)
(1) 上海交通大学(sjtug)
(2) 北京外国语大学(bfsu)
(3) 南京大学(nju)
(4) 南京邮电大学(njupt)
(5) 重庆邮电大学(cqupt)
(6) 哈尔滨工业大学(hit)
2
写入conda镜像源完成
```

创建python3.7虚拟环境

```
conda create -n py37 python=3.7
conda deactivate
conda activate py37
```

```
(myconda) root@a688d840812b:/# conda create -n py37 python=3.7
Collecting package metadata (current_repodata.json): done
Solving environment: done

## Package Plan ##

  environment location: /root/miniconda3/envs/py37

  added / updated specs:
    - python=3.7


The following packages will be downloaded:

    package                    |            build
    ---------------------------|-----------------
    _libgcc_mutex-0.1          |             main           3 KB  defaults
     openmp_mutex-4.5          |            1_gnu          22 KB  defaults
(myconda) root@a688d840812b:/# conda deactivate
root@a688d840812b:/# conda activate py37
(py37) root@a688d840812b:/#
```

安装依赖包

apt-get -y install libboost-dev libprotobuf-dev libgflags-dev libgoogle-glog-dev libhdf5-dev l
bopencv-dev protobuf-c-compiler protobuf-compiler libopenblas-dev libhdf5-dev libleveldb
dev liblmdb-dev libboost-system-dev libboost-filesystem-dev libsnappy-dev libboost-thread
dev libatlas-base-dev libboost-python-dev

```
(py37) root@a688d840812b:/# apt-get -y install libboost-dev libprotobuf-dev libgflags-dev libgoogle-glog-dev libhdf5-dev libopencv-dev
ibleveldb-dev liblmdb-dev libboost-system-dev libboost-filesystem-dev libsnappy-dev libboost-thread-dev libatlas-base-dev libboost-pyth
Reading package lists... Done
Building dependency tree
Reading state information... Done
The following packages were automatically installed and are no longer required:
  dictionaries-common emacsen-common gconf-service gconf-service-backend gconf2 gconf2-common libart-2.0-2 libavahi-glib1 libbonobo2-0
  libglade2-0 libgnome-2-0 libgnome-keyring-common libgnome-keyring0 libgnome2-common libgnomecanvas2-0 libgnomecanvas2-common libgnome
  libjpeg-turbo-progs liborbit-2-0 miscfiles
Use 'apt autoremove' to remove them.
The following additional packages will be installed:
  dh-python gdal-data hdf5-helpers i965-va-driver javascript-common libaacs0 libaec-dev libarmadillo8 libarpack2 libatlas3-base libavco
  libavresample-dev libavresample3 libavutil-dev libavutil55 libbdplus0 libbluray2 libboost-atomic1.65-dev libboost-atomic1.65.1 libboo
  libboost-date-time1.65.1 libboost-filesystem1.65-dev libboost-filesystem1.65.1 libboost-python1.65-dev libboost-python1.65.1 libboost-
  libboost-system1.65-dev libboost-system1.65.1 libboost-thread1.65-dev libboost-thread1.65.1 libboost1.65-dev libcharls1 libchromaprin
  libdc1394-22-dev libepsilon1 libexif-dev libexif-doc libexif12 libexpat1-dev libfreexl1 libfyba0 libgdal20 libgdcm2-dev libgdcm2.8 lib
  libgl2ps1.4 libgme0 libgoogle-glog0v5 libgphoto2-6 libgphoto2-dev libgphoto2-l10n libgphoto2-port12 libgsm1 libhdf4-0-alt libhdf5-cpp-
  libjs-jquery libkmlbase1 libkmldom1 libkmlengine1 liblept5 libleveldb1v5 liblmdb0 liblzma-dev libminizip1 libmp3lame0 libmpg123-0 libn
  libopenblas-base libopencv-calib3d-dev libopencv-calib3d3.2 libopencv-contrib-dev libopencv-contrib3.2 libopencv-core-dev libopencv-c
  libopencv-flann-dev libopencv-flann3.2 libopencv-highgui-dev libopencv-highgui3.2 libopencv-imgcodecs-dev libopencv-imgcodecs3.2 libop
  libopencv-ml3.2 libopencv-objdetect-dev libopencv-objdetect3.2 libopencv-photo-dev libopencv-photo3.2 libopencv-shape-dev libopencv-sh
  libopencv-superres-dev libopencv-superres3.2 libopencv-ts-dev libopencv-video-dev libopencv-video3.2 libopencv-videoio-dev libopencv-v
  libopencv-viz-dev libopencv-viz3.2 libopencv3.2-java libopencv3.2-jni libopenexr-dev libopenexr22 libopenjp2-7 libopenmpt0 libpng-dev
```

添加nvidia-machine-learning软件源

curl -fsSL https://mirrors.cloud.tencent.com/nvidia-machine-learning/ubuntu1804/x86_64/7fa
af80.pub | apt-key add - && \
echo "deb https://mirrors.cloud.tencent.com/nvidia-machine-learning/ubuntu1804/x86_64/ /"
> /etc/apt/sources.list.d/cuda.list

```
(py37) root@a688d840812b:/# curl -fsSL https://mirrors.cloud.tencent.com/nvidia-machine-learning/ubuntu1804/x86_64/7fa2af80.pub | apt-key add - && \
> echo "deb https://mirrors.cloud.tencent.com/nvidia-machine-learning/ubuntu1804/x86_64/ /" > /etc/apt/sources.list.d/cuda.list
OK
```

安装剩余依赖包

apt update
apt install libnccl2=2.6.4-1+cuda10.0 libnccl-dev=2.6.4-1+cuda10.0
apt-get install -y --no-install-recommends libboost-all-dev
pip install boost
conda install opencv

```
(py37) root@a688d840812b:/# apt install libnccl2=2.6.4-1+cuda10.0 libnccl-dev=2.6.4-1+cuda10.0
Reading package lists... Done
Building dependency tree
Reading state information... Done
The following packages were automatically installed and are no longer required:
  dictionaries-common emacsen-common gconf-service gconf-service-backend gconf2 gconf2-common libart-2.
  libglade2-0 libgnome-2-0 libgnome-keyring-common libgnome-keyring0 libgnome2-common libgnomecanvas2-(
  libjpeg-turbo-progs liborbit-2-0 miscfiles
Use 'apt autoremove' to remove them.
The following NEW packages will be installed:
  libnccl-dev
The following held packages will be changed:
  libnccl2
The following packages will be upgraded:
  libnccl2
1 upgraded, 1 newly installed, 0 to remove and 151 not upgraded.
Need to get 46.5 MB of archives.
After this operation, 53.3 MB of additional disk space will be used.
Do you want to continue? [Y/n] 
```

git clone caffe仓库

git clone -b 1.0 --depth 1 https://github.com/BVLC/caffe.git
cd caffe
for req in $(cat python/requirements.txt); do pip install $req; done
cp Makefile.config.example Makefile.config

git clone -b 1.0 --depth 1 https://gitee.com/matpools/caffe.git

```
(py37) root@a688d840812b:/# cd caffe
(py37) root@a688d840812b:/caffe# for req in $(cat python/requirements.txt); do pip install $req; done
Looking in indexes: https://mirrors.aliyun.com/pypi/simple/
Collecting Cython>=0.19.2
  Downloading https://mirrors.aliyun.com/pypi/packages/3d/48/bbca549da0b0f636c0f161e84d30172c40aafe99552680f
     |████████████████████████████████| 2.0 MB 41.4 MB/s
Installing collected packages: Cython
```

查找对应路径

python -c "from distutils.sysconfig import get_python_inc; print(get_python_inc())"
python -c "import distutils.sysconfig as sysconfig; print(sysconfig.get_config_var('LIBDIR'))"

```
(py37) root@a688d840812b:/caffe# cp Makefile.config.example Makefile.config
(py37) root@a688d840812b:/caffe# python -c "from distutils.sysconfig import get_python_inc; print(get_python_inc())"
/root/miniconda3/envs/py37/include/python3.7m
(py37) root@a688d840812b:/caffe# python -c "import distutils.sysconfig as sysconfig; print(sysconfig.get_config_var('LIBDIR'))"
/root/miniconda3/envs/py37/lib
(py37) root@a688d840812b:/caffe#
```

(py37) root@a688d840812b:/caffe# python -c "from distutils.sysconfig import get_python_inc; print(get_python_inc())"
/root/miniconda3/envs/py37/include/python3.7m
(py37) root@a688d840812b:/caffe# python -c "import distutils.sysconfig as sysconfig; print(sysconfig.get_config_var('LIBDIR'))"
/root/miniconda3/envs/py37/lib

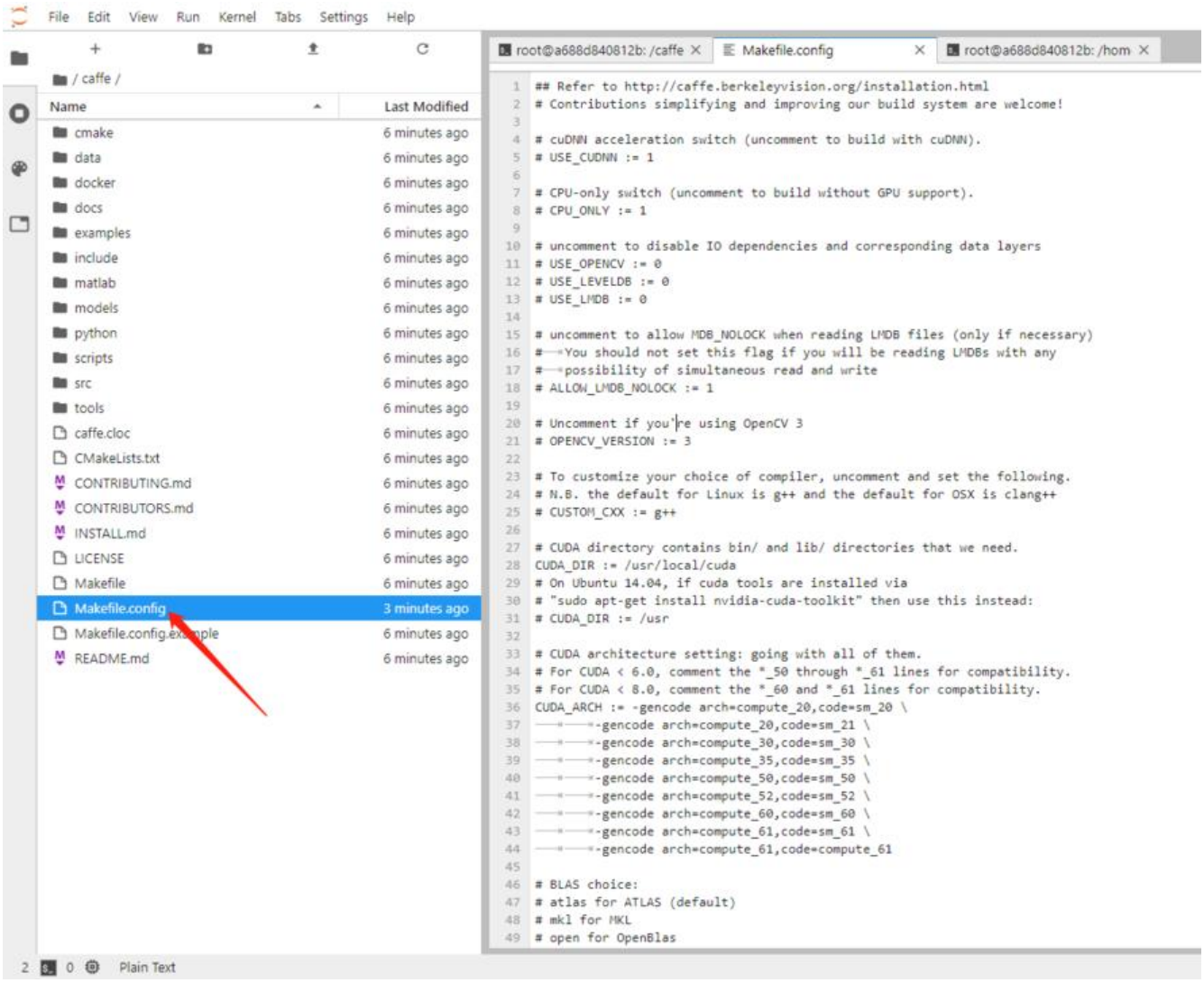
查找numpy路径

find /root/miniconda3/envs/py37/lib/ -name numpy

```
(py37) root@a688d840812b:/caffe# find /root/miniconda3/envs/py37/lib/ -name numpy
/root/miniconda3/envs/py37/lib/python3.7/site-packages/Cython/Includes/numpy
/root/miniconda3/envs/py37/lib/python3.7/site-packages/numpy
/root/miniconda3/envs/py37/lib/python3.7/site-packages/numpy/core/include/numpy
/root/miniconda3/envs/py37/lib/python3.7/site-packages/pandas/compat/numpy
```

(py37) root@a688d840812b:/caffe# find /root/miniconda3/envs/py37/lib/ -name numpy
/root/miniconda3/envs/py37/lib/python3.7/site-packages/numpy/core/include/numpy

如果也是cuda10纯镜像可以直接复制下面的文件，然后保存。



Refer to http://caffe.berkeleyvision.org/installation.html
Contributions simplifying and improving our build system are welcome!

cuDNN acceleration switch (uncomment to build with cuDNN).
USE_CUDNN := 1

CPU-only switch (uncomment to build without GPU support).
CPU_ONLY := 1

uncomment to disable IO dependencies and corresponding data layers
USE_OPENCV := 0
USE_LEVELDB := 0
USE_LMDB := 0

uncomment to allow MDB_NOLOCK when reading LMDB files (only if necessary)
You should not set this flag if you will be reading LMDBs with any
possibility of simultaneous read and write
ALLOW_LMDB_NOLOCK := 1

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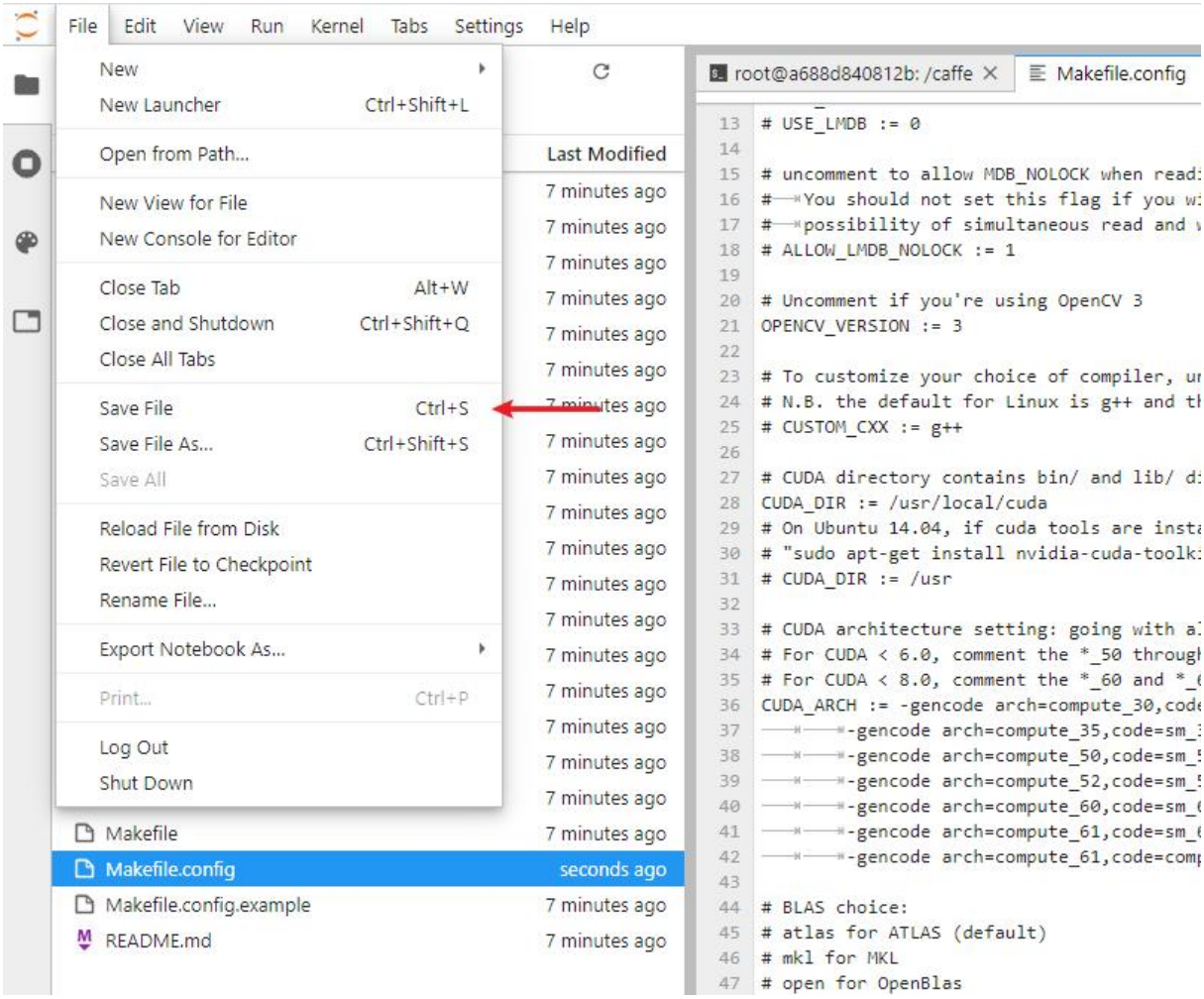
```
# Uncomment if you're using OpenCV 3
OPENCV_VERSION := 3

# To customize your choice of compiler, uncomment and set the following.
# N.B. the default for Linux is g++ and the default for OSX is clang++
# CUSTOM_CXX := g++

# CUDA directory contains bin/ and lib/ directories that we need.
CUDA_DIR := /usr/local/cuda
# On Ubuntu 14.04, if cuda tools are installed via
# "sudo apt-get install nvidia-cuda-toolkit" then use this instead:
# CUDA_DIR := /usr

# CUDA architecture setting: going with all of them.
# For CUDA < 6.0, comment the *_50 through *_61 lines for compatibility.
# For CUDA < 8.0, comment the *_60 and *_61 lines for compatibility.
CUDA_ARCH := -gencode arch=compute_30,code=sm_30 \
        -gencode arch=compute_35,code=sm_35 \
        -gencode arch=compute_50,code=sm_50 \
        -gencode arch=compute_52,code=sm_52 \
        -gencode arch=compute_60,code=sm_60 \
        -gencode arch=compute_61,code=sm_61 \
        -gencode arch=compute_61,code=compute_61

# BLAS choice:
# atlas for ATLAS (default)
# mkl for MKL
# open for OpenBlas
BLAS := atlas
# Custom (MKL/ATLAS/OpenBLAS) include and lib directories.
# Leave commented to accept the defaults for your choice of BLAS
# (which should work)!
# BLAS_INCLUDE := /path/to/your/blas
# BLAS_LIB := /path/to/your/blas

# Homebrew puts openblas in a directory that is not on the standard search path
# BLAS_INCLUDE := $(shell brew --prefix openblas)/include
# BLAS_LIB := $(shell brew --prefix openblas)/lib

# This is required only if you will compile the matlab interface.
# MATLAB directory should contain the mex binary in /bin.
# MATLAB_DIR := /usr/local
# MATLAB_DIR := /Applications/MATLAB_R2012b.app

# NOTE: this is required only if you will compile the python interface.
# We need to be able to find Python.h and numpy/arrayobject.h. 如果是自己弄需要改PYTHON_
NCLUDE
PYTHON_INCLUDE := /root/miniconda3/envs/py37/include/python3.7m \
        /root/miniconda3/envs/py37/lib/python3.7/site-packages/numpy/core/include
# /usr/include/python2.7 \
# /usr/lib/python2.7/dist-packages/numpy/core/include
# Anaconda Python distribution is quite popular. Include path:
# Verify anaconda location, sometimes it's in root.
```

```
# ANACONDA_HOME := $(HOME)/anaconda
# PYTHON_INCLUDE := $(ANACONDA_HOME)/include \
        # $(ANACONDA_HOME)/include/python2.7 \
        # $(ANACONDA_HOME)/lib/python2.7/site-packages/numpy/core/include

# Uncomment to use Python 3 (default is Python 2) 如果是自己弄需要改PYTHON_LIBRARIES
PYTHON_LIBRARIES := boost_python3 python3.7m
# PYTHON_INCLUDE := /usr/include/python3.5m \
#                 /usr/lib/python3.5/dist-packages/numpy/core/include

# We need to be able to find libpythonX.X.so or .dylib. 如果是自己弄需要改PYTHON_LIB
PYTHON_LIB := /root/miniconda3/envs/py37/lib
# PYTHON_LIB := $(ANACONDA_HOME)/lib

# Homebrew installs numpy in a non standard path (keg only)
# PYTHON_INCLUDE += $(dir $(shell python -c 'import numpy.core; print(numpy.core.__file__)
))/include
# PYTHON_LIB += $(shell brew --prefix numpy)/lib

# Uncomment to support layers written in Python (will link against Python libs)
# WITH_PYTHON_LAYER := 1

# Whatever else you find you need goes here.
INCLUDE_DIRS := $(PYTHON_INCLUDE) /usr/local/include /usr/include/hdf5/serial
LIBRARY_DIRS := $(PYTHON_LIB) /usr/local/lib /usr/lib /usr/lib/x86_64-linux-gnu/hdf5/serial /
sr/lib/x86_64-linux-gnu

# If Homebrew is installed at a non standard location (for example your home directory) and
ou use it for general dependencies
# INCLUDE_DIRS += $(shell brew --prefix)/include
# LIBRARY_DIRS += $(shell brew --prefix)/lib

# NCCL acceleration switch (uncomment to build with NCCL)
# https://github.com/NVIDIA/nccl (last tested version: v1.2.3-1+cuda8.0)
USE_NCCL := 1

# Uncomment to use `pkg-config` to specify OpenCV library paths.
# (Usually not necessary -- OpenCV libraries are normally installed in one of the above $LIBR
RY_DIRS.)
# USE_PKG_CONFIG := 1

# N.B. both build and distribute dirs are cleared on `make clean`
BUILD_DIR := build
DISTRIBUTE_DIR := distribute

# Uncomment for debugging. Does not work on OSX due to https://github.com/BVLC/caffe/i
sues/171
# DEBUG := 1

# The ID of the GPU that 'make runtest' will use to run unit tests.
TEST_GPUID := 0

# enable pretty build (comment to see full commands)
Q ?= @
```



开始编译

```
make clean
make all -j6
make clean
make pycaffe -j6
```

设置环境变量

```
export PYTHONPATH=/caffe/python/:$PYTHONPATH
export LD_LIBRARY_PATH=$LD_LIBRARY_PATH:/root/miniconda3/envs/py37/lib
```

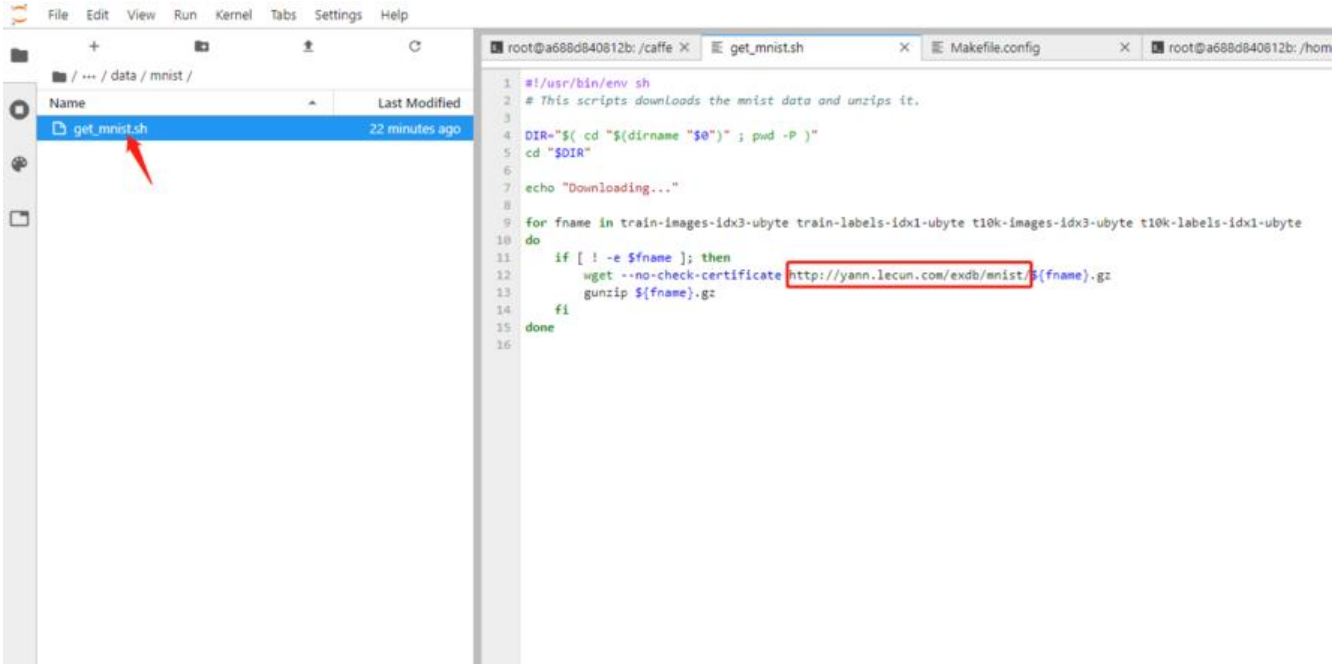
使用ipython环境测试

```
ipython

import caffe
caffe.set_mode_gpu()
caffe.__version__
```

原文链接：矩池云上安装 caffe gpu 教程

```
(py37) root@a688d840812b:/caffe# export PYTHONPATH=/caffe/python/:$PYTHONPATH
(py37) root@a688d840812b:/caffe# export LD_LIBRARY_PATH=$LD_LIBRARY_PATH:/root/miniconda3/envs/py37/lib
(py37) root@a688d840812b:/caffe# ipython
Python 3.7.11 (default, Jul 27 2021, 14:32:16)
Type 'copyright', 'credits' or 'license' for more information
IPython 7.26.0 -- An enhanced Interactive Python. Type '?' for help.

In [1]: import caffe
   ...:

In [2]: caffe.set_mode_gpu()

In [3]: caffe.__version__
   ...:
Out[3]: '1.0.0'

In [4]:
```

使用官方examples测试




```
#!/usr/bin/env sh
# This scripts downloads the mnist data and unzips it.

DIR="$( cd "$(dirname "$0")" ; pwd -P )"
cd "$DIR"

echo "Downloading..."

for fname in train-images-idx3-ubyte train-labels-idx1-ubyte t10k-images-idx3-ubyte t10k-la
els-idx1-ubyte
do
    if [ ! -e $fname ]; then
        wget --no-check-certificate https://storage.googleapis.com/cvdf-datasets/mnist/${fname
.gz
        gunzip ${fname}.gz
    fi
done

./data/mnist/get_mnist.sh
./examples/mnist/create_mnist.sh
```

./examples/mnist/train_lenet.sh

nvidia-smi -l 5

```
+-----------------------------------------------------------------------------+
| Processes:                                                       GPU Memory |
|  GPU       PID   Type   Process name                             Usage      |
|=============================================================================|
+-----------------------------------------------------------------------------+
Tue Aug  3 05:19:36 2021
+-----------------------------------------------------------------------------+
| NVIDIA-SMI 440.64       Driver Version: 440.64       CUDA Version: 10.2     |
|-------------------------------+----------------------+----------------------+
| GPU  Name        Persistence-M| Bus-Id        Disp.A | Volatile Uncorr. ECC |
| Fan  Temp  Perf  Pwr:Usage/Cap|         Memory-Usage | GPU-Util  Compute M. |
|===============================+======================+======================|
|   0  GeForce RTX 2080    On   | 00000000:85:00.0 Off |                  N/A |
| 41%   34C    P2   118W / 215W |    735MiB /  7982MiB |     68%      Default |
+-------------------------------+----------------------+----------------------+

+-----------------------------------------------------------------------------+
| Processes:                                                       GPU Memory |
|  GPU       PID   Type   Process name                             Usage      |
|=============================================================================|
+-----------------------------------------------------------------------------+
```

参考文章

https://hub.docker.com/r/floydhub/caffe/tags?page=1&ordering=last_updated

https://github.com/tensorflow/datasets/blob/master/tensorflow_datasets/url_checksums/mnist.txt

https://www.cnblogs.com/laosan007/p/11737704.html

https://blog.csdn.net/u010417185/article/details/53559107

https://github.com/BVLC/caffe/issues/720

https://github.com/BVLC/caffe/issues/263

https://github.com/BVLC/caffe/issues/6063

https://github.com/BVLC/caffe/issues/4843#issue-182962618

https://blog.csdn.net/xuezhisdc/article/details/48707101