# ubuntu 开发环境多版本CUDA管理

## 原理:

I. 系统默认CUDA版本由PATH变量决定;
II. anaconda环境激活或推出时会自动执行特定位置的脚本（具体位置请参考操作步骤）;
III. cudnn 及其他CUDA库文件是从LD_LIBRARY_PATH中的路径去寻找的;

IV. cmake 会根据以下两个环境变量的值来寻找CUDA:

```
CUDA_BIN_PATH
CUDA_TOOLKIT_ROOT_DIR
```

## 操作步骤:

1 。以下称本机原有CUDA为原始CUDA，假定对cuda_x_env环境进行操作，以切换为cuda10.1为例
2 。新装的CUDA都称为备选CUDA，备选CUDA中按需安装cudnn
3 。安装anaconda管理python 版本
4 。使用anaconda创建供备选CUDA使用的环境，指定好python版本，而后进行如下重要操作:

### a.激活备选环境;

### b.创建激活该环境时需要运行的脚本:

```
mkdir -p
/home/username/.conda/envs/cuda_x_env/etc/conda/activate.d
gedit
/home/username/.conda/envs/cuda_x_env/etc/conda/activate.d
/activate.sh
chmod +x
/home/username/.conda/envs/cuda_x_env/etc/conda/activate.d
/activate.sh
```

以下为该激活脚本内容：(使得该环境激活时自动激活CUDA-10.1)

```
sh
ORIGINAL_PATH=$PATH
ORIGINAL_LD_LIBRARY_PATH=$LD_LIBRARAY_PATH
ORIGINAL_CUDA_BIN_PATH=$CUDA_BIN_PATH
ORIGINAL_CUDA_TOOLKIT_ROOT_DIR=$CUDA_TOOLKIT_ROOT_DIR
export
PATH=/home/iron/anaconda2/envs/face/bin:/usr/local/matlab2
017b/bin:/usr/local/ffmpeg/bin/:/usr/lib/jvm/java-1.8.0-
openjdk-amd64/jre/bin:/usr/local/cuda-
10.1/bin:/home/iron/anaconda2/bin:/usr/local/nvidia/bin:/u
sr/local/opencv-
3.1.0/bin:/usr/local/matlab2017b/bin:/usr/local/ffmpeg/bin
/:/usr/lib/jvm/java-1.8.0-openjdk-
amd64/jre/bin:/usr/local/cuda-
8.0/bin:/home/iron/anaconda2/bin:/usr/local/nvidia/bin:/us
r/local/opencv-
3.1.0/bin:/usr/local/matlab2017b/bin:/usr/local/ffmpeg/bin
/:/usr/lib/jvm/java-1.8.0-openjdk-
amd64/jre/bin:/usr/local/cuda-
8.0/bin:/home/iron/anaconda2/bin:/usr/local/nvidia/bin:/us
r/local/opencv-
3.1.0/bin:/usr/local/matlab2017b/bin:/home/iron/bin:/home/
iron/.local/bin:/usr/local/sbin:/usr/local/bin:/usr/sbin:/
usr/bin:/sbin:/bin:/usr/games:/usr/local/games:/snap/bin
export LD_LIBRARY_PATH=/usr/local/cuda-
10.1/lib64:/usr/local/lib:/home/iron/zmq/lib:/usr/lib:/hom
e/iron/tiff-4.0.4/libtiff:/usr/local/opencv-
3.1.0/lib:/usr/local/lib/x86_64-linux-
gnu:/home/iron/anaconda2/lib:/home/iron/ffmpeg/lib:/data/T
ensorRT-
6.0.1.5/lib:/usr/local/pcre/lib:/usr/local/zlib/lib:/usr/l
ocal/openssl/lib
export CUDA_BIN_PATH=/usr/local/cuda-10.1
export CUDA_TOOLKIT_ROOT_DIR=/usr/local/cuda-10.1
```

*以上为PATH 和 LD_LIBRARY_PATH 所赋的值是跟你想要的CUDA相对应，获得这些值的步骤如下:

```
echo $PATH
echo $LD_LIBRARY_PATH
echo $CUDA_BIN_PATH
echo $CUDA_TOOLKIT_ROOT_DIR
```

执行这两条命令可以获得系统现在的PATH 和LD_LIBRARY_PATH值，修改其中CUDA相关的路径即可写入上述脚本中

**c.创建退出该环境需要运行的脚本:**

```
mkdir -p
/home/username/.conda/envs/cuda_x_env/etc/conda/deactivate
.d
gedit
/home/username/.conda/envs/cuda_x_env/etc/conda/deactivate
.d/deactivate.sh
chmod +x gedit
/home/username/.conda/envs/cuda_x_env/etc/conda/deactivate
.d/deactivate.sh
```

以下是该退出脚本内容：（使得退出该环境是自动切换回原始CUDA）：

```
export PATH=$ORIGINAL_PATH
export LD_LIBRARY_PATH=$ORIGINAL_LD_LIBRARY_PATH
export CUDA_BIN_PATH=$ORIGINAL_CUDA_BIN_PATH
export
CUDA_TOOLKIT_ROOT_DIR=$ORIGINAL_CUDA_TOOLKIT_ROOT_DIR
unset ORIGINAL_PATH
unset ORIGINAL_LD_LIBRARY_PATH
unset ORIGINAL_CUDA_BIN_PATH
unset ORIGINAL_CUDA_TOOLKIT_ROOT_DIR
```