1. find out CC compatibility

```
compute capability 8.6

look inside cmake/OpenCVDetectCUDA.cmake

and search for "8.6"

seems that will probably need opencv 4.5
```

2. build script for opencv 4.5

https://gist.github.com/raulqf/f42c718a658cddc16f9df07ecc627be7

3. adapt to our system

`-D CUDA_ARCH_BIN=8.6` according to the build gist

`-D CUDNN_VERSION=8.0` https://forums.developer.nvidia.com/t/opencv-building-with-cuda-cudnn-no-cudnn/174228/15

```
-D CUDNN_INCLUDE_DIR=/usr/local/cuda/include
-D CUDNN_LIBRARY=/usr/local/cuda/lib64/libcudnn.so
```

https://github.com/opencv/opencv/issues/15892#issuecomment-587418205

4. customized cmake flags

```
cmake -D CMAKE_BUILD_TYPE=RELEASE \
-D CMAKE_INSTALL_PREFIX=/usr/local \
-D WITH_TBB=ON \
-D ENABLE_FAST_MATH=1 \
-D CUDA_FAST_MATH=1 \
-D WITH_CUBLAS=1 \
-D WITH_CUDA=ON \
-D BUILD_opencv_cudacodec=OFF \
-D WITH_CUDNN=ON \
-D OPENCV_DNN_CUDA=ON \
-D CUDA_ARCH_BIN=8.6 \
-D WITH_V4L=ON \
-D WITH_QT=OFF \
-D WITH_OPENGL=ON \
-D WITH_GSTREAMER=ON \
```

```
-D OPENCV_GENERATE_PKGCONFIG=ON \
-D OPENCV_PC_FILE_NAME=opencv.pc \
-D OPENCV_ENABLE_NONFREE=ON \
-D OPENCV_PYTHON3_INSTALL_PATH=~/.virtualenvs/cv/lib/python3.8/site-pack
-D PYTHON_EXECUTABLE=~/.virtualenvs/cv/bin/python \
-D OPENCV_EXTRA_MODULES_PATH=~/Downloads/opencv_contrib-4.5.2/modules \
-D INSTALL_PYTHON_EXAMPLES=OFF \
-D INSTALL_C_EXAMPLES=OFF \
-D BUILD_EXAMPLES=OFF \
-D CUDNN_VERSION=8.0 \
-D CUDNN_INCLUDE_DIR=/usr/local/cuda/include \
-D CUDNN_LIBRARY=/usr/local/cuda/lib64/libcudnn.so ..
```

5. time consumption

the program took around `8 min` to compile.

the program might take twice as long to compile (i.e. `16 min`) first time

6. testing

try `nvidia-smi` to see if yoou need to restart.

follow the test in build script to see if errors.