Tutorial to train HARR CASCADE

0. Preface

This Doc to teach how to train a customized Cascade

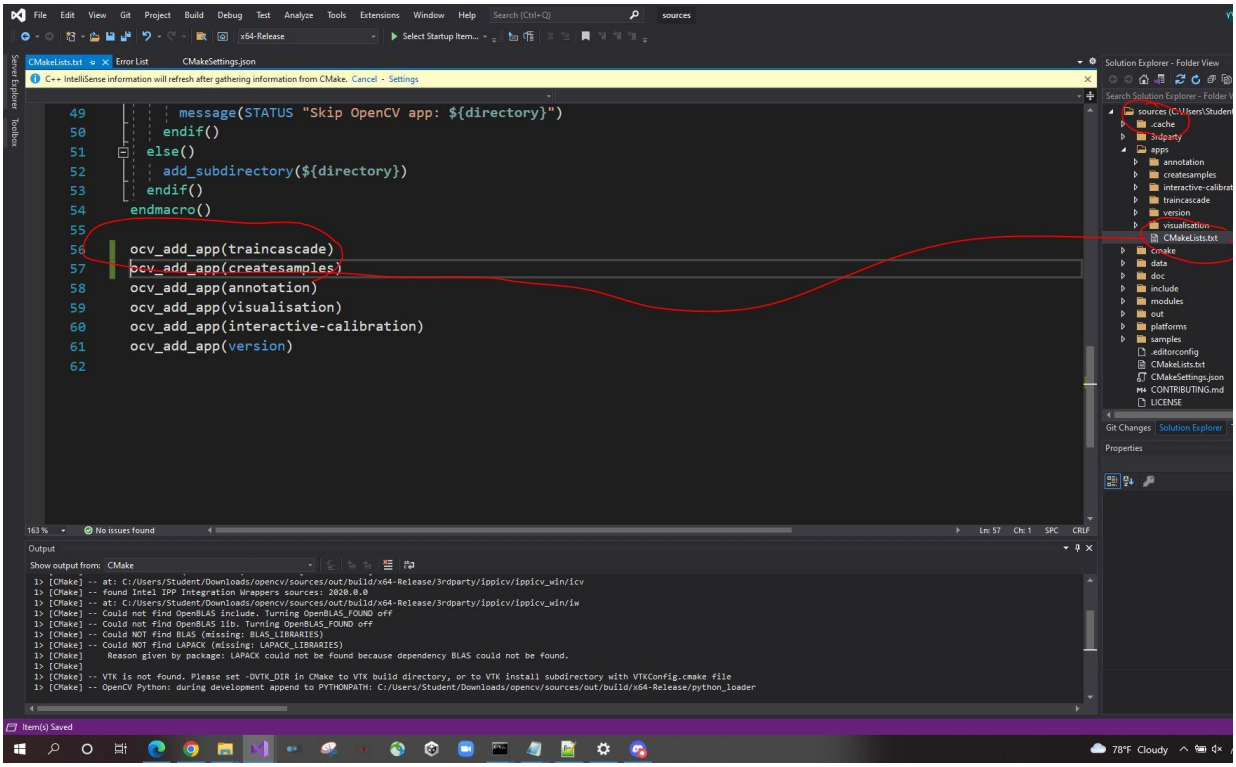
1. Intro

Train tools are only available in OpenCV 3.X ….bunch of errors in OpenCV 4.X no one is maintaining it.

https://github.com/opencv/opencv/issues/13609

https://docs.opencv.org/3.4/dc/d88/tutorial_traincascade.html

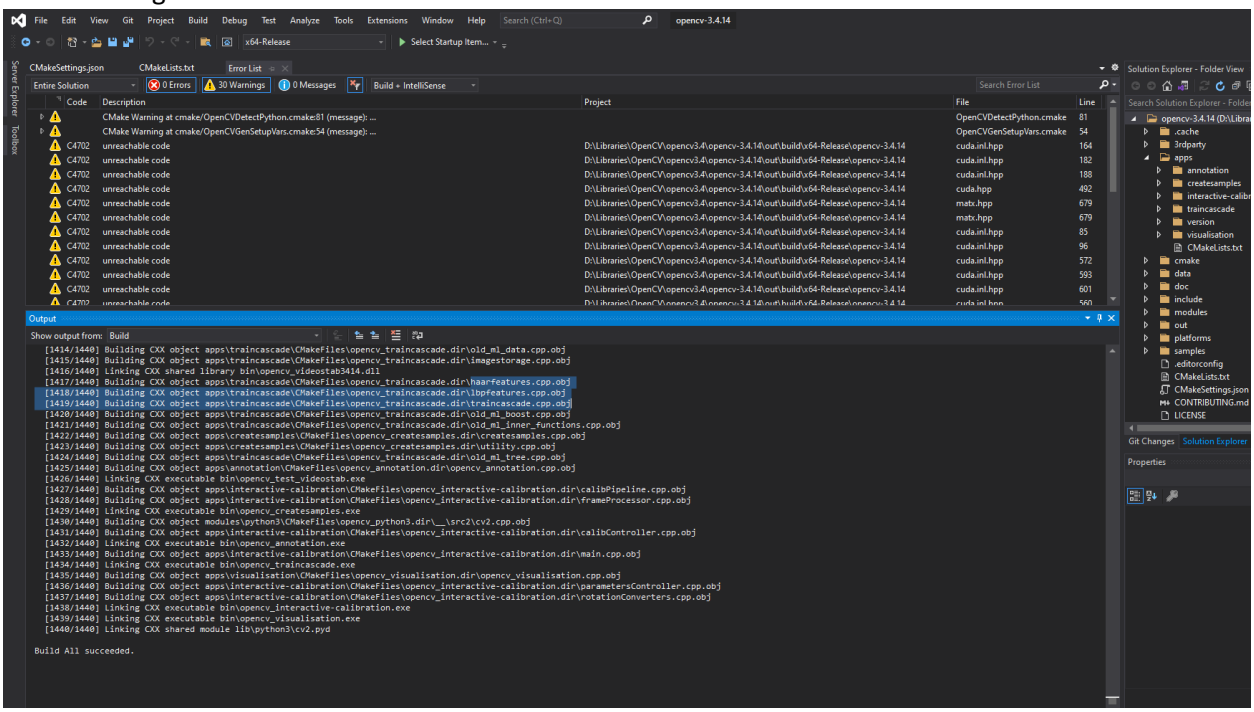
In the OpenCV 4.X these two tools are commented

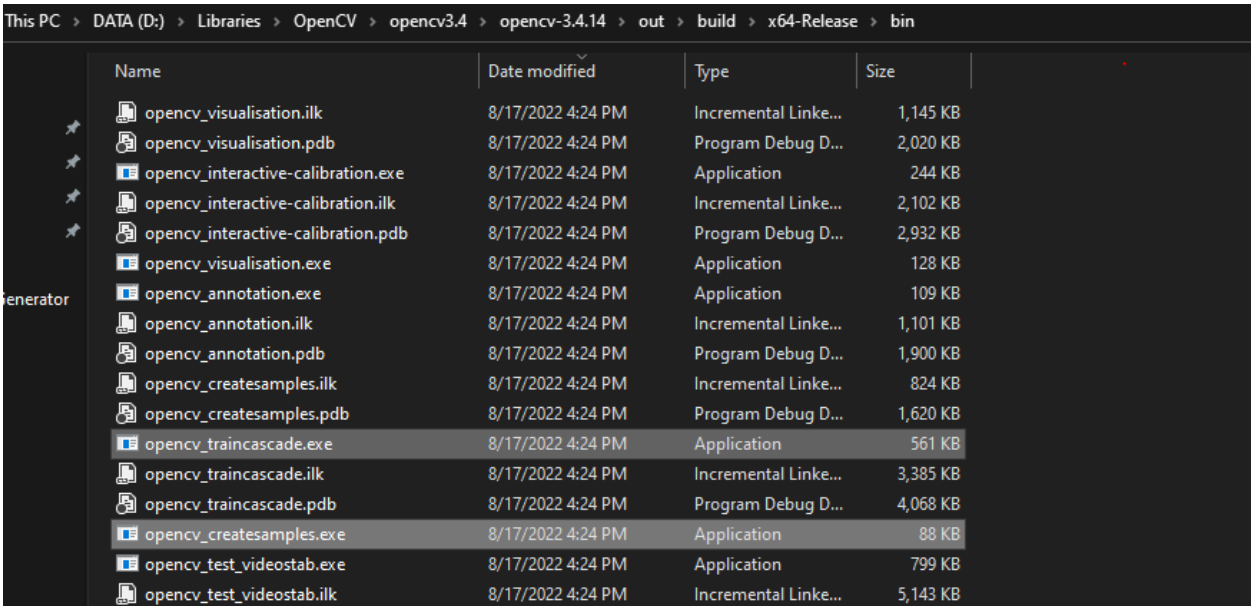


In this Doc, opencv-3.4.14 will be used. Built with MS visual studio.

If you have OpenCV source project folder, you might find the pre-trained xml and the source for the models.

2. After building with release mode





3. Prepare the data
   there is a need to prepare the negative data:
   the images do not contain the interested target objects in it.
   for instance, images not containing the face if the target object is the face.
   in this case, neg will use botany flower plants
   https://data.mendeley.com/datasets/hb74ynkjcn/1
   https://www.kaggle.com/datasets/amandam1/healthy-vs-diseased-leaf-image-dataset?resource=download

https://www.kaggle.com/datasets/lprdosmil/segmented-nature?resource=download
https://www.kaggle.com/datasets/arjuntyagi25/satellite-images
https://www.kaggle.com/datasets/hubinb/cityimage

4. cut the face area and apply the Gaussian blur and noise and save it into another folder. And then aggregate them into a opencv binary vec for haar training.
   actually it is ok the pos images are not in grayscale, it can read into
   as
   in utility.cpp of createsamples
   line 1131 around
   src = imread(fullname, IMREAD_GRAYSCALE);

   there is an example “opencv3.4\opencv-3.4.14\data\vec_files”

>opencv_createsamples.exe -vec test9.vec -info info.dat -w 240 -h 300 –num 100 –show TRUE

```
D:\Program Files\opencv\OpenCV3.4ReleaseX64>opencv_createsamples.exe -vec test6.vec -info info.dat -w 40 -h 40 -num 300 -show TRUE
Info file name: info.dat
Img file name: (NULL)
Vec file name: test6.vec
BG  file name: (NULL)
Num: 300
BG color: 0
BG threshold: 80
Invert: FALSE
Max intensity deviation: 40
Max x angle: 1.1
Max y angle: 1.1
Max z angle: 0.5
Show samples: TRUE
Scale: 4
Width: 40
Height: 40
Max Scale: -1
RNG Seed: 12345
Create training samples from images collection...
Done. Created 300 samples
```

opencv_createsamples.exe -vec test4.vec -info info.dat -w 240 -h 300 -num 100 -show TRUE -maxscale 2

opencv_createsamples.exe -vec test8.vec -info info.dat -w 24 -h 30 –num 100 –show TRUE

opencv_createsamples.exe -vec test7.vec -info info.dat -w 60 -h 75 –num 30 –show TRUE

opencv_createsamples.exe -vec test6.vec -info info.dat -w 40 -h 40 –num 300 –show TRUE

opencv_traincascade.exe -data data -vec test4.vec -bg bg.txt -numPos 100 -numNeg 28 -numStages 5 -w 240 -h 300

opencv_traincascade.exe -data data -vec test8.vec -bg bg.txt -numPos 100 -numNeg 28 -numStages 5 -w 24 -h 30

opencv_traincascade.exe -data data -vec test7.vec -bg bg.txt -numPos 30 -numNeg 28 -numStages 5 -w 60 -h 75 –maxDepth 1 –maxFalseAlarmRate 1

opencv_traincascade.exe -data data -vec test6.vec -bg bg.txt -numPos 300 -numNeg 280 -numStages 5 -w 40 –h 40

try **square** and smaller.

error experience:

1. with 240 w * 300 h, opencv_createsamples.exe can pull through, but opencv_traincascade.exe outputs nothing, no printing out in command line or any files out on the hard drive and memory leaking or content swap a lot, may crash the windows system, since huge memory allocation for this parameter

2. with 24 w * 30 h or 5 -w 60 -h 75

```
D:\Program Files\opencv\OpenCV3.4ReleaseX64>opencv_traincascade.exe -data data -vec test7.vec -bg bg.txt -numPos 30 -numNeg 28 -numStages 5 -w 60 -h 75 -maxDepth 1 -maxFalseAlarmRate 0
PARAMETERS:
cascadeDirName: data
vecFileName: test7.vec
bgFileName: bg.txt
numPos: 30
numNeg: 28
numStages: 5
precalcValBufSize[Mb] : 1024
precalcIdxBufSize[Mb] : 1024
acceptanceRatioBreakValue : -1
stageType: BOOST
featureType: HAAR
sampleWidth: 60
sampleHeight: 75
boostType: GAB
minHitRate: 0.995
maxFalseAlarmRate: 0
weightTrimRate: 0.95
maxDepth: 1
maxWeakCount: 100
mode: BASIC
Number of unique features given windowSize [60,75] : 9777630

===== TRAINING 0-stage =====
<BEGIN
POS count : consumed   30 : 30
Train dataset for temp stage can not be filled. Branch training terminated.
Cascade classifier can't be trained. Check the used training parameters.

D:\Program Files\opencv\OpenCV3.4ReleaseX64>opencv_traincascade.exe -data data -vec test7.vec -bg bg.txt -numPos 30 -numNeg 28 -numStages 5 -w 60 -h 75 -maxDepth 1 -maxFalseAlarmRate 0
```

3. square

```
D:\Program Files\opencv\OpenCV3.4ReleaseX64>opencv_traincascade.exe -data data -vec test6.vec -bg bg.txt -numPos 300 -numNeg 28 -numStages 5 -w 40 -h 40
PARAMETERS:
cascadeDirName: data
vecFileName: test6.vec
bgFileName: bg.txt
numPos: 300
numNeg: 28
numStages: 5
precalcValBufSize[Mb] : 1024
precalcIdxBufSize[Mb] : 1024
acceptanceRatioBreakValue : -1
stageType: BOOST
featureType: HAAR
sampleWidth: 40
sampleHeight: 40
boostType: GAB
minHitRate: 0.995
maxFalseAlarmRate: 0.5
weightTrimRate: 0.95
maxDepth: 1
maxWeakCount: 100
mode: BASIC
Number of unique features given windowSize [40,40] : 1242400

===== TRAINING 0-stage =====
<BEGIN
POS count : consumed   300 : 300
Train dataset for temp stage can not be filled. Branch training terminated.
Cascade classifier can't be trained. Check the used training parameters.

D:\Program Files\opencv\OpenCV3.4ReleaseX64>
```

4.

```
D:\Program Files\opencv\OpenCV3.4ReleaseX64>opencv_traincascade.exe -data data -vec test6.vec -bg
 bg.txt -numPos 300 -numNeg 280 -numStages 5 -w 40 -h 40
PARAMETERS:
cascadeDirName: data
vecFileName: test6.vec
bgFileName: bg.txt
numPos: 300
numNeg: 280
numStages: 5
precalcValBufSize[Mb] : 1024
precalcIdxBufSize[Mb] : 1024
acceptanceRatioBreakValue : -1
stageType: BOOST
featureType: HAAR
sampleWidth: 40
sampleHeight: 40
boostType: GAB
minHitRate: 0.995
maxFalseAlarmRate: 0.5
weightTrimRate: 0.95
maxDepth: 1
maxWeakCount: 100
mode: BASIC
Number of unique features given windowSize [40,40] : 1242400

===== TRAINING 0-stage =====
<BEGIN
POS count : consumed   300 : 300
NEG count : acceptanceRatio    280 : 1
Precalculation time: 6.793
+----+---------+---------+
|  N |    HR   |    FA   |
+----+---------+---------+
|   1|        1|        0|
+----+---------+---------+
END>
Training until now has taken 0 days 0 hours 0 minutes 28 seconds.

===== TRAINING 1-stage =====
<BEGIN
POS count : consumed   300 : 300
NEG count : acceptanceRatio    0 : 0
Required leaf false alarm rate achieved. Branch training terminated.

D:\Program Files\opencv\OpenCV3.4ReleaseX64>
D:\Program Files\opencv\OpenCV3.4ReleaseX64>
D:\Program Files\opencv\OpenCV3.4ReleaseX64>
```