

**Different parameters and data were tried during the training to create cascade xml files. The files were tested locally on training dataset and the best one was selected **

1. Some processing in the .txt file were done to work with google colab.
2. Training data was uploaded on drive and connected to colab.
3. Testing of model was done locally.

```
import os
from os import listdir
from os.path import isfile, join
import shutil
```

Double-click (or enter) to edit

```
import matplotlib.pyplot as plt
import cv2
```

```
!unzip /content/combine_data_for_colab_friday.zip
```

#changing details in txt files

```
file1 = open("/content/data2/pos2.txt", "rt")
file2 = open("/content/data2/pos22.txt", "wt")

temp = "posFinal/"
for line in file1:
    kk = line.split('.jpg')

    ver = kk[0].split('/')
    nam = ver[9]
    lol = temp+ver[9]+' .jpg 1 0 0 50 50\n'
    # print(lol)
    file2.write(lol)
file1.close()
file2.close()
```

#changing negative files

```
file1 = open("/content/data2/neg2.txt", "rt")
file2 = open("/content/data2/neg22.txt", "wt")

temp = "/content/data2/negFinal/"
for line in file1:
    kk = line.split('.jpg')

    ver = kk[0].split('/')
    nam = ver[9]
```

```
lol = temp+ver[9]+' .jpg\n'
# print(lol)
file2.write(lol)
file1.close()
file2.close()
```

```
#create samples
```

```
!opencv_createsamples -info /content/data2/pos22.txt -num 280 -w 24 -h 24 -
```

```
Info file name: /content/data2/pos22.txt
Img file name: (NULL)
Vec file name: /content/data2/vectorf.vec
BG file name: (NULL)
Num: 280
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: FALSE
Width: 24
Height: 24
Max Scale: -1
Create training samples from images collection...
/content/data2/pos22.txt(81) : parse errorDone. Created 80 samples
```

```
#training cascade
```

```
'_traincascade'-data-/content/data2/cascade'-vec-/content/data2/vectorf.vec'
```

```
POS count : consumed    78 : 78
NEG count : acceptanceRatio    100 : 0.00995718
Precalculation time: 1
```

```
+-----+-----+-----+
|  N  |      HR      |      FA      |
+-----+-----+-----+
|  1  |          1  |          1  |
+-----+-----+-----+
|  2  |          1  |       0.12  |
+-----+-----+-----+
```

```
END>
```

```
Training until now has taken 0 days 0 hours 0 minutes 9 seconds.
```

```
===== TRAINING 3-stage =====
```

```
<BEGIN
```

```
POS count : consumed    78 : 78
```

```
POS count : consumed    78 : 78
```

```
NEG count : acceptanceRatio    100 : 0.00253197
```

```
Precalculation time: 1
```

```
+-----+-----+-----+
|  N  |      HR   |      FA   |
+-----+-----+-----+
|   1 |          1 |          1 |
+-----+-----+-----+
|   2 |          1 |          1 |
+-----+-----+-----+
|   3 |          1 |         0.12|
+-----+-----+-----+
```

```
END>
```

```
Training until now has taken 0 days 0 hours 0 minutes 13 seconds.
```

```
===== TRAINING 4-stage =====
```

```
<BEGIN
```

```
POS count : consumed    78 : 78
```

```
NEG count : acceptanceRatio    100 : 0.000487389
```

```
Precalculation time: 2
```

```
+-----+-----+-----+
|  N  |      HR   |      FA   |
+-----+-----+-----+
|   1 |          1 |          1 |
+-----+-----+-----+
|   2 |          1 |         0.09|
+-----+-----+-----+
```

```
END>
```

```
Training until now has taken 0 days 0 hours 0 minutes 17 seconds.
```

```
===== TRAINING 5-stage =====
```

```
<BEGIN
```

```
POS count : consumed    78 : 78
```

```
NEG count : acceptanceRatio     1 : 0.00012207
```

```
Required leaf false alarm rate achieved. Branch training terminated.
```

```
!rm -r /content/data2/cascade
!mkdir /content/data2/cascade
# !mkdir /content/data2/results
```

```
!opencv_visualisation --image=/content/data2/posFinal/frame2175.jpg --model
```

```
Unable to init server: Could not connect: Connection refused
```

```
(features:716): Gtk-WARNING **: 16:01:07.695: cannot open display:
```

```
!unzip data3.zip
```

```
file1 = open("/content/data3/trainingDataDL/positive2.txt","rt")
file2 = open("/content/data3/trainingDataDL/positive22.txt", "wt")

temp = "positive/"
for line in file1:
    kk = line.split('.jpg')

    ver = kk[0].split('/')
    # nam = ver[len(ver)-1]
    lol = temp+ver[len(ver)-1]+'.jpg 1 0 0 50 50\n'
    # print(lol)
    file2.write(lol)
file1.close()
file2.close()
```

```
file1 = open("/content/data3/trainingDataDL/negative2.txt","rt")
file2 = open("/content/data3/trainingDataDL/negative22.txt", "wt")

temp = "/content/data3/trainingDataDL/negative/"
for line in file1:
    kk = line.split('.jpg')

    ver = kk[0].split('/')
    nam = ver[len(ver)-1]
    lol = temp+ver[len(ver)-1]+'.jpg\n'
    # print(lol)
    file2.write(lol)
file1.close()
file2.close()
```

```
!opencv_createsamples -info /content/data3/trainingDataDL/positive22.txt -n
```

```
Info file name: /content/data3/trainingDataDL/positive22.txt
Img file name: (NULL)
Vec file name: /content/data3/vectorf.vec
BG file name: (NULL)
Num: 700
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: FALSE
Width: 24
Height: 24
Max Scale: -1
```

Create training samples from images collection...
/content/data3/trainingDataDL/positive22.txt(171) : parse errorDone. Cr

```
!rm -r /content/data3/cascade
!mkdir /content/data3/cascade
# !mkdir /content/data2/results
```

```
!opencv_traincascade -data /content/data3/cascade -vec /content/data3/vectorf.vec
```

```
PARAMETERS:
cascadeDirName: /content/data3/cascade
vecFileName: /content/data3/vectorf.vec
bgFileName: /content/data3/trainingDataDL/negative22.txt
numPos: 170
numNeg: 520
numStages: 10
precalcValBufSize[Mb] : 5000
precalcIdxBufSize[Mb] : 5000
acceptanceRatioBreakValue : -1
stageType: BOOST
featureType: HAAR
sampleWidth: 24
sampleHeight: 24
boostType: GAB
minHitRate: 0.999
maxFalseAlarmRate: 0.3
weightTrimRate: 0.95
maxDepth: 1
maxWeakCount: 100
mode: BASIC
Number of unique features given windowSize [24,24] : 162336
```

===== TRAINING 0-stage =====

<BEGIN

POS count : consumed 170 : 170

NEG count : acceptanceRatio 520 : 1

Precalculation time: 6

+-----+-----+-----+-----+			
N	HR	FA	
+-----+-----+-----+-----+			
1	1	1	
+-----+-----+-----+-----+			
2	1	1	
+-----+-----+-----+-----+			
3	1	0.163462	
+-----+-----+-----+-----+			

END>

Training until now has taken 0 days 0 hours 0 minutes 16 seconds.

===== TRAINING 1-stage =====

<BEGIN

POS count : consumed 170 : 170

NEG count : acceptanceRatio 520 : 0.210782

Precalculation time: 6

+	-----	+	-----	+	-----	+
	N		HR		FA	
+	-----	+	-----	+	-----	+
	1		1		1	
+	-----	+	-----	+	-----	+
	2		1		1	

```
!zip -r lol.zip /content/data3
```

```
!opencv_visualisation --image=/content/neww.jpg --model=/content/data3/casc
```

Unable to init server: Could not connect: Connection refused

(features:1239): Gtk-**WARNING** **: 17:08:31.698: cannot open display:

```
import cv2
```

```
img = cv2.imread("17.jpg")
```

```
kk = cv2.resize(img, (0, 0), fx = 0.1, fy = 0.1)
```

```
kk = cv2.cvtColor(kk, cv2.COLOR_BGR2GRAY)
```

```
!mkdir data
```

```
!rm -r /content/data3/cascade  
!mkdir /content/data3/cascade  
# !mkdir /content/data2/results
```

```
# !opencv_traincascade -data /content/content/data3/cascade -vec /content/c  
!opencv_traincascade -data /content/data3/cascade -vec /content/data3/vecto
```

PARAMETERS:

cascadeDirName: /content/data3/cascade
vecFileName: /content/data3/vectorf.vec
bgFileName: /content/data3/trainingDataDL/negative22.txt
numPos: 170
numNeg: 700
numStages: 6
precalcValBufSize[Mb] : 5000
precalcIdxBufSize[Mb] : 5000
acceptanceRatioBreakValue : -1
stageType: BOOST
featureType: HAAR
sampleWidth: 24
sampleHeight: 24
boostType: GAB

```
minHitRate: 0.995
maxFalseAlarmRate: 0.5
weightTrimRate: 0.95
maxDepth: 1
maxWeakCount: 100
mode: BASIC
Number of unique features given windowSize [24,24] : 162336
```

```
===== TRAINING 0-stage =====
```

```
<BEGIN
```

```
POS count : consumed    170 : 170
```

```
NEG count : acceptanceRatio    700 : 1
```

```
Precalculation time: 8
```

```
+-----+-----+-----+
|  N  |      HR   |      FA   |
+-----+-----+-----+
|   1 |           1 |           1 |
+-----+-----+-----+
|   2 |           1 |           1 |
+-----+-----+-----+
|   3 |           1 | 0.332857 |
+-----+-----+-----+
```

```
END>
```

```
Training until now has taken 0 days 0 hours 0 minutes 21 seconds.
```

```
===== TRAINING 1-stage =====
```

```
<BEGIN
```

```
POS count : consumed    170 : 170
```

```
NEG count : acceptanceRatio    700 : 0.374532
```

```
Precalculation time: 7
```

```
+-----+-----+-----+
|  N  |      HR   |      FA   |
+-----+-----+-----+
|   1 |           1 |           1 |
+-----+-----+-----+
|   2 |           1 |           1 |
+-----+-----+-----+
```

```
!opencv_traincascade -data /content/data3/cascade -vec /content/data3/vectorf.vec
```

```
-----
Training parameters are pre-loaded from the parameter file in data folder.
Please empty this folder if you want to use a NEW set of training parameters.
-----
```

```
PARAMETERS:
```

```
cascadeDirName: /content/data3/cascade
```

```
vecFileName: /content/data3/vectorf.vec
```

```
bgFileName: /content/data3/trainingDataDL/negative22.txt
```

```
numPos: 170
```

```
numNeg: 700
```

```
numStages: 10
```

```
precalcValBufSize[Mb] : 5000
```

```
precalcIdxBufSize[Mb] : 5000
```

```
acceptanceRatioBreakValue : -1
```

```
stageType: BOOST
```

```
featureType: HAAR
```

```
sampleWidth: 24
sampleHeight: 24
boostType: GAB
minHitRate: 0.995
maxFalseAlarmRate: 0.5
weightTrimRate: 0.95
maxDepth: 1
maxWeakCount: 100
mode: BASIC
Number of unique features given windowSize [24,24] : 162336
```

Stages 0-4 are loaded

===== TRAINING 5-stage =====

<BEGIN

POS count : consumed 170 : 170

NEG count : acceptanceRatio 700 : 0.0161031

Precalculation time: 8

N	HR	FA
1	1	1
2	1	1
3	1	0.438571

END>

Training until now has taken 0 days 0 hours 0 minutes 22 seconds.

===== TRAINING 6-stage =====

<BEGIN

POS count : consumed 170 : 170

NEG count : acceptanceRatio 700 : 0.00930517

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#training with more negative images

!unzip /content/createdNegatives.zip

ls

combine_data_for_colab_friday.zip	createdNegatives.zip	sample_data/
createdNegatives/	data3/	selfNeg.txt


```
"/content/createdNegatives/lmao1IMG_20220421_101817_BURST1.jpg"
```

```
'/content/createdNegatives/lmao1IMG_20220421_101817_BURST1.jpg'
```

```
import os
```

```
file1 = open("/content/data3/trainingDataDL/Mynegative.txt", "w") # append
```

```
directory = "/content/createdNegatives"
```

```
for filename in os.listdir(directory):  
    f = os.path.join(directory, filename)  
    if os.path.isfile(f):  
        file1.write(f+"\n")
```

```
file1.close()
```

```
!opencv_traincascade -data /content/data3/cascade -vec /content/data3/vectorf.vec
```

```
PARAMETERS:
```

```
cascadeDirName: /content/data3/cascade
```

```
vecFileName: /content/data3/vectorf.vec
```

```
bgFileName: /content/data3/trainingDataDL/negative22.txt
```

```
numPos: 170
```

```
numNeg: 1600
```

```
numStages: 10
```

```
precalcValBufSize[Mb] : 5000
```

```
precalcIdxBufSize[Mb] : 5000
```

```
acceptanceRatioBreakValue : -1
```

```
stageType: BOOST
```

```
featureType: HAAR
```

```
sampleWidth: 24
```

```
sampleHeight: 24
```

```
boostType: GAB
```

```
minHitRate: 0.995
```

```
maxFalseAlarmRate: 0.5
```

```
weightTrimRate: 0.95
```

```
maxDepth: 1
```

```
maxWeakCount: 100
```

```
mode: BASIC
```

```
Number of unique features given windowSize [24,24] : 162336
```

```
===== TRAINING 0-stage =====
```

```
<BEGIN
```

```
POS count : consumed    170 : 170
```

```
NEG count : acceptanceRatio    1600 : 1
```

```
tcmalloc: large alloc 1149345792 bytes == 0x55dd30e90000 @ 0x7f784f5
```

```
Precalculation time: 18
```

```
+-----+-----+-----+-----+
```

```
|  N  |    HR  |    FA  |
```

```
+-----+-----+-----+-----+
```

```

| 1|      1|      1|
+---+-----+-----+
| 2|      1|      1|
+---+-----+-----+
| 3|      1| 0.26625|
+---+-----+-----+

```

END>

Training until now has taken 0 days 0 hours 0 minutes 47 seconds.

===== TRAINING 1-stage =====

<BEGIN

POS count : consumed 170 : 170

NEG count : acceptanceRatio 1600 : 0.271693

Precalculation time: 16

```

+---+-----+-----+
| N |      HR |      FA |
+---+-----+-----+

```

```

!rm -r /content/data3/cascade
!mkdir /content/data3/cascade
# !mkdir /content/data2/results

```

#34 from above

!opencv_traincascade -data /content/data3/cascade -vec /content/data3/vectorf.vec

Training parameters are pre-loaded from the parameter file in data folder.
Please empty this folder if you want to use a NEW set of training parameters.

PARAMETERS:

cascadeDirName: /content/data3/cascade

vecFileName: /content/data3/vectorf.vec

bgFileName: /content/data3/trainingDataDL/negative22.txt

numPos: 165

numNeg: 1600

numStages: 12

precalcValBufSize[Mb] : 5000

precalcIdxBufSize[Mb] : 5000

acceptanceRatioBreakValue : -1

stageType: BOOST

featureType: HAAR

sampleWidth: 24

sampleHeight: 24

boostType: GAB

minHitRate: 0.995

maxFalseAlarmRate: 0.5

weightTrimRate: 0.95

maxDepth: 1

maxWeakCount: 100

mode: BASIC

Number of unique features given windowSize [24,24] : 162336

Stages 0-6 are loaded

===== TRAINING 7-stage =====

<BEGIN

POS count : consumed 165 : 165

NEG count : acceptanceRatio 1600 : 0.00052835

tcmalloc: large alloc 1146093568 bytes == 0x55e4ef816000 @ 0x7fe89b1

Precalculation time: 18

N	HR	FA
1	1	1
2	1	1
3	1	1
4	1	1
5	1	0.664375
6	1	0.438125

#35 from above