

In []:

```
# ! cd drive/MyDrive/dataset/dataset3; mkdir campus2
[!] ls drive/MyDrive/dataset/Dataset2/car/cars_train | wc

      8144      8144      81440
```

In []:

```
import os
import cv2 as cv
import numpy as np
from skimage.io import imread, imshow
```

In []:

```
def remove_noise(folder, folder2, size):
    list_file= os.listdir(folder)
    for filename in list_file[0:size]:
        img= cv.imread(os.path.join(folder,filename), 0)
        img= cv.resize(img, (14, 28))
        img= cv.GaussianBlur(img, (5,5), 0.5)
        cv.imwrite(folder2+filename, img)
```

In []:

```
remove_noise("drive/MyDrive/dataset/dataset3/campus/", "drive/MyDrive/dataset/dataset3/campus2/", 2000)
```

In []:

```
def GenerationInfo(folder, state ,size, w, h, filename):
    files_name= os.listdir(folder)[0:size]
    text2="\n"
    if state: text2=" 1 0 0 "+str(w)+" "+str(h)+"\n"

    text=""
    for fn in files_name:
        text+= folder+fn+text2

    f = open(filename, "w")
    f.write(text)
    f.close()
```

In []:

```
folder1="drive/MyDrive/dataset/dataset3/campus2/"
folder2="drive/MyDrive/dataset/Dataset2/car/cars_train/"
GenerationInfo(folder1, True, 2000, 14, 28, "person.info" )
GenerationInfo(folder2, False, 2000, 0, 0, "bg.info")
```

In []:

```
[!] opencv_createsamples -info person.info -num 550 -w 14 -h 28 -vec person.vec
```

Info file name: person.info
Img file name: (NULL)
Vec file name: person.vec
BG file name: (NULL)
Num: 550
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: 14
Height: 28
Max Scale: -1
Create training samples from images collection...
Done. Created 550 samples

In []:

```
[!] opencv_traincascade -data data2 -vec person.vec -bg bg.info -numPos 500 -numNeg 500 -numStages 20 -w 14 -h 28 -featureType LBP
```

PARAMETERS:
cascadeDirName: data2
vecFileName: person.vec
bgFileName: bg.info
numPos: 500
numNeg: 500
numStages: 20
precalcValBufSize[Mb] : 1024
precalcIdxBufSize[Mb] : 1024
acceptanceRatioBreakValue : -1
stageType: BOOST
featureType: LBP
sampleWidth: 14
sampleHeight: 28
boostType: GAB
minHitRate: 0.995
maxFalseAlarmRate: 0.5
weightTrimRate: 0.95
maxDepth: 1
maxWeakCount: 100
Number of unique features given windowSize [14,28] : 3780

===== TRAINING 0-stage =====
<BEGIN
POS_count : consumed : 500 : 500

POS count : consumed 500 : 500
NEG count : acceptanceRatio 500 : 1
Precalculation time: 0
+-----+
| N | HR | FA |
+-----+
| 1 | 1 | 1 |
+-----+
| 2 | 0.998 | 0.21 |
+-----+
END>
Training until now has taken 0 days 0 hours 0 minutes 0 seconds.

===== TRAINING 1-stage =====
<BEGIN
POS count : consumed 500 : 501
NEG count : acceptanceRatio 500 : 0.381388
Precalculation time: 0
+-----+
| N | HR | FA |
+-----+
| 1 | 1 | 1 |
+-----+
| 2 | 1 | 1 |
+-----+
| 3 | 1 | 0.428 |
+-----+
END>
Training until now has taken 0 days 0 hours 0 minutes 0 seconds.

===== TRAINING 2-stage =====
<BEGIN
POS count : consumed 500 : 501
NEG count : acceptanceRatio 500 : 0.221337
Precalculation time: 0
+-----+
| N | HR | FA |
+-----+
| 1 | 1 | 1 |
+-----+
| 2 | 1 | 1 |
+-----+
| 3 | 0.998 | 0.486 |
+-----+
END>
Training until now has taken 0 days 0 hours 0 minutes 1 seconds.

===== TRAINING 3-stage =====
<BEGIN
POS count : consumed 500 : 502
NEG count : acceptanceRatio 500 : 0.113792
Precalculation time: 0
+-----+
| N | HR | FA |
+-----+
| 1 | 1 | 1 |
+-----+
| 2 | 1 | 1 |
+-----+
| 3 | 1 | 0.58 |
+-----+
| 4 | 1 | 0.218 |
+-----+
END>
Training until now has taken 0 days 0 hours 0 minutes 1 seconds.

===== TRAINING 4-stage =====
<BEGIN
POS count : consumed 500 : 502
NEG count : acceptanceRatio 500 : 0.0561735
Precalculation time: 1
+-----+
| N | HR | FA |
+-----+
| 1 | 1 | 1 |
+-----+
| 2 | 1 | 1 |
+-----+
| 3 | 1 | 0.566 |
+-----+
| 4 | 1 | 0.252 |
+-----+
END>
Training until now has taken 0 days 0 hours 0 minutes 2 seconds.

===== TRAINING 5-stage =====
<BEGIN
POS count : consumed 500 : 502
NEG count : acceptanceRatio 500 : 0.0383318
Precalculation time: 0
+-----+
| N | HR | FA |
+-----+
| 1 | 1 | 1 |
+-----+
| 2 | 1 | 1 |
+-----+
| 3 | 0.998 | 0.524 |
+-----+
| 4 | 0.996 | 0.256 |
+-----+
END>
Training until now has taken 0 days 0 hours 0 minutes 2 seconds.

===== TRAINING 6-stage =====
<BEGIN
POS count : consumed 500 : 504

NEG count : consumed 500 : 0.0189251

Precalculation time: 0

	N	HR	FA
1	1	1	1
2	1	1	1
3	1	1	0.784
4	1	1	0.462

END>
Training until now has taken 0 days 0 hours 0 minutes 3 seconds.

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

<BEGIN

POS count : consumed 500 : 504

NEG count : acceptanceRatio 500 : 0.0148505

Precalculation time: 0

	N	HR	FA
1	1	1	1
2	0.996	0.576	
3	1	0.748	
4	0.996	0.566	
5	0.996	0.38	

END>
Training until now has taken 0 days 0 hours 0 minutes 4 seconds.

===== TRAINING 8-stage =====

<BEGIN

POS count : consumed 500 : 507

NEG count : acceptanceRatio 500 : 0.00753591

Precalculation time: 0

	N	HR	FA
1	1	1	1
2	1	1	1
3	0.996	0.55	
4	0.996	0.476	

END>
Training until now has taken 0 days 0 hours 0 minutes 4 seconds.

===== TRAINING 9-stage =====

<BEGIN

POS count : consumed 500 : 509

NEG count : acceptanceRatio 500 : 0.00526587

Precalculation time: 1

	N	HR	FA
1	1	1	1
2	1	1	1
3	1	1	1
4	1	0.69	
5	0.996	0.438	

END>
Training until now has taken 0 days 0 hours 0 minutes 5 seconds.

===== TRAINING 10-stage =====

<BEGIN

POS count : consumed 500 : 512

NEG count : acceptanceRatio 500 : 0.00427797

Precalculation time: 0

	N	HR	FA
1	1	1	1
2	1	1	1
3	0.998	0.65	
4	1	0.786	
5	1	0.422	

END>
Training until now has taken 0 days 0 hours 0 minutes 6 seconds.

===== TRAINING 11-stage =====

<BEGIN

POS count : consumed 500 : 512

NEG count : acceptanceRatio 500 : 0.00240537

Precalculation time: 0

	N	HR	FA
--	---	----	----

	1		1
+	----	+	-----
	2		1
+	----	+	-----
	3	0.996	0.664
+	----	+	-----
	4	0.996	0.746
+	----	+	-----
	5	1	0.528
+	----	+	-----
	6	0.996	0.26
+	----	+	-----

END>
Training until now has taken 0 days 0 hours 0 minutes 7 seconds.

===== TRAINING 12-stage =====

<BEGIN			
POS count : consumed 500 : 516			
NEG count : acceptanceRatio 500 : 0.0035057			
Precalculation time: 0			
+	----	+	-----
	N	HR	FA
+	----	+	-----
	1	1	1
+	----	+	-----
	2	1	1
+	----	+	-----
	3	0.998	0.632
+	----	+	-----
	4	0.996	0.644
+	----	+	-----
	5	1	0.538
+	----	+	-----
	6	0.998	0.606
+	----	+	-----
	7	0.996	0.354
+	----	+	-----

END>
Training until now has taken 0 days 0 hours 0 minutes 8 seconds.

===== TRAINING 13-stage =====

<BEGIN			
POS count : consumed 500 : 518			
NEG count : acceptanceRatio 500 : 0.0014621			
Precalculation time: 0			
+	----	+	-----
	N	HR	FA
+	----	+	-----
	1	1	1
+	----	+	-----
	2	0.996	0.664
+	----	+	-----
	3	1	0.786
+	----	+	-----
	4	0.996	0.502
+	----	+	-----
	5	0.996	0.534
+	----	+	-----
	6	0.996	0.33
+	----	+	-----

END>
Training until now has taken 0 days 0 hours 0 minutes 10 seconds.

===== TRAINING 14-stage =====

<BEGIN			
POS count : consumed 500 : 520			
NEG count : acceptanceRatio 500 : 0.0005917			
Precalculation time: 0			
+	----	+	-----
	N	HR	FA
+	----	+	-----
	1	1	1
+	----	+	-----
	2	1	1
+	----	+	-----
	3	1	0.734
+	----	+	-----
	4	0.996	0.436
+	----	+	-----

END>
Training until now has taken 0 days 0 hours 0 minutes 12 seconds.

===== TRAINING 15-stage =====

<BEGIN			
POS count : consumed 500 : 524			
NEG count : acceptanceRatio 500 : 0.000572132			
Precalculation time: 0			
+	----	+	-----
	N	HR	FA
+	----	+	-----
	1	1	1
+	----	+	-----
	2	1	1
+	----	+	-----
	3	0.998	0.764
+	----	+	-----
	4	0.996	0.516
+	----	+	-----
	5	0.996	0.526
+	----	+	-----
	6	0.996	0.406
+	----	+	-----

END>
Training until now has taken 0 days 0 hours 0 minutes 14 seconds.

===== TRAINING 16-stage =====

<BEGIN
POS count : consumed 500 : 531
NEG count : acceptanceRatio 500 : 0.000377154
Precalculation time: 1

	N	HR	FA
1	1	1	1
2	1	1	1
3	1	1	0.744
4	0.996	0.504	
5	0.998	0.514	
6	0.998	0.398	

END>
Training until now has taken 0 days 0 hours 0 minutes 18 seconds.

===== TRAINING 17-stage =====
<BEGIN
POS count : consumed 500 : 532
NEG count : acceptanceRatio 500 : 0.000265968
Precalculation time: 0

	N	HR	FA
1	1	1	1
2	1	1	1
3	0.998	0.762	
4	0.996	0.75	
5	0.996	0.508	
6	0.996	0.392	

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

===== TRAINING 18-stage =====
<BEGIN
POS count : consumed 500 : 534
NEG count : acceptanceRatio 500 : 0.000174972
Precalculation time: 0

	N	HR	FA
1	1	1	1
2	1	1	1
3	1	0.74	
4	1	0.574	
5	0.996	0.516	
6	0.996	0.374	

END>
Training until now has taken 0 days 0 hours 0 minutes 28 seconds.

===== TRAINING 19-stage =====
<BEGIN
POS count : consumed 500 : 537
NEG count : acceptanceRatio 500 : 0.000122886
Precalculation time: 0

	N	HR	FA
1	1	1	1
2	1	1	1
3	1	1	1
4	0.998	0.854	
5	0.996	0.608	
6	0.998	0.694	
7	0.998	0.442	

END>
Training until now has taken 0 days 0 hours 0 minutes 37 seconds.