Computer Vision

Roll No: AA.SC.P2MCA2107434

CV LAB ASSIGNMENT -6

Implement Haar Cascade Classifier to detect vehicle in image and video. Use any images or videos of your choice.

In [1]:
```python
import cv2
import matplotlib.pyplot as plt
import numpy as np


# Read the input image
img = cv2.imread('traffic.jpeg')

#convert color image to grayscale for viola-jones
gray = cv2.cvtColor(img, cv2.COLOR_BGR2GRAY)
```

In [2]:
```python
plt.figure(figsize = (10,10))
plt.subplot(1,2,1)
plt.title("Original Image")
plt.axis(False)
plt.imshow(cv2.cvtColor(img, cv2.COLOR_BGR2RGB))

plt.subplot(1,2,2)
plt.title("Gray Image")
plt.axis(False)
plt.imshow(gray, cmap='gray')

plt.show()
```


In [3]:
```python
# Load the classifier
cascade_classifier = cv2.CascadeClassifier('haarcascade_car.xml')
```

In [4]:
```python
# Detect vehicles in the input image
vehicles = cascade_classifier.detectMultiScale(gray, scaleFactor=1.1, minNeighbors=5, minSize=(50, 50))
```

In [5]:
```python
print(vehicles)
```

```
[[193 112  62  62]
 [ 34  85  69  69]]
```

In [6]:
```python
# Draw bounding boxes around the detected vehicles
for (column, row, width, height) in vehicles:
    cv2.rectangle(
        img,
        (column,row),
        (column+width,row+height),
        (0,255,0),
        2
    )
```

In [7]:
```python
# Display the output image
plt.figure(figsize=(10, 10))
plt.title("Original Image")
plt.axis(False)
plt.imshow(cv2.cvtColor(img, cv2.COLOR_BGR2RGB))
plt.show()
```
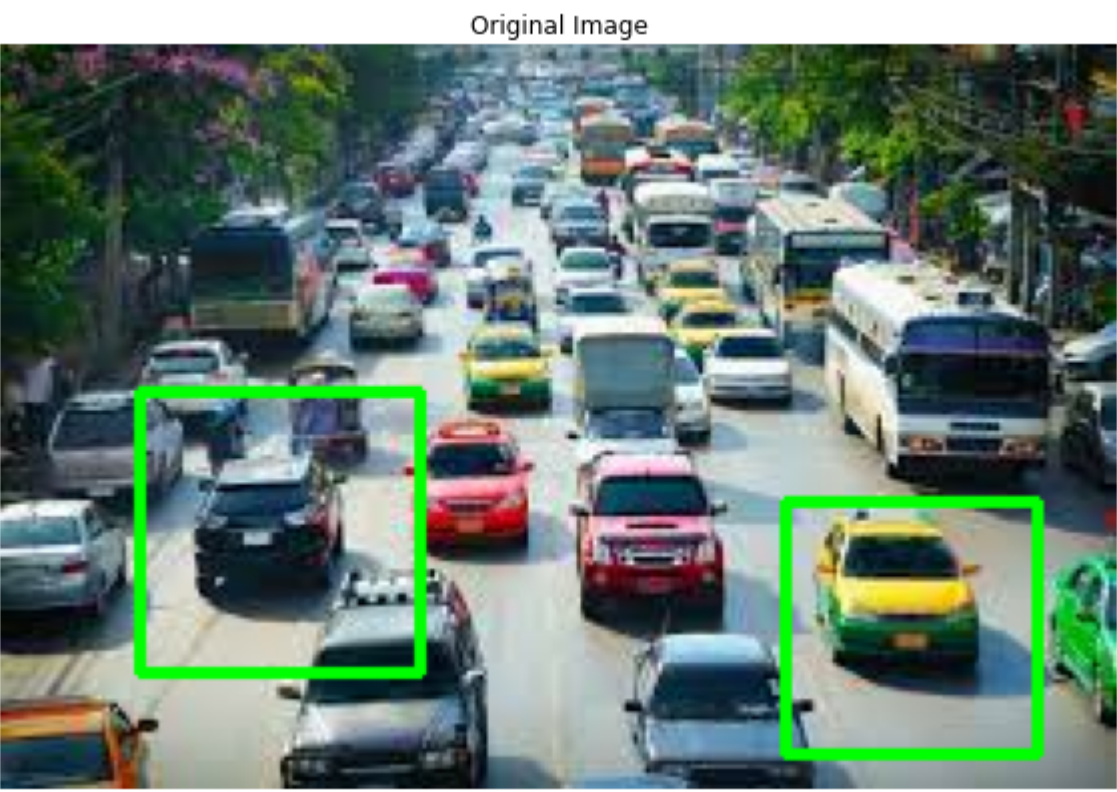

In [8]:
```python
#detecting cars from video

cascade_src = 'haarcascade_car.xml'

video_src = 'cars.mp4'

cap = cv2.VideoCapture(video_src)

car_cascade = cv2.CascadeClassifier(cascade_src)

while True:
    ret, img = cap.read()

    if (type(img) == type(None)):
        break
    gray = cv2.cvtColor(img, cv2.COLOR_BGR2GRAY)

    cars = car_cascade.detectMultiScale(gray, 1.1, 2)

    # Draw bounding boxes around the detected vehicles
    for (x,y,w,h) in cars:
        cv2.rectangle(img,(x,y),(x+w,y+h),(0,255,255),2)

    #Display the result
    cv2.imshow('Video Detection', img)

    if cv2.waitKey(33) == 27:
        break

cv2.destroyAllWindows()
```

In [ ]:

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