

28. Implement a vehicle detection algorithm using Open CV to detect and locate vehicles in each frame of the video.

PROGRAM:

```
import cv2
```

```
# Load pre-trained Haar Cascade classifier for car detection
```

```
car_cascade = cv2.CascadeClassifier(r"C:\Users\harik\Downloads\CV LAB\cars.xml") # Make sure  
'cars.xml' is in the same folder or provide full path
```

```
# Open video file or capture device
```

```
video = cv2.VideoCapture(r"C:\Users\harik\Downloads\CV LAB\vehicle.mp4") # Replace with  
your video file
```

```
while True:
```

```
    ret, frame = video.read()
```

```
    if not ret:
```

```
        break
```

```
# Convert frame to grayscale
```

```
gray = cv2.cvtColor(frame, cv2.COLOR_BGR2GRAY)
```

```
# Detect vehicles
```

```
cars = car_cascade.detectMultiScale(gray, 1.1, 3)
```

```
# Draw rectangles around detected vehicles
```

```
for (x, y, w, h) in cars:
```

```
    cv2.rectangle(frame, (x, y), (x+w, y+h), (0, 255, 0), 2)
```

```
# Display the result
```

```
cv2.imshow('Vehicle Detection', frame)
```

```
# Break the loop on 'q' key press
```

```
if cv2.waitKey(1) == ord('q'):
```

```
    break
```

```
# Release resources
```

```
video.release()
```

```
cv2.destroyAllWindows()
```

