Car Detection project

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Goal of the project :

- The main goal of the project is to identify vehicles in a video from a front-facing camera on a car.

In [1]:
```
!pip install opencv-python
```

```
Requirement already satisfied: opencv-python in c:\apps\lib\site-packages (4.
7.0.72)
Requirement already satisfied: numpy>=1.19.3 in c:\apps\lib\site-packages (fr
om opencv-python) (1.22.4)
```

In [2]:
```
import cv2
import time
```

In [6]:
```
car_classifier = cv2.CascadeClassifier('haarcascade_car.xml')

cap = cv2.VideoCapture("cars_on_highway (1080p).mp4")

# Loop once video is successfully loaded
while cap.isOpened():

    time.sleep(.05)
    # Read first frame
    ret, frame = cap.read()
    gray = cv2.cvtColor(frame, cv2.COLOR_BGR2GRAY)

    # Pass frame to our car classifier
    cars = car_classifier.detectMultiScale(gray, 1.4, 2)

    # Extract bounding boxes for any bodies identified
    for (x,y,w,h) in cars:
        cv2.rectangle(frame, (x, y), (x+w, y+h), (0, 255, 0), 2)
        cv2.imshow('Cars', frame)

    if cv2.waitKey(1) & 0xff==ord('q'):       #is the Enter Key
        break

cap.release()
cv2.destroyAllWindows()
```

conclusion :

> Vehicle detection is a computer that determines whether there is a vehicle in a given image and video that determines the location of the vehicle. Vehicle detection is the basis and premise for researches such as parking lot management, vehicle tracking, and vehicle license plate recognition. But in the actual operation, there are still many difficulties to be solved in vehicle detection, such as occlusion, lighting, and object shape changes. This paper introduces some technologies of vehicle detection from the two directions of deep learning and vision, and compares the real-time and correctness of different algorithms.

In [4]:
```
from IPython.display import Image
```

In [5]:
```
Image(filename="cars_bounded.jpg")
```

Out[5]: