

Vehicle Counting System

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SUMMARY

The objective of the program given is to detect object of interest(Car) in video frames and to keep tracking the same object. This is an example of how to detect vehicles in Python

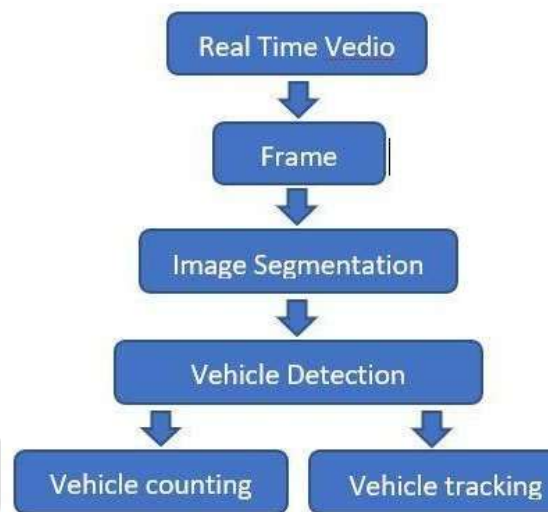
With the rapid development of intelligent video analysis, traffic monitoring has become a key technique for collecting information about traffic conditions. Using the traditional sensors such as loop detectors, ultrasonic sensors may cause damage to the road surface. Meanwhile, many of these sensors need to be installed in urban areas, the cost of this work is high. Surveillance video cameras are commonly used sensors in the traffic monitoring, which can provide video stream for vehicle detection and counting. Vehicle counting process provides appropriate information about traffic flow, vehicle crash occurrences and traffic during the peak times in roadways. An acceptable technique to achieve these goals is by using digital image processing methods on roadways. Our project describes the methodology used for image processing or video processing for traffic flow counting with real time videos using a programming language

Technical Keywords: *Flask, OpenCV, Tensorflow ,Detection system.*

INTRODUCTION:

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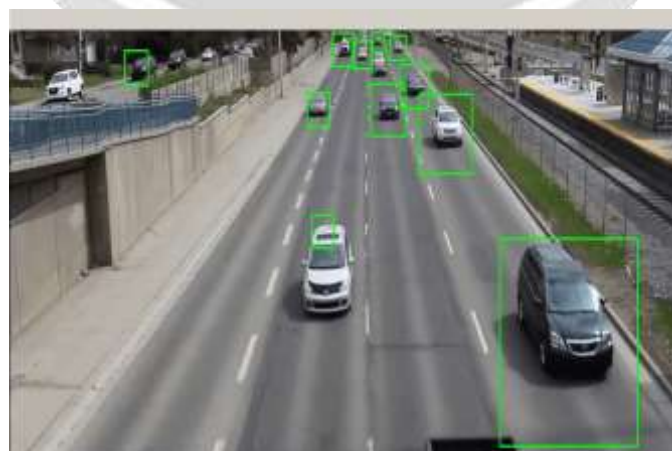
Object detection is a computer technology related to computer vision and image processing that deals with detecting instances of semantic objects of a certain class in digital images and videos. Machine learning can be used to detect and classify objects in images and videos. Vehicle detection, also known as computer vision object recognition, is basically the scientific methods and ways of how machines see rather than human eyes. Vehicle detection is one of the widely used features by companies and organizations these days. We can use computer vision to detect different types of vehicles in a video or real-time via a camera. Vehicle detection and tracking finds its applications in traffic control, car tracking, creating parking sensors and many more.

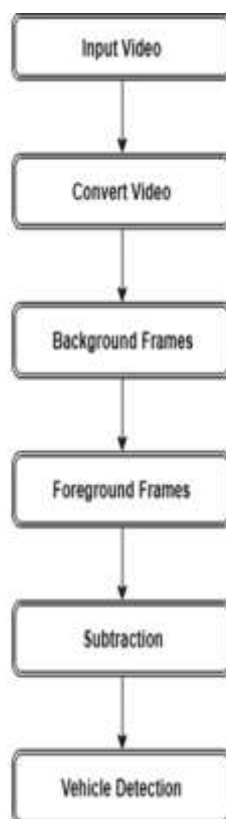
State diagram:

Vehical Counting System is a great way for counting the vehicles on road is very easy. In the first release, we needed to implement a registration procedure, login, user profiles, and incorporate the payment method. The client was directly involved in the development of the application and worked directly with the team.

Digital image processing deals with manipulation of digital images through a digital computer. It is a subfield of signals and systems but focus particularly on images. DIP focuses on developing a computer system that is able to perform processing on an image. The input of that system is a digital image and the system process that image using efficient algorithms, and gives an image as an output. It allows much wider range of algorithms to be applied to the input image and can avoid problems such as build-up of noise and signal distortion during processing.

Statistical method: The statistical models has evolved to solve the limitations of fundamental background subtraction techniques. In the statistical method, the characteristic of individual pixel or group of pixels are considered to construct the background frame and statistics of background can automatically update during processing. This technique provides more reliable and effective in several scenarios like illumination changes, distortion caused by low resolution, roadside trees, and shadows. In this system, pixels are represented by its intensity values minimum and maximum intensity values and maximum intensity difference between any succeeding frames noticed at the initial stage where the scene has stationary objects.



Data flow Diagram :**SCOPE:**

Helps traffic police: A vehicle detection and counting system could be beneficial for the traffic police because everything they can monitor from one place only likes how many vehicles have crossed this toll and which vehicle.



Maintaining records: It is challenging for some individuals to record all the vehicles with them because the cars are passing by in real-time. It's not like that one is watching the video, and they can pause it and have a note of it, so to remove this limitation, this application can be very well-versed to attain the time-saving quality and be automated.

Traffic surveillance control: As this application can be planted anywhere as it only requires a camera or some wires (for establishing the connectivity with the central system) hence if the traffic is high at someplace, then from that area, an officer can monitor it and forward the information to next toll officer so that they could be prepared beforehand.



CONCLUSION:

The vehicle traffic data from this application can be used to count and classify vehicles on busy routes. Once this application is used to gather the data of vehicle types. Open Source Computer Vision Library (OpenCV) and Python Programming language is used to implement the method developed. The system in this is to calculate the number of vehicles passing on the road. It was based on the detection of vehicles that cross a virtual line.

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