

AN AUTOMATIC NO PARKING VEHICLE NOTIFICATION SYSTEM USING IOT

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ABSTRACT

Since India has a huge population, there are huge no of vehicles present in India. This leads to the frequent occurrence of the traffic congestion. Traffic congestion has become one of the major problems in the Indian traffic system. Many people tend to violate the traffic laws of our country. One among them is the act of parking vehicles in the No Parking Zone. Traffic congestion occurs mainly due to the vehicles being parked in the No Parking Zones. With the increase in the number of vehicles, discipline in road regulation or traffic system has become mandatory for India. Parking vehicles in the no parking zones leads to the narrowing of the roadway and thus leads to the occurrence of the traffic congestion. The existing traffic system is not efficient enough to monitor all the vehicles on the road. In order to avoid these kinds of problems in India, we have developed a project which is used to detect the vehicles in the no parking zone and then notify the nearby traffic police.

KEYWORDS: Vehicle Detetion, License Plate Detetion, Histogram of oriented gradients, Support Vector Machine, Optical Character Recognition.

1. INTRODUCTION

In the modern world, the number of cars which are privately owned has been increased very much and it causes a huge burden to the traffic management. This has also resulted frequent occurrence of the traffic congestion. One of the main causes of the traffic congestion is the act of parking vehicles in the no parking zones. When people park their vehicles in the no parking zone, it leads to the narrowing of the roads, thus leading to the occurrence of the traffic congestion. It is very difficult to monitor the people parking their vehicles in the no parking zone physically. But we can use the help of the automatic license plate detection in order to monitor the cars, especially the ones which are being parked in the no parking zone.

The work in this paper is divided into three stages. 1) Vehile Detection 2) License Plate Detection 3)Notification to Towing Vehicle .Vehicle Detetion is done using Histogram of Oriented Gradients (HOG) and Support Vector Machine (SVM) using Machine Learning to train the dataset which is needed for vehicle detetion, secoondly after detecting the vehicle the vehicle number plate is captured using the camera available in the traffic areas and then the vehicle identification and the owners details will be fetched from the cloud this module also calculates the time duration of the vehicle parked in the no parking zone at last the warning message will be sent to the vehicle owner using the information feteched from the cloud and even after the vehicle is not taken away a notification will be provided to the traffic department who will take care of this issue using the towing vehicle the vehicle parked for too long will be cleared off from the site. Vehicle detection can be done by training various data set But the license plate recognition has various issues like image clarity and noise in the image all these factors have been overcome to provide the maximum acuracy level for the vehicle license plate detection

II. PROPOSED SYSTEM

The license plate detection method can be detected through the CCTV cameras fixed on the roads. So, whenever a person parks his/her vehicle in a no parking zone, the CCTV camera captures it and can notify the traffic department. Also, it has many other applications such as the expressway toll collection, over speeding violations and so on. The methods such as the traditional and the convolution neural networks, shortly known as CNN, are actually used to solve the problems of the car license plate detection. Even though people are able to make use of multiple independent features and some of the incorporate models, it is still hard to find whether it is sufficient or not in order to meet the challenges with that of limited features and models. To get rid of these problems, the CNN based methods have been used, which will automatically try to learn the features from the data that has been acquired. But there are also some problems that are associated with the multi directional car license plate detection such as the view point variation of the hand held cameras. There are chances that these cameras can be rotated accidentally. The use of the vision based traffic vehicle surveillance consists of some complications with any traffic system. From this we can come to know that there are a lot of challenges involved in this project. There are many efforts being taken for the development of the traffic system intended for the purpose of raising the safety of the road environment .Also, we have seen the computing platforms growing towards the parallelization. But the performance level of this system actually depends on the traffic object detector and the use of the robust detector will make it more reliable.

III. TRAFFIC OBJECT DETECTION

The traffic object detection has actually become one of the interesting topics for the researches. There are some limitations for the object detectors and can lead to the decrease of the performance of the traffic object detector because of the large variations between the source training data set and the target scene. A solution that is considered is the exploitation of the transfer learning approaches. These actually help us to develop a specific scene detector, in order to choose the training samples automatically from the target scenes without the actual need of labeling manually. The embedded system for the traffic surveillance actually integrates the advances in the computer vision domain like the transfer learning, deep learning techniques to enhance the performance of the detection. It is important that the performance of the detection is good enough in both day and also in night. When a target video is given where the labeled information is not found available, an iteration process is to be estimated for both the sets of the target objects. Also, the parameters of the deep detector that is specialized will be estimated.

IV. VEHICLE DETECTION

Vehicle detection is done through video detection using the help of CCTV cameras located at traffic areas. It is executed through the algorithms such as Histogram of Oriented Gradients (HOG) (Fig 1.1) and Support Vector Machine.

Histogram of Oriented Gradients (HOG)

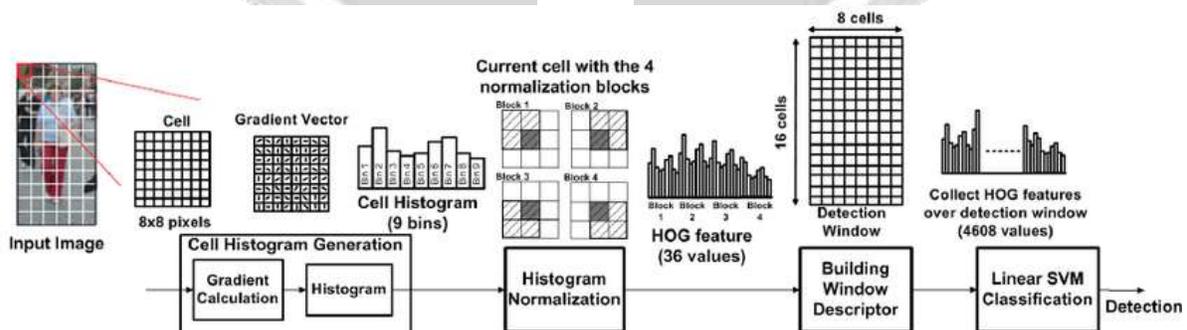


Fig 1.1 Working of HOG which process the frames in a video along with SVM to detet vehicles.

Support Vector Machine:

It's a classification algorithm for differentiating vehicle from a video sample (fig 1.2)

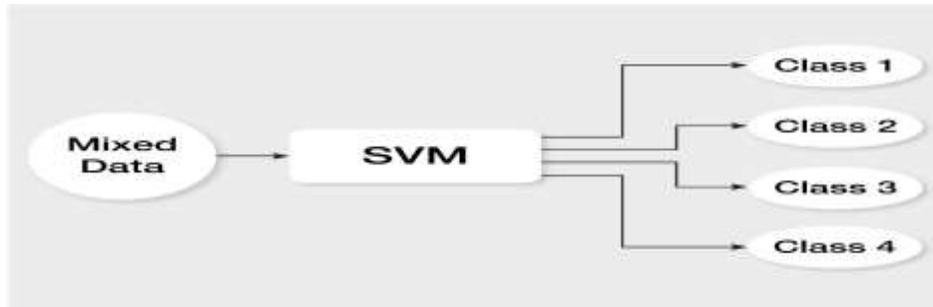


Fig 1.2 Support Vector Machine used for classifying vehicle from other objects.

V. LICENSE PLATE RECOGNITION

The automatic license plate detection is executed in order to monitor the cars, especially the ones which are being parked in the no parking zone which is done through Optical Character Recognition (OCR)(fig 1.3).

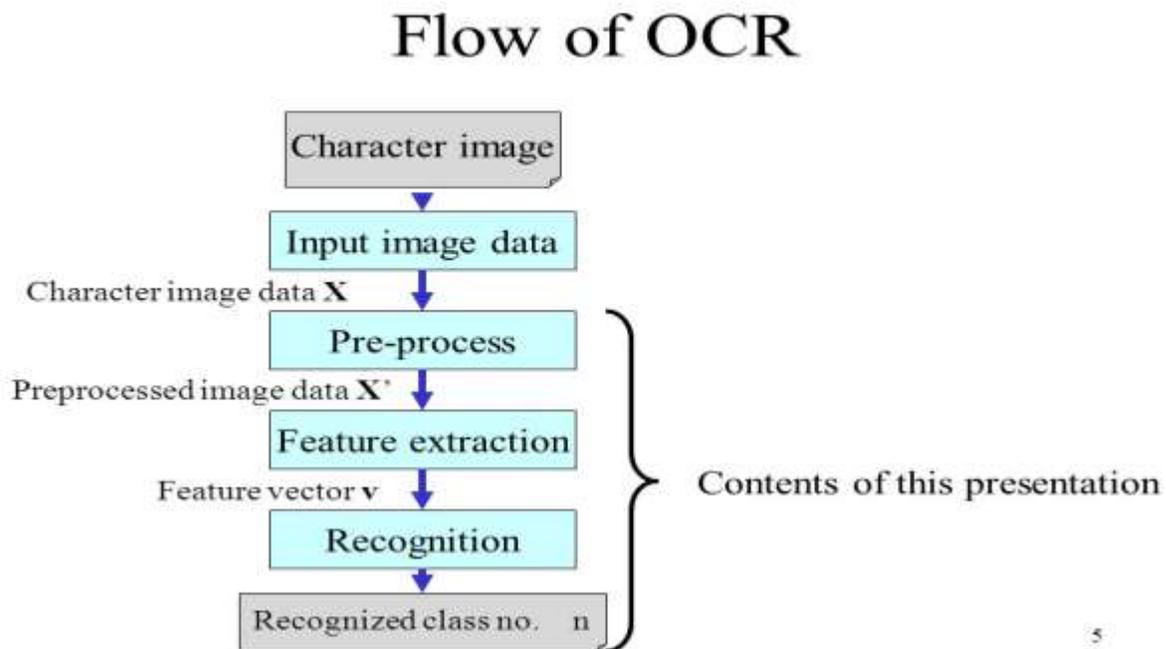


Fig 1.3 Flow chart for Optical character Recognition which is used for feteting the license plate number.

VI. EXPERIMENTAL RESULTS

Vehicle Detection:

The below sample depicts various vehicle detetion methodologies that will be used to predict vehicle in the video sample (a)original image sample from a video, (b) predicts the moving object here it is vehicle and calculates the direction of motion indicate it by red arrows ,(c) finds the possible vehicle object in the frame using gaussian algorithm for vehicle detection.



(a)



(b)



(c)

License Plate Detection:

The below output samples scans the license plate from an image and detects the license plate number from the frame.(a) Actual frame from a video sample after detectiong vehicle it is obtained ,(b) The image is processed for classiyng number plate from the car converted into b/w , (c)conversion to gray scale so that only license plate area is considered, (d) License plate number is obtained from the grayscale image.



(a)



(b)



(c)



(d)

VI. CONCLUSION

- Traffic congestion that occurs due to the vehicles being parked in No parking zones has become a very serious problem in major cities of India.
- With the rapid increase in the number of vehicles in India, discipline in road regulation or traffic system has become mandatory.
- The existing traffic system is not found to be efficient enough to monitor all the vehicles that are being parked in the no parking zone.
- In order to avoid these kinds of problems occurring, this project has been developed in order to detect the vehicles in the no parking zone and notify the nearby traffic police.

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