

VEHICLE INFLUX DETECTION USING VIDEO PROCESSING

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Abstract -Vehicle influx is a major problem in the world due to the increase in the number of vehicles. At present traffic control is done via feature-based methods or via traditional methods which are inefficient and consume a lot of time. To control the traffic here we are using computer vision-based algorithms using Open CV [1] and machine learning algorithm Haarcascade[2], which is comparatively easier and faster.

“Time is Money”, our main focus was to save peoples’ time by reducing the heavy congestion of traffic. Through this research paper, we tried to give an idea to control the traffic efficiently.

Key Words: Haarcascade Classifier, OpenCV

1. INTRODUCTION

In today's fast-paced life, "time is money". People spend a significant number of hours standing in traffic. Therefore, to minimize this problem it is imperative to develop an efficient traffic management system that can save everybody's time. CCTV cameras are very essential to monitor traffic and detecting vehicles. The captured pictures provide helpful data to the police about the breach of traffic rules or any other criminal activities. Similarly, with this research work, we tend to use the data collected by the cameras and count the number of vehicles in a certain lane with the help of OpenCV. We have set a threshold value for the vehicle count and if the real-time count value surpasses that threshold value then we will manage the waiting time of the lane accordingly. Moreover, if there are fewer vehicles in a certain lane then also we can manage the waiting time of that lane and control the traffic.

In past, many research works have been conducted in this field to detect vehicles, number-plates using image processing techniques. The focus of this project is to count the vehicles in a lane and manage the waiting time of the signal.

Furthermore, if the camera detects an ambulance then provide the way for it and inform the cops to allow the movement of the ambulance swiftly.

2. RELATED WORK

Many research works have been performed to make the traffic system effective and more efficient using the Computer Vision algorithms. 'Vehicle Counting Based on Vehicle Detection and Tracking from Aerial Videos' by [3]Xuezhi Xiang, MingliangZhai, Ning Lv and Abdulmoteleb El Saddik propose an effective vehicle counting framework based on

vehicle detection and tracking from aerial video. Their method can process two situations, static and moving background. Their experiment had provided 90% and 85% accuracy on the static and moving background.

Moreover, Vehicle Detection and Tracking Techniques: A Concise Review by Raad Ahmed Hadi, Ghazali Sulong and LoayEdwar George[4] provides a summary of studies that have been done in the field of vehicle detection. It shows and classifies traffic management into 3 types based on certain methods which are used for developing it. It shows the complete erudition about the use of image processing methods and analysis tools to detect, segment, and tracks the vehicles in the traffic management system.

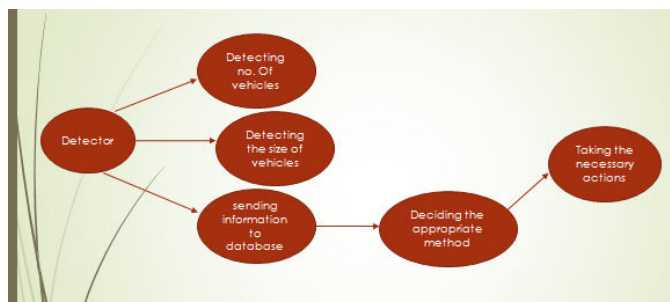
3. METHODOLOGY

The current traffic management system is such that all the lanes have a fixed average waiting time. This project aims to change the average waiting time according to a number of vehicles present in a lane. The proposed system is based on the measurement of traffic density using a real-time video processing technique.

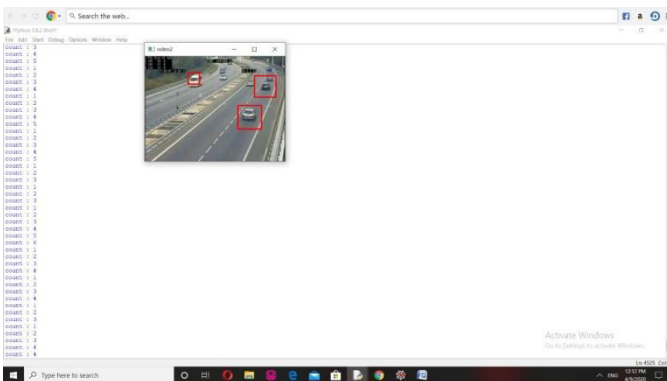
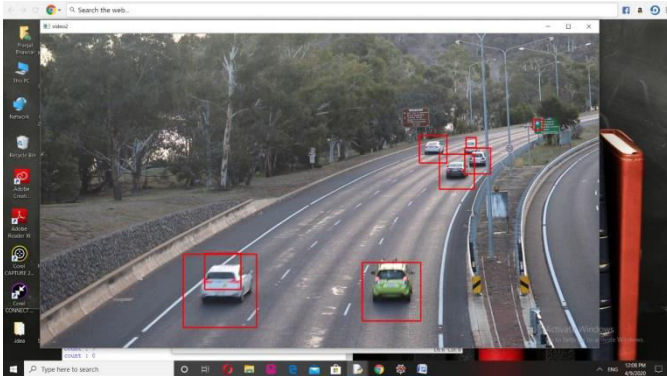
The main idea behind this system is to count the number of vehicles present on the lane through image processing and then based on the count obtained, manipulate the traffic signal, instead of the traditional round-robin approach of assigning a particular time slot to each lane in afore lane.

The data will be sent to the central system through the internet, which will decide the timing for the signal according to the situation. A multidirectional high resolution camera placed on squares which will monitor the vehicular traffic flow continuously.

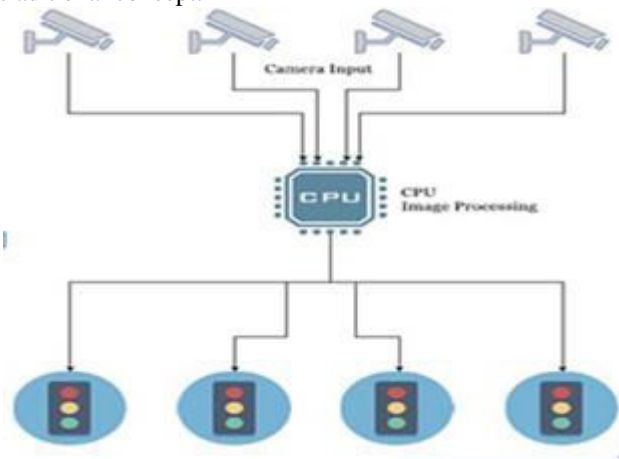
Through the image detection technique, bulky vehicles can also be detected and can be prohibited on time from entering into the hustling areas. The data is visualized immediately so that quick actions can be taken to reduce the chances of vehicle influx. It will provide real-time information to the traffic department about the number of vehicles passing at a time.



The implementation is done using Haar Cascade Classifier. This is a machine learning-based approach where cascade function is trained from a lot of images both positive and negative. Based on the training it is then used to detect objects in the other images.



The present traffic control system uses a fixed average waiting for time concept for controlling the traffic. But, in large crowded cities, it is still difficult to control the traffic using this traditional concept.



4. CONCLUSIONS

The existing system is just limited to some squares of a particular city. At the squares, the cameras are used to detect people who are violating traffic rules action is taken against them by looking at their vehicle number.

But our project deals with the prevention of traffic which can be accepted globally. The idea of the project is not to manage traffic but to not let traffic occur by stopping vehicles for some time if over vehicles are detected. Also, by detecting bulky vehicles they can be stopped on time so that they cannot cause traffic.

REFERENCES

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