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SMART TRAFFIC MONITORING SIGNAL

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Abstract - *A gentle increase in population and large increase the amount of vehicles on road, results in holdup often during peak hours. The traffic analysis and controlling becomes a challenging problem also because it needed to regulate the traffic in decent and safe manner. The traffic signals are operated on the fixed predefined program, these are supported the time. If there's no vehicle on the road, the time will lapsed for the opposite vehicles which are waiting on the opposite side. to unravel this issue, we present an approach for analysis and detecting vehicles by CCTV cameras in sort of images. The methodology consists of model creation and pickled model. When there's less number of vehicles within the lane the traffic light count is reduced, if the amounts of vehicles are more, then the signal count is increased. This technique control traffic automatically.*

***Key Words*: CCTV camera, Model creation, pickled model, Frames**

1. INTRODUCTION

The basic mode of transportation for limited distances is usually through road ways. Because the problem of urban traffic overcrowding spreads, there's a pressing need for the introduction of advanced technology and equipment to enhance the state-of-the-art control. Nowadays traffic problem are increasing due to the increasing number of vehicles and therefore the limited resources provided by the present infrastructures. Due to this, there's a requirement to attend longer ahead of the signals.

This results in wastage of a while. In concern with this problem, we've designed a paper which may help for Traffic flow monitoring and traffic analysis supported computer vision techniques. The article presents an application of computer visualization method to traffic flow monitoring and road traffic analysis. the appliance is utilizing image processing and pattern recognition methods planned and personalized to the requirements and constrains of road traffic analysis.

Traffic flow monitoring and traffic analysis supported computer visualization techniques, and specially traffic analysis and monitoring during a real-time mode raise valuable and sophisticated demands to computer algorithms and technological solutions. Most realistic applications are in vehicle tracking, and therefore the critical issue is initiating a track automatically. Traffic analysis then results in reports of speed violations, traffic congestions, accidents, or against the law actions of road users.

A variety of approaches to those tasks were suggested by many scientists and researchers [1–3]. The approach during this article focuses on methods of image processing, pattern recognition and computer vision algorithms to be useful to road traffic examination and monitoring. One among the foremost important aspects was to switch these algorithms to suit to real-time road monitoring processes, and as a consequence the model of system for traffic analysis was developed. Technically this scheme is predicated on stationary video cameras also as computers linked to wide area network.

2. PROPOSED SYSTEM

This System will monitor activities at traffic intersections for detecting congestions, and then predict the traffic flow which assists in regulating traffic. Within the proposed project, initially image is uploaded with the assistance of the camera had been captured then processed in AI to count the amount of vehicles within the captured image. Captured Images are going to be processed and object identified then supported vehicle count traffic light seconds are going to be calculated.

3. METHODOLOGY

This design consists of overview of the entire system, Python application will read the dataset which consist of frames and python application will call for model creation process. In model creation the frames are processed and weights of each frame is calculated and the after calculating the weight, training of model takes place and finally the calculated weights will present in AI model.

There is a model called pickle model which has all the weights of pixel that we have calculated and it acts as a reference model for comparison. The weights of frames of video input are compared with pickle model. If both the weights are matched then it will detect the object based on its weights as whether it is two wheeler or four wheeler as shown in Fig-1.

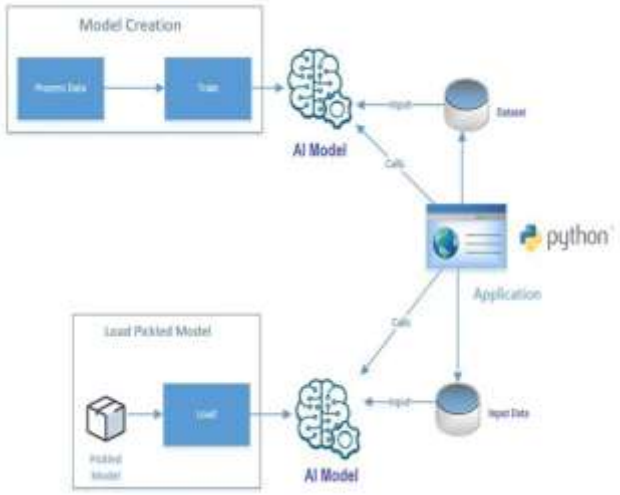

Fig-1: Block diagram of traffic system

4. IMPLEMENTATION

In this implementation have been done in module wise. The modules are:

- Video uploading: In this phase video from local directory will be loaded into the application. In this module the frames will be extracted as shown in Fig-4.1 from the uploaded video by considering the bit rate and the components value of the video.

Fig-4.1: Frames extraction

- Object detection: In this module each and every frames that has been extracted will be undergoing a series of data manipulation where the frame value will be exercised from x-axis and y-axis and the object weights will be calculated for the object that has been detected as shown in Fig-4.2.

Fig-4.2: Object detection

- Object matching: Whatever the object that has been matched into the frame is compared with the vehicle object dataset and its weights are matched then it will be controlled as a vehicle as shown in Fig-4.3.

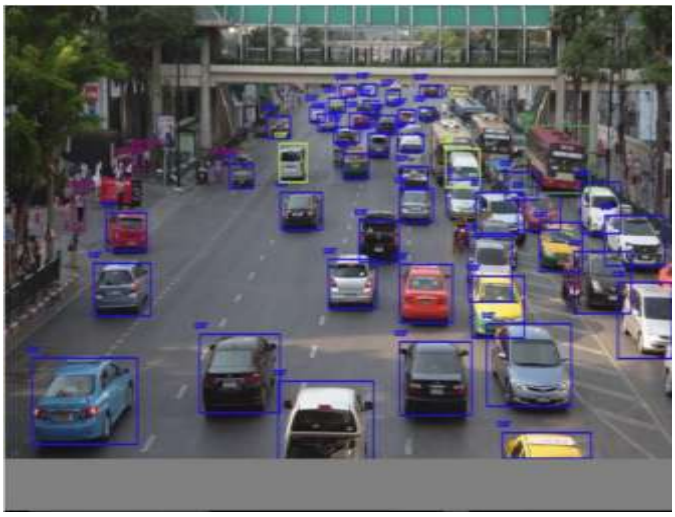

Fig-4.3: Object matching

- Vehicle counting mechanism: Based on the frame structure vehicles will be counted and it will be listed down as shown in Fig-4.4.

Fig-4.4: Vehicle counting mechanism

- Classification of vehicles: In this module the vehicles will be classified as 2 wheeler, 4 wheeler, ambulance etc.
- Controlling of the traffic signal: The automated controlling of traffic signal will be done to ensure the automation of traffic signal based on the vehicle count or vehicle density.

6. CONCLUSIONS

The study reveals that image processing overcomes the restrictions of all traditional methods of control. It eliminates the necessity for extra hardware like sound sensors. This method is using only simple CCTV camera which are already installed on road side poles. The utilization of image processing is sweet for traffic management but it still requires much improvement. the utilization of image processing may help to spot density of vehicles as they pass and priority are often given to emergency vehicles and help in supervision on a fairly large scale.

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