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Traffic rule violation detection and reporting system

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ABSTRACT

The increasing number of vehicles in cities can cause high volumes of traffic, and implies that traffic violations become more critical nowadays in India and also around the world. This causes severe destruction of property and more accidents that may endanger the lives of the people. To solve the alarming problem and prevent such unfathomable consequences, traffic violation detection systems are needed. For which the system enforces proper traffic regulations at all times, and apprehends those who do not comply.

Keywords— Traffic violation, Tensorflow, OpenCV, OpenALPR API

1. INTRODUCTION

The high extent of traffic implies that traffic violations grow to be more important in recent times in India and additionally round the arena. This causes extreme destruction of assets and extra accidents which could endanger the lives of the people. For which we want a system that enforces proper traffic violation guidelines at all times, and apprehends people who do not comply. A traffic violation detection machine must be realized in real-time as the authorities tune the roads all of the time. Subsequently, traffic enforcers will now not only be at ease in imposing safe roads correctly but additionally efficaciously; as the traffic detection machine detects violations faster than humans. A person-pleasant graphical interface is related to the device to make it simple for the user to perform the system, reveal traffic, and take action in opposition to the violations of traffic policies.

2. RELATED WORK

2.1 Traffic Rules Violation Detection System

The designed set of rules was correctly capable of stumbling on the type of violation particular on this challenge that's denying traffic signals, parking in no parking zone, and wrong direction driving. The convergence of detection for the three kinds of traffic violations mentioned is dissimilar since they each have a different threshold condition. The system provides detection for all three violations but detects signal violation and parking

violation better than direction violation. Further, the system can process one data at a time. Additionally, this system runtime is somewhat sluggish and can be improved through using a pc with high-speed processor specs or GPU

Future research about the software of the designed set of rules for different superior image processing strategies. Because this will improve the runtime of the system by neglecting different useless steps done in a background distinction approach. A computer vision algorithm may be achieved rather to offer extra intelligence within the machine. We plan to implement the number plate detection with OCR support to make this system more robust.

2.2 Automatic Traffic Rule Violation Detection and Number Plate Recognition

The proposed model includes an automated system that uses IR sensors and a camera-based on Arduino to capture video. The project presents Automatic Number Plate Recognition (ANPR) techniques and other image manipulation techniques for plate localization and character recognition which makes it faster and easier to identify the number plates. After recognizing the vehicle number from the number plate the SMS based module is used to notify the vehicle owners about their traffic rule violation. An additional SMS is sent to the Regional Transport Office (RTO) for tracking the report status." This project was designed to detect the traffic signal violation and also to report the victim. It was able to detect "Signal violation detection", "Reporting the victim". The system could not process more than one data at a time and also the runtime was slow. Project was sensitive to vibration and fast-changing targets due to the long shutter time

3. METHODOLOGY

The block diagram system architecture of the project is shown below in Fig-1 The architecture of the violation Detection system follows the basic architecture of the Application, in which the real time video from a surveillance camera sent to the server is processed using the tensorflow moules and OpenCV concepts and the violation are detected based on speed, Red light

and etc are detected at the server side and the picture of the object is saved in system for future enhancements and the number plate detection. Once the Data sent to the server is processed, if a violation is detected then it will store the frame and send it to OpenALPR API to detect the Licence Plate Number which will return the number which will be used for the database operations. Which later used in User and admin modules.

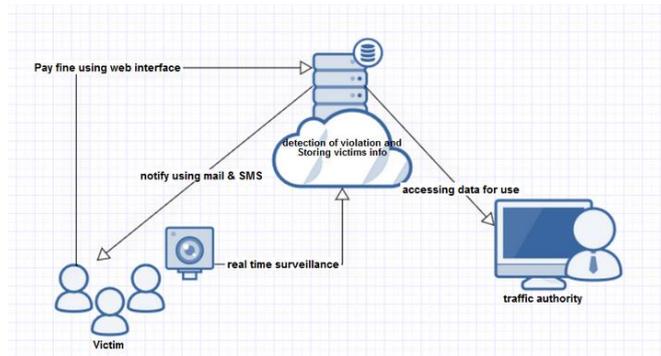


Fig. 1: System Architecture

4. IMPLEMENTATION

The system has mainly three modules:

- Object Detection Module
- User Module
- Administration Module

4.1 Object Detection Module

In this module the video from the surveillance camera will be sent to this module for the processing of the data from frames to detect the vehicles and the type of violation. This module makes use of the Tensorflow object detection API and OpenCV

modules to detect objects and also the pretrained model from the Tensorflow model hub.

4.2 User Module

This is the presentation layer for the user. This module enables the user to pay the fine amount based on his Mobile number or vehicle license plate number and type of violation. This module is developed using PHP which is a server side scripting language. The data will be dynamically loaded from the MySQL database.

4.3 Administration Module

This is the presentation layer for the traffic authority. This module enables the authority to send the email notification to the victim who hasn't paid the fine yet. This module is developed using PHP which is a server side scripting language. The data will be dynamically loaded from the MySQL database.

5. CONCLUSION

The Traffic Monitoring System is one of the effective tools for enforcement of traffic rules on Indian roads in a transparent manner. The system aims at harnessing the strength of technology and minimising human intervention to bring about the speed and transparency in the whole process of traffic regulation.

6. REFERENCES

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