TRAFFIC VIOLATION DETECTION SYSTEM

FINAL YEAR PROJECT [CSC-499]

SUBMITTED BY:

MUHAMMAD KASHIF [16SBSCSM081]

MUHAMMAD YASIR HASAN [16SBSCSM017]

PROJECT SUPERVISOR:

DR. SYED ASIF ALI

COURSE CO-ORDIATOR:

MR. BASIT HASSAN

MS. SYEDA WAJIHA NAIM

DEPARTMENT OF COMPUTER SCIENCE

SINDH MADRESSATUL ISLAM UNIVERSITY

KARACHI

ABSTRACT

Nowadays road traffic has become real problem in one-tier and two-tier cities. There are several ways to make travelling safe and one is through the Traffic Police. Responsibility of the traffic Police regarding traffic management includes directing traffic, enforcing traffic rules and regulations and penalizing the driver in case of violating traffic rules. Another way of enforcing traffic discipline is frequent conduction of awareness program, from the Department of Traffic Police, based on the offence data collected. But the existing system do not have centralized repository for storing the penalized data, so this project work is an attempt to develop an android application which will help the traffic police to record the penalty information in the centralized repository. Application to be developed will also consist of analysis part of traffic offences based on which higher authorities can take necessary measures regarding traffic discipline.

KEYWORDS

Traffic Violation Detection, Traffic Infringements, Image Processing, Image Acquisition and Transfer.

1. INTRODUCTION

Road accidents have been very common in the present world with the prime cause being the careless driving. The necessity to check this has been very essential and different methods have been used so far. However, with the advancement in the technology, different governing bodies are demanding some sort of computerized technology to control this problem of over speed driving.

The overall system is divided in three categories: Image acquisition and transfer, image processing and Violation detection. The situation there is compared with the preset threshold and camera is triggered if the violation is detected. Acquisition and transfer of image is done to the server via internet. The server runs an Image processing program which generates the penalty challan.

2. **PROBLEM STATEMENT**

To design and develop a real-time traffic violation detection, tracking and license plate recognition system that will work efficiently under the supervision of human and detect the objects that are merged into the background due to a temporary stop and becoming foreground again, adaptive to different traffic environment conditions, robustness against progressive or sudden illumination changes, Occlusions, identification time of the system should be as short as possible. The system should detect all the types of vehicles by recognize all the license plates of the country and should also be resistant to any kinds of disturbances, which may occur in images and mechanical plate damages which may appear.

The existing system has loop holes and less flexibility. One has to pay the fine at the moment. The generated penalty slip must be payed within time period (some days) which will be doubled otherwise.

3. **OBJECTIVES**

The goal of this work is aimed at developing an android application that depicts smart traffic offence analysis tool. The proposed system will facilitate the public in paying the traffic challan and parking tickets. Not to mention that it will facilitate e-payment. No only that, but it will also facilitate authenticated user access. Another appealing feature of this application is to develop a system that is faster, efficient and manageable. We are focused in preparing complete, integrated solution for traffic offence management.

4. **LITERATURE REVIEW**

Traffic offence management is a major concern in cities around the world. Mobilized Traffic Offence System is a powerful mobile based application that records all the traffic offences committed citywide. The application helps the traffic police keep adequate information of all traffic offences that has been committed by road users and maintain the databases of the driver and vehicle details. We have many existing android applications that helps the vehicle driver to check his challan status and he can pay the penalty online without the intervention of traffic police .but our application focuses on traffic police as user and he can penalize the one who commits the traffic offence and can collect the penalty amount on spot using e-payment .with the information stored in the database the higher authorities can take appropriate measures. (Gevorgyan, 2018)

Traffic violations and offences are becoming more and more serious as the traffic volume increasing, which may bring property damage and threaten personal safety. Existing systems lack capability to analyze high-throughput traffic monitoring stream and detect various types of violations in real-time. Thus, a real-time vehicular traffic violation detection system is in real demand. In this paper, we design and implement a real-time vehicular traffic violation detection system. Our system proposes a detection algorithm which can discover various types of violations taking place on the roadways as well as in the parking lots. In order to achieve real-time analysis, parallel computing techniques are used in our implementation. An optimization scheme as well as a well-design data structure is proposed to improve the performance of the parallel implementation. Both real data and synthetic data are applied in our experiments. Experimental results demonstrate that our proposed system can discover all the violations from the high-throughput traffic monitoring stream in real-time. Good scalability on multiple threads is also shown in the experimental results. (Ou, G., 2012)

Pietzsch (1997) patented this solution as an arrangement for monitoring vehicular traffic and providing information and warnings to drivers of traffic disruptions, driver error, dangerous road conditions, and severe weather. Road and traffic conditions are detected with roadside traffic sensing equipment, and the conditions are displayed over luminescent elements with signal lamps distributed at intervals along the road and combined into chains of lamps. The luminescent elements are illuminated simultaneously or in sequence for providing continuous traffic information. A processor network and a signal network are combined through a communication network to regulate the luminescent elements by processing, if necessary, under real time-controlled conditions.

In general lane change violations are likely to happen before the stop line in the red-light violation detection region. The system which can be detecting red-light and lane change violation is very useful for the traffic management detection using vehicles moving in the region of interest and combining with the evaluation of the trajectories behavior of multiple vehicles using mean square displacement (MSD) to detected both of violation. We are using image processing technique only to detected traffic signal without help of another other system.

Statistic from many countries showed that high percentage of serious road accident occurred at the road junction due to driver disobeying or red light violating Based on observation, drivers often change lanes before the stop line, which is one reason that cause traffic accidence and traffic jam. Many researchers developed some systems with advanced technologies for traffic-violation detection in action and taking photography of incidents for records. Those systems comprised of many equipment and devices such as induction coils, radar, ultrasonic, laser, video detection, etching comparison with the traditional traffic violation detection technology, the video-based image processing method for traffic violation detection has many advantages, for example easy maintenance, high accuracy of detection, long life service, Realtime detection and inexpensive was identified (Klubsuwan, 2015).

The proposed method shows high performance in terms of accuracy for violation detection and computation complexity since the system can be perform in the real-time. The algorithm can be detecting traffic light signal using purely video processing with high accuracy and it showed high performance red-light and lane-change violations detections. In order to reduce computation time, motion detection operation is applied on all sub profiles while the vehicle detection operation is only used when it is necessary.
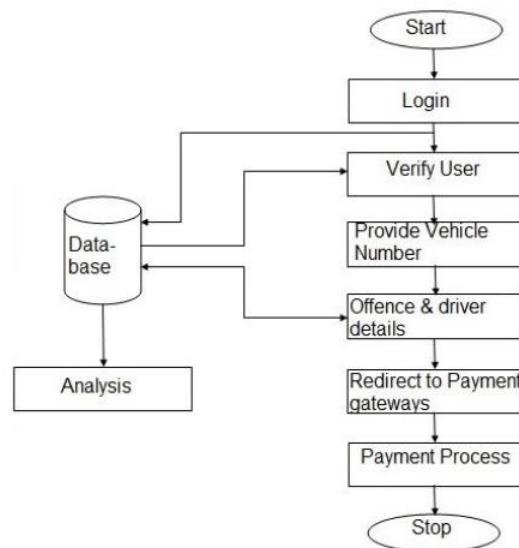
5. WORK FLOW

Figure 1 System Design

6. PROPOSED SYSTEM

LOGIN: Only authorized users (traffic police) can login into our application using their userID and password.

VERIFY USER: Once the user has entered his userID and password, it is verified from the database. If he is an authorized user, he is allowed to carry out further processes.

PROVIDE VEHICLE NUMBER: After the successful login, the user has to provide the vehicle number of the vehicle rider who has committed the traffic offence.

OFFENCE AND DRIVER DETAILS: Once the vehicle driver is caught, if his details are not available in the database then all the information regarding the offence committed are stored in the database for future reference and the notification will be sent to his mobile number provided by him.

DETECTION: Once the vehicle driver is caught if his/her details are already available in the database and if the offences committed by him has crossed the fixed limit then the police can either seize the vehicle or can refer to cancel the license of the vehicle rider.

REDIRECT TO PAYMENT GATEWAYS: The control of the application is redirected to payment gateways in order to collect the penalty amount. The payment gateways provide different modes of payment.

PAYMENT PROCESS: Once the control is given to the payment gateways, the person who has committed the offence can pay the penalty amount through his credit card/debit card/net banking. After the process is completed the payment gateways send the control back to the application

ANALYSIS: Using the information available in the database, the higher traffic authorities can analyze the data and they can take necessary measures to create awareness among the public regarding traffic discipline.

7. **CONCLUSION**

The proposed application helps traffic police to penalize traffic offences. And helps them in analyzing traffic details with centralized data repository stored in the department server. There by generates graphs for the easier analysis by which the traffic police can enforce the traffic discipline. By this application, we can reduce the traffic offences drastically.

This integrated system locates tracks and extracts traffic parameters. Furthermore, the system can utilize any existing traffic surveillance infrastructure without further modification or tuning (except for the camera calibration that calculates image metrics). Overall, the system was found to work satisfactorily, and the background reconstruction algorithm added robustness to the process. In normal traffic conditions the system responded well and the outcome results regarding vehicle license plate and trajectory were accurate enough. The experiments carried out showed that the proposed algorithm is capable of real time operational working due to its low complexity. The system works well either in real time mode or in already stored image.

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