DETECTION OF SIGNAL VIOLATION AND SIGNALING FOR EMERGENCY VEHICLES

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ABSTRACT
In today's era the fast moving world scenario in large cities causes the traffic congestion due to the increase in number of vehicles. Design and development of the traffic violation control system is major issue. The existing system does not fulfill the constraints imposed by the roads and traffic situations in India. Through this paper we proposed a system under the smart traffic control towards the digital India. This system discuss about the technology for fine collection after signal violation and automatic signaling for emergency vehicles such as ambulance, fire brigade and VIP vehicles. The vehicle which violates the signal is detected using the electromagnet and the fine is recorded on the vehicle. Vehicle contains the record of owner and signal violation which is used during the collection of fine. For the emergency vehicle RFID is used to detect the ambulance. This system builds discipline in the society.

KEYWORDS: Electromagnet, Magnetic Switch, RFID, GSM, AVR

INTRODUCTION

The road network of any city is its lifeline. In developing countries there is tremendous growth in urbanization and industrialization. During the past few years, we come across the many traffic problems such as road accident and traffic congestion causes the disturbance in whole system. Traffic control at intersection is major issue. In several countries, many attempts have been made to operate the traffic light according to the current volume of traffic. These system uses sensor for counting the current volume of traffic but it has limitations. These techniques only count the number of vehicles and treat the emergency vehicle as ordinary vehicle. As a result, these vehicles get stuck in traffic and waste their valuable time.
To reduce these problems and improve the road discipline, advanced technologies are provided for the solution. This system contains the fine collection after signal violation and automatic signalling for emergency vehicles. This project includes detection of the vehicle at the traffic signal and sending encryption to the vehicle after breaking the signal. For the detection of ambulance RFID technology is used. After detection of the ambulance, indicator at respective path is shown. So that people can give path to the ambulance.

LITERATURE REVIEW

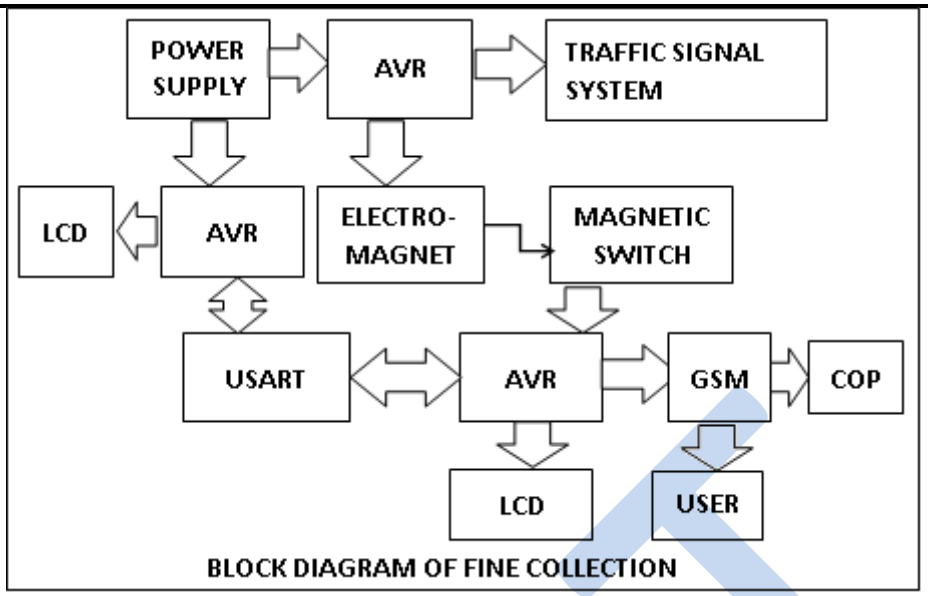
Study of present scenario of the traffic monitoring and controlling systems are done. Camera based and RFID based systems are used for penalty charging. Many other systems such as Infrared detector, magnetic loop are used for counting and classification of vehicles. The detection of emergency vehicle is done by Cryptography, camera based system, RFID and GSM. Only detection of ambulance is done.
A. Camera based system: This system uses the image processing to detect a various traffic parameters of vehicle and to detect the emergency vehicles. It requires more storage and complex circuitry. Installation cost is high [3]
B. Magnetic loop: Magnetic loops are placed in each lane and act as counters for counting the number of vehicles
C. RFID based system: This system is used for identification and tracking of vehicle [2], [1]
D. GPS based system: GPS vehicle tracking system is one of the important applications in vehicle tracking. GPS tracker device on vehicle receives the signal from satellite. Location of vehicle is determined by time taken by signals to reach devices [4]

METHODOLOGY

System is proposed in two parts: A. Fine collection after detection of signal violation B. Signalling for Emergency vehicle.

A. FINE COLLECTION AFTER DETECTION OF SIGNAL VIOLATION

In this, when traffic signal goes red, relay is switched to turn on electromagnet which will generate the magnetic field. It will be around zebra crossing where electromagnet has kept.

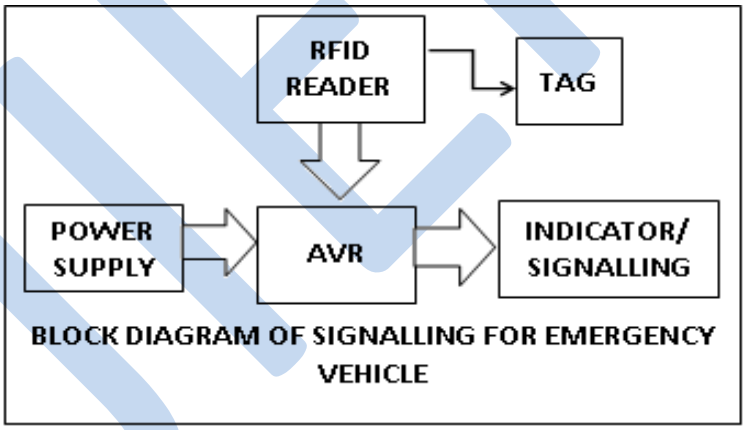


BLOCK DIAGRAM OF FINE COLLECTION

Owner and fine collection details are stored on vehicle unit. Number of fine count increased as it receives the interruption from magnetic switch and record the date and time of signal violation. Magnetic switch is on when the vehicle come across the magnetic field generated on zebra crossing. This recorded data is send to the owner through the GSM. As the owner of vehicle come across the cop, the data of total fine is scanned using the serial communication (USART). After collecting the fine data is cleared from owner module.

B. SIGNALLING FOR EMERGENCY VEHICLE

In this, RFID system is used to detect the emergency vehicles. Every emergency vehicle will have RFID tag with unique identification code. Active RFID reader is mounted on streetlight pole or pole on divider which detects the emergency vehicle when vehicle is in receiving area of RFID reader. Upon detection of vehicle, receiver will send signal to microcontroller. Microcontroller will glow the opposite side indication array so that traffic congestion will not takes place and will provide easy path for emergency vehicle.



BLOCK DIAGRAM OF SIGNALLING FOR EMERGENCY VEHICLE

CONCLUSION

In this way, this paper presents system for fine collection on traffic signal violation and signalling for emergency vehicle. Fine collection system is used to collect the fine from the vehicles violating traffic signal. System for emergency vehicle will provide smooth path for vehicles. Implementation of this system causes the discipline in traffic system. In this system, detection of signal violation is done by electromagnet.

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