Traffic Rule Violation Detection and Toll Collection using RFID

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Abstract: - Today traffic is the major issue in India. Due to heavy traffic, some of the people break traffic rules. It is very tedious task to identify these people and take action against them. We are going to develop a system to avoid the manual work. Our system will identify the traffic rule violation and will automatically take the specified and appropriate action. The toll also will be collected automatically. This system can be installed at Traffic Signal at 4-way road and Toll Booth. This system will provide a parental control to detect the location of the family member, especially the ladies and to detect theft of the Vehicle.

Keywords: - RFID, Traffic Signal, Rule Violation, Parental Control

I. INTRODUCTION

India is a vastly dense nation. India is the second largest country in terms of population in the World. Today, India is facing so many problems and the traffic problem is very important among them. In cities, there is a massive traffic congestion. This is seen mostly at Traffic Signals. The Traffic Police are unable to handle and control this huge traffic. The research is going on to control the traffic automatically and intelligently. There is another problem related to emergency vehicles. Due to traffic congestion, these emergency vehicles don’t get the road to pass quickly.

Traffic should be controlled smartly to let these emergency vehicles pass immediately. RFID plays an important role in outdoor applications because of its advantages. But at the same time, we have to keep in mind that RFID has some limitations also. PLC and SCADA are also used to control traffic. But RFID is better solution upon them due to the security and privacy provided by it. To implement RFID based smart systems we have to take help of cloud computing. These systems work automatically with the help of sensors. RFID is implemented at toll booths for toll collection in some countries. We are planning to use RFID at the traffic signal to detect the vehicle that violates the traffic rule. If any vehicle breaks the Red Signal, then the fine will be deducted automatically from owner account. We can also provide safety measures for women. This system will also help to detect the theft of the vehicle as the thief will never stand at the signal due to fear.

Zebra crossing is the section near traffic signal used by walking people to cross the road. It is a big strap of Black and White broad lines. The vehicle must stop before this strap while the Red light is blown on a traffic signal. Now the Pune traffic system has implemented a system in which the traffic control room continuously monitors all the signals. If any vehicle crosses the signal, then that vehicle is identified in CCTV and traffic police go to the owner house and collects the fine.
Traffic and Toll System: 

RFID will be placed at the edge of Zebra crossing. It will pass light ray when a traffic signal is Red. When any vehicle breaks this light ray placed near Zebra, it will be detected and read by RFID. The fine will be deducted and the message will be sent to the traffic police and the owner of the car. Same will be recorded in the central database of the control room. The person will attach his/her account details with vehicle details with the help of RFID Tag at RTO Office or Showroom or both. The emergency vehicles will have special RFID Tags. If these vehicles are near (About 1 Km away) traffic signal/Toll Booth, then it will be notified and space will be created to allow these vehicles pass. The Toll will also be collected automatically with the help of RFID. As the vehicle details are connected to RFID Tag, the type of the vehicle will also be detected and the specified amount will be deducted from owner account. Parental Control will let the person at home detect the exact and current location of the vehicle. If the vehicle is at the same location for more time, then the person can contact the driver. This system will also help to detect theft of the vehicle.

The proposed system is divided into following modules, and they are used along with each other to provide more services as follows:

1) **Module 1**: If the Traffic Signal light is Red and the RFID Card is scanned, then the fine will be deducted.

2) **Module 2**: Toll will be collected by scanning RFID Card.

3) **Module 3**: Parental Control will work if activated by user.

**Methodologies**: 
In our project, we are going to use KNN Algorithm. This algorithm will be used to detect the vehicle location as well as to read/scan RFID Tag of the vehicle. This algorithm is preferable because it uses minimum distance to find out the path and transfer the data.

**System Analysis**: 
We have used .Net Framework and SQL Server to implement this system. When any user is registered in the system, then he/she gets the welcome message. A virtual bank gets allocated to the user. If any user breaks the Signal, then the money is deducted from his/her account and the message is sent. Toll Collection works in the same manner except that, there is no issue of the Signal.
II. RESULT AND DETECTION

RFID Card number is read by reader and associated user information is identified. User is compared in Database based on this number only. The records of Fine Deduction and Toll Collection are stored in Database.

III. CONCLUSION

This system will provide helping hand to solve the traffic signal break problem and will reduce a headache arising due to this. It will also reduce the time required to catch and fine the accused person. This system will also solve the problem of traffic congestion at a toll booth. It will also ensure the safety of the vehicle as well as the people in that vehicle.

Future scope: -

We can also implement this system at parking place to avoid dash of the vehicle while taking the reverse.

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REFERENCES