AUTOMATIC PENALTY ASSORTMENT SYSTEM FOR TRAFFIC LIGHT VIOLATION

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ABSTRACT: *Due to the increase in traffic problems, we see so many cases of red signal breakage every day, to solve this problem we have developed a system called "Automatic Penalty Assortment System for Traffic Light Violation" with IoT. The purpose of the project is to properly track traffic signal violations with the help of cameras using RFID tag and infrared sensor. This document shows the entire traffic light handling system using the latest technologies. The system works with red light. In the existing system SMS are being sent on the phone, so we use email notifications. Us, our system would be helpful so that traffic management officers can successfully track all traffic sign issues in the most appropriate and desired manner.*
Keywords: RFID reader, IR sensor, Node MCU camera, Arduino UNO.

I. INTRODUCTION

Traffic sign violations often lead to accidents. To solve this problem, police authorities and our traffic department have many solutions, as we see surveillance cameras today, through which additional measures are taken in the event of any type of vehicle breakdown. Many systems are available there. Our system works out of the box, as all vehicles with registered users now have RFID tags. Therefore, when the red light is on and the vehicle passes the line it recognizes this automatically and the detection of the rule breaker becomes easy for the system. The notification of the criminal details will be sent to this user immediately.

There is an application through which we can see all the data of the penalties with the details of this user. This also allows users to see how the fees were charged. for them and by camera there is also a picture of their violations. If there is no RFID tag, because our old vehicles do not have RFID tags. So here we are using ultrasonic sensor, so if a vehicle passes by without an RFID tag, the sensor detects this and the camera takes the picture. Hence the system is useful to keep track of all vehicles. India is the second most popular country in the world and a rapidly growing economy. The number of vehicles is increasing exponentially from day to day.

Increased traffic will bring many problems, such as accidents, various pollution, time loss and health problems. The main causes of traffic problems are the increase in the number of cars and violation of traffic rules. The main purpose of the project is to collect fines for violating traffic lights. The project includes the use of RFID tags in cars and the use of RFID readers in signals. Responsible for detecting vehicles that violate traffic rules.

1.1. Traffic officers

In the traffic module, they have authority over the details of the penalties, view photos, send notifications and also see the list of rule breakers of the day. Penalties or not, traffic agents can check all of this through applications.

1.2. Vehicle owners

In the system's user module, users have the right to see what kind of penalties the image that the system sends to their license plate assigns all data to them.

II. Literature Review

Hiasat and Almomani have developed and implemented a system that combines radio frequency identification (RFID) with the Global System for Mobile Communications (GSM) to control traffic and identify searched vehicles. This document introduces a system that uses adaptive components, is including radio frequency identification (RFID) transponders, which can be placed anywhere on the road, and then transmits real-time collected data from a short time to a server in a

fixed and static state. Message retention (SMS) to the next or police station. Stop offending vehicles via GSM and can choose to notify the driver Violation through e-government system (in Jordan) and immediate payment of fines.

In another study [1] the author Shruthi KR was proposed a system for detecting car accidents and speed limits. Electromechanical system technology (MEMS), radio frequency (RF), global positioning system (GPS) and global system for mobile communications (GSM). The dashboard also displays driver warnings for accidents and speed limits.

In another article [2] the author Sayanti Banerjee has a system was introduced to automatically control car brakes using speed limit displays and active RFID tags on traffic signs. In his work, he proposed a system based on three stages: identifying the RFID transponder (tag), inputting the vehicle speed sensor into the electronic control unit (ECU), and finally controlling the vehicle brakes. [2] The system uses an RFID reader (30m reading range) to send the reference speed from an RFID tag connected to a road sign or speed limit sign to the ECU, and the ECU provides an output signal to control the speed of the vehicle.

In another study [3] the author r. Hedge has developed a system that can track traffic congestion in real time. The controller is updated via short message service (SMS) or a website using radio frequency identification (RFID) and general packet radio service (GPRS) technology and Google Maps API. [3] The design of the proposed system is divided into two categories: 1. The server, which is usually composed of a GSM modem and a website or portal, and 2. The client is usually composed of a GPRS modem and two RFID readers (Texas Instruments). In the system, two radio frequency identification readers (RFID) are placed at a certain distance on the road, and passive RFID tags are affixed to the car. Essentially, the RFID reader reads passive tags when they pass, and then uses the web server algorithm to calculate the vehicle speed based on the number of tags sent in the GPRS mode in the saved database. The web server algorithm is derived from the two vehicle driving times. Finally, drivers can identify traffic jams on monitored roads through websites or short message services (SMS). The street selected by SMS or email. In another study [4] the author G. Vara Prasad proposed a low-cost system that handles over speeding through Zigbee. The system in this document consists of two parts: the sending part or unit and the receiving unit. The transmitter module is located in a certain area. The speed limit is programmed in the PIC16F877A microcontroller. The information is sent to the receiver module in the car through the Zigbee radio protocol (CC2530). The receiver module is divided into two blocks, one of them is next to the rear-view mirror, composed of a Zigbee receiver that receives wireless signals, a 16F877A PIC microcontroller that receives signals from the Zigbee receiver, and a CAN controller that receives signals from the microcontroller. The baud rate is 125KB/ab.

The other unit is next to the dashboard of the vehicle. The communication between the two CAN controllers comes from two sub-units. In the second sub-unit, the CAN controller receives the vehicle speed from the speedometer and sends it. [2] The microcontroller then compares the speed of the car with the maximum speed and draws conclusions from it.[5]-[7] The speed difference is constantly checked and a warning is issued on the liquid crystal display (LCD). If the speed limit is exceeded, an audible warning is issued to slow down. If the driver ignores the warning, the violation will be recorded and recorded. [1] The microcontroller will save any violations detected by the vehicle and will display a message containing the speed difference and vehicle license plate information.

BACKGROUND

In recent years, the digital space has undergone tremendous changes, and industry experts believe that it will continue to develop. The Internet of Things (IoT) is the latest player in the digital field. The Internet of Things can also be defined as the interoperability of software, telecommunications, and electronic products. The hardware industry has brought huge opportunities to many industries.

III. EXISTING SYSTEM

Various devices for detecting traffic rule violations are available on the market. They are as follows:

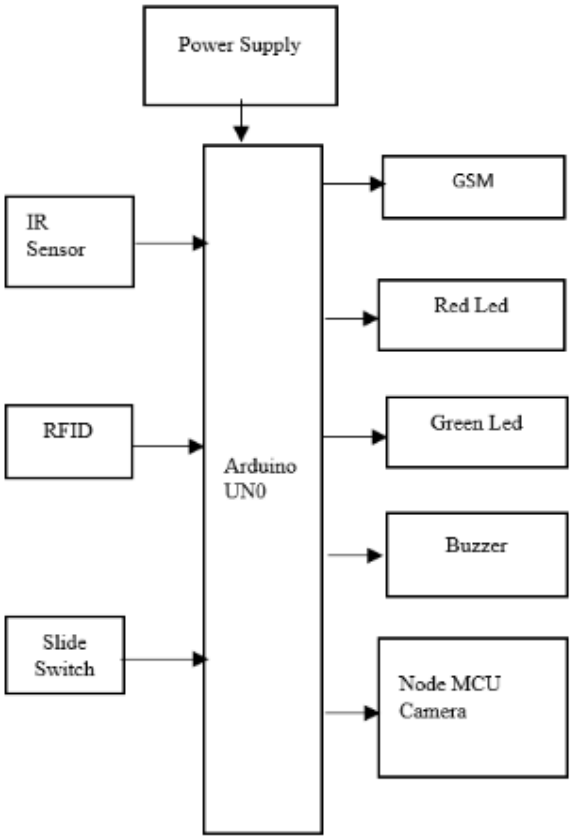
1) Integrated system
2) Android traffic detection system
3) RFID technology for intelligent control of vehicles by communicating speed limit signs of traffic signs
4) Detection of violations in traffic signs by RFID system

IV. PROPOSED SYSTEM

The proposal deals primarily with the use of the system in order to take appropriate measures against traffic sign violations in a timely manner. Therefore, the agents can easily do their work with the help of the system. Vehicle, but in some situations, there are no RFID tags available in some vehicles, so the situation sensor is in the street to detect the vehicle. There are also cameras available to take pictures of injured vehicles. If several vehicles interrupt the signal at the same time, automatically capture the image of all vehicles and send it to the next traffic Additional policing is done manually.

4.1 BLOCK DIAGRAM

The below figure shows that the proposal block diagram. In our project the main component is Arduino Uno. The Arduino UNO consists of 6 analog pins and 14 digital pins the digital pins acts as input as well as output. In Arduino UNO has two special pins i.e. digital '0' pin act as receiver and digital '1' pin act as transmitter. IR sensor is used to detect the vehicle when crosses the red signal it is connected as input to Arduino, slide switch is used to change the green mode or red mode it is also connected input to Arduino. The led is used to print the status of the project and it is connected to all analog pins, the Node MCU camera is used to capture when the IR sensor sense the vehicle crossing it is connected as output of Arduino Uno. RFID reader number reads the RFID tag the RFID number is unique it is connected with vehicle number. GSM is used to send the message to the related violated vehicle number.



4.2 Working

The project will reduce all the problems associated with traffic rule violation on road. In this system it consists of RFID reader will read the RFID tag number which is attached to the vehicle

while purchasing or passing the vehicle for the amount plate received by RTO which will be mandatory. The camera will also be there for capturing the image of auto that has broken the rule. The latest image capture by camera and send this information to the server database. the related image from server and related details about that particular vehicle like name of owner, address, license number, passing number, photo, mobile number, their checking account number. This application will receive the fine automatically from the owner's checking account consistent with the rule broken by vehicle driver and fine decided by government. This application also will send the message to vehicle owner about the breaking of traffic rule, fine according to that rule, proof of breaking the rule in the form of image capture by camera, date and time of breaking the rule and accurate fine is issued and SMS will be sent.

4.3 Difference between existing system and proposed method

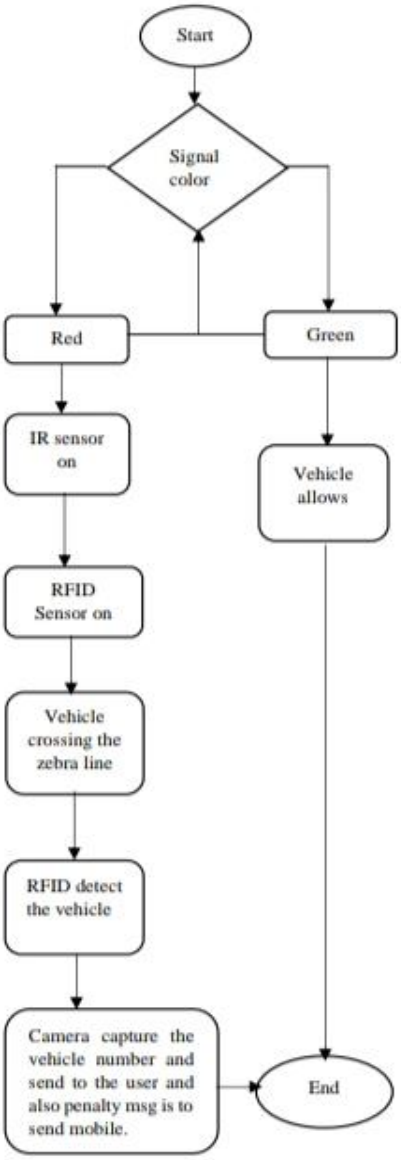
Parameter	**Embedded System**	**Traffic Detection system using Android**	**Violation detection at traffic signals using RFID system**	**Proposed Method**
Def	IR sensors are used to measure density of the vehicles which are fixed with in fixed distance.	It determined behaviour of traffic in a particular location. It calculates the speed of vehicles on the basis of sensors.	We can integrate RFID tag on very vehicle which can be read by RFID reader, if any violate the rule of traffic signal.	If any violate the rule of traffic signal then it read RFID tag number of that vehicle send the info to that smart phone via SMS. And also, it sends the captured photo to the mail id.
Device Dependency	Micro-controller	GPS	RFID tag & RFID Reader PC	Camera, RFID tag and RFID Reader
Automatic Fine Collection	No	No	No	Yes
Maintain Data Base	No	No	Yes	Yes
Way of Detection	Measure density of vehicles	Calculates speed of vehicles	RFID system	RFID System & smart phone

4.4 Features of Proposed System

The different features in this proposed system are:-

1. Application Interface
2. Corruption Avoidance
3. Automatic Penalty Collection
4. Reduce Work load of Traffic Police

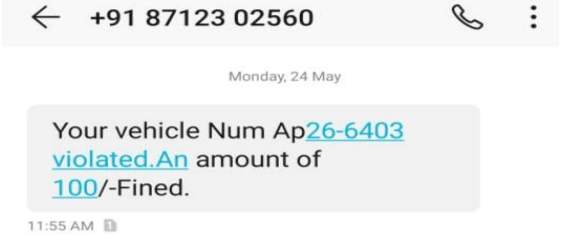
4.5 Flow Chart



V Result

The system described above has been found to be effective in detecting vehicles with a latency of about 1.5 seconds. The system has been implemented with commercially available RF transmitters and receivers that are supplied as a receiver-transmitter pair so that the system can only detect the vehicles whose respective transmitter, in a commercial implementation, will be able to receive signals other than multiple Detect transmitters, such as cellular signals that you are using a considerably many vehicles.

When a vehicle crosses the zebra crossing line at traffic sign then GSM send the message like
Your Vehicle Number AP XX-XXXX Violated. An Amount of 100/-Fined



VI Conclusion

In this way, the system is automatically penalized for violating traffic rules and, in turn, leads to disciplined traffic in our country. It will help minimize many traffic-related problems that cause system-wide disruptions and reduce the number of accidents. Traffic jam that devours our precious time. In our system, we only monitor traffic at the signposts, but it could also be useful for monitoring no entry, one-way streets, etc. The system saves time and is designed for fast application. The Automated Penalty System for Traffic Sign Violations is a very easy to use application that saves time and effort. The application works efficiently and helps traffic system management to reduce your manual work and time.

REFERENCES

1. Shruti KR and Vindhya K, Priority-based traffic light controllers using wireless sensor networks, International Journal of Electronic Signals and Systems (IJESS) ISSN:
2. Ms. Pallavi Choudekar, Ms. Sayanti Banerjee and Prof. M K Muju, “Real Time Traffic Light Control Using Image Processing”, Pallavi Choudekar et. al./ Indian Journal of Computer Science and Engineering (IJCSE), ISSN: 0976-5166, Vol. 2 No.
3. R. Hegde, R. R. Sail, and M. S. Indira, “RFID and GPS Based Automatic Lane Clearance System for Ambulance”, Int. J. Adv. Elect. Electron.Eng, vol.2, no. 3, pp. 102-107, 2013. [4] Marianne A. Azer, Ahmed Elshafee,” A Real-Time Social Network- Based Traffic Monitoring & Vehicle Tracking System” 978-1-5386-5111-7/18/, IEEE,2018.
4. G. Vara prasad and R. S. D Wahida Banu, “Flexible Routing Algorithm for Vehicular Area Networks”, in Proc. IEEE Conf. Intel. Transp. Syst. Tele communication., Osaka, Japan, 2010, pp.30- 38.
5. Varsha Sehdev Nagmode, Prof. Dr. S.M. Rajbhoj, “An IoT Platform for Vehicle Traffic Monitoring System and Controlling System Based on Priority” 978-1-5386-4008-1/17/, IEEE, 2017ss
6. P Rajasekar, R. Usha Nandhini, R. Nivethika, Reshma Chandran, S. Pavithra,, “Wi-Fi Combined Visible Light Communication for Intelligent Transportation System”, International Journal of Innovative Technology and Exploring Engineering (IJITEE), ISSN: 2278-3075, Volume-9 Issue-3, January 2020
7. A.M.Mahaboob Basha, M.Rajaiah, Penchalaiah P et al., “Machine Learning-Structural Equation Modeling Algorithm: The Moderating role of Loyalty on Customer Retention towards Online Shopping”, International Journal of Emerging Trends in Engineering Research, ISSN: 23473983 (SCOPUS), Volume-8, No. 5, Page 1578–1585,May, 2020.
8. Sruthi P.M, Parani T.K, P. Rajasekar,“An Efficient and Secured Data Transmission in WBAN Using U-Wear Technology”, International Journal of Current Trends in Engineering & Research (IJCTER) e-ISSN 2455–1392 Volume 3 Issue 5, May 2017 pp. 207– 217
9. Imperial Journal of Interdisciplinary Research (IJIR) Vol-2, Issue-5, 2016 ISSN: 2454-1362, http://www.onlinejournal.in Violation Detection at Traffic Signals Using RFID System.
10. Bhargavi Yadav N and B Mohan Kumar Naik, “RFID and ZIG BEE Based Intelligent Traffic Control System”, International Journal of Computer Engineering and Applications, ICCSTAR-2016, Special Issue, May.16