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ADVANCED TRAFFIC CONTROL AND VIOLATION SYSTEM WITH WEB SERVER

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Abstract:-The number of vehicles has been increased drastically in India, in according to that traffic accidents have also been increased. In order to decrease these accidents various steps have been initiated by the government but these initiations have been failed numerous times and citizens breaking traffic rules have been increased. To avoid this various projects and coordination have been initiated. One of the coordination is imposing penalty for those people who violate traffic rules especially signal jumps. In this title the idea which has been proposed will definitely decrease the traffic accidents and avoidance.

Key Words:- RFID, ThingSpeak(Cloud based Server), Raspberry Pi3, GSM

I.INTRODUCTION

Traffic jam is an uncompromising issue across the world and it has become a bad experience for the daily traveler. In most of the metropolitan arrangements to make traffic light controllers more intelligent. The development of new technologies such as communication networks and image processing is being used regulation of the traffic demand at each intersection in the network is the key features involved in this method.

So we have to avoid traffic accidents and shorten the length of the queue at the traffic signal .The main objective of the system is to monitor the traffic signal and control traffic light sequence. In most of countries the accidents are caused due to red signal breaking. The system will continuously monitor traffic signal. If any person or vehicle breaks the red signal, then the tag of the bike will be read by the RFID Reader and the vehicle number will be send to Cloud which is operating by the RTO. Then an SMS will be send to the Vehicle owner regarding the fine he needs to pay for jumping the signal. Therefore system will detect traffic rule break and also monitor traffic light sequence**.**

II. LITERATURE SURVEY

A number of papers have been published with an aim to overcome the disadvantages of the traditional traffic light system. The various methods use to find the density of traffic can be classified based on vehicle detectors such as piezoelectric sensors and Inductive Loops[2], Ultrasonic Sensors[3], Infrared Sensors[4] and sound Sensors[5], Acoustic Sensors[6], Video/ Image processing techniques[7]-[9], RF based detectors[10], Fuzzy Logic Systems[11] and systems based on cloud computing and IoT[12],[13]. This paper uses a combination of techniques so as to provide results that are more accurate.

(i) Guoyu Ou, Yang & Ying Liy.[1] describes the traffic violators and offences are becoming more and more serious as the traffic volume increasing, which may bring property damage and threaten personal safety. The lack of capability is 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. An optimization scheme as well as a well-design data structure is proposed to improve the performance of the parallel implementation. The real data and synthetic data are applied for the experimental results. Experimental results demonstrate that our proposed system can discover all the violations from the high throughput.

(ii) Nourdine Aliane,Javier Fernandez,Mario mata & serigo bemposta.[2] examine to detect some specific traffic violations,record data associated to these faults in a local data-base and also allow visualization of the spatial and temporal information of these traffic violations in a geographical map. The system is able to detect some specific traffic violations, record data associated to these faults in a local data-base, and also allow visualization of the spatial and temporal information of these traffic violations in a geographical map using the standard Google Earth tool.

(iii) Govind Prasad Arya,Durga Prasad Chauhan, Vishal Garg.[3] examine the automatic intelligent system to identify culprit vehicle due to large population and traffic congestion it is difficult to identify which vehicle has broken traffic rules or by which vehicle the accident has happened. To monitor culprit vehicle manually is very difficult. Therefore, there is need to monitor these vehicles automatically. In today's time there are so many people breaking traffic rules without any fear, one of them is jumping red light signals. Sometimes due to this the vehicle meets an accident with another vehicle. The traffic monitoring authorities need to find new methods of overcoming this difficulty.

III. PROPOSED METHODOLOGY

In this system we use different components such as raspberry pi 3, GSM, LCD, RFID reader, RFID tags, and web camera. In order to control traffic violation and to monitor traffic light sequence.

In this proposed method, the system will continuously monitor traffic signal. If any person or vehicle breaks the red signal, then the tag of the vehicle will be read by the RFID Reader and the vehicle number will be send to Cloud which is operating by the RTO.

Then an SMS will be send to the Vehicle owner regarding the fine he needs to pay for jumping the signal by GSM. Therefore the system will detect traffic rule break and also monitor traffic light sequence.

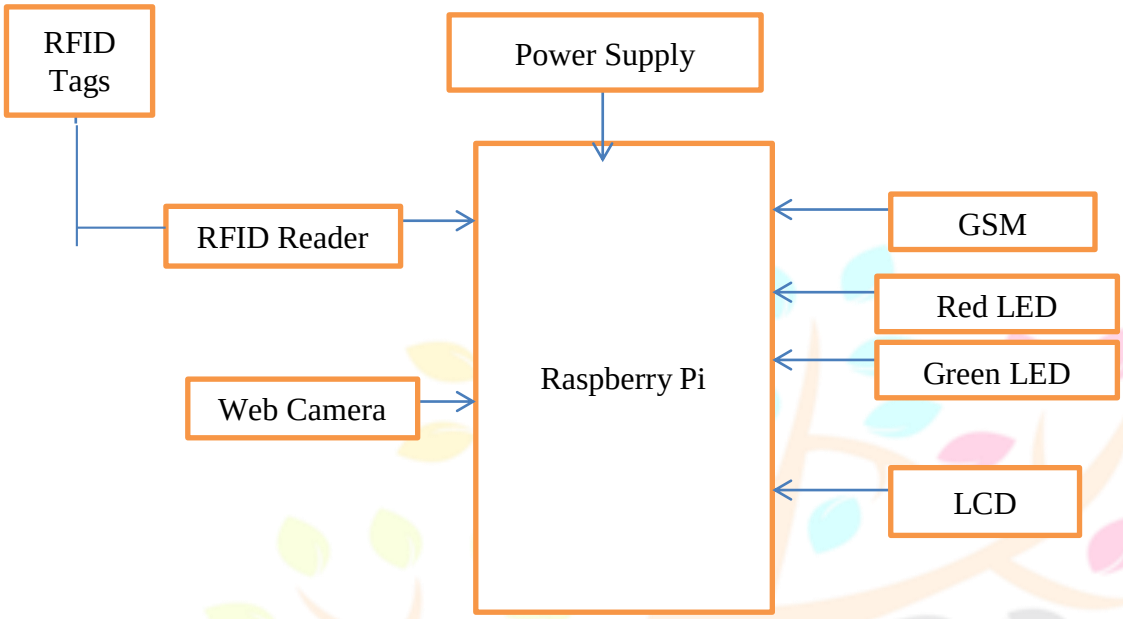

Figure.1 Block Diagram

3.1 Violation detected

The RFID Tags needs to be installed in Every vehicle. A RFID tag is seen in the illustration (brilliant card molded tag). RFID labels may be found in a variety of sizes and forms. The Tag includes integrated circuits(IC).

Figure.2 RFID Tags

With the Automatic Identification and Data Capture (AIDC) innovation gathering, RFID has a position. As a result, AIDC methods recognize things, acquire information about them, and enter that information directly into PC frameworks with little to no human intervention. RFID methods make use of radio waves to do this.

At a fundamental level, RFID frameworks are made up of three parts: an RFID tag or dazzling mark, an RFID reader, and a radio wire. For transferring information to the RFID reader, RFID labels include a coordinated circuit and receiving wire (otherwise called the examiner). The reader then converts the radio waves into an electrical signal. Information structure that becomes more useful over time. The information gathered from the labels is then sent to a host PC framework via a communication interface, where it can be stored in a database and broken down at a later time. Whenever the vehicle breakes Signal, The RFID Reader activates and it is configured as a Violation.

3.2 Capturing the Images of the Violater

Here were have been Using Camera to capture the Things at a moment(it might be bike/ persons Photo) to show it as a verification for the violater.

3.3 Validations

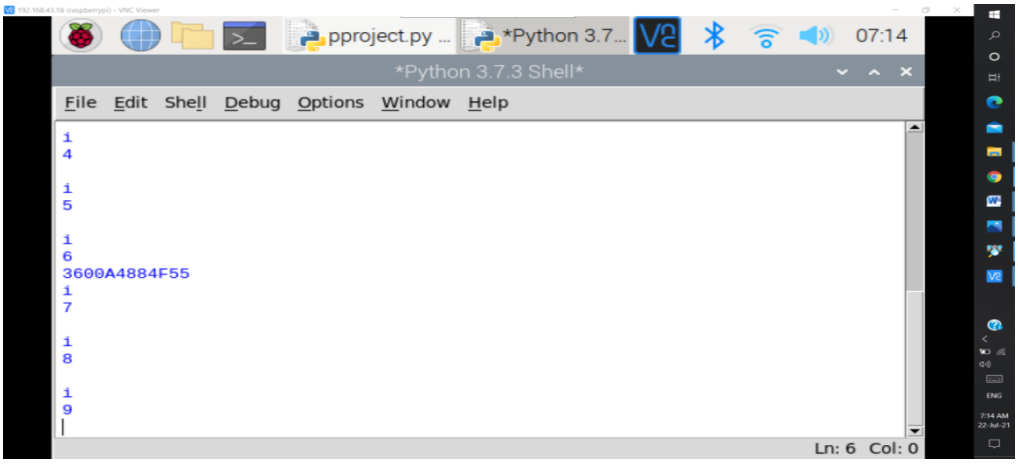

Figure.3 Validation window of Python Console (Test case-1)

In the above Image user has passes the Signal when the signal is in Green so, as per the Logic in Algorithm no Violation has occurred.

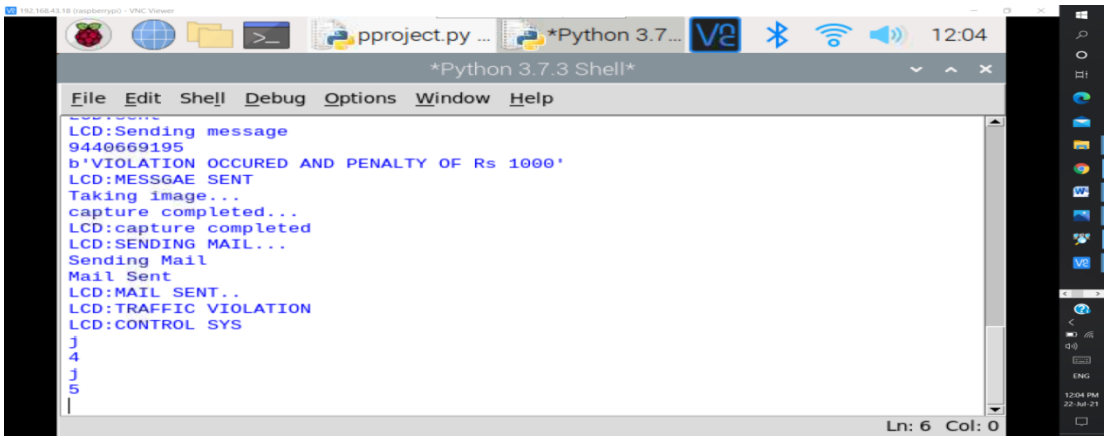

Figure.4 Validation window of Python Console (Test case-2)

In the above Figure we can see that Violation has been Occurred i.e., in second stage of testing signal Jumping has taken the place and the System has to send the message to the user and upload the image of the violator to the cloud(ThingSpeak).

3.4 ThingSpeak

In order to check the violation and store the data we need cloud, so ThingSpeak is one of the cloud servers to upload and retrieve the data. These data are with RTO officials.

3.5 API Keys

API (Application Programming Interface) keys are used in ThingSpeak. The API key is a one-of-a-kind identifier that authenticates requests for use and payment reasons connected with your project. At least one API key must be linked with your project. Here in our case the API keys of RFID Tags have been stored in ThingSpeak Server.

3.6 SMS and Email to the user

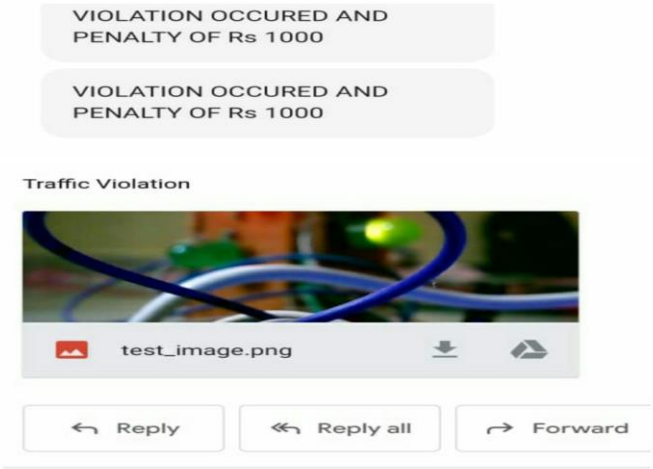

Figure.5 SMS and Email

The SMS and Email will be triggered as per the below Algorithm

```
lcd.stringlcd(0x80,"Sending message")
time.sleep(1)
gsm.Sendmsg("9440669195","VIOLATION OCCURRED AND PENALTY OF Rs 1000")
lcd.stringlcd(0x80,"MESSGAE SENT")
time.sleep(1)
camera = cv2.VideoCapture(camera_port)
temp = get_image()
print("Taking image...")
camera_capture = get_image()
file ="/home/pi/test_image.png"
cv2.imwrite(file, camera_capture)
print("capture completed...")
lcd.stringlcd(0xC0,"capture complted ")
time.sleep(2)
del(camera)
time.sleep(2)
lcd.stringlcd(0xC0,"SENDING MAIL...")
sendemail('Traffic Violation')
time.sleep(2)
lcd.stringlcd(0xC0,"MAIL SENT..")
time.sleep(2)
time.sleep(3)
lcd.stringlcd(0x80,"TRAFFIC VIOLATION")
lcd.stringlcd(0xC0,"CONTROL SYS")
```

IV. Results and Analysis

4.1 LCD for Validations

In validation we use LCD instead of PC so that processing and stages of the Project can be seen.

As per the algorithm the messages were displayed on the Screen.

Figure.6 Different stages of proposed method using LCD

As a part of validation in which stage the simulation is observed with the messages that has been Configured in the Algorithm.

4.2 Data Collection.

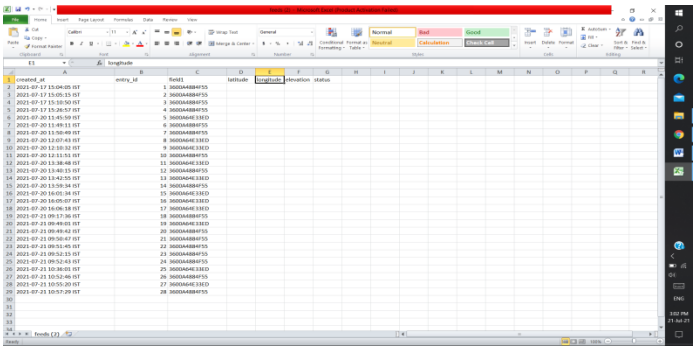

Figure.7 Data of Violators stored in the form of RFID Tag No's

Here in our case the API keys of RFID Tags are entered and the data need to be downloaded and these data can only viewed by RTO Officials.

V. CONCLUSION

This system setup avoids massive traffic infractions caused by faults in widely used traditionally built systems. We employed sophisticated technology in this project to identify and regulate the signal braking system used by cars, as well as to control traffic lights automatically, using RFID Tags and RFID Readers to detect the number of the vehicle that was not in the current system.

The technology also minimizes the workload of police who may be called upon to regulate traffic in an emergency. It also allows traffic lights to operate constantly with less risks of failure; in other words, the system provides a simple yet effective answer to ineffective traffic violation management systems.

This system's major application is to efficiently regulate traffic and decrease accidents.

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