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Smart Vehicle Signal Breaking Prevention System using RFID in IOT

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Abstract: ***The objective of this project is to design an efficient automatic authorized vehicle identification system using RFID. Due to rise in the number of accidents and violation of signal rules, we have developed this system which would prevent the problem and thus create a safe crossing for the pedestrian as well as for people travelling in vehicles. In the developed system, when the signal is red and vehicle is on zebra crossing line, then the system detects the RFID Tag situated on vehicle through RFID Reader. Once the unique Tag number is read by the RFID Reader it compares the Tag number with records on a database. In database there can be specific information about the vehicle and vehicle owner. If the Tag number matches with the database then the associated owner's information is verified and then displayed. After retrieval of owner's details the RTO has authority to send notification and apply fine to the correspondent owner and thus owner too has authority to view history and pay fine.***

Keywords: RFID Tag, RFID Reader, Microcontroller, Wi-Fi Model.

I. INTRODUCTION

With increase in number of road accidents and violation of signal rules, solution for it is need of an hour.. The heart breaking fact is that in India 16 people die on road accidents every hour. In 2015 the condition is worsen with death rate rise to 130,000 annually. The main reason is people fail to obey the traffic rules since the security systems is not enough to enforce on problems like crossing the roads and follow the red signal. Today red light violation is one of the most common and serious problem which results increased rate. Advanced transportation system are built from technologies to solve transport related problems .It is estimated that India is among top 10 countries to face more death rate on road. To overcome this problem we have developed system which uses RFID Technology to deal with traffic problems.

The red light violation can be monitored using RFID. RFID is new upcoming technologies in many fields and RFID is basically an identification technique which uses Radio waves for the purpose of identification of objects having RFID Tag. The feature of RFID is low voltage, low cost, non-contact card chip to read and write. Many technologies are implemented in RFID technology. The system uses advanced techniques to tackle thieft control the speed of the vehicle and identify signal violators. The major components of the system are RFID Reader, RFID Tag and Microcontroller. The system minimizes the conflict and confusion between the people and vehicle and which will automatically reduce the number of road accidents on roads.

Automatic Number Plate Recognition system is an important technique used in intelligent transport system. ANPR is an advanced machine vision technology used to identify vehicles by their corresponding number plate without direct human intervention. ANPR system is software model.

We also implement our system further in such a way that if a vehicle breaks the signal then our system can detect a vehicle number through unique tag situated on the vehicle. We mainly concentrate on two steps: one is to locate the number the number plate and second is to segment all the number and letters to identify each number separately.

As the number of automobiles grows rapidly, the traffic problems increase as well, for example, car theft, speeding, and running the red light, etc. Due to the above mentionable traffic control problem, vehicle tracking, recognition and management has become major topics of modern traffic control system.

The current vehicle recognition system includes technique of radio frequency identification (RFID), infrared, microwave and image recognition. The first three techniques require the installation of transponders on the vehicle. But, in high speed driving, the accuracy rate of de-tection and recognition is low with the system using transponders. Usually the system uses a monitoring system to enhance the accuracy of the system. Meanwhile, there are still many unsolved problems. For instance, the transponders could be pirated, and the user's privacy could be violated.

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II. LITERATURE SURVEY

Takkedasila Johny, M. Maruthi Prasad Reddy," RFID and Number Plate Based Two Level Authentication System for Vehicles" ijmetmr,2015.

In this paper the vehicle number plate is extracted by using the image segmentation and optical character reorganization technique which is used for recognizing the character. And then the resulting data is used to compare with the records on a database and data extracted from RFID. And in database there can be specific information like vehicles owner name, place of registration, or address, etc.

Sabeen Javaid, Ali Sufian,"Smart Traffic Management System using IOT", International Conference on Advanced Communication Technology(ICACT),(2018)

In this paper Traffic management is considered as one of the major dimensions of a smart city. To tackle various issues for managing traffic on roads and to help authorities in proper planning, a smart traffic management system using the Internet of Things (IoT). The system is developed using camera and sensors. The main aim of the system is to prioritize the emergency vehicles on busy roads, thus by making help available to the needy as soon as possible.

Wei Shao and Ling Chen,"License Plate Recognition Databased Traffic volume Estimation using Collaborative Tensor Decomposition" ,(IEEE 2018)

In this paper, system is used to estimate the traffic volume data on the roads. With increase in number of vehicles it has become mandatory to keep a record of the vehicle density. Which road/path faces higher traffic volume data so accordingly the future road directions can be planned.

Ms. Aarthy D K, S. Vandanaa, M. Varshini, "Automatic Identification of Traffic Violation and Theft Avoidance", International Conference on Science Technology, Engineering and Management (ICONSTEM),(IEEE2016)

The main purpose of this paper is to provide high level security. As we know violating traffic rules have become predominant on Indian roads. Because of this carelessness many people lose their life. .So to overcome this, the proposed system uses RFID technology to deal with the traffic problem. The major components of this proposal are RFID reader, camera, Tag and a database server.

Dhiraj Y. Gaikwad Pramod B. Borole, "A Review Paper on Automatic Number Plate Recognition (ANPR) System", International Journal of Innovative Research in Advanced Engineering (IJIRAE) Volume 1 Issue 1 (April 2017).

In this paper image processing technology is used. In which number plate of vehicle is used to recognize the vehicle. The main objective is to design an efficient automatic vehicle identification system by using the vehicle number plate, and to implement it for various applications such as automati toll tax collection, parking system, Border crossing, Traffic control ,stolen cars etc..

M.M Shidore ,S.P.Narote "Number Plate Recognition for Indian vehicles", International Journal of Computer Science and Network Security(IJCSNS) VOL.11 No.2,Feb. 2011.

This paper presents Automatic Number Plate extraction, character segmentation and recognition for vehicles. Number plate extraction is done using sobel filter and connected component analysis. The character segmentation is done by using vertical projection analysis.

"Detecting Convoys Using License Plate Recognition Data", 2016.

This paper proposes novel models for LPR observations of traffic which are well-suited for online convoy detection. Baseline traffic is modeled as following a mixture of semi- Markov processes, and specific models for temporal and spatial correlation of observations of vehicles traveling in a convoy are introduced. These models are used within a sequential hypothesis testing framework to obtain a system for real-time convoy detection. The model of baseline traffic may be of independent interest for forecasting road traffic patterns. Experiments with an extensive simulated dataset illustrate the performance of the scheme and offer insights into the trade-offs between detection rate, false alarm rate, and the expected number of observations required to detect a convoy.

III.EXISTING SYSTEM

The Existing system is CCTV Camera.. Till now, a CCTV camera is the system used to monitor the vehicles which breaks the Signal. But this system has some limitations and they are as follows.

1) CCTV Cameras can only monitor limited areas..
2) Sometimes the image of number plate on vehicle is not captured because of the vehicles speed.
3) CCTV Camera not working.
4) If number plate is broken or it is not clean then it is not possible to detect the vehicle.
5) Weather condition not proper.

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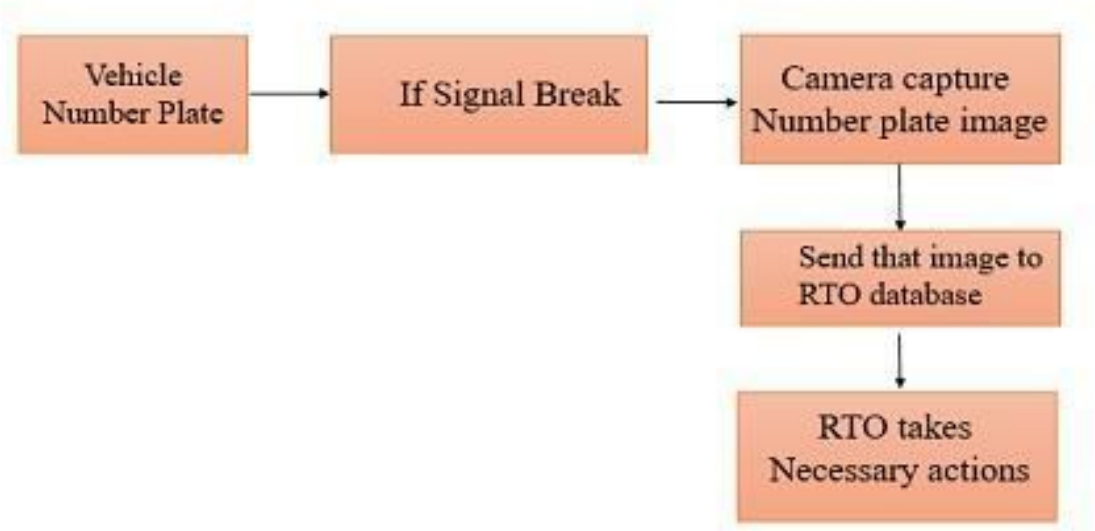


Fig 1. Existing system

IV. PROPOSED SYSTEM

In the present existing system (CCTV Camera) it has some limitations, which doesn't fulfil the requirement as needed. To overcome those limitations we have proposed a system which would not only fulfil the requirement but also add some advanced features.

In the proposed system, when the signal is red and vehicle is on zebra crossing line then the system detects the RFID Tag situated on vehicle through RFID Reader. Once the unique Tag number is read by the RFID Reader it compares the Tag number with records on a database. In database there can be specific information about the vehicle and vehicle owner. If the Tag number matches with the database then the associated owners information is verified and then displayed. After retrieval of owners details the RTO has authority to send notification and apply fine to the correspondent owner and thus owner too has authority to view history and pay fine.

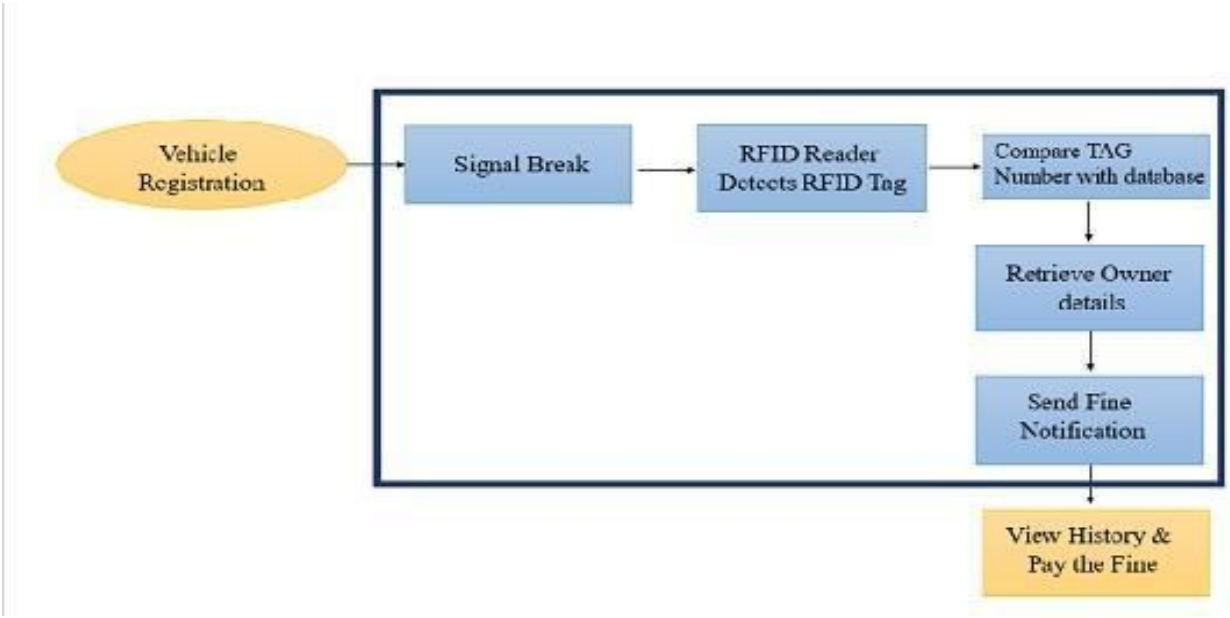


Fig 2. System architecture

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V. ALGORITHM

1) *Input:* Vehicle TAG Number.
2) *Output:* Vehicle Owner Details.
a) Step1: If any vehicle breaks signal.
b) Step 2: Capture the TAG Number.
c) Step 3: Send the number to RTO.
d) Step 4: TAG Number of vehicle is input to the system.
e) Step 5: Check details of owner.
f) Step 6: Retrieve the vehicle's owner details from the database matching with the TAG number.
g) Step 7: Send the fine details to the owner.
h) Step 8: Repeat steps 1-7 for each vehicle which breaks the signal.

VI. ADVANTAGES

A. Traffic rules followed strictly.
B. Many life would be saved.
C. Theft detection
D. Easy to use

VII. METHODOLOGY

A. RFID Technology

RFID is an abbreviation for radio frequency identification. RFID tags are nothing but small chips which looks like a smart card or visiting card that are used in our day to day life. These small chips along with an RFID reader forms the RFID system. Electromagnetic fields are used by RFID to automatically identify and track tags attached to objects. Electronically the information is stored in Tags. From a nearby RFID readers interrogating radio waves Passive tags collect energy.

B. RFID Reader

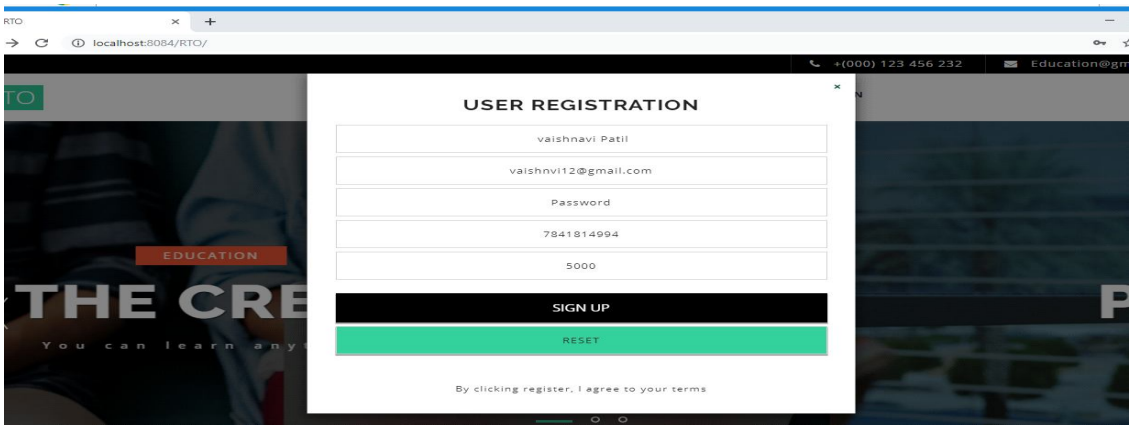
The RFID reader contains a radio transmitter and receiver inside.. On powering the reader transmits radio frequency signals continuously. When an RFID tag is placed inside the range area of a RFID reader, the tag is energized through electromagnetic induction and collects the information from it.

C. RFID TAG

In different types of shapes and sizes RFID Tags are available. An IC is used for storing data, for transmitting and receiving data antenna is used, and a modulator is also used. As the Tags are very small in size they can hold only few bits of data. There are two types of RFID tags
1) Active RFID Tags.
2) Passive RFID Tags.

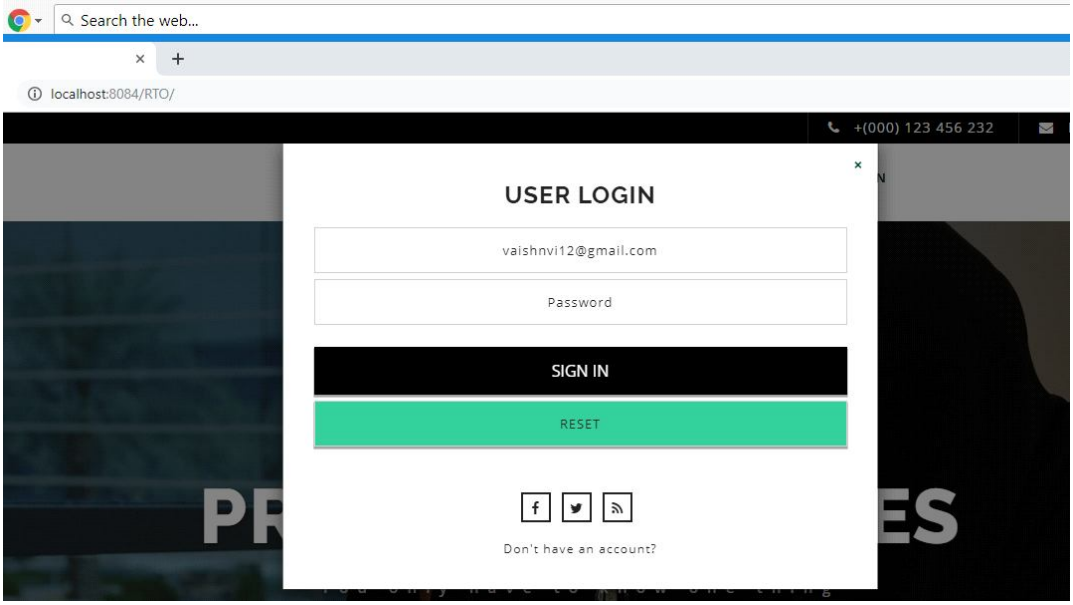
VIII. RESULTS

A. User Registration

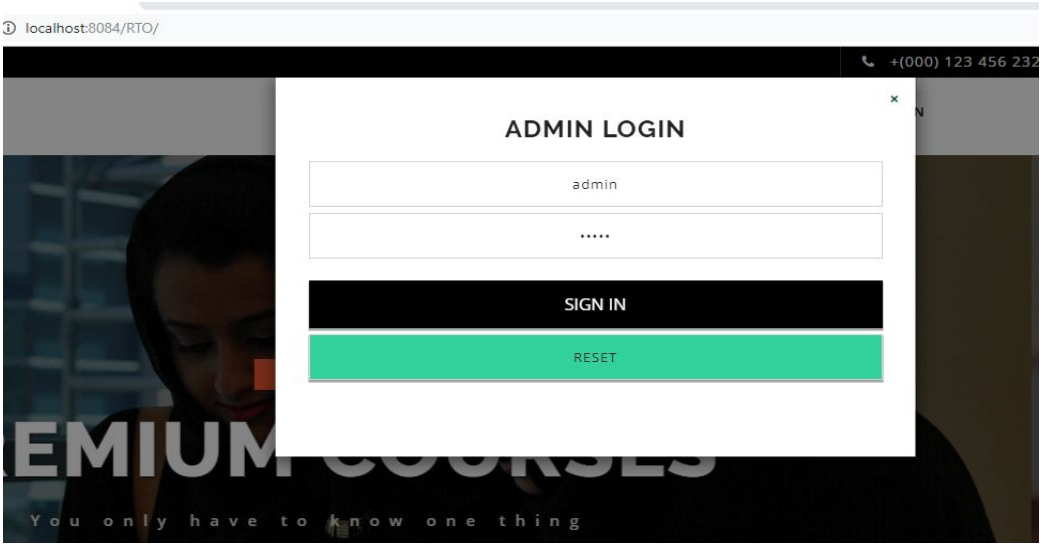


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B. User Login



C. Admin Login

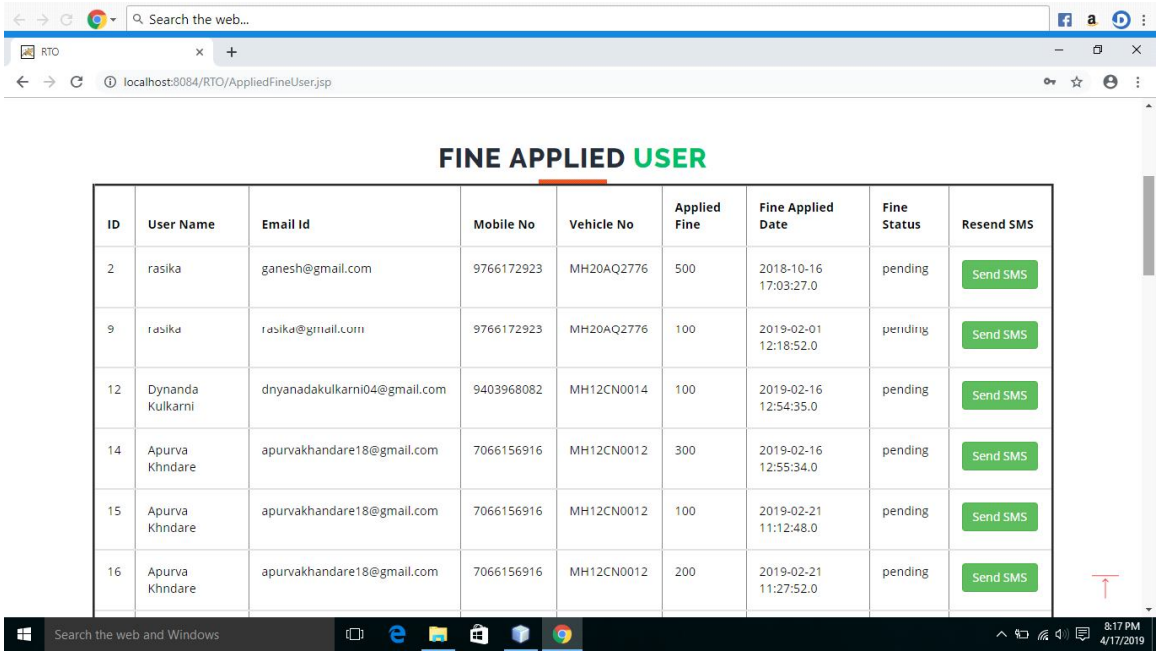


D. Vehicle Registration



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E. Fine Applied To User



ID	User Name	Email Id	Mobile No	Vehicle No	Applied Fine	Fine Applied Date	Fine Status	Resend SMS
2	rasika	ganesh@gmail.com	9766172923	MH20AQ2776	500	2018-10-16 17:03:27.0	pending	Send SMS
9	rasika	rasika@gmail.com	9766172923	MH20AQ2776	100	2019-02-01 12:18:52.0	pending	Send SMS
12	Dynanda Kulkarni	dnyanadakulkarni04@gmail.com	9403968082	MH12CN0014	100	2019-02-16 12:54:35.0	pending	Send SMS
14	Apurva Khndare	apurvakhandare18@gmail.com	7066156916	MH12CN0012	300	2019-02-16 12:55:34.0	pending	Send SMS
15	Apurva Khndare	apurvakhandare18@gmail.com	7066156916	MH12CN0012	100	2019-02-21 11:12:48.0	pending	Send SMS
16	Apurva Khndare	apurvakhandare18@gmail.com	7066156916	MH12CN0012	200	2019-02-21 11:27:52.0	pending	Send SMS

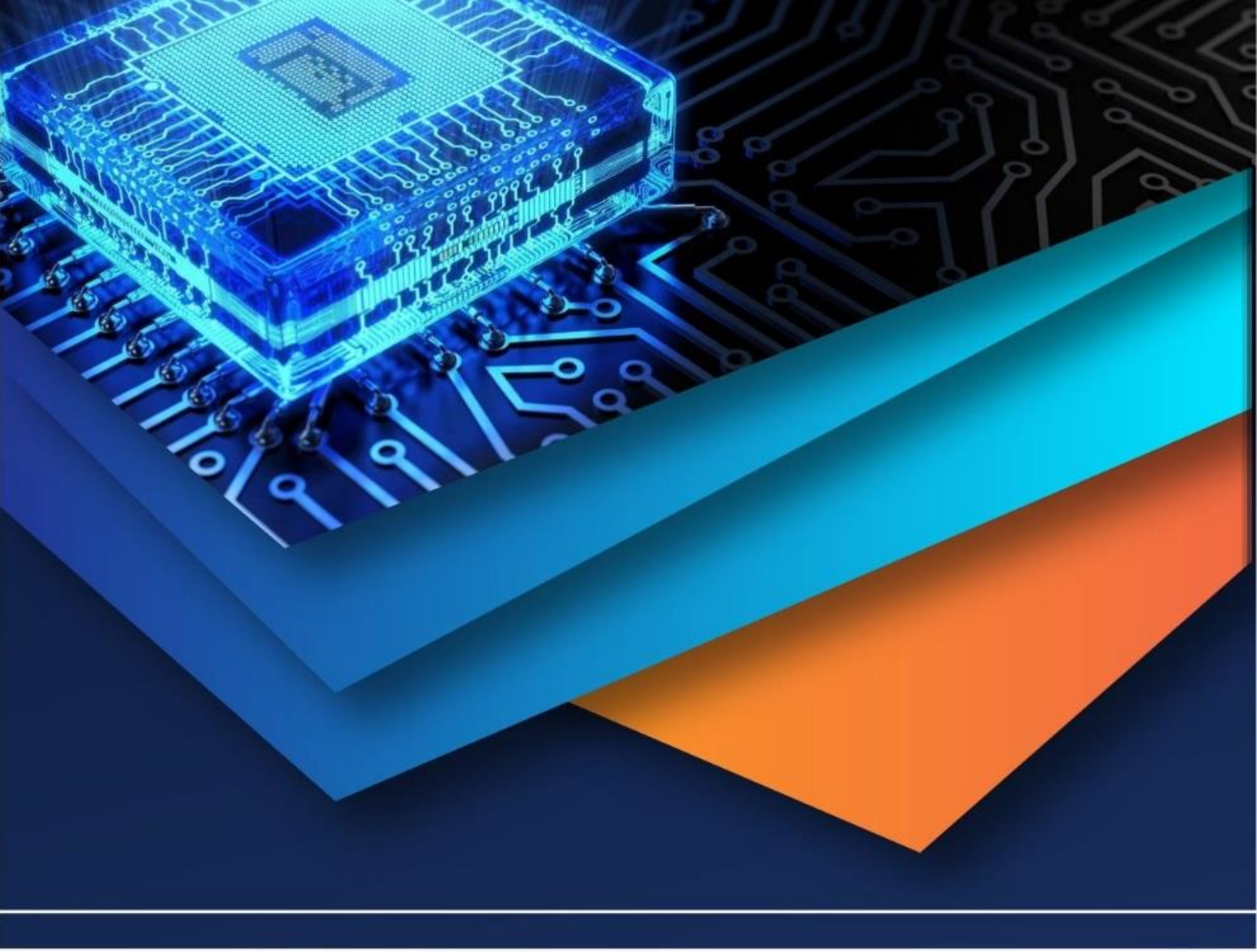
IX. CONCLUSION

Here we conclude our system which is developed in IOT is presented. The system uses the RFID technology to detect and take right actions against the person violating the signal rules by applying fine. Unless and until the person pays fine the RTO has rights to take action against that person. The objective of this project is to design an efficient automated system to abide the people by certain laws and make them follow. Thus creating a safe crossing for all.

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