CHAPTER 3
An IOT Based traffic system, emergency and theft vehicles Identification by using a cloud database

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ABSTRACT

In today's world, traffic jams during rush hours are one of the major concerns. During rush hours, emergency vehicles like ambulances get stuck in jams. Due to this, these emergency vehicles are not able to reach their destinations in time, resulting in a loss of human lives. We have developed a system that is used to provide clearance to any emergency vehicle by turning all the red lights to green on the path of the emergency vehicle, hence providing a complete green wave to the desired vehicle. In addition to the green wave path, the system will track a stolen vehicle when it passes through a traffic light. It is a novel system that can be used to implement the concept of the green wave.

Keywords:—Emergency Vehicle, Theft Vehicle, RFID, Ultrasonic Sensor, Embedded C

INTRODUCTION

Describe the general perspective of the chapter. End by specifically stating the objectives of the chapter.

Introduction

In the existing method, automatic traffic management based on vehicle type is difficult. There is no wireless technology available for monitoring. Traffic management is done by traffic police and directs the vehicles on each side. The existing system has the following disadvantages,

- Difficult to find the theft vehicle.

- Manpower is required.
- Traffic congestion takes place.

In our proposed system, we are going to monitor the traffic system, emergency, and theft vehicles easier by using a cloud database. Here, an Ultrasonic sensor that is away from the traffic light section detects the density of vehicles on that line. Based on these conditions traffic light signal will glow. Our system has the following advantages,

- Fast response.
- Theft vehicle is detected.
- One-time installation.
- Traffic congestion will not occur.

EASE OF USE

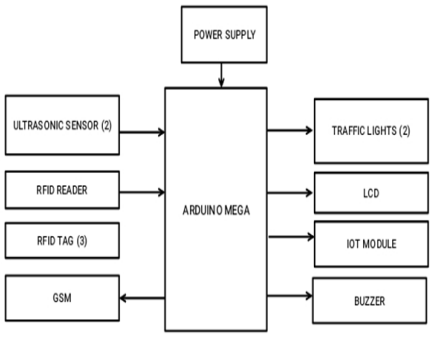
PROBLEM STATEMENT

- To reduce traffic density at traffic junctions and identification of emergency and theft vehicles in the traffic systems using RFID.
- To distinguishes between emergency and non-emergency cases, thus preventing unnecessary traffic congestion.

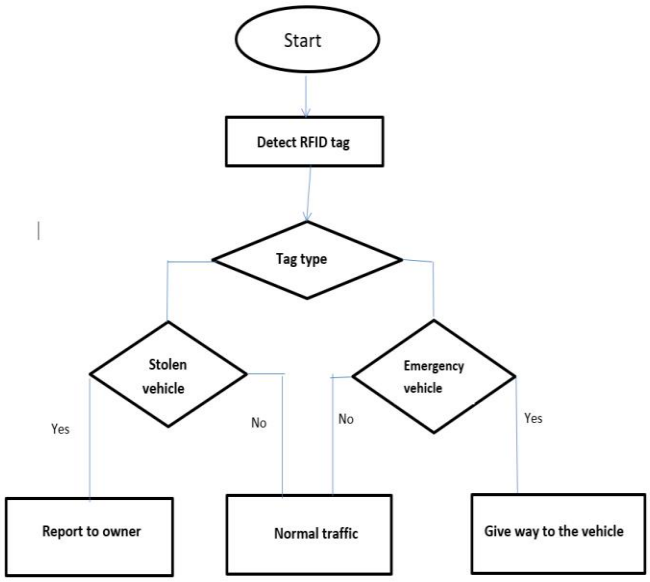
NEED FOR THE PROJECT

- In this system with emergency vehicle clearance, the traffic signal turns green as long as the emergency vehicle is waiting at the traffic junction. The signal turns red, only after the emergency vehicle passes through. This system proved to be effective to control not only ambulances but also classic vehicles using an RFID tag.
- We can also find the theft vehicles using RFID tags by reporting the tags number to the police. This will reduce the pressure on police and make it easy for them to see the theft vehicle.

SYSTEM DESIGN



WORKING PROCEDURE



WORKING PRINCIPAL

In our system, we have used the ARDUINO MEGA microcontroller which, acts as the brain of our system. Hence entire system program is stored in it. The ultrasonic sensor is placed away from the traffic junction on each line of the road so that continuously monitors the distance to the traffic lights, if that distance is reduced we came to know that vehicle congestion takes place. Based on which traffic line congests, the traffic light glows a green signal to it. In which the traffic signal management for emergency vehicles is included.

To make the proposed system work, every, each vehicle going for registration is provided with an RFID tag. In which information like the vehicle' s unique registration number and vehicle type is stored. The vehicle type is mentioned as e (for an emergency) and n (for normal) on the tag.

These data are stored in the database in the transport office. To read the information in the tag, an RFID reader is installed in the traffic control unit.

Whenever the vehicle passes through, the signal reader gets the vehicle type and gives it to the controller unit. If any e (emergency) type vehicle is found, that lane is made green w.r.to the other lanes. To upgrade furthermore theft vehicle detection method is used.

To find a theft vehicle, the user has to contact the transport office to update the database of the vehicle with t (for theft). So, whenever a vehicle is passing through the traffic signal, the buzzer gives an alarm signal and also sends information about the vehicle to the owner using a device called GSM, and the control unit picks up the tag details and sent to the transport office via the IoT unit. From the obtained value, the police in the transport office check the database. If any theft vehicle is found, the control unit in the transport office will send to the police station about the vehicle passing through the particular signal. Thus, the police were can intercept the vehicle on the following possible path. All the data are fetched to the controller and displayed on the LCD. Hence all the information can be monitored through IoT.

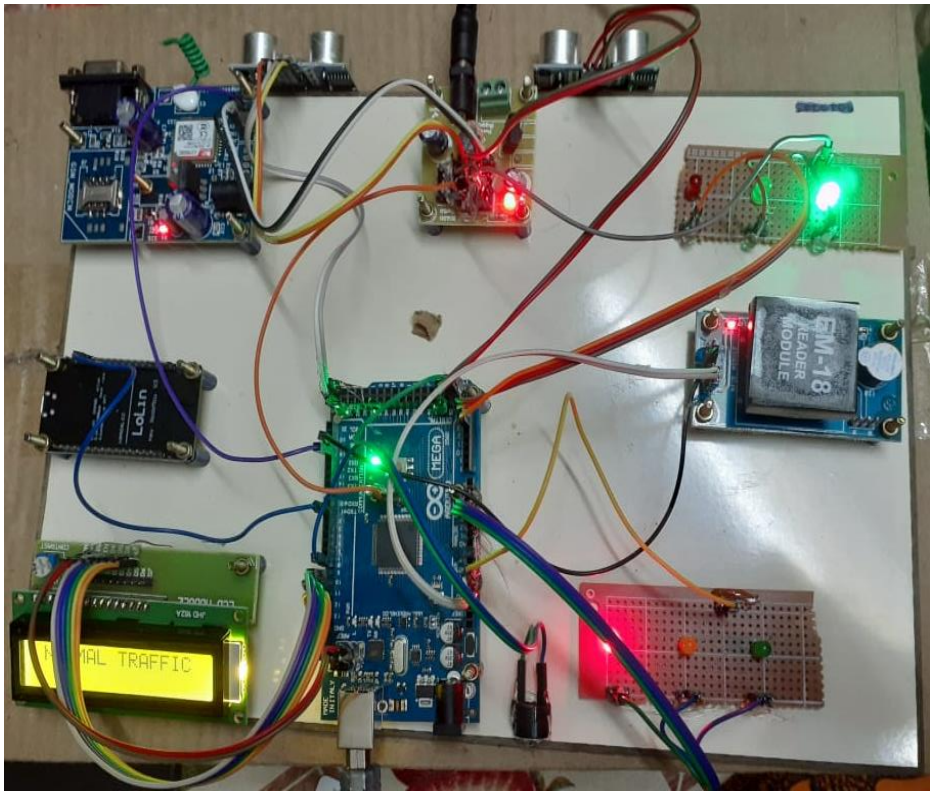
REVIEW OF LITERATURE

Gour Karmakar,Member , Abdullahi Chowdhury, Student Member, Joarder Kamruzzaman, Senior Member, and Iqbal Gondal, Member, 2020 IEEE

"A Smart Priority Based Traffic Control System for Emergency Vehicles"

Unwanted events on roads, such as incidents and increased traffic jams, can cause human lives and economic loss. For efficient incident management, it is essential to send Emergency Vehicles (EVs) to the incident place as quickly as possible. To reduce incidence clearance time, several approaches exist to provide a clear pathway to EVs, mainly fitted with RFID sensors in urban areas. However, they neither assign priority to the EVs based on the type and severity of an incident nor consider the effect on other on-road traffic. To address this issue, in this paper, we introduce an Emergency Vehicle Priority System (EVPS) by determining the priority level of an EV based on the type and the severity of an incident, and estimating the number of necessary signal interventions while considering the impact of those interventions on the traffic in the roads surrounding the EV' s travel path. We present how EVPS determines the priority code and a new algorithm to estimate the number of green signal interventions to attain the quickest incident response while reducing the impact on others. A simulation model is developed in Simulation of Urban Mobility (SUMO) using the actual traffic data of Melbourne, Australia, captured by various sensors. Results show that our system recommends the appropriate number of interventions that can reduce emergency response time.

RESULT OF THE PROJECT



APPLICATIONS AND ADVANTAGES

- Traffic signals are monitored and controlled.
- Theft vehicles and emergency vehicles will be identified.
- Emergency vehicles will be given way, and theft vehicles will be captured by the traffic inspector.
- Traffic density is reduced.
- Traffic signals are monitored and controlled.
- Theft vehicles and emergency vehicles are identified. Emergency vehicles are given way and theft vehicles are captured by the traffic inspector.
- Traffic density will be reduced.

CONCLUSION

In this article, an optimized IoT-based Emergency and Theft Vehicle Identification in Traffic System Using RFID is proposed.

- In the future, there will be no traffic congestion. RFID can reduce the cost of keeping an accurate retail inventory, including limiting lost sales owing to out-of-stock, reducing losses during merchandise movement.
- Each vehicle can be uniquely identified by an Electronic Product Code (EPC) by RFID.
- The currently following FASTag employs RFID technology. So this current technology will be very easily come into practice and very useful to people and the government.

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