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IOT Based Emergency and Theft Vehicle Identification in Traffic System Using RFID

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ABSTRACT: In today's world, traffic jams during rush hours is 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 into a loss of human lives. we have developed a system which 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. So, it is an autonomous 2-tier system which will help in the identification of emergency vehicles or any other desired vehicle. It is a novel system which can be used to implement the concept of the green wave.

I. INTRODUCTION

In this system with emergency vehicle clearance, the traffic signal turns to green as long as the emergency vehicle is waiting in the traffic junction. The signal turns to red, only after the emergency vehicle passes through. This system was proved to be effectual to control not only ambulance but also authoritative vehicles using RFID tag.
We can also find the theft vehicles using RFID tag by reporting the tag number to police. This will reduce the pressure of police and easy for them to find the theft vehicle.

II. WORKING PRINCIPLE

In our system, we have used ARDUINO MEGA microcontroller which acts as brain of our system. Hence entire system program is stored in it .Ultrasonic sensor is placed away from the traffic junction each line of the road so that continuously monitors the distance to the traffic lights, if that distance reduced so that we came to know that vehicle congestion take place. Based on which traffic line congests traffic light glows green signal to it. In which the traffic signal management for emergency vehicle is include. To make the proposed system to work, each and every vehicle going for registration is provided with an RFID tag . In which information like vehicle's unique registration number and vehicle type is stored. The vehicle type is mentioned as e (for emergency) and n (for normal) in the tag. These data are stored in the database in the transport office. To read the information in tag an RFID reader is installed in the traffic control unit . Whenever the vehicle passed through the signal reader get the vehicle type and gives it to the controller unit. In which if any e (emergency) type vehicle is found, that lane is made green w.r.to the other lanes . To upgrade further more 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, buzzer gives alarm signal also send information about the vehicle to the owner using device call GSM and the control unit picks up the tag details and sent to the transport office via IOT unit. From the obtained value the pc in the transport office check with the database . If any theft vehicle is found, the control unit in the transport office will send to police station about the vehicle passing through the particular signal. Thus, the police able to intercept the vehicle in the next possible path. All the data are fetched to the controller and displayed in the LCD. Hence all the information can be monitored through IOT .

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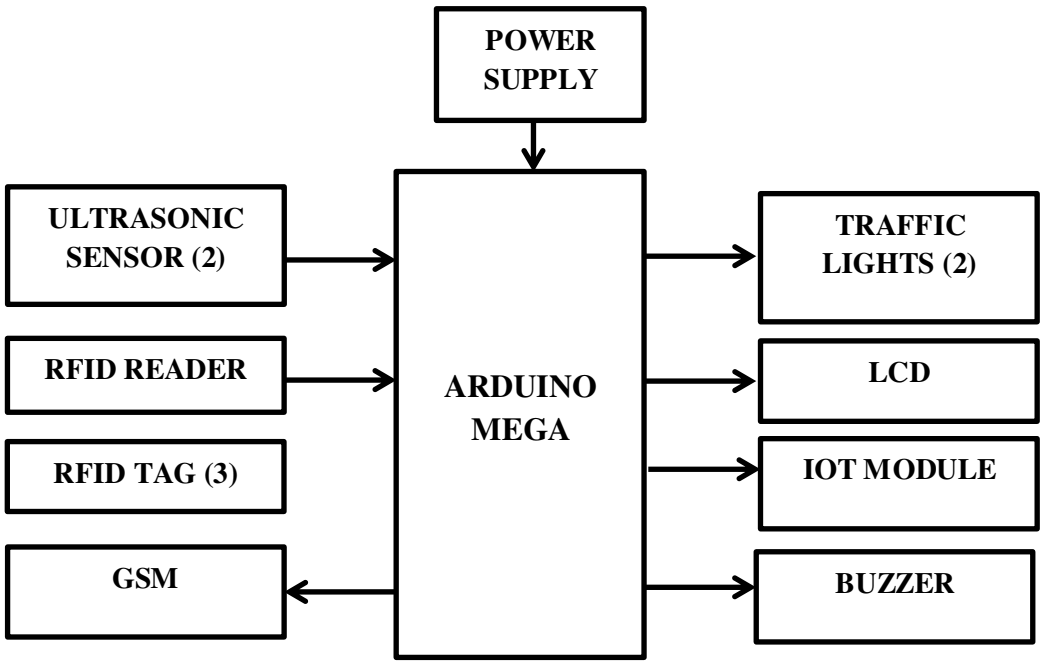
BLOCK DIAGRAM:



III. LITERATURE REVIEW

1. A NOVEL ASSISTIVE ON-RAMP MERGING CONTROL SYSTEM FOR DENSE TRAFFIC MANAGEMENT

By Weihai Chen, Zheng Zhao, Zhong Liu, Peter C. Y. Chen, 2017, IEEE.

1.On-ramps are area of frequent traffic congestion. Proper traffic guidance around on-ramp merging areas exerts a positive effect on the relief of traffic congestion. The objective of this paper is to design an assistive ramp-merging control (ARMCON) system. It utilizes knowledge about professional driver behavior and the dynamical relationship among the on-ramp vehicles, to produce timely information so as to guide the on-ramp drivers when merging with the main traffic flow. Under the guidance of ARMCON, disruption of the main traffic on the express way is minimized while a certain merging rate is maintained.

2. IMPROVED INTELLIGENT TRANSPORT SYSTEM FOR RELIABLE TRAFFIC CONTROL MANAGEMENT BY ADAPTING INTERNET OF THINGSBy Ramkumar Eswaraprasad, Linesh Raja, 2017, IEEE.

As the population increases, vehicle usage has been increased considerably. Traffic becomes the most crucial factor at the time of traffic management which needs to be controlled for the improved traffic management. However traffic management would be more difficult task in case of increased vehicles usage by different number of peoples. Internet of Thing makes things easier by interconnecting vehicles with the server through the internet. IoT can monitor the vehicle periodically and track their location by sending periodic information to the server. This is focused in the proposed research framework by collecting and analyzing the traffic information so that traffic can be controlled very effectively. The significant target of this proposed framework is to carry out a novel IoT based Traffic Management (IoT-TM) that can make short term decision about the traffic management, thus the accurate and efficient traffic clearance can be achieved. In this research method, data set is gathered from the multiple traffic profiles which includes attributes such as time consumption, traffic rate, number of vehicles and so on. These data's would be learned in the training phase by using the Hybrid Artificial Neural Network with Hidden Markov Model (HANN-HMM) which can accurately learn the traffic profile information with reduced time. To perform accurate recognition of the traffic optimized feature selection is done before learning by using Hybrid Ant colony Glow worm swarm optimization approach. The complete interpretation of the aniticipated investigational framework has been conducted on MATLAB

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environment from which it is proved that the proposed research method namely IoT-TM can make better decision about the traffic management than the existing research systems.

3. AN AUTOMATED GAME THEORETIC APPROACH FOR COOPERATIVE ROAD TRAFFIC MANAGEMENT IN DISASTER

By SamyaMuhuri, Debasree Das, Susanta Chakraborty, 2017, IEEE.

Transportation system gets paralyzed when a place affected by any catastrophic natural disaster. Some roads get blocked and vehicle density increases in all the other remaining routes. Each vehicle stuck at different position of the road network and tries to reach its destination in minimum time. A cooperative game theory based approach is proposed to regulate road traffic and minimize the waiting time of individual vehicles in any disaster situation. Each vehicle acts as a player and tries to increase its payoff value. Payoff value is based on the different parameters of the vehicle like its arrival time, velocity, priority and traffic density. Payoff value is adjusted according to the existing vehicle density in the road segment. Traffic density of each road is minimized simultaneously which increases the flow of the vehicles in the network cooperatively. Waiting time of a vehicle is directly proportional to the number of adjacent edges of the corresponding node and its density. The method also shows that any vehicle with higher priority will cross the road in minimum time. New alternative road creation process is also proposed based on graph theory for the worst situation. The alternative path will join the affected road with a minimum utilized node in the network to evacuate the affected traffic. Experimental results suggest that our proposed method achieve minimum average waiting time compare to the existing method. The shortest time travel path is found for each vehicle from its source to the desired destination in post disaster situation.

4. A REVIEW OF IOT DEVICES FOR TRAFFIC MANAGEMENT SYSTEM

By N. B. Soni, Jaideep Saraswat, 2017, IEEE.

In recent times, traffic congestion has increased at a breakneck speed especially in metropolitan cities. Traffic congestion leads to increase in noise pollution, traveling time, pollution, and fuel wastage etc. There are short term and long term causes of traffic congestion. Short term causes include traffic signal failures, inefficient law enforcement, inadequate road infrastructure, accidents etc. Long term causes are attributed to economic growth of the society, changes in lifestyle of people etc. As a result, traffic management has become one of the vital areas to be looked into. It includes monitoring of traffic density, communication, rerouting of traffic to avoid further delay. Internet of things can help in smooth implementation of traffic management system. There are different methods of traffic management – video analysis, wireless sensor network, adaptive traffic control system that are closely knit around IoT devices.

5. RESEARCH ON COLLABORATIVE STRATEGIC AIR TRAFFIC FLOW MANAGEMENT BASED ON BDI AGENT

By Wu Xiping, Yang Hongyu, Yang Bo, Yu Jing, 2016, IEEE.

The agent model based on Belief-Desire-Intention (BDI) has been proved as a powerful computing technique. In the BDI model, the Desire is the goal to achieve or event to handle, the Intention is a set of plans to realize the predefined goal or react to a specific situation, and the Belief is the knowledge about the agent itself and the varying environment. Applying BDI agent, collaborative strategic air traffic flow management based on BDI agent was proposed. The architecture of collaborative strategic air traffic flow management based on multiagent was established. The agent's BDI collaborative decision model was described. The internal architecture of air traffic flow manager agent, air traffic controller agent, airport agent, airline agent, environment agent and communication service agent were proposed. The simulation experiment validated the model with air traffic data of a typical data in the traffic flow management system. The experiment result proved that the model was available and practical. The model provided significant decision-making assistance for collaborative strategic air traffic flow management.

IV. RESULTS AND DISSCUSSIONS

- RFID READER-The RFID tag in each vehicle is read by RFID reader at traffic junction and the information are detected.
- BUZZER-It gives alarm to police about the theft vehicle.
- GSM-It gives message about the theft vehicle to the owner.
- All the information about the vehicles like emergency , normal, theft vehicles are updated in a web page where we can access it any time.

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APPLICATIONS:

- 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 is reduced.

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