INTELLIGENT TRAFFIC MONITORING SYSTEM

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COLLEGE: NIE INSTITUTE OF TECHNOLOGY, MYSURU
BRANCH: DEPARTMENT OF INFORMATION SCIENCE AND ENGINEERING
GUIDE: MRS. NANDINI.M.S
STUDENTS: MS. DIVYA R
MS. SINDHU S
MR. MANOHAR P
MR. VISHNUDATHA JAMADAGNI S

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INTRODUCTION:
India is the second most populous Country in the World and is a fast growing economy. It is seeing terrible road congestion problems in its cities. Infrastructure growth is slow as compared to the growth in number of vehicles, due to space and cost constraints[1]. Also, Indian traffic is non-lane based and chaotic. It needs a traffic control solutions, which are different from the developed Countries. Intelligent management of traffic flows can reduce the negative impact of congestion. In recent years, wireless networks are widely used in the road transport as they provide more cost effective options[2]. Technologies like ZigBee, RFID and GSM can be used in traffic control to provide cost effective solutions. RFID is a wireless technology that uses radio frequency electromagnetic energy to carry information between the RFID tag and RFID reader. Some RFID systems will only work within the range inches or centimeters, while others may work for 100 meters (300 feet) or more. A GSM modem is a specialized type of modem, which accepts a SIM card and operates over a subscription to a mobile operator, just like a mobile phone. AT commands are used to control modems. These commands come from Hayes commands that were used by the Hayes smart modems. The ZigBee operates at low-power and can be used at all the levels of work configurations to perform predefined tasks.

OBJECTIVE:
From the current problem section, it can be seen that, existing technologies are insufficient to handle the problems of congestion control, emergency vehicle clearance, stolen vehicle detection, etc. To solve these problems, we propose to implement our Intelligent Traffic Control System. It mainly consists of three parts. First part contains automatic signal control system. Here, each vehicle is equipped with an RFID tag. When it comes in the range of RFID reader, it will send the signal to the RFID reader. The RFID reader will track how many vehicles have passed through for a specific period and determine the congestion volume. Accordingly, it sets the green light duration for that path. Second part is for the emergency vehicle clearance. These commands come from Hayes commands that were used by the Hayes smart modems. The ZigBee operates at low-power and can be used at all the levels of work configurations to perform predefined tasks.
light to red, so that the vehicle is made to stop in the traffic junction and local police can take appropriate action.

**METHODOLOGY:**

**Automatic signal control system**

Each vehicle is equipped with a RFID tag. RFID Reader Is placed at the road junction. The reader will track how many vehicles have passed through and determine the congestion volume. Reader communicates with the centralized server and thereby decides the green light duration of that path.

**Emergency vehicle clearance**

Emergency vehicle is also equipped with the rfid tag and when the vehicle arrives, the server detects that the vehicle is on emergency and it immediately switches the traffic light to green.

**Stolen vehicle detection**

The RFID reader reads the RFID tag, it compares it to the list of stolen RFIDs. if a match is found, it sends SMS to the police control room and changes the traffic light to red, so that the vehicle is made to stop at the traffic junction.

![Sequence diagram](image)

**CONCLUSION AND ENHANCEMENTS:**

With automatic traffic signal control based on the traffic density in the route, the manual effort on the part of the traffic policeman is saved. As the entire system is automated, it requires very less human intervention. With stolen vehicle detection, the signal automatically turns to red, so that the police officer can take appropriate action, if he/she is
present at the junction. Also SMS will be sent so that they can prepare to catch the stolen vehicle at the next possible junctions. Emergency vehicles like ambulance, fire trucks, need to reach their destinations at the earliest. If they spend a lot of time in traffic jams, precious lives of many people may be in danger. 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. Further enhancements can be done to the prototype by testing it with longer range RFID readers. Also GPS can be placed into the stolen vehicle detection module, so that the exact location of stolen vehicle is known. Currently, we have implemented system by considering one road of the traffic junction. It can be improved by extending to all the roads in a multi-road junction.

REFERENCES:


