Implementing Stolen Vehicle Detection System Intelligent Traffic System for Congestion Control and Ambulance Clearance

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Abstract— In this paper, we proposed an Implementing Intelligent Traffic Control for Congestion, Ambulance clearance, and Stolen Vehicle Detection. This system was implemented based on present criteria that tracking three conditions in those one is heavy traffic control and another one is making a root of emergency vehicle like ambulance and VIP vehicle. In this paper we are going to implement a sensor network work which is used to detect the traffic density and also use RFID reader and tags. We use ARM7 system-on-chip to read the RFID tags attached to the vehicles. It counts number of vehicles that passes on a particular path during a specified duration. If the RFID tag read belongs to the stolen vehicles. GSM SIM300 used for message send to the police control room. In addition, when an ambulance approaching the junction, it will communicate the traffic controller in the junction to turn on the green light. This module uses Zigbee modules on CC2500.

Keywords— ZigBee, CC2500, GSM, SIM300, ARM-9, ambulance vehicle stolen vehicle, congestion control, traffic junction

I.INTRODUCTION

India is the second most thickly populated Nation in the World and is a fast growing economy. It is seeing dreadful highway congestion problems in its capitals. Infrastructure growth is slow as compared to the growth in number of vehicles, owing to space besides cost constraints. Also, Indian traffic is non-plan based and chaotic. It needs a traffic control solutions, which are unlike commencing the developed Countries. Intelligent management of traffic flows can diminish the negative impact of congestion.

In modern years, wireless networks are widely used in the road transport as they afford more rate effective decisions. Technologies like ZigBee, RFID and GSM container be used in traffic control to provide cost actual solutions. RFID is a wireless machinery that uses radio frequency electromagnetic oomph to transport facts between the RFID tag with RFID reader. Some RFID patterns will only work within the range inches or centimeters, while others could work for 100 meters (300 feet) or more. A GSM modem is a specialized type of modem, which accepts a SIM card and activates over ap contribution to a mobile operator, just like a mobile phone. AT commands are hand-me-down to control modems.

These commands come sinceHayes commands that were charity by the Hayes smart modems. The ZigBee operates by low-power and canister be used at all the levels of work configurations to perform predefined tasks. It operates popular ISM groups (868 MHz fashionable Europe, 915 MHz in USA and Aust). Data transmission rates vary from ralia, 2.4 GHz in rest of the world 20 Kilobits/second in the 868 MHz frequency collection to 250 Kilobits/second in the 2.4 GHz frequency crowd The ZigBee uses 11 channels popular case of 868/915 MHz

broadcasting frequency and 16 channels in case of 2.4 GHz radio frequency. It similarly uses 2 channel configurations, CSMA/CA and fitted CSMA/CA .

The entire paper is gathered into 5 parts. Sections II conferences about the literature survey. Section III discusses about the current difficulty that exist in producing way to an ambulance and extra vehicles. It moreover talks of how the proposed copy will beat the difficult faced in developing Countries as well as established countries. Section IV gives the execution details of the proposed model. Section V presents the enhancement of this work.

II.LITERATURE SURVEY

Traffic congestion is a major problem in cities of developing Countries like India. Growth in urban population and the middle-class segment contribute significantly to the rising number of vehicles in the cities. Congestion on roads eventually results in slow moving traffic, which increases the time of travel, thus stands-out as one of the major issues in metropolitan cities.

In , green wave system was discussed, which was 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. A 'green wave' is the synchronization of the green phase of traffic signals. With a 'green wave' setup, a vehicle passing through a green signal will continue to receive green signals as it travels down the road. In addition to the green wave path, the system will track a stolen vehicle when it passes through a traffic light.

Advantage of the system is that GPS inside the vehicle does not require additional power. The biggest disadvantage of green waves is that, when the wave is disturbed, the disturbance can cause traffic problems that can be exacerbated by the synchronization In such cases, the line of vehicles in a green wave

produces in size until it becomes too large and some of the vehicles cannot spread the green lights in time and duty stop. This is called over-saturation .

In , the use of RFID traffic regulator to avoid problems that usually arise with standard traffic control systems, especially those associated to image processing and beam intermission techniques are discussed. This RFID technique deals with multivehicle, multilane, multi road junction areas. It delivers an effective time management scheme, in which, a dynamic time schedule is worked obtainable in real time for the opening of each traffic column. The real-time operation of the system emulates the decision of a traffic policeman on obligation. The number of vehicles in each column and the routing are proprieties, upon which the controlsand the judgments are completed.

III.DESIGN AND IMPLEMENTATION

This chapter is SETUP of TRAFIC CONTROLSYSTEM FOR CONGESTION CONTROL,AMBULANCE CLEARANCE, AND STOLEN VEHICLE DETECTION hardware, it explores schematic diagram of the device and its configurations. As we already discussed features of ZIGBEE in previous chapters.
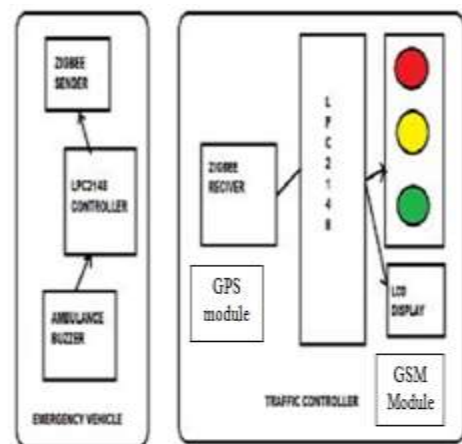

Figure 1:block diagram

3.1 Block diagram explanation

Power supply unit:

When working with electronics,you always need one basic thing power.In every electronic circuit power supplyis required the proper working

Automatic Signal Control System

In this module for experiment purpose, we have used passive zigbee tags and zigbee reader. zigbee tag, when vehicle comes in the range of the receiver will transmit the unique zigbee to the reader. The microcontroller connected to the zigbee reader will count the zigbee tags read in 2 minute duration. For testing purpose, if the count is more than 10, the green light duration is set to 30 seconds, if count is between 5 and 9, the green light duration is set to 20 seconds.

If the count is less than 5, the green light duration is set to 10 seconds. The red light duration will be for 10 seconds and orange light duration will be for 2 seconds. Figure 3 implementation for automatic signal control and stolen vehicle detection system.

Stolen Vehicle Detection System

In this module, for testing purpose, we compare the unique zigbee tag read by the zigbee reader to the stolen zigbees stored in the system. If a match is found, then the traffic signal is immediately turned to red for a duration of 30 seconds.

Emergency Vehicle Clearance System

In this module, there are 2 parts, first part which is ZigBee transmitter is placed in the emergency vehicle. When the switch is pressed, it will transmit the signal. The signal contains unique id and security code. The transmitter contains PIC16F877A microcontroller and ZigBee module. The microcontroller sends the commands and data to the ZigBee via serial communication. Second part is the receiver, which is placed at traffic pole. It also contains PIC16F877A microcontroller and ZigBee module.

The receiver compares the security code received to the security code present in its database. If it matches, then it will turn the green light on. For testing purpose, we used short range RFID reader in our prototype. First, the receiver part is turned on. The red and green signal will be on for 10 seconds duration and orange light will be on for 2 seconds duration one after the other. secondly, we bring the RFID of stolen vehicle into the range of RFID reader.

Then the signal will turn to red for duration of 30 seconds and a SMS is received.Thirdly, we bring 12 RFIDs into the range of RFID reader, and then the green light duration will change to 30 seconds. Fourthly, we bring an emergency vehicle carrying ZigBee transmitter into the range of ZigBee receiver, and then the traffic light will change to green till the receiver receives the ZigBee signal the images of different components and highlighted features the proposed work the signal pole installed in junction.

In the default condition, red and green light will set for 10 seconds. The time period will be varied according to the traffic conditions, stolen vehicle, part is placed in the ambulance. It transmits ZigBee signalcontinuously. Figure 5.c shows the LCD display status at different conditions (in that figure one is normal conjunction image (traffic signal running as per the default time period) and another one is LCD display status, when an ambulance coming near to junction.

Figure 5.d shows the actual connections of different components like RFID, GSM, ZigBee, interfacing different microcontrollers. Figure 5.e shows the status updated at the time of stolen vehicle is found. The stolen vehicle RFID number should be

updated in the database. If stolen vehicle is found, then it will immediately turn on red light in the signal. It sends immediately a message to authorized person.

Fig: 2.Prototype of intelligent traffic control sytem,ambulance clearance and stolen vehicle detection

3.3 Flowchart of Implementation:

The flowchart of implementation is shown in below. This flowchart clearly explains what happens in the implementation.
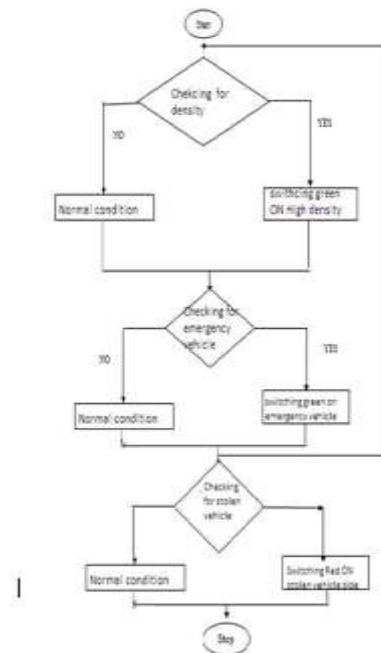

Figure 3. Flow chart of implementation

IV.CONCLUSION

As the entire system is automated, it requires very less human intervention. With stolen vehicle detection possible junctions. Emergency vehicles need to reach their destinations at the earliest. If they spend a lot of time in traffic jams. 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. Currently, it is implemented system by considering one road of the traffic junction.

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