

Accident Detection Module and IOT Based Traffic Light Control for Smooth Passage of Emergency Vehicle

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Abstract:- In this project, the aim is to develop an IOT based traffic light control for smooth passage emergency vehicle and automatic accident detection system. Project is divided into two parts. First is accident detection module, which is fitted in vehicles, through which we can detect accident and notify the operator about the location of accident with the help of text message. Accident detection module also stops the engine, when accident is detected. Second part is IOT based Traffic light control for emergency vehicles; it provides smooth passage for emergency vehicle by forcing green signal in the desired lane. Commands are given through a website, from which we can control traffic lights. This system can reduce the response time of emergency services and also save the time delay in traffic signal which can reduce the fatality rate in road accidents.

from a web page to provide a smooth passage for emergency vehicle by forcing green signal in desired lane of the vehicle.

II. BASIC BLOCK DIAGRAM

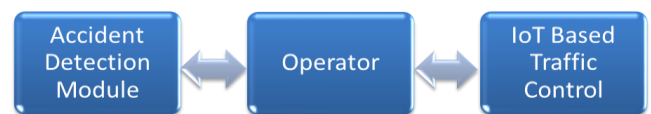


Fig 1:- Basic Block Diagram

Keywords:- Arduino Uno, GPS module, GSM module, IOT, Accelerometer, Accident detection.

I. INTRODUCTION

Internet of things is a technique in which we connect various physical devices like vehicles, toasters, traffic signals and many more devices to electronics and software through wire or wireless to exchange data and sometimes commands. It is network of devices which is used to collect data. Everyday things like your fan switch can be connected to internet and then you can control your fan speed and turn on or off your fan through a website or a mobile application, you can even know for how much time the fan is tuned on or off. If you forgot to turn off your fan while leaving your house, then you can check the status and if it is left on, then you can turn it off from your mobile phone or other device that is connected to internet. There are so many other examples of application of Internet of Things like you can monitor your room temperature by connecting digital room thermometer with internet. IOT is making its place in medical field and defense forces also. Data collected from devices is used data analytics, thus helping in improving services.

It is very sad to write but everyday many lives are lost due to road accidents. Many of the people can be saved if emergency services can reach the accident spot early and provide medical treatment earlier. It can be done with the help of IOT.

In smart traffic light control for emergency vehicles, the traffic lights are connected to internet and can be controlled

III. PROPOSED CIRCUIT DIAGRAM OF ACCIDENT DETECTION MODULE

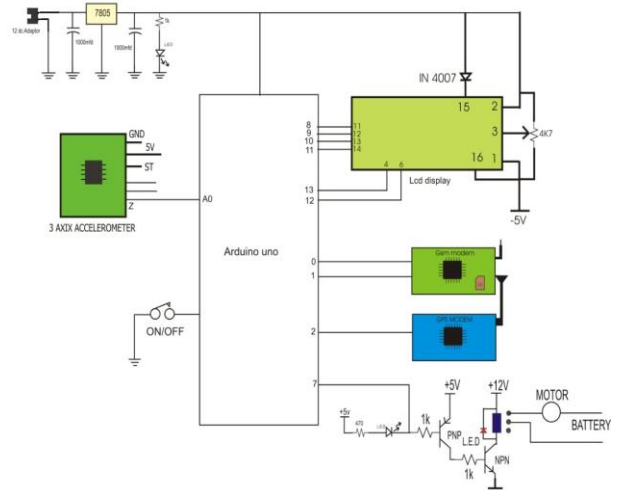


Fig 2:- Proposed circuit diagram of accident detection module

V. ACCIDENT DETECTION MODULE DESCRIPTION

The accident detection module is fitted in the vehicle. This module contains Accelerometer, GPS module, GSM module, Arduino Uno and some other components. At the time of accident, the accelerometer detects the sudden change in the axis values and sends these analog values to Arduino Uno. The controller of Arduino Uno then converts the analog signal to digital signal. If the values are higher than predefined

threshold in programming of Arduino Uno, then Arduino Uno sends signal to stop the vehicle and send location in form of text message to registered emergency service number. The location is continuously gets updated with the help of GPS module.

VI. ROLE OF OPERATOR

When accident happens, operator receives message containing location of vehicle from GSM module of Accident Detection Module. Then, the operator informs the emergency vehicle nearest to that location and then clear lane for that vehicle using the IOT based traffic control system.

- While giving emergency vehicle a free path, it can cause traffic congestion on other lanes.

X. CONCLUSION

The accident detection system has been created using GPS module, GSM module, Accelerometer to detect the accident of vehicle and notifying the emergency services using text message carrying the location of the vehicle. The IOT based traffic signal system can force the green and red signal in desired lane so that a smooth passage for emergency vehicle on its way to hospital can be created.

Merging of these two systems can reduce the response time of emergency service in tracking the accident location and save the delay in traffic which can result in reducing the number of deaths in road traffic accident due to late medical treatment.

XI. FUTURE SCOPE

We can also use IOT in accident detection module to monitor the location and coordinate efficiently with traffic control module from a webpage.

With further advancement of technology we can also induce artificial intelligence effectively in the project.

XII. ACKNOWLEDGEMENT

We would like to express our special thanks of gratitude to our project guide Mohd. Suhaib Abbasi (Assistant Professor), for his continuous guidance and support. His profound knowledge and advice helped up in understanding various technical concepts and its application in the project. We would also like to express thanks of gratitude to our course coordinators; Mrs. Rupali Singh (Assistant Professor) and Mr. Arun Kumar (Assistant Professor), for providing valuable suggestions and encouragement to our project. At last we would like thank all those who had helped us in completing this project.

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VII. PROPOSED CIRCUIT DIAGRAM OF IOT BASED TRAFFIC LIGHT CONTROL

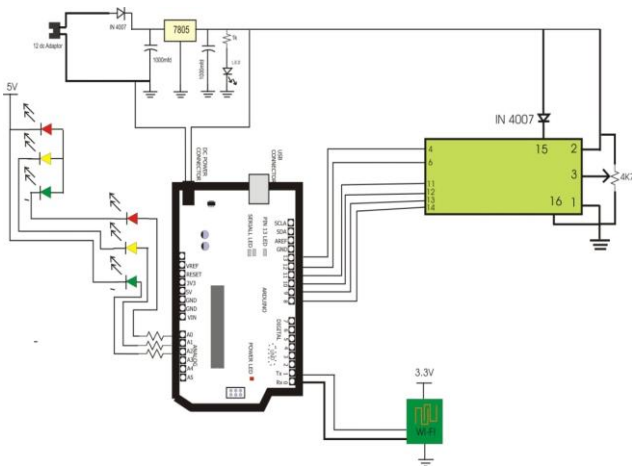


Fig 3:- Proposed circuit diagram of IOT based Traffic light control

VIII. DESCRIPTION OF IOT BASED TRAFFIC CONTROL SYSTEM

This module consists of a Wi-Fi module, Arduino Uno board, LCD Screen, Traffic Lights, a website and some other components. The IOT based traffic light system is connected to internet through Wi-Fi module and can be controlled over internet by web page containing specific commands with which green and red traffic signals can be forced in desired road lane so that emergency vehicle do not encounter any red signal on its way to the hospital. LCD screen shows status of traffic lights

IX. ADVANTAGES

- Emergency vehicles can reach the destination on time.
- Many lives can be saved that are being lost due traffic jams.
- Traffic signals can be controlled remotely.

X. DISADVANTAGES

- If network fails, then traffic lights can't be controlled.
- Severity of accident can't be known.

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