

Arduino Based Vehicle Accident Alert System Using GPS GSM and Accelerometer

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Abstract - According to WHO (World Health Organization) survey results, more than 50% of people die each year in road accidents, most of who suffer from head injuries. In the event of an accident, rescue of a person is delayed, so the proposed study aims to address this issue by building an automated system that alerts families immediately after the accident. From this perspective, the proposed model integrates an Arduino UNO R3 microcontroller, GPS GY6MV2 beneficiaries, and SIM800L GSM module. GPS GY6MV2 is also used to get the perimeter and longitude of the accident area. The SIM 800 L GSM modules is used to send SMS and inform people of the type of accident and provide the location of the accident via Google Maps. The ADXL335 MEMS accelerometer captures the X and Y coordinates of the vehicle. In addition, the 16x2 LCD is used to display news, perimeter and longitude of the location of the accident.

Keywords: Arduino, Vehicle Accident, Alert System, GPS, GSM, Accelerometer.

I. INTRODUCTION

Due to the high demand for cars, traffic accidents are increasing and people's lives are at risk. Road accidents requires from detection and urgent medical attention. The project aims towards detecting accidents in short period of time and send information such as geographic coordinates, time and angle at which the vehicle accident occur to the emergency center within seconds.



Figure 1: System design

A warning message will be sent to emergency departments to save lives in short period of time. In the event of an accident, an alert message will be automatically send to the rescue team and police station. A message is sent using GSM and location sent using GPS module. Accident can be detected accurately with the help of accelerometer.

II. AIM

Aim of the project is to detect accident and send SOS to health and safety departments.

III. OBJECTIVE

- To instantly alert the rescue team about accident victims by sending a message.
- Designing and implementing the notification mechanism for GSM.
- To get the location regarding the place of accident.

IV. LITERATURE SURVEY

[1] Due to delay in rescuing the person from road accident by old methods of calling the ambulance and it takes more time delay to overcome this problem and saving the persons life in a the specific time period. Researcher PachipalaYellamma, N S N S P Chandra, Puli Sukhesh, PuligaddaShrunith, PuligaddaShrunith, Sunkesula Siva Teja, proposed model GPS is used to get the scope and longitude of the accident region. GSM enlighten the individuals regarding the type of accident and provides accident location. MEMS accelerometer sensor gives the coordinates of the vehicle.

[2] Car accident detecting system is not new to the market and is seeing tremendous changes in it with time car. This paper is a tool to make a contribution towards generating location of incidents. Naziaparveen, Asif ali, Aleem ali are trying to improve the technology by using accelerometer it can identify the accident and defined coordinates of the location this method can detect accident site more precisely and give the requisite to the concerned administrative and health department.

[3] In this design by Gowshikha. B, Madhu Mitha. G, the function of GPS is to track position of the vehicle, GSM function is to transfer communication and ARM regulator function is to save the module number in EEPROM and send communication when accident happens. Accidents can be detected more accurately using MEMS detector and vibration detector. Therefore the idea is to descry accident and automate exigency backing services. Thus, then system is transferring SMS to the nearest Exigency backing service provider from accident position and saves inestimable lives.

V. BLOCK DIAGRAM

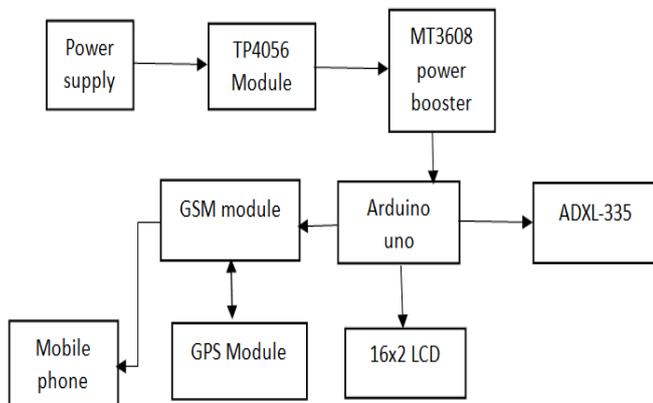


Figure 2: Block diagram of proposed system

Description of Components

Power supply: It is an electrical device which is used to supply electric power to the project.

TP4056 module: It is a battery charging module used for charging single cell batteries.

MT3608 power booster: It is a step up convertor used at constant frequency and used for low power application.

Arduino UNO: It is an open source platform contingent on easy to use hardware and software. Ardiuno uno is programmed using IDE.

ADXL-335: It is a sensor used for detecting motion, shopk, vibration and also used to measure static changes in acceleration of gravity in tilt sensing application.

GSM module: It is a widely used digital mobile network by mobile phone user all over the world. It used for transmitting mobile voice and data services.

GPS module: It contains small processor and antennas that directly receive data sent via satellite through RS frequencies.

16X2 LCD: It a display screen used to display output.

Applications

- 1) Providing faster emergency services.
- 2) Tracking of trucks carrying valuable goods.
- 3) Home delivery and food delivery status tracking.
- 4) Vehicle security and smooth fleet management.
- 5) Recovery of stolen vehicle.

VI. CONCLUSION

To give the precise accident location we have used both GSM, GPS modules which can track the area of incidents and send the SOS to contacts separately and to the emergency services. It will provide location and accident detection will give security and safety to the vehicle user. In case of burglary we can track the location of our vehicle. It can further be used for alcohol and sleep detection.

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REFERENCES

- [1] Yellamma Pachipala¹, Tummasrinivas Rao², G Siva Nageswara Rao³, D Baburao⁴,” An IoT Based Automatic Accident Detection and Tracking System for Emergency Services”, Jour of Adv Research in Dynamical & Control Systems, Vol. 12, Issue 2020, PP:111117, DOI:10.5373/JARDCS/V12I2/S202010013.
- [2] Elie Nasr, Elie Kfoury, David Houry, “An IoT Approach to Vehicle Accident Detection, Reporting, and Navigation”, IEEE Explore, 2016.
- [3] Gowshika , Madhu Mitha and Jayashree, “Vehicle Accident Detection System By Using GSM And GPS”, IRJET, 2019.
- [4] Himanshu Arora, Samyak Jain, SanketAnand, “Real Time Safety Alert System for Car”, published in the year 2019 in IEEE.
- [5] RajvardhanRishi, SofiyaYede, Keshav Kunal, Nutan V. Bansode, “Automatic Messaging Model for tracking

vehicles and Accident Detection”, published in IEEE in the year 2020.

- [6] Aboli Ravindra Wakure and Apurva Rajendra Patkar, “Vehicle Accident Detection and Reporting System Using Gps and Gsm,” IJERGS April 2014.

- [7] Francisco J., Piedad Garrido, Manuel Fogue Juan-Carlos Martinez, Carlos T. Cano, “Automatic Accident Detection: Assistance Through Communication Technologies and Vehicles,” Calafate and Pietro Manzoni, IEEE Vehicular Technology Magazine, Volume 7, Issue 3, September 2012.

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