

Vehicle Accident Detection System Using GPS and GSM Modems

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Abstract- This research is basically on an electronic device which is used at the time of emergency while driving a vehicle. It has embedded the concept of wireless communication GSM and many other sensors by the help of which immediate help can be delivered to the people who met with the accident. The structure of the ADS is based on the ATmega 328P microcontroller. The GPS is also used which will help to find the exact location of the vehicle with ease.

Keywords: ADS, GPS, GSM, CPU

I. INTRODUCTION

According to the Accidents India 2016 report, which is released by the minister for road transport and highways Nitin Gadkari, revealed that a total of 4,80,652 road accidents occurred in India last year which has resulted in the loss of 1,50,785 lives and causing serious injuries to 4,94,624 persons meaning more than 400 people lost their lives daily on road. Though the increasing technology contributes for lessening auto accidents, yet the bad driving behaviours like drunken driving, speeding and not using seatbelts are still accounted responsible for causing major traffic deaths. The post accident measures will reduce the deaths. Vehicle accident detection and messaging using GPS and GSM helps reduce the information process time and speed up the response.

The intention of the project is to identify the accident location co-ordinates and process the information by means of messaging to the nearby hospital and to the relatives through the system installed in the vehicle. This enhances the capability in tracing the exact location of the accident and provide emergency services to the victims which can help them to survive. This system consists of ATMEGA328P microcontroller coded using C language for the better accuracy and understanding. The GPS and GPRS modules helps to find out the location and GSM helps in sending the message.

II. BLOCK DIAGRAM

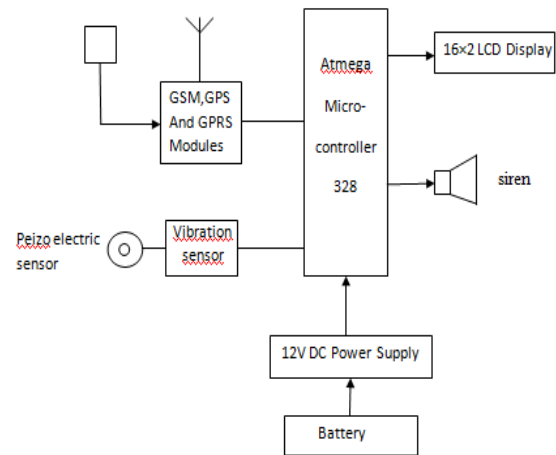


Fig1: Block diagram

The accident detection system is installed to the vehicle and the power is drawn from the battery. The microcontroller is like a CPU to which all the other components are connected. Both the Input and Output signals are given by the microcontroller. GPS, Vibration sensor with piezo electric sensor are inputs to the microcontroller based on which the output signals are sent to the GSM module and the siren.

III. DESCRIPTION

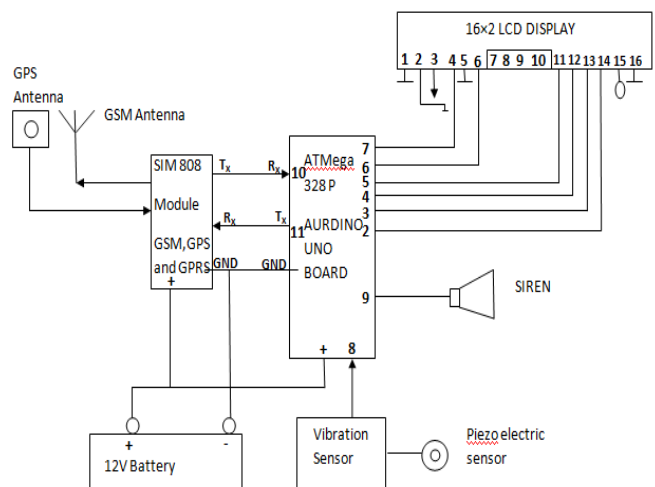


Fig2: Circuit diagram

Accident Detection System consists of basically four parts. They are:

- Arduino UNO Board
- SIM808
- Simple touch alarm system
- LCD display

Arduino UNO Board:

The Arduino UNO Board consists of ATmega328P microcontroller, six Analog pins, six power pins, 14 digital pins, USB Interface, External power supply and Reset button. A 5V power supply can be given. The Buzzer is connected to the 8 pin. The USB interface is used to Dump the program to the microcontroller.

SIM808:

The SIM808 consists of a SIM slot, A 5V GPS antenna is connected to GPS pin and GSM antenna to the GSM pin.

Simple Touch Alarm system:

It is a vibration sensor it has NE555 IC and 3 resistors and 2 capacitors are embedded to it.

LCD display:

It is a 16x2 characters LCD display.

The assembling of the Accident Detection system is as follows:

- The ATmega328P microcontroller is like a CPU to this ADS system. It is present in the Arduino UNO Board.
- The pins 2,3,4,5,6,7 of the microcontroller are connected to the 14,13,12,11,6,4 of the LCD display respectively.
- The pin 9 of microcontroller is connected to the siren and pin 8 to the simple touch alarm system.
- The Tx pin (11) of microcontroller is connected to the Rx pin of the SIM808 and the Tx pin of the SIM808 is connected to the Rx pin (10) of microcontroller.
- The 1, 5, and 16 pins of LCD display are grounded and pin 2 and 3 are connected to rheostat.

IV. WORKING

The Accident detection system will be turned on, showing the message 'welcome to ADS system' as soon as the

vehicle is switched on. The GPS will take a few seconds to boot and as soon as the GPS is turned on the location of the vehicle can be displayed on the LCD screen with respect to Latitude and Longitude. When the Vehicle is hit the vibrations are carried to smart alarm system which immediately gives a buzzer if the accident is minor then the driver can switch off the buzzer and if the accident is major and the driver is unable to turn it off in that case the message is sent to the numbers informing about the accident in the form of a message.

V. RESULT AND CONCLUSION

The Accident Detection system is fabricated and the final figure is give below.

This will help reduce post accident deaths by providing information and emergency medical support.



Fig3: Vehicle Accident Detection system

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