

ACCIDENT DETECTION FOR RELEASE AIRBAG USING GSM, GPS&MEMS

T. Lasya Lavanya¹, N.Chrysolyte², U.Manasa³, B.Karunaiah⁴, Y.David Solomon Raju⁵

Abstract : Main concentration of this project is to find out the vehicle which is met with an accident by using MEMS sensor and GPS, GSM to release Air bag. This system will be placed in a moving vehicle. The Atmel controller will poll GPS module in prefixed intervals and sends the vehicle location information (Latitude & Longitude) to central station over GSM network. Whenever any accident occurs MEMS sensor detects the vibration of the vehicle and sends mechanical force, to ARM, by using GPS. We will get particular location where accident occurs, and then GSM sends message to authorized members & 108. One best feature is whenever any authorized people gives message to GSM at accident location then it sends back the message of the accident location Long and Lat values. This project uses regulated 5V, 750mA power supply. 7805 three terminal voltage regulators are used for voltage regulation. Bridge type full wave rectifier is used to rectify the ac output of secondary of 230/18V step down transformer. This system can be interfaced with vehicle airbag system that prevents vehicles occupant from striking interior object such as the steering wheel or windows. This can also develop by interconnecting a camera to the controller module that takes the photography of the accident spot that makes the tracking easier.

Keywords: MEMS sensor, GPS, GSM , Atmel controller, 7805 three terminal voltage regulators

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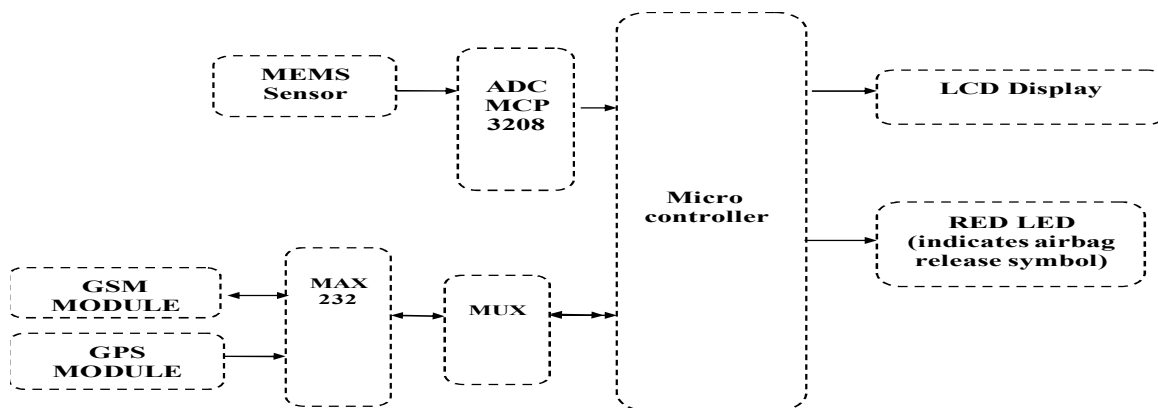
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1. INTRODUCTION

Vehicle tracking system is one of the hot topics in embedded systems industry. By using this project, a vehicle can be tracked anywhere on the globe. Speed is one of the basic reasons for vehicle accident. Many lives could have been saved if emergency service could get accident information and reach in time. Nowadays, GPS has become an integral part of a vehicle system. This paper proposes to utilize the capability of a GPS receiver to monitor speed of a vehicle and detect accident basing on monitored speed and send accident location to an Alert Service Centre. The GPS will monitor speed of a vehicle and compare with the previous speed in every second through a Microcontroller Unit. Whenever the speed will be below the specified speed, it will assume that an accident has occurred. The system will then send the accident location acquired from the GPS along with the time and the speed by utilizing the GSM network. This will help to reach the rescue service in time and save the valuable human life. The accident detection techniques and some future possibilities in this field. Now-a-days lots of accidents happen on highways due to increase in traffic and also due to rash driving of the drivers. And in many situations the family members or the ambulance and police authority is not informed in time. This result in delaying the help reached to the person suffered due to accident. Road accidents constitute the major part of the accident. The purpose of the project is to find the vehicle where it is and locate the vehicle by means of sending a message using a system which is placed inside of vehicle system. Most of the times we may not be able to find accident location because we don't know where accident will happen. Our project Real Time Vehicle Tracking and Accident Detection with GPS is designed to avoid such situations. Keywords-GPS, GSM, microcontroller AT89S52 and Accident detection

2. DESIGN



POWER SUPPLY:

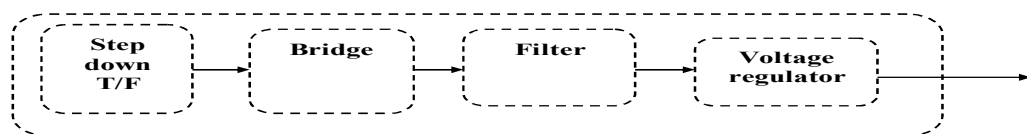
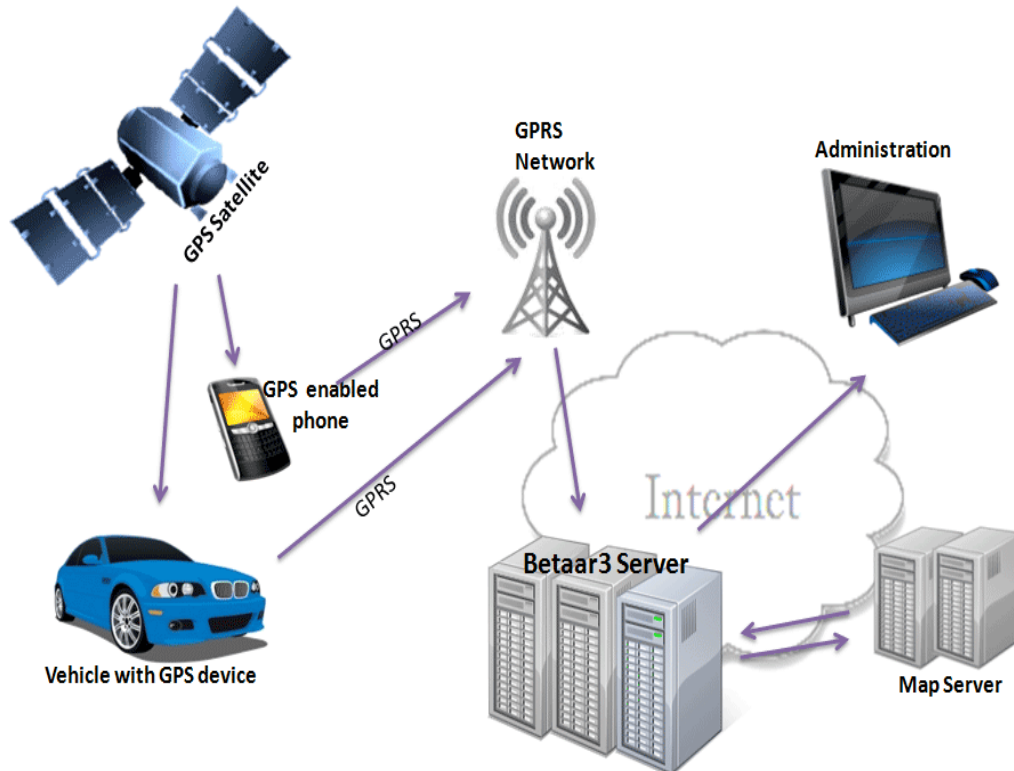


Figure: block diagram

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Working: In this project AT89S52 communicates with LCD, GPS module and GSM modem. This system will be placed in a moving vehicle. The AT89S52 will poll GPS module in prefixed intervals and sends the vehicle location information (Latitude & Longitude) to central station over GSM network. Whenever any accident occurs mems, sensor detects the vibration of the vehicle and sends mechanical force, to AT89S52, by using GPS, we will get particular location where accident occurs, then GSM sends message to authorized members & 108. One best feature is whenever any authorized people gives message to GSM at accident location then it sends back the message of the accident location long and latitude values.



ATMEL MICROCONTROLLER:

- AVR is a family of microcontrollers developed since 1996 by Atmel, acquired by Microchip Technology in 2016.
- It contains on chip central processing unit (CPU), Read only memory (ROM), Random access memory (RAM), input/output unit, interrupts controller etc.
- Therefore, a microcontroller is used for high speed signal processing operation inside an embedded system.

MAX 232

- MAX 232 is a dual driver / receiver.
- It is used to convert the TTL logic level to RS232 logic levels during serial communication if microcontrollers with PC.

ADC MPC 3208:

- The MCP3208 12-bit Analog-to-Digital Converter (ADC) combines high performance and low power consumption in a small package, making it ideal for embedded control applications.
- Applications for the MCP3208 include data acquisition, instrumentation and measurement, multi-channel data loggers, industrial PCs, motor control, robotics, industrial automation, smart sensors, portable instrumentation and home medical appliances.

GSM MODULE:

- GSM is a mobile communication modem; it stands for global system for mobile communication (GSM).
- A GSM digitizes and reduces the data, then sends it down through a channel with two different streams of client data, each in its own particular time slot.

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GPS MODULE:

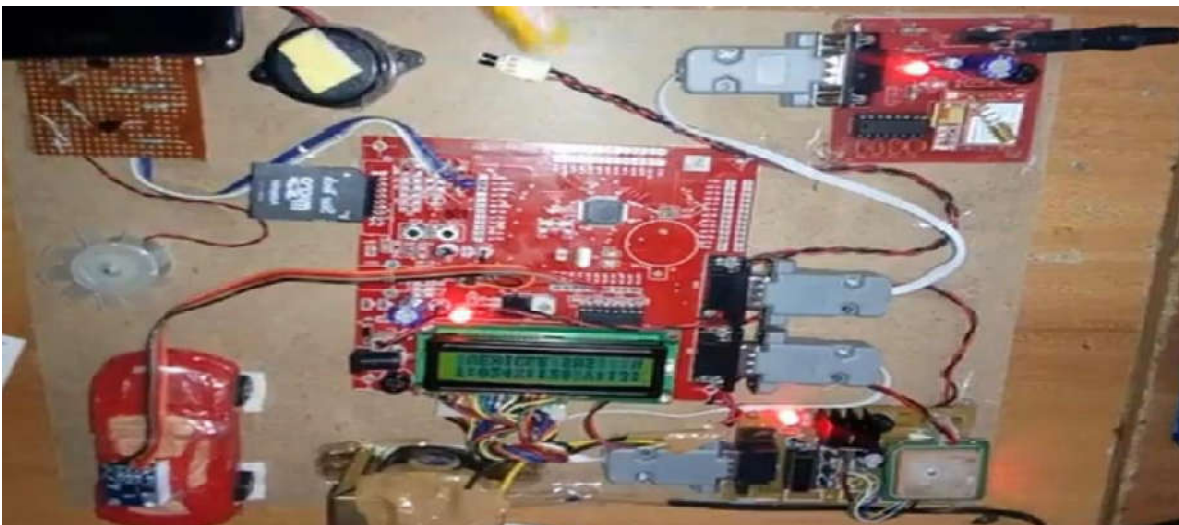
- GPS receivers use a constellation of satellites and ground stations to compute position and time almost anywhere on earth.
- With this information and some math, a ground-based receiver or GPS module can calculate its position and time.

MEMS SENSOR:

- MEMS sensors combine electrical and mechanical components into or on top of a single chip - i.e. they are electro-mechanical sensors.
- In this way, MEMS sensors represent a continuum bridging electronic sensors at one end of the spectrum, and mechanical sensors at the other.

3. RESULT

The system detects accident from vehicle and send message through GSM Module. The message is received by another GSM module. Google Map Module It displays Google map show u exact location of accident and it details. It gets detail SMS from accident location. Hence there is small variation in the coordinates, initial value of latitude and longitude are same but fractional value changes with small difference When a car met with accident it starts to decelerate very rapidly and an accelerometer detects the change of speed and it triggers the air bags. Air bags will be opened here are using LED's instead of compression air bags. It sends the message and vehicle position to the authorized person. When a car met with an accident MEMS detects the vibration and triggers the air bag circuits. Here the LED indicates airbags. It is used for vehicle tracking. Whenever any authorized people give message to GSM at accident location then it sends back the message of the accident location long and Lat values.



4. CONCLUSION

A wireless webcam can be added in this for capturing the images which will help in providing driver's assistance. This can also be bettered by locking all the brakes automatically in case of accident. Mostly in accidents, it becomes serious as the drivers lose control and fail to stop the vehicle. In such cases, the vibration sensor will be triggered because of the vibrations received and also processed by the processor. The processor has to be linked to the devices which can lock the brakes when triggered. With this improvement, we can stop the vehicle and can weaken the impact of the accident. It reduces the death percentages in accidents. It gives immediate information to the belonging one, Simple and reliable, Low cost and Easily applicable.

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