



ACCIDENT DETECTION AND ALERT SYSTEM USING GPS AND GSM

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ABSTRACT

We're able to track vehicles using various applications, which aids in securing personal vehicles, public vehicles, foot units and others. Further on the road, the Accident Rate is on the rise. This paper is about a system that can be easily detected and alert the nearest hospitals and medical services about an accident. It also can pinpoint the location of the accident so the medical services can be directed immediately after it. The purpose of this paper is to build up a vehicle accidental monitoring system using MEMS, GPS and GSM technologies. The system contains accelerometers, MCUs, GPS and GSM Module support. The accelerometer is used to detect fall, and Threshold Algorithms (Sign-Signal) are used to detect accident. Short- Messages will contain GPS coordinates, which help in finding the vehicles.

KEYWORDS

MEMS, GPS, GSM.

INTRODUCTION

In present days the rate of accidents can be increased rapidly. Due to employment the usage of vehicles like cars, bikes can be increased, because of this reason the accidents can be happened due to over speed. People are going under risk because of their over speed, due to unavailability of advanced techniques, the rate of accidents can't be decreased. To reduce the accident rate in the country this paper introduces a optimum solution. Automatic alert system for vehicle accidents is introduced; the main objective is to control the

accidents by sending a message to the registered mobile using wireless communications techniques. When an accident occurs at a city, the message is sent to the registered mobile through GSM module in less time. Arduino is the heart of the system which helps in transferring the message to different devices in the system. Sensors will be activated when the accident occurs and the information is transferred to the registered number through GSM module. GPS system will help in finding the location of the accident spot. The location can be

sent through tracking system to cover the geographical coordinates over the area. The accident can be detected by a sensor which is used as major module in the system.

PROBLEM STATEMENT

Accident detection and vehicle messaging system uses GSM modem which helps to detect accident by vibration sensor. Vibration sensor comes in handy when you need to detect vibration or a knock. Vibration sensor helps to send the signal to Arduino controller. Arduino controller send the alert message through GSM modem with location. If the person meets a small accident, the driver can inform attention is not required by terminating the message using switch.

LITERATURE SURVEY

To protect the vehicle and tracking so many advanced technologies are available in now a days. In olden days the information of accident can be transferred, but the place of accident spot cannot be identified. In any vehicle airbags are designed, air bags are used for security and safety travels[2]. The air bag system was introduced in the year of 1968. TPMS is system designed to control the pressure inside the pneumatic tires on vehicles that provides different operating conditions such as a lower tire pressure is desired in order to maximize traction, through challenging terrain, pulling a heavy load out of an incline at slow speeds, crawling out of soft dirt. The pressure ranges from 15 to 45 PSI. Many other systems have been proposed to deduce the accident. The existing system deals with two sensors where MEMS sensor is used to detect the angle and vibration sensor is used for detection the change in the vehicle. The other existing system uses IOT and cloud computing system. Where the

vehicle detection is done through SVM (support vector machine) that is developed by Ant Colony Algorithm (ACA). Here IOT will monitor the vehicles using magneto resistive sensors. The main aim of this project is to differentiate the accidents which took place in traffic and at no traffic place. Existing system also provides the location of the accident using Atmega 328 Microcontroller and RF transmitter and receiver. The information is sent to the saved mobile numbers[3].

EXISTING SYSTEM

When an Accident occurs, the information is sent through GSM and GPS. If a vehicle met with a minor accident it will give an intimation to their family. The alert message only consists of location data of the mis-adventure which is coordinate the system and a direct link that is synchronized with Google map application.

PROPOSED SYSTEM

Here we present an automotive localization system using GPS and GSM-SMS and MEMS Sensor Services. It has two level of Accident (minor and major) based on the level of intimation will be made

METHODOLOGY:

In this era of large professional growth everybody is busy with their lives. People, especially in urban areas have to move from one place to another any time of the day with much of speed. Due to this reason and sometimes due to inefficient people in the driving seats road accidents are quite common thing that can happen. Road accidents can snuff out a life if the victim is not given proper medical

attention at proper time. So, in this project we have to planned to design a system that can detect road accident and identify the location through GPS. After that, through GSM interface this will be notified to the nearest emergency care unit so that the victim can get immediate medical attention. And we also include Heartbeat Measure sensor. Heartbeat Sensor is an electronic device that is used to measure the heart rate i.e. speed of the heartbeat. Monitoring body temperature, heart rate and blood pressure are the basic things that we do in order to keep us healthy.

WORKING MODULE:

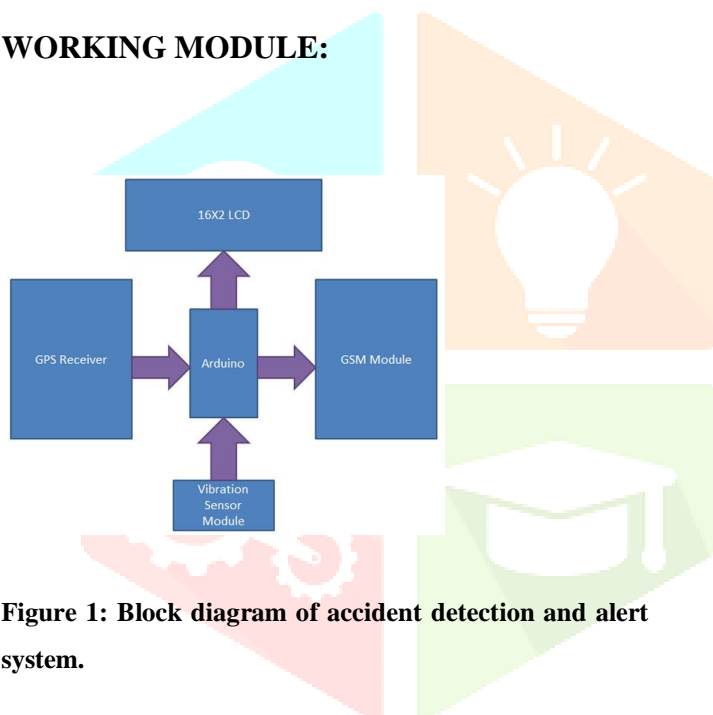


Figure 1: Block diagram of accident detection and alert system.

ARDUINO UNO:

The Arduino UNO is an open-source microcontroller board based on the Microchip ATmega328P microcontroller and developed by Arduino.cc. The board is equipped with sets of digital and an analog input/output (I/O) pin that may be interfaced to various expansion boards (shields) and other circuits. The board has 14 Digital pins, 6 Analog pins, and programmable with the Arduino IDE (Integrated Development Environment) via a type B USB cable. It can be

powered by a USB cable or by an external 9 volt though it accepts voltages between 7 and 20 volts. It is also similar to the Arduino Nano and Leon

GPS MODULE:

GPS stands for Global Positioning System and is used to detect the latitude and longitude of any location on the earth, with the exact UTC time. GPS module is used in our project to track the location of the accident. This device receives the coordinates from the satellite for each and every second, with time and date. In our project, we have used GPS module SKG13BL, which is a Ultra High Sensitivity and Low Power GPS Receiver Module.

GSM MODULE:

GSM/GPRS module is used to Establish communication between a computer and a GSM-GPRS system. Global System for Mobile communication (GSM) is an architecture used for mobile communication in most of the countries.

MEMS SENSOR:

MEMS, or Micro Electro-Mechanical System, is a chip-based technology where sensors are composed of a suspended mass between a pair of capacitive plates. When the sensor is tilted, a difference in electrical potential is created by this suspended mass. The created difference is then measured as a change in capacitance.

SENSOR:



SENSOR

(a.Graphic Sensor)



(b.Accelerte Sensor)



(c.Window Pressure Sensor)



(d.Break Pressure Sensor)



(e.Heart Rate Sensor)

Expected Result:

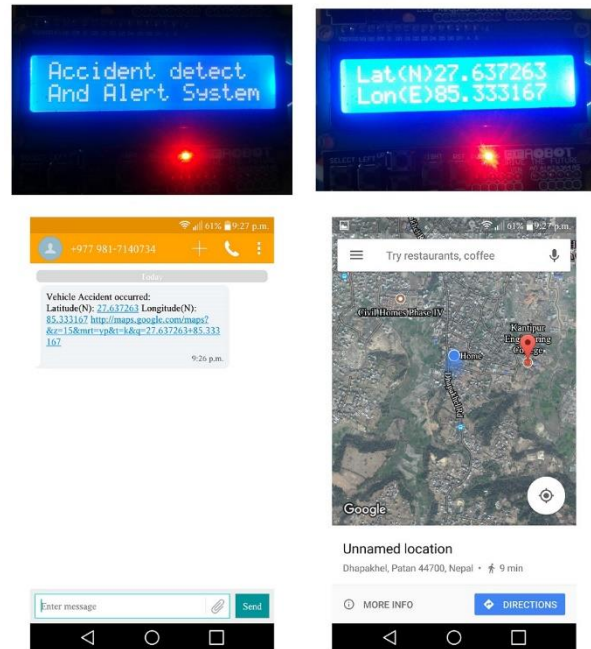


Figure 2: Author Prototype of Accident Detection and Alert System using Arduino UNO

The system comprises of accelerometer, MCU, GPS & GSM Module support in sending message.

The accelerometer is used to detect fall and Threshold Algorithm are used to detect accident. Short Message will contain GPS [Latitude, Longitude] which helps in locating the vehicles.

Index Terms—MEMS Accelerometer, GPS, GSM.

Conclusion:

Speed is one of the most significant causes of an accident. Nowadays, GPS receiver has become an integral part of a vehicle. Besides using in other purposes, the GPS can also monitor the speed and detect an accident. It can use a very cheap and popular GSM modem to send the accident location to the Alert Service Centre. It can also send the last speed before accident which will helps to assess the severity of the accident and can initiate a voice call. Beside the automatic detection system, the vehicle occupant will be able to manually send the accident situation by pressing the Manual Detection Switch.

A rescue measures in time with sufficient preparation at the correct place can save many life. Thus, the proposed system can serve the humanity by a great deal as human life is valuable.

[IoT Based Accident Detection Systems for Smart Vehicles](#)

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