



# **AUTOMATED ACCIDENT DETECTION AND RESCUE SYSTEM**

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## **ABSTRACT**

**Arduino Based Vehicle Accident Alert System using GPS, GSM and control switch. Control switch detects the sudden change in the axes of vehicle and GSM module send the alert message on your Mobile Phone with the location of the accident. The advancing technology has made our day to day lives easier. Since every coin has two sides similarly technology has its benefits as well as its disadvantages. The rise in technology has increased the rate of road accidents which causes huge loss of life. The poor emergency facilities available in our country just add to this problem. This paper is going to provide a solution to this problem.**

## **INTRODUCTION:**

Vehicle accidents cause lot of damage. Early detection and timely action will help a lot in accident situations. Automobile and sensor technology is so much improved. GPS device can provide the exact positional information of the vehicle or person with latitude, longitude and altitude parameters. Altitude information is essential when vehicle is travelling in hilly areas. Accelerometer sensor senses the sudden changes in the vehicle acceleration. There are sensors to sense shock, vibration, rotation, smoke inside vehicle, vehicle tube air pressure, vehicle orientation, petrol level and other informal- ton. These sensors will send the sensed information. By seeing them independently we may not identify big clear picture. By correlating the information provided by these entire sensors one can detect the accidents effectively. But it is not Straight forward. Detecting the accident alone may not help for rescue.

Accident detection and rescue operation is time

critical operation. Real time action is required. System should be able to detect and react to the situations in real time. Real time response should be considered while designing the architect- true. Traffic density now a day is huge. Accident detection and rescue system is essential for every vehicle. To scale well and to reach to masses, its architecture should address 4 V's of Big Data (Volume, Variety, Velocity and Veracity). System development should not be one time job. It should improve continuously. It should learn from its experience and with the feedback given by the domain experts so that it can act better in the future. Required architecture needs a learning module to learn and improve.

## **LITERATURE SURVEY:**

Complex Event Processing (CEP) plays vital role in Detect and Inform Applications, Detect and Act Applications. Data originating from multiple data sources will be fed to CEP unit. CEP unit will correlate them in a particular fashion and continuously monitor for the occurrence of interesting events. When such interesting events occur, it informs it to corresponding personnel or it does corresponding automated actions. CEP tools are aimed to detect patterns of interest in real time. CEP tools have been widely used in operational management, information security and finance domains. In this paper CEP based system is proposed for accident detection and rescue.

Lot of research is in progress in accident detection and rescue systems. Most of the work is concentrating on making a hardware device using appropriate sensors to identify accidents. Some research is focusing on developing smart phone applications to detect accidents. Some research is in progress in assessing the impact

of accidents. Some research focuses on alerting the relevant personnel. When accidents are detected, through some media say SMS or call corresponding people will be intimated. This section of the paper presents some of the work done in accident detection and alerting field. C prabha. have proposed automatic accident detection rescue system [1].The traffic hazards and road accidents take place frequently which cause huge loss of life property because poor emergency facilitator, in [1] paper will provide and optimum solution to their drawback, an accelerometer can be used in car alarm application.so that dangerous driving can be detected, if can be used as a crash detector of the vehicle during and after a crash. Deepak Yadav [2]. Have proposes a new dimension in order to allow rarely response and rescue of accident victims; saving lives & properties. Their system uses the capability of GPS & GSM along with the android phone provide solution which can be used precisely detect the accident spot and send emergency notification to the nearby hospital and victim relatives. this proposal[2] system consisting of two units those are android control unit and crash detector control unit, these are responsible for sensing using accelerometer,position encoder and temper sensor.

**OBJECTIVES:**

In emergency condition, each and every second is important is saving human’s life. The theme

**METHODOLOGY:**

of this project is to use each second efficiently to save person and to communicate as well as controls every part of system.

- Finding the nearest ambulance to the accident spot
- Personal data base to get the personal details like (contact details of family members, collage and family doctors.
- Sending the notifications to the police station, hospital and predefined contacts from accident location.

**PROBLEM STATEMENT:**

In emergency condition, each and every second is important is saving human’s life. The use of vehicles increases in the proportion of the population. Due the traffic congestion, the accidents are also increasing day by day. This causes the loss of life due to the delay in the arrival of ambulance to the accident spot or from the accident spot to the hospital. So, it necessary to take the accident victim to the hospital as possible. Whenever, the accident is occurred, it has to be informed to the investigation unit.so, it is also beneficial if the intimation is reached to the enquiry section so that the time for the investigation can be minimized.

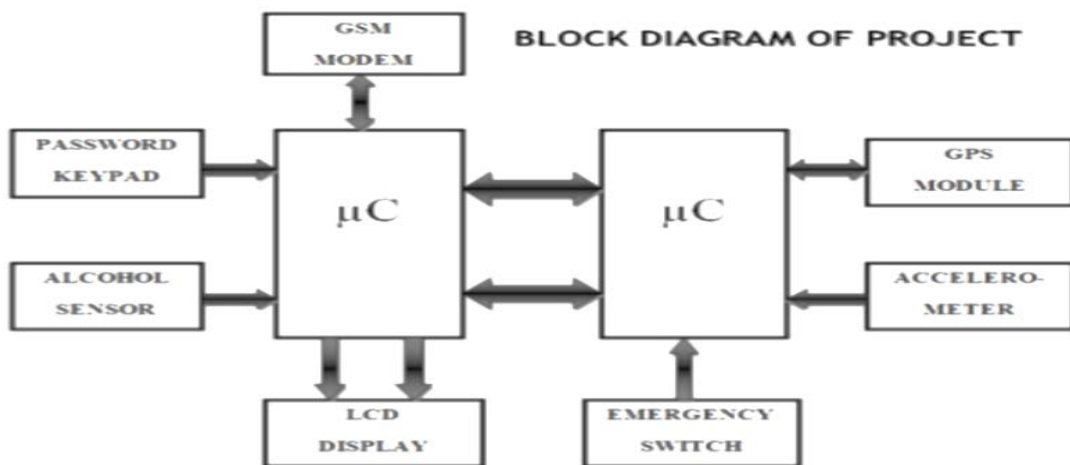


Fig 1.1 Block diagram of the project

The method using in this project are, Embedded technology, microcontroller, sensors, GSM model, LED display, GPS model.

**DESIGN CONSIDERATIONS**

**3.1 BLOCK DIAGRAM**



**Fig 3.1 Block diagram**

**Block diagram description**

This is the block diagram of accident alert system. This shows the overall view of the vehicle tracking and accident alert system circuit. The blocks connected to Arduino UNO here are LCD display, GPS Module, GSM Module, Accelerometer Sensor, Alcohol Sensor, Seat Belt & Power supply.

In this project, Arduino is used for controlling whole process, **SeatBelt & AlcoholSensor** are used to control the ignition of the car, if both the conditions are satisfied, the ignition of the vehicle starts. Using **GPS Receiver and GSM module**. GPS Receiver is used for detecting coordinates of the vehicle, GSM module is used for sending the alert SMS with the coordinates and the link to Google Map.

**MICROCONTROLLER:**

**MICROCONTROLLER:  
ATMEGA 328**

**FEATURES**

- 8-bit AVR RISC-based microcontroller
- 32KB ISP flash memory
- 1024B EEPROM
- 2KB SRAM
- 23 general purpose I/O lines
- 32 general purpose working registers,
- three flexible timer/counters with compare modes
- internal and external interrupts
- serial programmable USART
- SPI serial port
- a 6-channel 10-bit A/D converter
- programmable watchdog timer with internal oscillator
- five software selectable power saving modes
- The device operates between 1.8-5.5 volts



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**HARDWARE COMPONENTS:**

- |   |  |
|---|--|
| <input type="checkbox"/> Atmega 328 Microcontroller | <input type="checkbox"/> Cables and connectors |
| <input type="checkbox"/> Gsm modem                  | <input type="checkbox"/> Diodes                |
| <input type="checkbox"/> Accelerometer sensor       | <input type="checkbox"/> PCB and breadboards   |
| <input type="checkbox"/> Crystal oscillator         | <input type="checkbox"/> Led                   |
| <input type="checkbox"/> Resistor                   | <input type="checkbox"/> Transformer           |
| <input type="checkbox"/> Capacitor                  | <input type="checkbox"/> Pushbuttons           |
| <input type="checkbox"/> Transistor                 | <input type="checkbox"/> Switch and Ic sockets |

**SOFTWARE COMPONENTS:**

- Embedded system/iot based
- C++ language
- Internet, cloud

**Conclusion:-**

An Iot Based Accident detection and rescue system for Vehicle is successfully Assembled by use of database services, API and satisfied all requirements. The devices are capable of receiving and storing the data. Also Transmit it securely on the server. This device can also have trace of a vehicle on which it is mounted. If the accident happens the system is capable of communicating hospital and police station that are near to accident spot. Ambulance & police can identify the shortest route for reaching accident spot with the help of this system that have the web applications and mobile applications. By monitoring real time data system are more convenient for seeing all the data. As Day to day No of vehicles are increasing rapidly due to which Traffic Density is increased and we face Jam on roads frequently. To avoid Jam traffic must be Managed in such a way that there will not be any jam and every vehicle should Run at good speed. So we are designing system which will be consist of RSU (Road Side Units) Vehicles, Ambulance, Server. All sub part or systems will communicate with each other to manage the traffic density. There will be a system which will communicate with the vehicles and

control traffic signal timer for managing traffic density as well as path clearance to ambulance using IOT technology

**References**

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