# Post Accident Identification System by Using GSM and GPS Modem

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Abstract - The rapid growth of technology and infrastructure has made our live easier. The advent of technology has also increased the traffic and the road accident takes place frequently which causes huge loss of life because of poor emergency facilities. Our project will provide an optimum solution to this draw back. According to this project when a vehicle meet with an accident immediately vibration sensor will be activated and send to the signal to microcontroller. Microcontroller sends the alert message through the GSM MODEM including the location to police control room or a rescue team. So the police can immediately trace the location through the GPS MODEM, after receiving the information. Then after conforming the location necessary action will be taken. If the person meets with a small accident or if there is no serious threat to anyone's life, then the alert message can be terminated by the driver by a switch provided in order to avoid wasting the valuable time of the medical rescue team.

There is a one death every four minutes due to traffic accident. These causes huge social and economic burden to people involved, so it's very important to nullify accidents and find out the real reason of it. The proposed system records information about the vehicle much before and during the accident by using a black box.

*Keywords* - GSM, GPS, Vibration sensor, Temperature sensor, Alcohol sensor, Tyre Pressure Sensor, Black box, seatbelt control.

#### I. INTRODUCTION

Nowadays accidents occur in all the places but major accidents occur in school zone and college zone because of all high speeding of vehicles. The main objective of the system is to provide security for the vehicle user and also detects the accident if occurred and informs the respective authority through wire less technologies. If any accident occurs in highway or any other road accidents. Life of the people is high risk. This is because of the lack of best emergency facilities available in our country. An automatic alarm device for place. The accident information system will get activated and message will be transmitted to respective authority with the help of GPS and GSM MODEM. The high demand of automobiles has also increased the traffic hazards and the vehicle accident is introduced in this paper. This design is a system which can detect accidents in less time and sent the alert to the rescue team which will help in saving the valuable lives. Drinking and driving is already a serious public vigor problem, not only drunken drive, but also driving rudely without wearing seat belts in cars causes a lot of tragic lethal deaths. Seat belt is one among the key safety measure used in vehicles like car to avoid major injuries to the driver driving the vehicle. Due to driver carelessness there occur to demand chief road accidents within the city, but outside the city accident mostly occur due to drunken driving. This application provides the optimum solution to poor emergency facilities provided to the roads accidents in the most feasible way.

#### II. RELATED WORK

Many researchers had made the project related on accident alarm system. This technology includes: GPS, GSM, communication and others. But we use SIM808 module which is the combination of two devices named GPS and GSM. The accident alarm system has two parts, first is controlling device which send the messages and other is mobile unit which receives the messages. The system processes, interfaces, connection data transmission and reception of data between the controlling device and mobile unit are working successfully. These results are compatible with SIM908 technology. The accident alarm system is an electronic device, install in all type of car bikes and line follower.

This system includes vibration sensor which measures vibration and detects accidents. This system is also used for detecting the alcoholic drivers with the use of alcohol sensor. The temperature sensor is also a part of accident alarm system which detects the fire. This project is totally based on embedded system. If any of these sensors activated then the message of current location will automatically send to preloaded mobile number.

# III. PRESENTATION OF THE MAIN CONTRIBUTION OF THE PAPER

The system has four modules. The first module is SIM808, the combination of GPS and GSM module in which the GPS receiver receives the location information from the satellite in the form of latitude and longitude real time reading and the GSM sends the location and other information in the form of SMS. The second module is vibration sensor which helps us

to indicate in how much pressure the crash on the vehicle have occurred. The third module is alcohol sensor which helps us to indicate with the driver is drunken or not. The fourth module is temperature sensor which helps us to indicate with the car have caught the fire or not. So this is the overall review of each important modules used in this project and combine they are used to achieve the goal of project.

# IV. BLOCK DIAGRAM



Fig: 4.1 Block Diagram of Proposed model

The block diagram of accident Alarm System using GSM, GPS as shown in figure. It consist of the power supply section, Microcontroller ATMEGA16, SIM808,Vibration sensor, Temperature sensor, Alcohol sensor, Tyre pressure sensor. The GSM board has a valid SIM card with sufficient recharge amount to send SMS. The circuit is powered by +5V dc.

# A. Tire Pressure Sensor

**Direct TPMS** uses a sensor mounted in the wheel to measure air pressure in each tire. When air recommended level, the sensor transmits that information to your car's computer system and triggers your dashboard indicator light.

**Indirect TPMS** works with your car's Antilock Braking System's (ABS) wheel speed sensors. If a tire's pressure is low, it will roll at a different wheel speed than the other tires. This information is detected by your car's computer system, which triggers the dashboard indicator light.

*B. ATmega16* is an 8-bit high performance microcontroller of Atmel's Mega AVR family with low power consumption. Atmega16 is based on enhanced RISC and CISC (Reduced Instruction Set Computing, and Complex Instruction Set

Computing) architecture with 131 powerful instructions. Most of the instructions execute in one machine cycle.

ATmega16 is a 40 pin microcontroller. There are 32 I/O (input/output) lines which are divided into four 8-bit ports designated as PORTA, PORTB, PORTC and PORTD. ATmega16 has 16 KB programmable flash memory, static RAM of 1 KB and EEPROM of 512 Bytes. Atmega16 work on a maximum frequency of 16MHz.

# C. Alcohol Sensor:

"A hi-sensitivity alcohol sensor is built into the transmission shift knob, which is able to detect the presence of alcohol in the perspiration of the driver's palm as he or she attempts to start driving. When the alcohol-level detected is above the pre-determined threshold, the system automatically locks the transmission, immobilizing the car. A drunk-driving" voice alert is also issued via the car navigation system.

# D. Temperature Sensor (LM 35):

The LM35 series are precision integrated-circuit temperature devices with an output voltage linearly proportional to the Centigrade temperature. The LM35 device has an advantage over linear temperature sensors calibrated in Kelvin, as the user is not required to subtract a large constant voltage from the output to obtain convenient Centigrade scaling.

# E. Vibration Sensor:

The vibration sensor, which is useful for a variety of different fields, has the ability to detect vibrations in a given area. This can help to alert someone to trouble with a system, and you will even find these types of sensors in use with security systems today. They have quite a few different uses.

# V. HARDWARE MODEL



Fig: 5.1 Hardware Implemented Model

In this proposed model we are going to use an accident detection unit which will be fitted inside the front and rear

bonnet of the car. This accident detection unit consists of two metallic plates which are kept at little distance apart from each other. In case of accident, if the car is hit to some other vehicle or an object then due to the impact the two metal plates will come in contact with each other. Due to this a signal will be sent to microcontroller. Microcontroller is the central processing unit CPU of our project. Once microcontroller gets signal from metal plates, then it will immediately turn on the buzzer.

A key will be provided for the driver. If the accident is very normal, or driver has hit the wall in some situations like parking then driver will press the key. This will inform the microcontroller that this is a very normal accident. But if driver is not in situation to press the switch or if the accident is really a major accident then driver will not press the key. Then microcontroller will get the coordinates from the GPS modem then it will send this information to the GSM modem, GSM modem is used to send this information via SMS. SMS will be sent to the family member of the driver, so that they can take immediate action to help the persons suffering due to this accident.

#### VI. PROPOSED PROJECT RESULT

The prototypic model of the vehicle enabled with SIM 808, Alcohol sensor, Temperature sensor and Vibration sensor. Whenever any accident occurs the vibration and sends the information to the microcontroller, by using GPS, we will get particular location where the accident occurs, then GSM sends message to authorized members & 108. It indicates if fire has been caught in the vehicle and also indicates if the vehicle have became upside down. It indicates it in similar way by sending SMS. It also indicates if the driver is drunk.

# Result

Case 1



Vibration Sensor: - This sensor senses the vibration caused during vehicle collision. And also we can adjust the pressure or force of vibration sensor according to accident or vehicle ability. When the measured impact is higher than set threshold value it will inform microcontroller that the collision has occurred.

Case 2



Alcohol Sensor :- Alcohol sensor is used to detect whether the driver is drunk or not. if it senses alcohol above threshold value, the microcontroller will get a signal from sensor that the driver is drunk.

Case 3



Temperature sensor :- Here, we are using the temperature sensor LM35 to detect the engine temperature during collision it will inform the microcontroller about engine temperature.

Case 4



Tire pressure And Seat belt :- This sensors will sense whether tire pressure is normal or not and the driver and passenger were wearing seat belt or not, these sensors status will be sent to microcontroller during collision.



#### VII. CONCLUSION AND FUTURE WORK

To minimize the deaths and severe conditions due to accidents the GPS and GSM technologies are used where immediate action would be taken by the ambulance and police service which might reduces the severity. On the whole this system proves to be very cost effective and efficient. The experimentations and results prove that the system is easily implementable in real time. In future, the system can be interfaced with the airbag system of vehicle to prevent occupants from striking to the interior parts of the vehicle such as steering or swindow. A camera can be interfaced to the controller module that takes the photograph of the accident spot that makes a help for the tracking of the vehicle.

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