# SMART WEARABLE MODULE TO TRACK ACCIDENT ZONE AND RESCUE ACTION USING GPS AND GSM

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***Abstract*--** Now a day's people are moving from rural lifestyle to urban lifestyle, the urban lifestyle is more complex when compared to rural. The road condition is worse due to heavy traffic and high ratio of vehicles on roads. For every one hour 7 people are losing their life due to road accidents in all over the world. The major cause of the death is due to inadequacy of medical aid on time. So in this paper a module is designed in a vehicle and helmet to track the person if they meet an accident and the information will be shared to the nearest hospital, police station and relative of the person to provide immediate medical aid. We are using Global positioning system (GPS) to track the accident zone and the information regarding the accident will be provided to the pre programmed numbers through Global System for Mobile Communication (GSM). The device will continuously monitor the moving vehicle whenever the ignition starts along with the person wearing the helmet or holding the stearing and report about the status whenever it needs regarding the latitude and longitude of the person who meet with an accident with the help of Arduino interfaced serially to a communication module. The latitude and longitude of a person who meet the accident will be identified with the help of GPS module and the information will be sent to pre programmed numbers feed in the controller.

**Key Words: GPS, GSM, Arduino microcontroller**

## I. INTRODUCTION

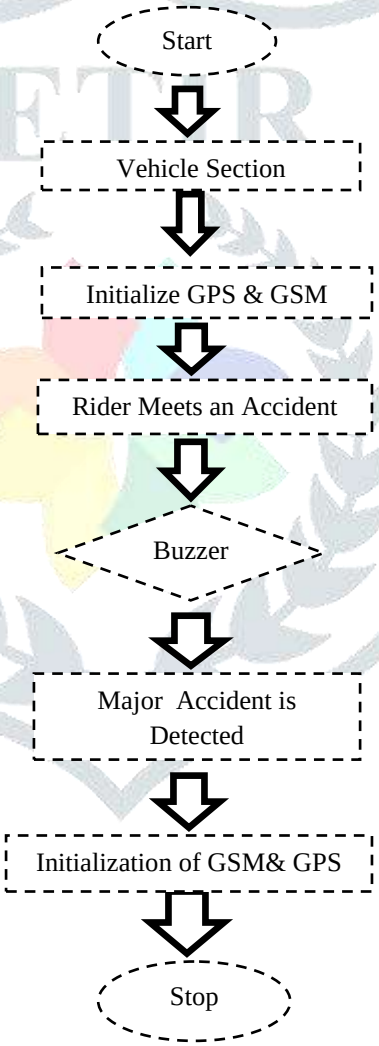
There is a drastic increase in the number of vehicles in these days, which also cause a steep rise in the number of accidents with a lot of people losing their lives. According to the World Health Organization, an estimated 1.2 million people lose their lives every year due to accidents. India's road
Accident records 16 %of the world's road accident deaths, whereas India has only 1 % of the world's road vehicles. It is due to the increase in the number of vehicles without a subsequent increase in the road facilities required for it. In most of the accident cases, the victims lose their lives because of the unavailability of medical facilities at the right time. To solve problems like these, this concept came into existence.This tracking system can inform you the location and route travelled by the vehicle, and that information can be observed from any other remote location. This module will help us to track person who meets the accident in any weather conditions using GPS and GSM technologies. The paper constitutes the hardware module which span of GPS, GSM, Arduino microcontroller with 16x2 LCD and interfacing is done between the components using the required software. The main theme is to design a module that can be easily installed and provide a platform for further enhancement

## II. PROPOSED SOLUTION

The theme of this concept is to track the position of the vehicle, also this can be used in public transportation medium to know the position of the bus and whether the drive wear stearing or helmet. The module will send the message nearest police station, hospital and all the pre-registered contacts regarding the position of the rider in case if he or she meet the accident. For tracking the exact location of vehicle in few feet's this system uses GPS (Global Positioning System). The location of the vehicle will send to the preprogrammed numbers via GSM module. All the modules in the system are controlled by the "Arduino Microcontroller". When any extra pressure is detected, sensors are triggered and system sends signals to the microcontroller. According to the program of the microcontroller, processing of the input signal is done and output is produced. Piezo Electric Sensor used here will detect.

Fig -1: Tracking and Recovering vehicle using GPS and GSM

## III. FLOW CHART




## IV. METHODOLOGY

### A. Peizo electric Sensor:

Piezo Electric Sensor used here will detect the pressure in the Helmet or stearing and also senses stress, temperature, linear Velocity and displacement.

### B. GPS Module:

The GPS makes it possible to precisely identify locations on the earth by measuring distance from the satellites. GPS allows you to record or create locations from places on the earth and help you navigate to and from those places.

### C. GSM Module:

GSM (Global System for Mobile) / GPRS (General Packet Radio Service) TTL -Modem is SIM900 Quad-band GSM / GPRS device, works on frequencies 850 MHZ, 900 MHZ, 1800 MHZ and 1900 MHZ. It is suitable for SMS as well as DATA transfer applications in mobile phone to mobile phone interface.

**D. RF Transmitter:**

RF transmitter is used to transmit the Radio frequency to required circuits.

**E. LCD:**

The LCD is commonly known as Liquid Crystalline Display, which is used to display the output of the circuit.

**F. Buzzers:**

Buzzers are used to indicate the sound when the driver meets the accident to the person near the location.

**G. Transmitter**

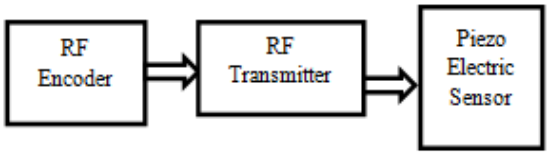



Fig -2: Transmitter Section

**H. Receiver**

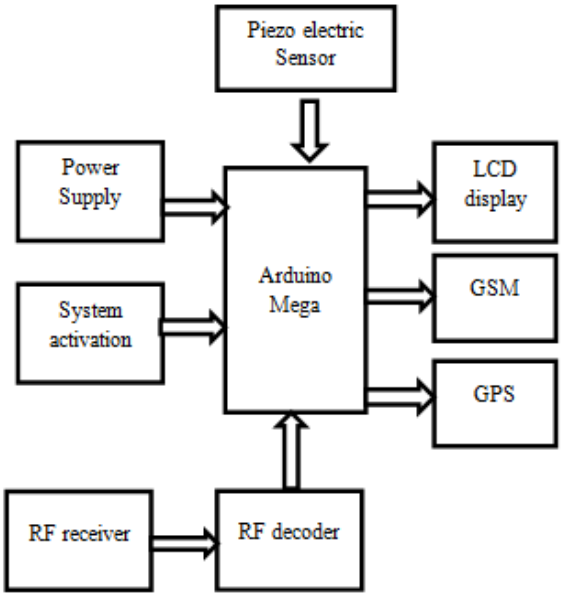



Fig -2: Receiver Section

Transmitter Section contains of one Piezoelectric Sensor, RF module. These components are integrated into a single module and deployed in the driver's helmet or steering. Piezo Electric Sensor is the transducer that converts the physical changes to equivalent electrical impulse. The signal fetched from the piezoelectric sensor will be converted to the desired format using RF Encoder and Decoder and that signal can be sent to the receiving end for proper action can be performed. When the person who rides the vehicle meet the accident, there will be a pressure on the module and the signal will be sensed by the piezoelectric sensor fixed in the helmet or stearing and then such radical signals are transmitted through the RF transmitter.

Receiver section contains Arduino microcontroller which fetch the information from the transmitter section and based on the information provided by the transmitter it shares the exact location and alert message of the accident to the predefined number with the help of GSM and GPS module.

## V. WORKING PRINCIPLE

### A. When Engine is in OFF Condition

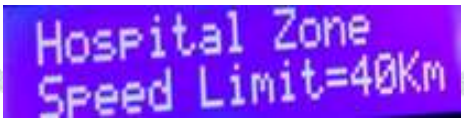

When the Engine is in OFF Condition, the circuit will be in open condition and does not work. The helmet or stearing also does not detect the vibration.

### B. When Engine is in ON Condition:


When the Engine is in ON Condition, the circuit became closed condition and it works.

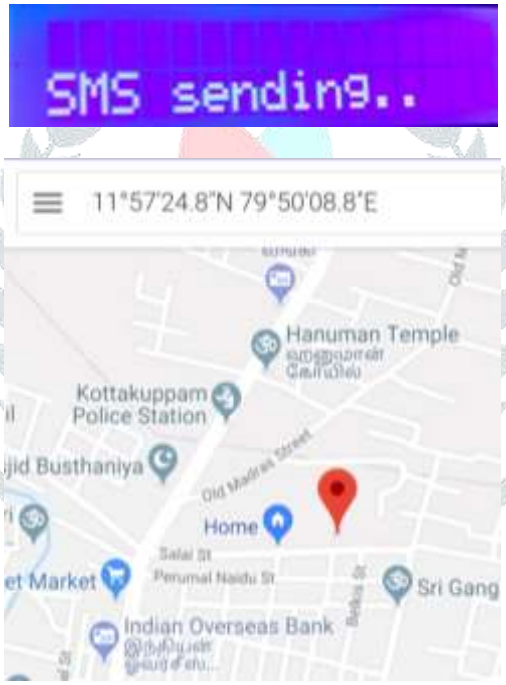
**C. Speed Identification:**






Speed Identification is for detecting the accident zones and indicating the driver by a buzzer. The speed limit set for the school zone is 30km/HR, for the hospital zone is 40km/HR, for the accident zone is 50km/HR**.**

**D. Message Sending process**




When the accident occurs and the helmet or stearing vibrates, the co-ordinates of the location where the accident has been occurred is sent to the pre-programmed number.

**E. Module View**

**a. Helmet or Stearing Module**


**b. Vehicle Module**


## VI. CONCLUSION

This paper has described the design and implementation of a vehicle tracking module to give information about the accident and tracing of the accident location in real time. The transmitter module detects the accident with the help of pressure in the module and sends the sensed data to the receiver module for necessary action. Then the received signals will be decoded in the RF decoder. Then the decoded signals will be transmitted to the microcontroller. Microcontroller controls the incoming signals and performs the necessary actions as coded in it. If the rider meets with a normal mishap then he can switch off the buzzer otherwise after a certain delay the information about the accident is sent to ambulance (108), police station and rider's relatives by using the GSM module along with GPS coordinates. The system was able to experimentally demonstrate its effective performance to track the accident location anytime from anywhere. Furthermore, our implementation is low-cost that is based on easily accessible off-the-shelf electronic modules.

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