



ACCIDENT DETECTION AND MESSAGING SYSTEM USING IOT

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Abstract: The rapid growth of technology has made our lives easier. Also increase in population and advent of technology has increased number of automobiles leading to traffic hazards and the road accidents take place frequently which causes huge loss of life and property because of the very poor emergency facilities. Because of unavailability of emergency services and unknown location of accident caused more peoples to lost their lives. Our project will provide an optimum solution to this problem. Physical sensors such as piezoelectric sensor, gyroscope and accelerometer, camera will send data to microcontroller which will be processed to detect accident. If accident occurred then GPS will track the location of vehicle with latitude and longitude. GSM will contact to nearest health care for help and provide location of accident. GSM will also send message to emergency contact with location of accident.

Index Terms - FSR, Gyroscope, Accelerometer, GPS, Arduino, GSM

I. INTRODUCTION

India has population over 1.3 billion and its increasing day by day. As well as increase in population has led to increase in number of automobiles and accidents. The past few decades, there been large boom in number of accidents, injuries and deaths per million population of entire world. The main reasons behind this is rising in number of vehicles and changing nature of the traffic and lack of traffic management. According to World Health Organizations (WHO) Global Status Report on Road Safety, India leads the world in road accident deaths. In 2014-2015, 13 million people were victim of road accidents in India. According to survey the causes for accident and speeding, drunken driving, less use of helmets and belts, child restraints, lack of enforcement, bad roads etc. According to road traffic safety experts report, the number of casualties is higher considering many accidents goes unreported. Many lives have been lost because of poor emergency services and unknown location of accident.

II. LITERATURE SURVEY

India is a country where 34 births are seen per every minute and over 10 deaths happening every minute. One of the reasons of deaths is road accidents and it's the major. Analysis report of data in 2015 shows that average about 1374 accident happens per day and causing average 400 deaths per day. Further translating 57 accidents happens per hour leading to 17 deaths per hour. About 54.1 percent of all persons killed in road accidents were in the 15 – 34 years age group during year 2015. With almost one life lost for every 3.8 minutes the road accidents are not taken into consideration with greater seriousness. As far as the recent statistics released by the Indian Ministry of Road transport and Highways in India the total number of road accidents increased by 2.5 percent from 4.89 lakh in 2014 to 5.01 lakh in 2015. Road accident injuries have also increased by 1.4 per cent from 4,93,474 in 2014 to 5,00,279 in 2015. Reasons behind accident from human are contains over speeding, drunken driving, distraction of driver, red light jumping, avoiding safety measures such as wearing seat belt and helmets.

Parameter	2014 In lakhs	2015 In lakhs	% change over previous years
Total accidents in the country	4.89	5.01	2.5
Total no of persons killed in the country	1.39	1.46	4.6
Total no of persons injured in the country	4.93	5	1.4
Accident severity*	28.5	29.1	2.1

Table Statistics of Road Accidents

III. SYSTEM DESIGN

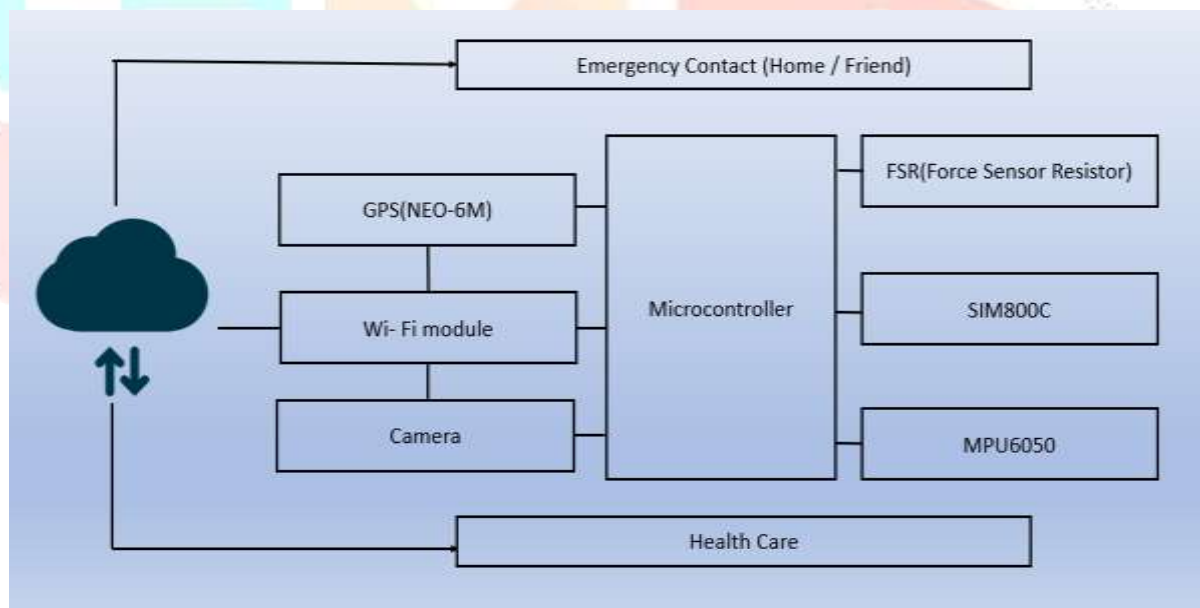


Fig. System design diagram

The FSR (force sensor resistor) sensor used to detect force, pressure or strain applied on a vehicle during accident. This produces analogue signals which are converted to digital signal by Arduino. Another sensor MPU6050 is integrated Gyroscope and Accelerometer which is connected to microcontroller is used for detecting the tilting angle and speed drop and acceleration of vehicle. Based on threshold values and inputs from these sensors as soon as an accident is detected the SIM900 module will get activated. Using GPS module NEO6M the coordinates of accident are taken and those coordinates are sent to Emergency contact and Health care using SIM800C which is GSM module for sending a SMS. The camera is set at the dashboard of the vehicle which clicks the image of the driver and sent to the server along with the exact GPS coordinates using wi-fi module. At the server the image along with exact coordinates and will be sent to nearby Hospitals and Emergency Contacts of the person.

IV. SENSOR AND WORKING

a) **FSR (Force Sensor Resistor)** - We are going to use FSR Sensor for detecting impact of force on vehicle. This sensor provides analogue output with high sensitivity. This analog output is used as an input to Arduino. To calculate precise value of impact we are going to use multiple FSR sensors. These Sensors are placed on different parts of vehicle like front side, back side and doors. After impact, these sensors provide analogue value to Arduino. This analogue value is converted into digital signal. Depending upon this value threshold is set based on that threshold value and values coming from sensors, accident is detected.

b) **SIM800C** – SIM800C is quad band (850/900/1800/1900MHz) GSM/GPRS module. It is used to send SMS, transfer data and voice hence used in the embedded customer application. It requires SIM card for service to activate. It requires external power supply to work. After accident is detected, GSM module sends system generated messages to nearby emergency health care and pre-set contacts.



Fig. SIM800C

c) **MPU6050** - MPU6050 is combination of gyroscope and accelerometer. It is used to detect angle of tilt, temperature, or sudden change in speed. It measures the angel of jerk as well as speed drop or acceleration of vehicle using accelerometer. It senses the physical condition of vehicle in any angel. These values of angles and acceleration will be sent to Arduino. After crossing the threshold value accident will be detected.

d) **NEO6M** - It's a fully functional and independent GPS receiver module. It needs satellite connection to work. It gives latitude, longitude, date, time, altitude etc. data which is received by satellite. External antenna is used to catch the satellite signal. It takes 3V to 5V of power supply. It does not work on cellular network hence does not require any network or sim card for its function.



Fig. NEO6M

V. CONCLUSION

In this paper from all the analysis and study, we have concluded that the system can be used detect the accident in very less time using sensors and is helpful to find the location co-ordinates of accident place and sends them to the nearest health care and to emergency contacts to inform them about the accident. Also, image taken helps to find out level of injury of user. The parameters on which accident will be detected are speed, angle of jerk, external force or pressure sensed. This system can be also used to prevent theft of vehicle using GSM and GPS by extending systems functionalities.

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VII. REFERENCES

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