

Accident Intensity Detection and Intimation Over IOT

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Abstract—An accident is an unpredicated and unintentional event. Considering the alarming increase in the number of motor bike riders and the number of accidents happening in our country, this system ensures to make the two-wheeler driving safer than before for the rider. The lack of treatment in proper time is the major reason for half of the deaths in road accidents. This system aims at providing early detection of accidents and communicating the information immediately to the emergency responses on time to provide quick assistance for the injured person. When the rider met with an accident and the helmet hits the ground, the vibration sensor which is embedded in the helmet or the top of the roof of a car, which senses the vibration frequency and transfers the value to the ESP32 module that is interfaced to it. While flex and mems threshold frequency exceeds the programmed maximum limit, the ESP32 board extracts GPS data from the GPS module and the notification message with all the necessary information is sent quickly to the registered emergency contacts of the rider. This system assures to provide immediate assistance to the victim of the accident. The results give exact locations of the accident.

Index Terms--GPS, Internet of Things, Push button, ESP32 module , mems, Flex Sensor.

I. INTRODUCTION

Total count of registered motor vehicles in India is more than 21 million as per the report of 2015. The numbers of car users in India are 22,536,000 and around 17.6 million two-wheelers were sold to the customers in 2017. In India, 1214 road crashes occur every day. Out of total road crash deaths, 25% of them are two-wheeler accidents. Recent survey states the maximum number of road crash injuries occur in the state Tamil Nadu. Figure 1.1 depicts the Accident

report of Indian Roads in the year 2016. One death occurs every four minutes due to a road accident in India. Government of India revealed that more people died on road accidents in 2016 as compared to 2015 based on the survey published by transport research wing under ministry of road transport and highways. As per the data, 413 people died every day in 1,317 road accidents. Also, the data shows that at least 17 deaths occurred in road accidents every hour. Internet of things has now become an essential part in our day-to-day life. The usage of electronic and digital devices is increasing more than 13 billion, in equals of 2 devices per person. Suitable example for the IoT is “SMART HOME”, the smartest devices are developed with programmable and remote-controlled appliances. Future growth in IoT is basically from every sector of the economy like commercial, industrial, health care and public safety.

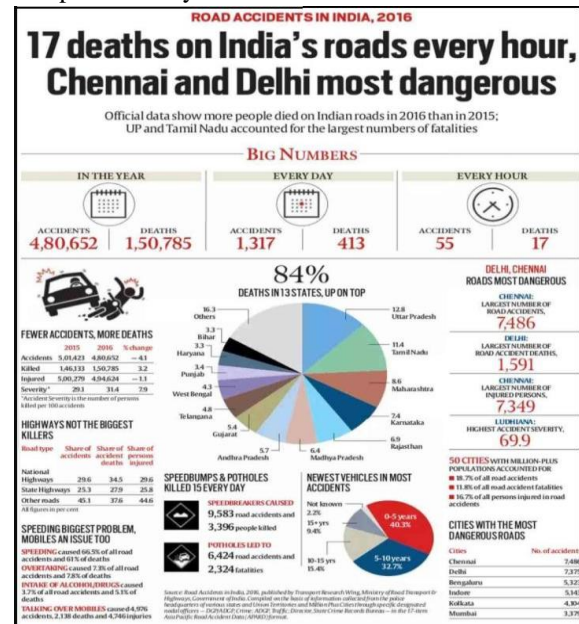


Fig 1: Accident Report of Indian Roads

II. EXPERIMENTAL METHODOLOGY

A. Methodology

At the time of accident, the process to intimate and locating the place of the victim is a bit difficult task that is to be discovered. The credentials of the victim are unknown which is tedious during crucial moments for the people at the accidental spot. The main motive of the project is to design IOT detection and reporting system. The unique feature of the system is to locate the victim and report the accident with the relevant information to ambulances and his concerned people to provide a quick medical aid to the victim.

A ESP32 module is used and a unique code is programmed in this module to achieve this functionality. Flex and mems sensors are interfaced with the ESP32 module which senses the vibration and intensity of the accident. A maximum stress limit of the flex and mems threshold is programmed in the module. The GPS module is connected to the ESP32 module and all these are embedded in the helmet or on the car. The GPS module will be helpful for the family members and the friends, to track the victim's location.

B. Analysis

Blynk application is installed in the rider's mobile and it is used to switch on and off the system. Blynk API is used to sense and trigger a response in our IoT device when the specified threshold level is met. Blynk is an application that acts as a bridge between your mobile devices and desktop OS and sets the standard for developer updates. This application is installed on all the mobile devices of the registered emergency contacts. Any number of contacts could be stored in the ESP32 and sent the message. Blynk provides the way to send notifications from ESP32 to the mobile phones with a simple scripting. The access tokens of the respective Blynk application are programmed in the ESP32 module.

III. MODELLING ANALYSIS

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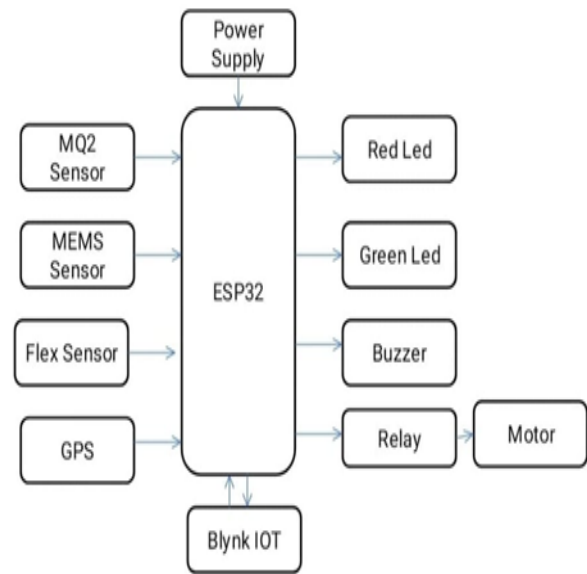


Fig 2: Block Diagram

IV. RESULTS AND DISCUSSION

This project is well prepared and acting accordingly (including all the hardware and software) as per the initial specifications and requirements of our project. Because of the creative nature and design the idea of applying this project is very new, the opportunities for this project are immense.

The practical representation of an experimental board is shown below:

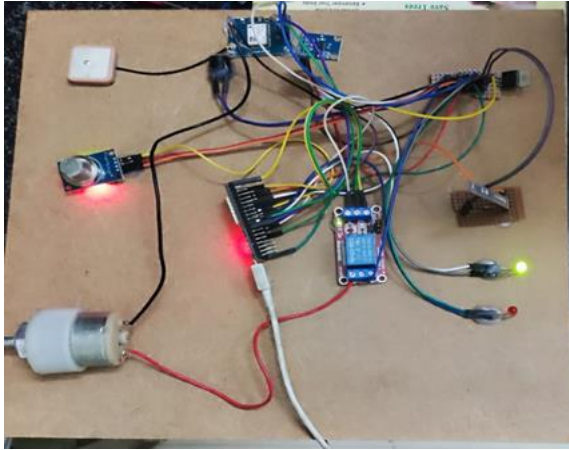


Fig 3: Practical Representation of Experiment

Now we turn on the power supply. Here we use Flex sensor to detect the dents whether there are any dents occurred to vehicle and we use mems sensor to detect the coordinates of the vehicle and we use MQ2 sensor to detect the smoke or gas and we use GPS module for the location. If there are no dents and there is no change in the coordinates of the vehicle and there no detection of gas or smoke then green led will glow. If there are any dents occurred to the vehicle and change in coordinates of vehicle and detection of gas or smoke then red led will glow and buzzer gives alerting sound and by using GPS module we can track the exact location of vehicle and we get alerting messages using Blynk IOT app.

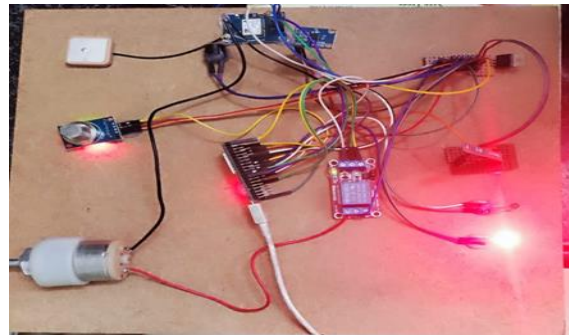


Fig 4: Received Alert Message

Above figure gives the alerting message i.e, red led will glow and the buzzer gives the sound due to detection of dents and change in coordinates of the vehicle and detection of gas or smoke in the vehicle.

V. CONCLUSION

In recent days, the occurrence of most of the accidents is by motor bikes and cars. This alarming rise in the motor bike and cars accidents leads to loss of many lives. The lack of treatment in the proper time is the

major reason for many deaths. The major causes may be the late arrival of ambulance or no person at the place of accident to give information to the ambulance or family members.

The proposed work offers a solution to this problem by introducing accident detection and reporting system aiming to save at least half the lives that are lost due to bike accidents. In future, this system could be implemented for lock protection and for other safety purposes. It could also be implemented to control the speed of the vehicle and to prevent the rider from over speeding by passing the information to the rider's family. The early detection and reporting will account to the responsibility of saving many lives.

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