# AUTOMATIC ACCIDENT DETECTION SYSTEM

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*ABSTRACT:*
*The road transport facilities are increasing with respect to the number of users and the possibility of accidents as well. The reason being inadequate safety tools present in the vehicle especially in low budget cars. In these type of cars neither air bag system is available for protecting the driver nor notification system is available to show actual position after an accident through an IP address. Due to this problem, there is no communication between relatives and injured persons after accidents. So the proposed project captures the image of an accidents and sends an email to the family members, ambulance services and the patrolling department. It is possible to increases the survival after accident only when the medical services reach the accident spot immediately after occurence of accident.*

*(Keywords: IP address , email , MEMS sensor, Raspberry pi)*

## I.    INTRODUCTION

In today's world as the population increases day by day the number of vehicles also increases on the roads . This result in more accident that inturn leads to the traffic jam . This module provides information about the accident to the hospital and police station. As a result, this additional feature will help to save many  lives and the traffic jam also will be reduced. The development of vehicular design brings public more convenience in life but also brings many problems at the same time, for example traffic congestion, difficulty in monitoring dispersive vehicle, theft and other series of problems.

 A wireless system is developed using MEMS accelerometer for accident detection and reporting. If any accident occurs, the wireless device will send an email to  the emergency medical services and family member giving the exact position of the spot where the accident as occurred.

So that , they can provide proper medical treatment to the patient .This system is used to record information related  to the accident. In order to confiscate the need of controlling traffic, Raspberry pi  is used, Mems sensor used to detect the vibration of the car and driver circuit is used to amplify current to the required levels.
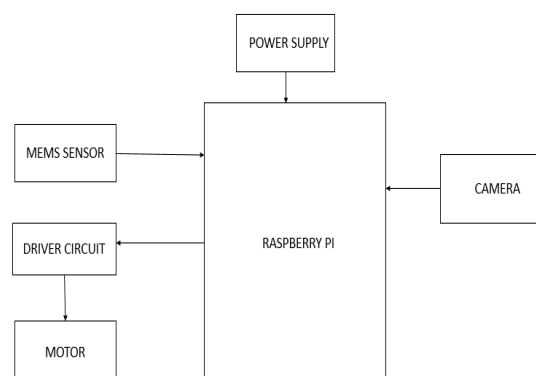


Figure 1- block diagram

## II. LITERARTURE SURVEY

Automative fire initiated barking and alert system (sumit pandey;2015) : [1]  This paper proposes an embedded system that will be used to alert people  so  which sends an alert  people so that life as well as the damage of the vehicle can be minimized.  If the train coach catches fire , the smoke sensor will sense it and send a signal to the microcontroller . This microcontroller activates the motor to pull the chain and also activates an emergency alert system which sends an alert message to the train driver and guard room and activates the alarm . If the chain system which is used to stop the train doesn't work properly ,then even in that case ,this system is very effective . So this system is useful to protect  precious lives of passengers and minimize the heavy damages due to the fire accidents .But it  doesn't capture images of  the victim.

Intelligent location identification and passenger alert system in Indian railways using GPS receiver (S.Moorthi;2013): [2]  This system would alert the passenger when the train is within  a pre-specified distance to a mention destination . An alarm is activated once the distance is within a certain pre-specified limit, thereby functioning as a passenger-alert system. The purpose of this alert system is to make sure that the passenger travelling in the train alerts comfortably at the intended destination. A novel embedded system has been designed interfacing a GPS receiver with a host Field Programmable Gate Array (FPGA) board. This  system won't work  when the network range is limited.

Automatic vehicle accident detection and messaging system using GSM and GPS modem (C.Prabha;2016):  [3]  In this project when a vehicle meets with an accident immediately vibration sensor will detect the signal and send it to ARM controller.  Microcontroller sends the alert message through the GSM MODEM , after receiving the information . Then after conforming the location necessary action will be taken . If the person meets with a small accident or any injury , 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. This paper is useful in detecting the accident  by means of vibration sensor and Micro electro Mechanical system (MEMS) or accelerometer. This system will pass the information to  the server  even if the passengers are safe and the vehicle is  lightly damaged .

Characterizing road segments using compass sensors to predict approaching bus stop (Stephen Yan;2015): [4]  In this project, they  provide a personalized approach where in a world of pervasive smart phone use, users may take advantage of sensor data to learn and personalize their bus routes, and alert them on time when a bus stop is approaching. They accomplish this through the development and implementation of two algorithms they are ;1) the  detection  made  by using on-board compass sensor of a smart phone, and 2) characterizing road segments in terms of turns and thereby approaching the bus stops. They conduct field experiments on a route with four selected bus stops in the town of Chapel Hill. Results show that the accuracy of turn  and detection of approaching bus stops are 95.7% and 83%, respectively. As it make use of smart phone ,  rural areas may have network tower problem .

## III. RELATED  WORK

This paper describes about a solution to help the injured person. Nowadays Wireless Sensor Networks (WSN) has been applied in various domains like weather monitoring, military, home automation, health care monitoring, security and safety etc. The vehicle system which is placed inside the vehicle detects the accident and the accident location is sent through e-mail with the help of raspberry pi.

## IV. EXISTING MODEL

There is no such system to inform the rescue forces when the driver is seriously injured, when an accident occurs the information only is sent   through GSM but there is no possibility to locate the spot.

## V. PROPOSED SYSTEM

The medical services and patrolling department are informed by an image of an accident to rescue the injured person in the accident spot. The system consists of a MEMS sensor to detect the accident. The image of the injured person is captured and updated to the server using through e-mail. Now the concerned person can know the status of the driver and the impact of an accident.

## VI.    HARDWARE  COMPONENTS AND DESIGN

### A.   RASPBERRY PI

Raspberry pi -3   model B is the third generation single board computer . It is the  latest version of the raspberry pi . It uses 4GHZ , 62 bit quad-core processor dual band wireless LAN. It can be used for many applications . It is 10 times faster than the first generation of  Raspberry  pi.

Figure 2 – RASBPERRY PI

### B.  DRIVER CIRCUIT

A  driver is an electrical circuit or other electronic component used to control another circuit such as higher power transistor . It  is used to boost the current . when  the voltage or current are in the correct range , the transistor act as a high current switch . They  are used to regulate current flow or to control other factors such as other components , some devices in the circuit .Integrated circuit that control high power switches in switched mode power converters . An amplifier can be consider as a driver for loud speaker or voltage regulator that  keeps attached component operating with in a broad range of input voltage . The driver stages of a circuit requires different  characteristics to other circuit stages.

### C. ACCELEROMETER SENSOR

For  detecting tilt angle accelerometer sensor is used. "Accelerometer sensor" plays a major role. Fig 3 shows the sensor which is employed here. The sensor is a 3-axis accelerometer sensor (MMA7660FC) which is capable of finding different physical chains like tilt, tap, shake etc. figure 4 shows the vehicle position in x-axis, figure 5 shows the vehicle position in y-axis and figure 6 shows the vehicle position in z-axis. The advantage of this sensor is it can sense the physical conditions in all the direction (i.e., 3-axis).

Figure 3- Accelerometer sensor

Figure 4- when vehicle position is in x-axis



Figure 5 - when vehicle position is in y-axis



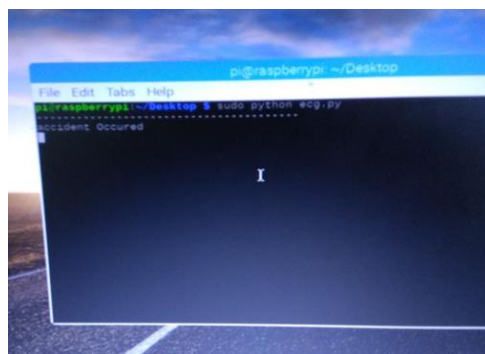Figure 6- when vehicle position is in z-axis

**VII. RESULT**



Figure 7-MEMS result

The above figure 7 appears when it crosses the threshold value which is 320 and sends it to the raspberry pi which act as a server , which sends the command to capture the photo.

## VIII. CONCLUSION

The airbag deployment and accident alert system is one of the efficient accident detection system. These system are cheap and are suitable in all types of vehicles like car, trucks etc. It is used for providing help to the accident victims and to rescue the accident victim as soon as possible. This system can be enhanced by adding few more sensors in future and the recorded video can be sent to the nearest police station or hospital .

## IX. REFERENCE

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