

# Wireless Sensor Based Automatic Vehicle Accident Detection System

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## ABSTRACT:

Now-a-days, technology rapidly grows but also people do not survive his/her life after road accident because there is no emergency facilities available in our country. So, we design a technology which facilitates the emergency facilities. This project informs about a vehicle to rescue team and the family members of the travelling persons. This uses MEMS sensor which can detect the abrupt vibration when an accident is occurred and also used ultrasonic sensor for distance calculation. More advantages of this system is information send to the rescue team by using IOT technology and locate the position by GPS receiver modems in the form of latitude and longitude. The development in the field of automobiles is highly increasing and which leads to the accidents and so many hazards due to traffic. People's life is under high risk. This situation prevails, just because there is a lack of emergency facilities in our country.

**KEYWORDS:** Arduino UNO, MEMS Sensor, Ultrasonic Sensor, GPS, GSM, LCD, Antenna and Power supply.

## I. INTRODUCTION

In this paper, we are learning about One of the most important research efforts in Intelligent Transportation Systems (ITS) is the development of systems that automatically monitor the flow of traffic at intersections. Such systems would be useful both in reducing the workload of human operators and in warning drivers of dangerous situations. Not only would the systems automatically monitor current situations at intersections but, if the systems could reliably assess those situations and predict whether they might lead to accidents, they might be able to warn drivers and thus reduce the number of accidents. One of the most important research efforts in

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Tracking at intersections is often impeded by the occlusion that occurs among vehicles in crowded situations.

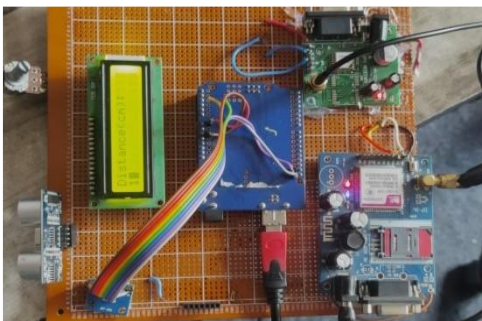
Everyone needs a safe and secured travelling. The advancement of technology also plays a significant role. With the improvement of the growth of traffic and thus road accident count has reached to an enormous scale. Nowadays it became very difficult to know that an accident has occurred and to locate the position where it has happened. And there is no system to identify it. The main cause of the death is due to lack of immediate medical facility provided to the victim.

## II. OBJECTIVE

This project informs about an accident that occurred to vehicle to rescue team and family members of the travelling persons. It uses

MEMS sensor which can detect the abrupt vibration when an accident is occurred and also used ultrasonic sensors for distance calculation. If vehicle is normal, no information sends to rescue team. Whenever accident occurred, the vehicle changes its direction randomly and vibrates with high frequency. The MEMS sensor detects the happening with vehicle. The controller gets the input from sensor and sends the accident alert information to rescue team and family member and location of the accident place through WIFI and GPS. It can facilitate connectivity to the nearest hospital and provide medical assistance.

### III. PRACTICAL DESIGN OF PROJECT



So, the arrangement of the project is done by interfacing the MEMS sensor and Ultrasonic sensor with the Arduino microcontroller. In this project, the program for Arduino in Embedded C language has been executed in an Arduino UNO Software. When an accident occurs, then the angle or direction of the MEMS sensor changes. These changes are considered to be an input and the process starts. Everyone needs a safe and secured travelling. The advancement of technology also plays a significant role. With the improvement of the growth of traffic and thus road accident count has reached to an enormous scale. Nowadays it became very difficult to know that an accident has occurred and to locate the position where it has happened. It uses Ultrasonic sensor to calculate the distance of object where accident occurs. So, the Arduino uno will operate all the operations that to be performed. By using GPS Module the exact location of accident spot will be detected and by using GSM Module the alerting message will send to the rescue team.

### IV. EXPERIMENTATION DIAGRAM



The HC-SR04 ultrasonic sensor uses SONAR to determine the distance of an object just like the bats do. It offers excellent non-contact range detection with high accuracy and stable readings in an easy-to-use package. It offers excellent non-contact range detection between 2 cm to 400 cm (that's about an inch to 13 feet) with an accuracy of 3mm. Since it operates on 5 volts, it can be hooked directly to an Arduino or any other 5V logic microcontrollers. The operation is not affected by sunlight or black material, although acoustically, soft materials like cloth can be difficult to detect. It comes complete with ultrasonic transmitter and receiver module.



The position of the three axis (X-axis, Y-axis, and Z-axis) will change according to the ADXL345 accelerometer's position. If we hold the board in a different position, the direction of the three-axis will also change. Moving the board in a particular direction will cause a change in the voltage of the respective axis.



The latitudes and longitudes are traced by the means of GPS module. These information is sent to the rescue team and hence there is a chance of rescuing the victim.

## V. CONCLUSION

Generally, it is difficult to track multiple vehicles without confusing them. In particular, tracking is very difficult at intersections where various kinds of occlusion and cluttered situations occur. In order to achieve robust tracking in occluded and cluttered situations, we have derived an algorithm, which we refer to as the Spatio-Temporal Markov Random Field Model, and evaluated it on real traffic images. We can successfully demonstrate the ability to track multiple vehicles at intersections with occlusion and clutter effects at the success rate of 93%–96%. Although the algorithm achieves such reliable tracking, it requires only gray-scale images; it does not assume any physical models, such as shape or texture, of vehicles. By using such a reliable tracking method, it becomes possible to monitor and analyze traffic events at intersections in detail. Although this algorithm for accident detection has been demonstrated only on a small number of cases, due to the limitation of observed accidents at these intersections during our observation period—three cases during one-year observation period—its performance is excellent we can confidently predict its promise.

## VI. ADVANTAGES FROM ABOVE RESULTS.

- Traffic overcrowding and in an urban areas traffic flow management were familiar as major problems, which have caused much thwarting for the ambulance. Moreover, road accidents in the city have been continuous process the more crucial process is protecting the loss of life due to the accidents.
- After the accident occurrence there will be intimation to the vehicles which around

the accident spot. The ambulance is controlled by the central unit which provide short and traffic controlled route to reach the hospital as early as possible on the accident location.

- The accident spot is located through the sensor systems in the vehicle and server guide the ambulance to reach the spot. Total processing is fully automated one.
- This vehicle accident detection and reporting systems provide crucial information to emergency responders in the earliest possible time.

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