

# IOT BASED AUTOMATIC VEHICLE ACCIDENT AND THEFT DETECTION SYSTEM

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**Abstract** - 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. Now a days 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. The main intention of automatic vehicle accident and theft detection is to find the accident happened at any place and intimating it to the medical rescue team, control station and family members through GPS and GSM respectively. Apart from that, it is also helpful to find the stolen vehicles.

**Key Words:** Microcontroller (Arduino), Vibration sensor, GPS, GSM, LCD display.

## 1. INTRODUCTION

Automobile usage has increased traffic and thus resulted in rise of road accidents. People lives are under high risk, just because there is a lack of immediate emergency facilities. IoT based automatic vehicle accident detection using GPS has gained attention because it facilitates the emergency facility. The automatic vehicle accident and theft detection are introduced. The proposed design in the system, that detect accidents significantly in less time and sends an alert message along with the basic information to medical rescue team, control station and to family members in a short time using GSM and covering geographical coordinates using GPS which will help in saving the valuable lives. In case, the person met with a small accident or if there is no serious injury to anyone's life, a switch is provided to terminate the sending of alert messages. And it also provides better security against the theft of the vehicle. When the engine starts, an alert message is sent to owner's mobile. If it is an act of stealing, the owner will be aware of the steal and able to find the location of the vehicle. This application provides the best solution to lack of emergency facilities.

## 2. LITERATURE SURVEY

Life is precious and short, and a large number of lives are lost due to accidents every day. There is a need to have accident detection system, location and information sharing system in place to save victims. [H. M. Sherif, M. A. Shedid

and S. A. Senbel] designed a "Real time traffic accident detection system using wireless sensor network" using Wireless Sensor Network and Radio-Frequency Identification technologies. In this they have explained the hardware prototype setup, the algorithms used, configuration of the setup advantages and the limitations of the entire system. The sensor in the vehicle is used to detect the accident happened. The sensor then sent the control to microcontroller. The microcontroller is used to send the alert message to respective members. They track the location where the accident has occurred using GPS and directs the alert message to the respective authorities using GSM.

## 3. DETAILED DESIGN

To prevent accidents, it is not in our hands always but, it is possible to save the victims. Under such circumstances automatic vehicle accident detection is used. The main issue is that, to save the injured people lives depend on the mercy of nearby people. Automatic vehicle accident and theft detection spot with the help of GPS and sends the message to the respective persons using GSM.

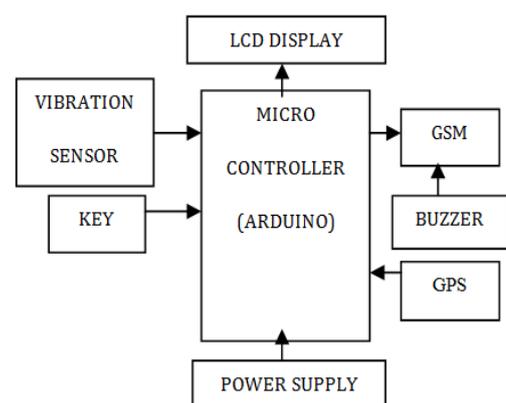


Fig-1: Block diagram

## 4. WORKING PROCEDURE OF AUTOMATIC VEHICLE ACCIDENT AND THEFT DETECTION SYSTEM

**Step1:** When the system is switched on, LCD will be ON indicating that the power is supplied to the circuit.

**Step2:** An intimation message is sent to the owner, when the vehicle is started. It is also helpful to find the stolen vehicles along with the location.

**Step3:** When the vibration sensor senses any vibration above the threshold range (15mA), they send interrupt to microcontroller (Arduino).

**Step4:** The GPS receives the location of the vehicle that met with an accident and gives the information to the respective person.

**Step5:** This information is sent to a mobile number through SMS using GSM. The message received gives longitude and latitude values.

**Step6:** If there is no danger to life of the person, then the message service is deactivated.

#### 4.1 VIBRATION SENSOR

The vibration sensor with certain acceleration is fixed in the vehicle. When a vehicle meets with an accident, the vibration sensor detects the signal. If vibration range exceeds above certain level (15mA), then it sends instruction to microcontroller.



Fig-2: Vibration sensor

#### 4.2 MICROCONTROLLER

Arduino consists of both a physical programmable circuit board and a piece of software like IDE, runs on the computer. Embedded C is used for programming on IDE. It gets information from the sensor and sends the control to the GSM. It compares the vibrated range with the threshold level set and according to that output is generated.

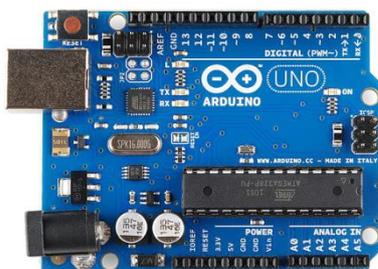


Fig-2: Arduino

#### 4.3 POWER SUPPLY

A power supply is an electrical device that supplies electrical power to an electrical load. The primary function of the power supply is to convert electrical current from a source to the voltage, current and frequency to power the load.

#### 4.4 GSM

Global System for Mobile is a unique type of wireless modem, accepts SIM card and it operates similar to mobile phone with its own specific mobile number. It is used for forwarding the alert messages in case of any emergency. GSM has also meant that data communication was easy to build into the system



Fig-4: GSM module

#### 4.5 GPS

Global Positioning System is used in the vehicle for both tracking and navigation. GPS receiver gets the location from the satellite. When an accident occurred in any place then GPS device tracks the location of the vehicle. GPS is an excellent anti-theft device that allows tracing and locating the vehicle which is stolen by someone.



Fig-5: GPS module

#### 4.6 LCD DISPLAY

The liquid-crystal display (LCD) is that uses the properties of both liquid and crystals and there is need of light to read the display. It is used to display the operating instructions and status of the output. It is has better legibility, more information displaying capability and a wider temperature range.

## 5. ADVANTAGES

- Mobile number can be changed dynamically.
- The accident location of the vehicle can be identified accurately.
- The information about the accident is being directly sent without any obstacles.
- Stolen vehicles can be identified.

## 6. LIMITATIONS

This system is not applicable for poor network connection places.

## 7. APPLICATION

- Automotive and transport vehicles.
- Security, remote monitoring and transportation and logistics.
- This system also can be interfaced with the vehicle alerting system.

## 8. CONCLUSION

In our country, many people have lost their life by accidents, because of causalities or improper communication. So an automatic vehicle accident and theft detection system are implemented. Also, it is used in the theft detection. To minimize deaths and to treat people with high injury due to accidents, immediate action would be take place by rescue teams.

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