

# Gps And Gsm Based Accident Alert System

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**Abstract-** — This project presents a GPS and GSM based accident alert system that automatically detects accidents and sends emergency notifications. The system uses Arduino Uno and an accelerometer such as ADXL335 to detect sudden impacts. When an accident occurs, the location is obtained using the NEO-7M GPS Module and an alert message is sent through the SIM800 GSM Module to a predefined mobile number. This system helps provide faster emergency response and improves road safety .

**Keywords:** Accident detection system, Arduino Uno, accelerometer sensor, ADXL335, GPS tracking, NEO-7M GPS Module, GSM communication, SIM800 GSM Module, emergency alert system, road safety, automatic accident notification.

## I. INTRODUCTION

Road accidents are one of the major causes of injuries and fatalities worldwide. In many cases, victims lose their lives due to delayed medical assistance and lack of immediate communication with emergency services. To address this critical issue, modern technology can be applied to create an intelligent system that quickly detects accidents and alerts concerned authorities.

The Arduino-Based Smart Traffic Accident Alert System is designed to improve road safety and emergency response. This system uses sensors such as accelerometers, vibration sensors, and GPS modules to detect sudden impacts or unusual movements that indicate an accident. Once an accident is detected, the system automatically sends an alert message containing the exact location of the incident to emergency services or registered contacts through a GSM module.

This automated solution reduces human dependency, minimizes the response time, and increases the chances of saving lives. Being cost-effective, portable, and reliable, the Arduino-based system is suitable for integration into vehicles and can also assist in monitoring road traffic conditions.

## II. RELATED WORK

- Several Researchers Have Worked On Accident Detection And Alert Systems To Improve Road Safety. These Systems Use Sensors And Communication Technologies To Automatically Send Alerts During Accidents.
- One Of The Commonly Used Approaches Is Based On Global Positioning System (GPS) And Global System For Mobile Communication (GSM). GPS Is Used To

Determine The Location Of The Vehicle, While GSM Is Used To Send Emergency Messages To Predefined Contacts.

- Many Previous Studies Have Used Accelerometer Sensors Such As ADXL335 To Detect Sudden Changes In Acceleration During An Accident. When The Acceleration Exceeds A Predefined Threshold, The System Assumes That An Accident Has Occurred.
- Researchers Have Also Used Microcontroller Boards Such As Arduino Uno To Process The Sensor Data And Control The Communication Modules. The Location Of The Accident Is Obtained Through GPS Modules Like NEO-6M GPS Module Or NEO-7M GPS Module.
- For Communication, GSM Modules Such As SIM800 GSM Module Are Widely Used. These Modules Allow The System To Send SMS Alerts Containing The Location Coordinates To Emergency Contacts, Enabling Quick Response And Assistance.
- The Proposed System Builds Upon These Existing Methods By Combining Accelerometer-Based Accident Detection With GPS Location Tracking And GSM Communication To Automatically Send Alerts In Case Of An Accident. PROPOSED SYSTEM A.

### System Working

- The System Is Designed To Detect A Vehicle Accident And Automatically Send An Alert Message With The Location To A Predefined Mobile Number.
- In This System, The Arduino Uno Acts As The Main Controller. It Reads The Data From The Accelerometer

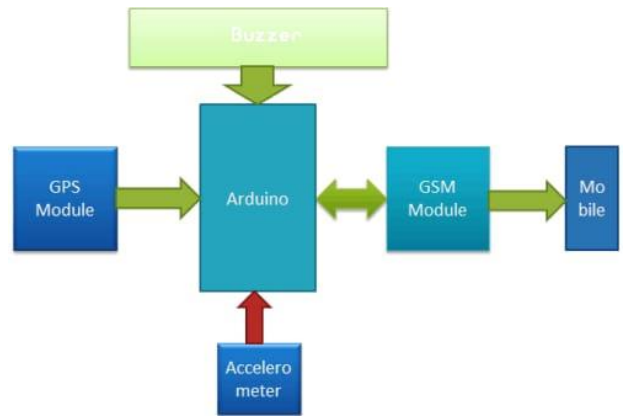
Sensor ADXL335, Which Detects Sudden Changes In Acceleration During A Collision Or Accident.

- When The Acceleration Value Exceeds The Predefined Threshold, The Arduino Identifies It As An Accident. After Detecting The Accident, The Arduino Activates The GPS Module NEO-7M GPS Module To Obtain The Latitude And Longitude Of The Location.
- Once The Location Coordinates Are Obtained, The Arduino Sends This Information To The GSM Module SIM800 GSM Module. The GSM Module Then Sends An SMS Alert To The Predefined Emergency Contact Number.
- The Message Usually Contains A Warning Text Along With The GPS Location Link, Which Helps Emergency Services Or Family Members To Quickly Locate The Accident Site And Provide Assistance.
- Thus, The System Helps In Reducing The Response Time During Road Accidents And Improves The Chances Of Saving Lives.

• **Experimental Results And Testing**

- The Proposed Accident Detection System Was Tested Using The Arduino Uno, ADXL335 Accelerometer Sensor, NEO-7M GPS Module, And SIM800 GSM Module. The System Was Powered And The Sensors Were Properly Connected To The Arduino Board.
- During Testing, The Accelerometer Sensor Was Subjected To Sudden Movements And Vibrations To Simulate Accident Conditions. When The Acceleration Value Crossed The Predefined Threshold Level, The System Successfully Detected The Event As An Accident.
- After Detecting The Accident, The GPS Module Obtained The Location Coordinates (Latitude And Longitude). The GSM Module Then Sent An SMS Alert Containing The Accident Message And Location Information To The Predefined Mobile Number.
- The Testing Results Showed That The System Was Able To Detect Sudden Impacts And Send Alert Messages Within A Few Seconds. The GPS Module Required A Clear Sky View To Obtain Accurate Location Data.

- Overall, The Experimental Results Confirmed That The System Works Effectively For Accident Detection And Emergency Alert Notification.



### III. CONCLUSION AND FUTURE WORK

**Conclusion**

The developed accident alert system successfully detects accidents and sends emergency notifications automatically. The system uses Arduino Uno as the main controller along with an accelerometer sensor such as ADXL335 to detect sudden changes in motion.

When an accident occurs, the system quickly collects the location using the NEO-7M GPS Module and sends an alert message through the SIM800 GSM Module to a predefined mobile number. This helps in informing emergency services or family members immediately.

The system is simple, low-cost, and easy to implement. It can help reduce the time taken to provide medical assistance after road accidents, which can ultimately help save lives.

**future work**

In the future, the system can be improved by adding more advanced features. Internet connectivity can be integrated using IoT technology to send accident data to a cloud server for real-time monitoring.

Additional sensors such as gyroscope or vibration sensors can be added to improve the accuracy of accident detection. A

mobile application can also be developed to display the accident location on a map in real time.

Furthermore, the system can be integrated with vehicle safety systems to automatically contact emergency services and provide faster response during critical situations.

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5. Scribd – Arduino Based Accident Detection and Alert System Project Report (389742219)
6. IEEE Xplore – Accident Detection and Notification System Using Smartphones and Sensors(7328157)An Arduino-based accident alert system uses motion sensors such as ADXL335 or ADXL345 to detect sudden acceleration during a collision. The system processes the data using Arduino Uno and obtains the accident location through a GPS module such as NEO-7M GPS Module. The location information is then sent to emergency contacts using a GSM module like SIM800 GSM Module. This system helps in automatically notifying emergency services and reducing the response time after road accidents.