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# IOT BASED ACCIDENT ALERT AND DETECTION SYSTEM

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**Abstract**: This project demonstrates the effective use of embedded systems and IoT in improving vehicle safety and reducing accident-related risks. This system includes Arduino UNO, accelerometer, ultrasonic sensor, IR sensor, GPS module, WIFI module which is used to detect the occurance whether colliion is happened. if happen and abnormal disturbance the info is shared to monitoring unit and cloud platform.

**Keywords**: IoT, WIFI module, GPS, Accelerometer, Ultrasonic Sensor, Real-Time Monitoring, Think speak.

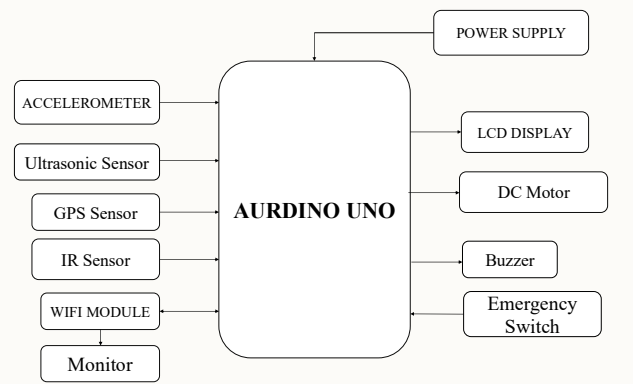
## I. INTRODUCTION

This project addresses these challenges by proposing a real-time, dual-validation IoT based solution using accelerometer and ultrasonic fusion, with GPS-enabled WIFI MODULE alert capabilities. To address these challenges, this paper proposes a low-cost, real-time accident detection and emergency response system based on Internet of Things (IoT) architecture and multi sensor fusion. The system integrates an MPU6050 accelerometer, ultrasonic proximity sensors, a NEO-6M GPS module, and a WIFI module, all controlled by an Arduino UNO

## II. SYSTEM DESIGN

The key components of this project are:

i. Arduino UNO
ii. Accelerometer
iii. Ultrasonic sensor
iv. IR sensor
v. GPS module
vi. WIFI module
vii. DC motor
viii. Buzzer
ix. LCD 16x2 display



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## III. WORKING

The proposed system is based on a microcontroller platform that continuously monitors vehicle conditions using multiple sensors. An accelerometer sensor is used to detect sudden changes in motion, tilt, or impact, which helps in identifying accident conditions. An ultrasonic sensor is used to detect obstacles in front of the vehicle and provides early warnings to avoid collisions. Additionally, an IR sensor is implemented to monitor the driver's eye position and detect drowsiness of driver and gives buzzer sound. The system also includes a GPS module to obtain real-time location data in terms of latitude and longitude. Whenever an abnormal condition or accident is detected, the GPS module captures the exact location of the vehicle. This information is then transmitted through a WiFi module to a predefined user using an internet-based communication platform such as Telegram. The alert message contains the accident notification along with a Google Maps link, enabling quick identification of the vehicle's location.

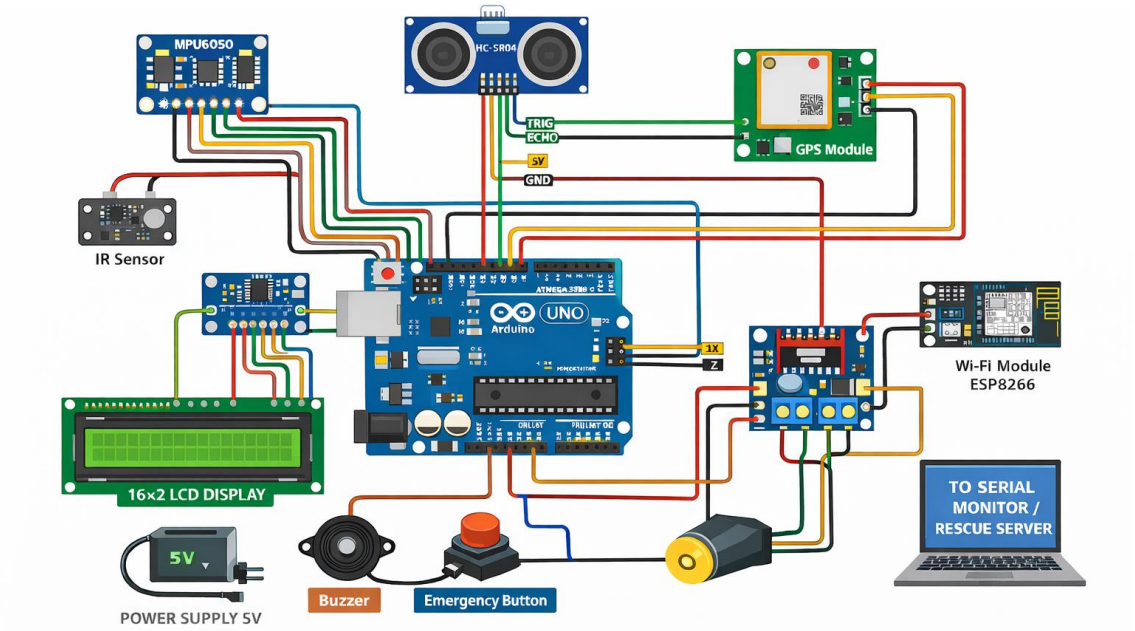
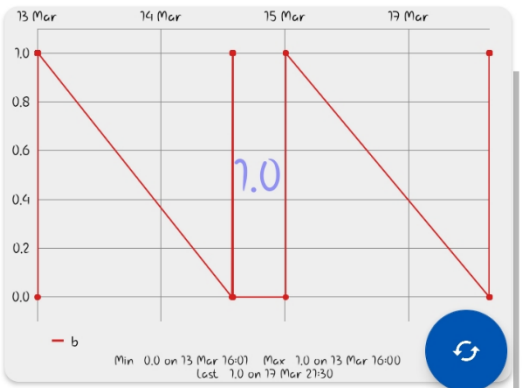



Fig. 1 circuit diagram

## IV. RESULT

The proposed Vehicle Black Box system successfully detects accidents using sensor data and responds to abnormal conditions effectively. The GPS module accurately provides real-time location coordinates during emergency situations. The system sends instant alert messages with location details through the WiFi module. The buzzer and LCD display provide immediate local alerts and system status. Overall, the system improves vehicle safety and ensures faster emergency response.

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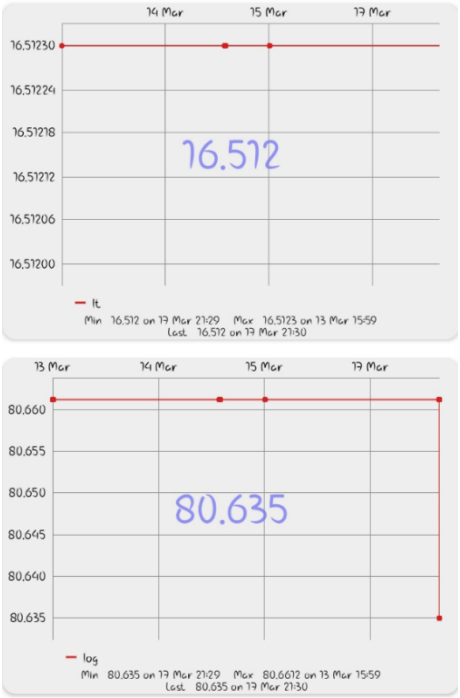



## V. CONCLUSION

We conclude that the proposed Vehicle Black Box system effectively detects accidents and monitors vehicle conditions in real time. The integration of sensors, GPS, and WiFi communication enables accurate location tracking and instant alert transmission. The system provides timely notifications during emergencies, helping to reduce response time. It is simple, cost-effective, and reliable for practical implementation. Overall, the system contributes significantly to S. M. Tang and H. J. Gao, "Traffic-incident detection algorithm based on nonparametric regression," IEEE Transactions on Intelligent Transportation Systems, vol. 6, 2005, pp. improving vehicle safety and rescue operations.

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