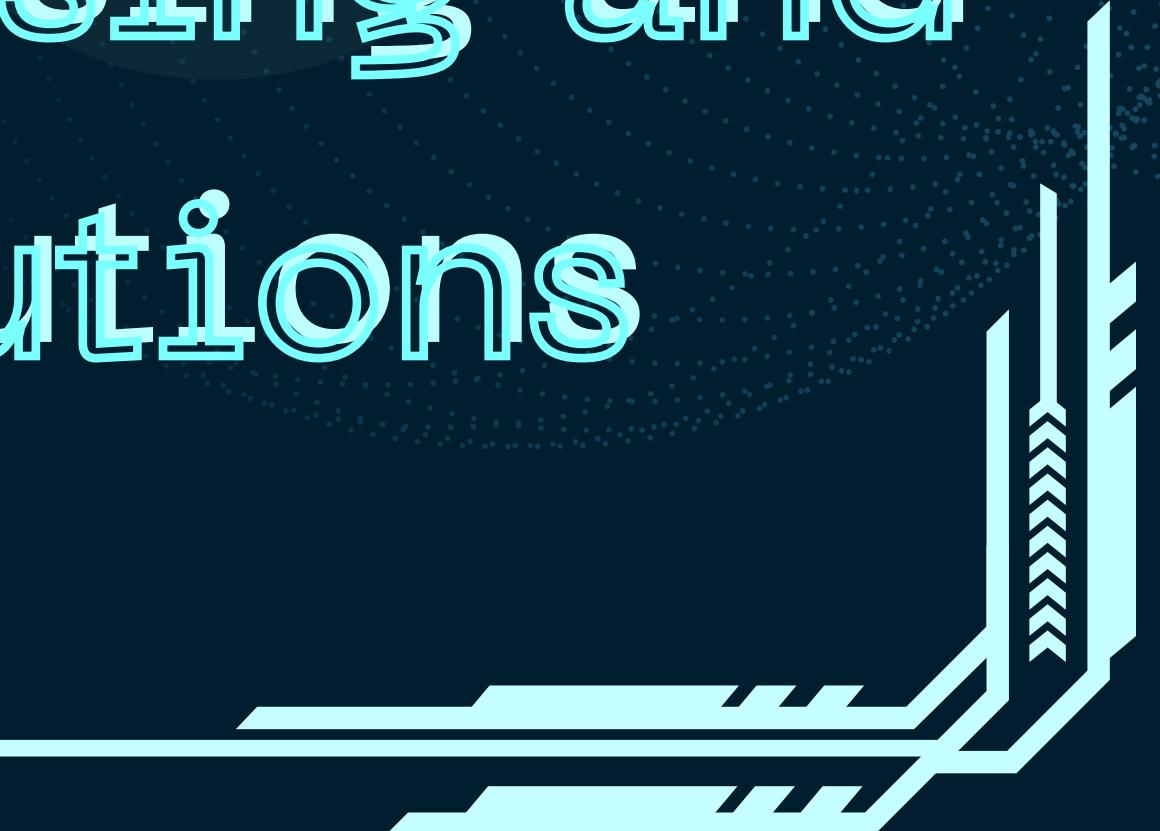




# RAPID RESCUE:

## Vehicle Crash Sensing and Emergency Solutions



## THE TEAM...

- 
1. RISHABH ADHITHYA B S - 22011102078
  2. RAHULJI V - 22011102073
  3. SHAJAN SELVAM - 22011102095

## GITHUB LINK



<https://github.com/RahuljiV2004/accident-alert>

## PROBLEM STATEMENT

Delays in reporting vehicle accidents and unclear location data can hinder timely emergency response, risking severe outcomes.

A system is needed that detects accidents instantly, locates them accurately, and alerts emergency services for rapid rescue.

## Introduction

Rapid rescue vehicle technologies represent a significant innovation in emergency response systems. These technologies are designed to detect vehicle crashes promptly and mobilize emergency services effectively. The integration of sensors and communication systems enables real-time data transmission, reducing response times significantly.



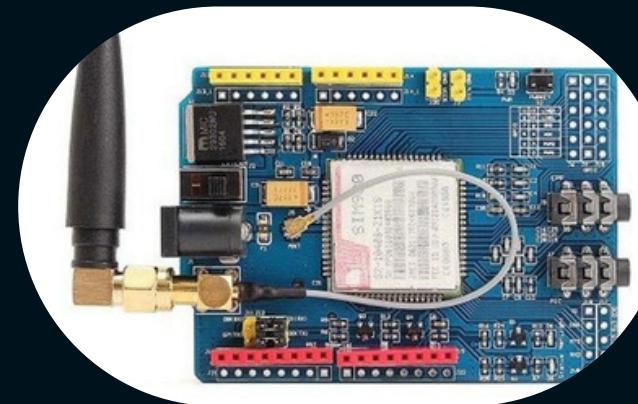
## Components and Tools



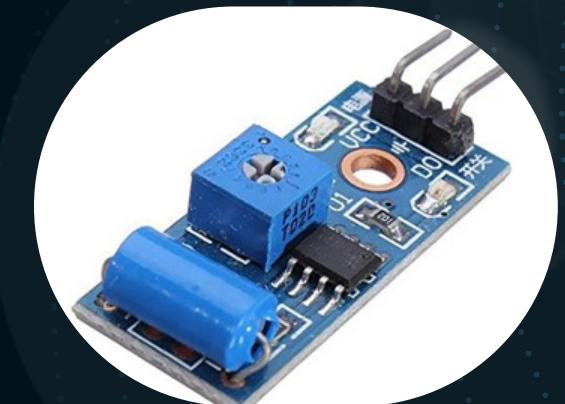
Arduino Uno – manages movements and sensor controls



GPS module v1.0 – Location Tracking



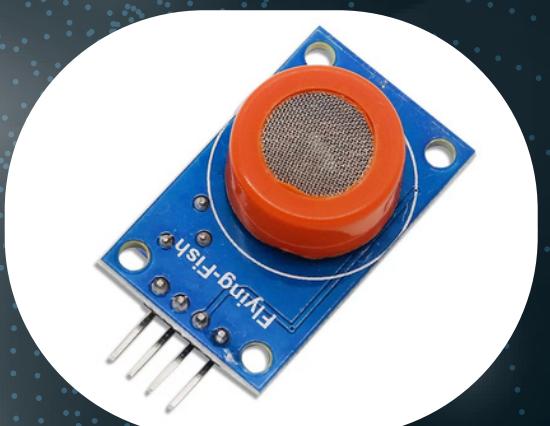
GSM module Sim900D – enabling wireless communication (sms)



Vibration Sensor SW420 – detects sudden vibrations or impacts



IR Sensor SW420 – Seatbelt Detection



MQ3 Gas Sensor – Alcohol Detection



Relay Module – Controlling the motor



Buzzer – Alert Alarm



LM016L – LCD Display



Simple DC Motor

# Working

- 1) **Accident Detection:** GPS module captures latitude and longitude from satellites when an accident occurs.
- 2) **Data Processing:** Location data is sent to Arduino Uno for processing.
- 3) **Local Display:** Processed data is shown on an LCD screen.
- 4) **SMS Alert:** GSM modem sends accident location to a registered mobile phone via SMS.
- 5) **Web Dashboard:** Displays nearby hospitals for quick access by emergency services.
- 6) **Notifications:** Sends accident details to emergency responders, insurance companies, and relatives/friends.

# Use Cases and Applications

**Accident Detection:** Sensors trigger alerts after detecting impact or deceleration.

**Emergency Alerts:** Sends SMS with accident details and location.

**Health Monitoring:** Alerts for unsafe conditions like seatbelt or alcohol use.

**Insurance Reporting:** Automatically sends accident data to insurers.

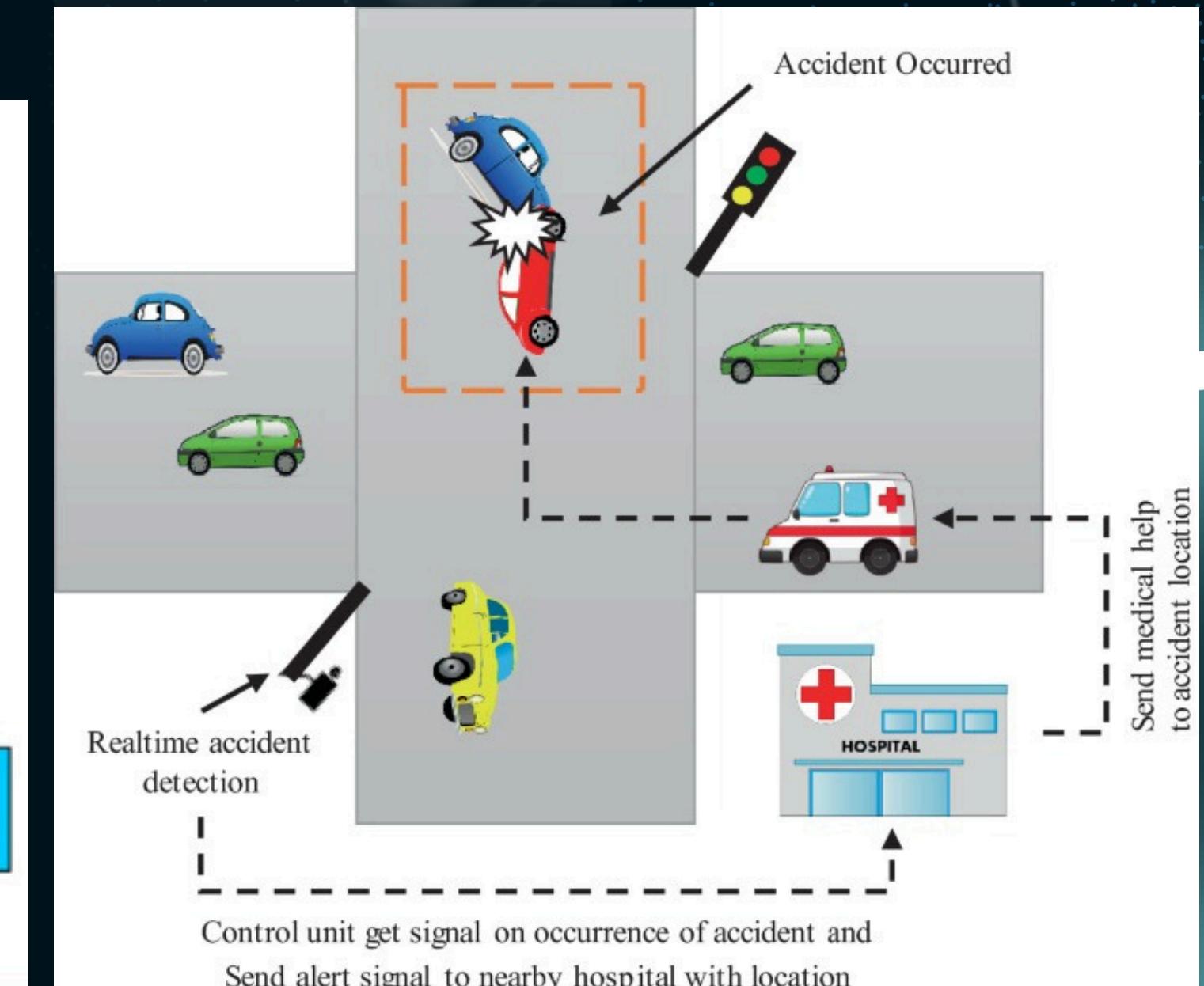
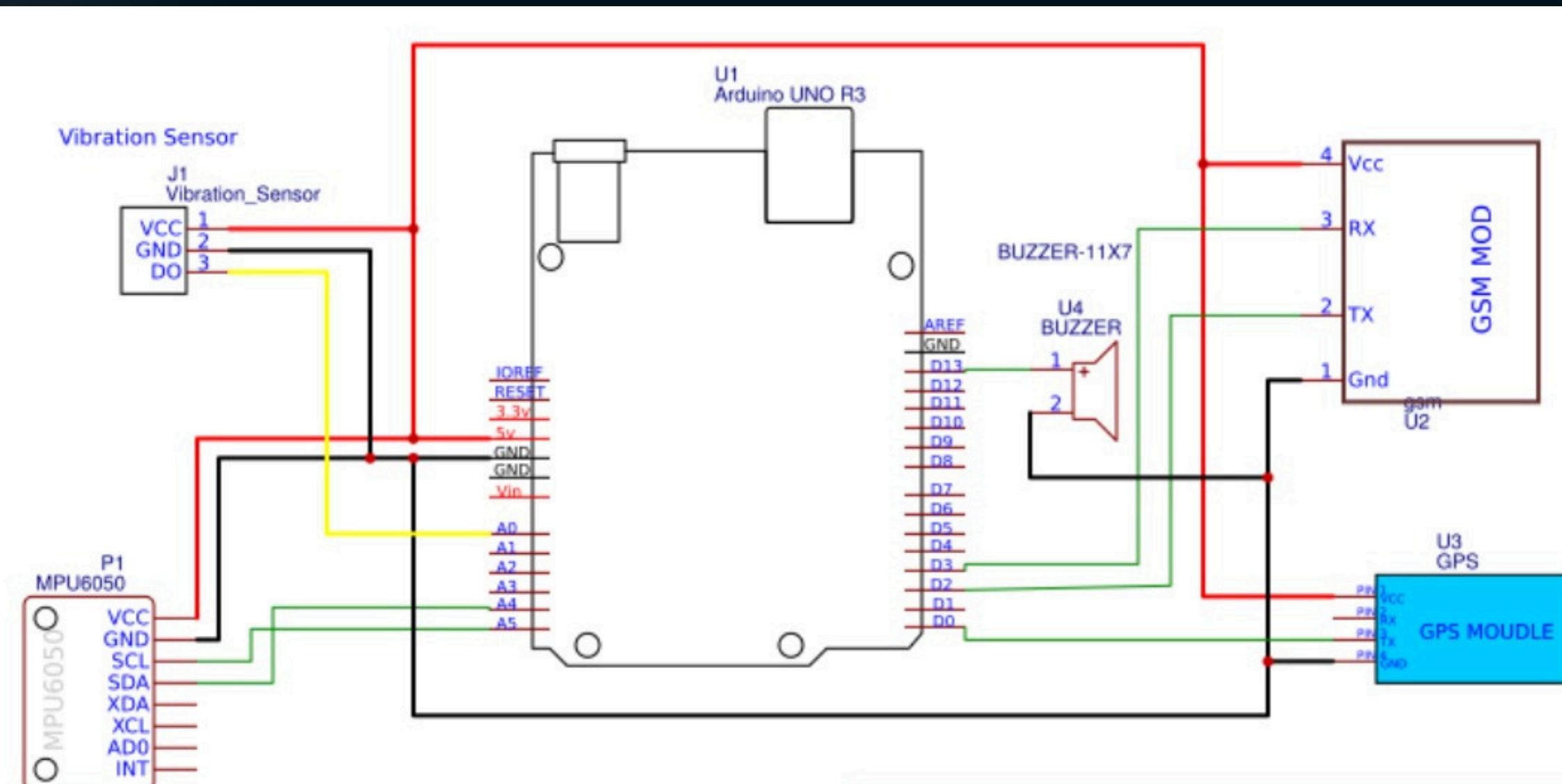
**Rescue Coordination:** Connects with nearby rescue services.

**Accident Data Analysis:** Data helps improve vehicle safety and crash research.

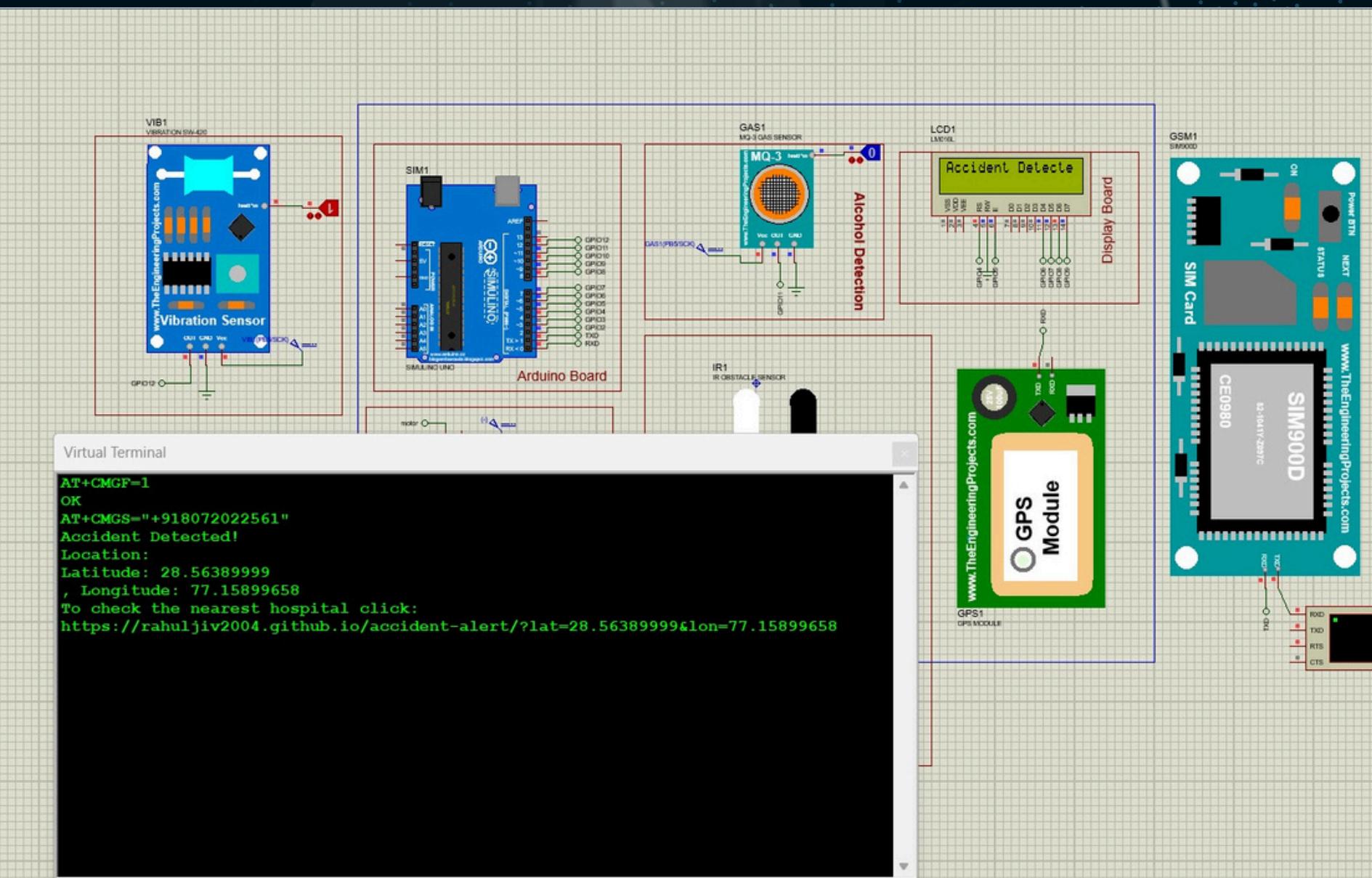
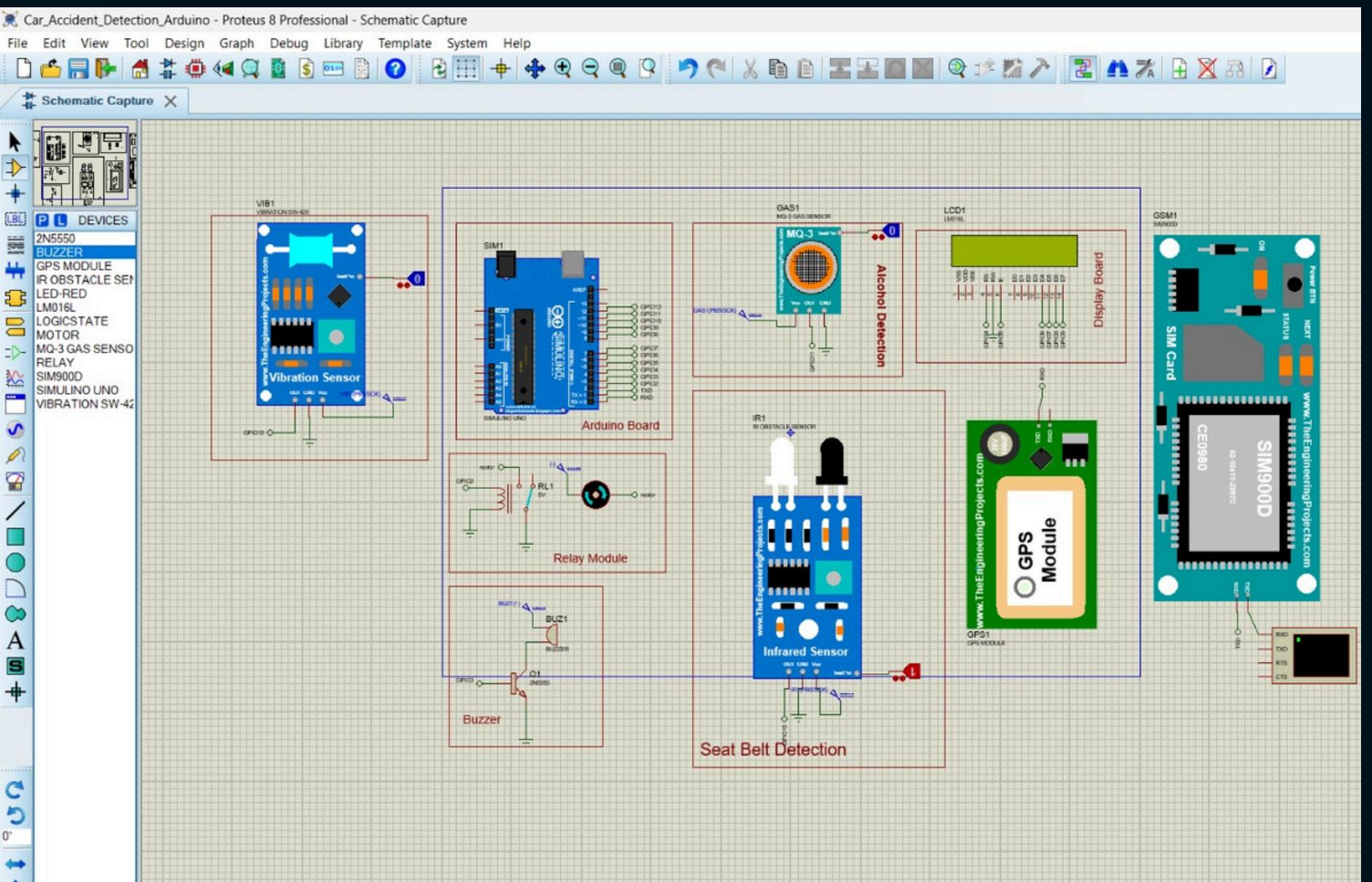
**Public Safety:** Enhances safety in public transport and fleets.



# Schematics & WorkFlow



# Simulation Images



# Simulation Images

Working

Use Cases and Applications

Schematics & WorkFlow

Simulation Images

DashBoard

# Dashboard

Nearby Hospitals

rahuljiv2004.github.io/accident-alert/?lat=28.7041&lon=77.1025

## 73,78,95 ACCIDENT ALERT SYSTEM

Nearby Hospitals

**Kanta Sethi Hospital**  
Distance from accident spot: **0.48 km**  
[View More](#)

**Family Hospital**  
Distance from accident spot: **0.51 km**  
[View More](#)

**Tamish**  
Distance from accident spot: **0.54 km**  
[View More](#)

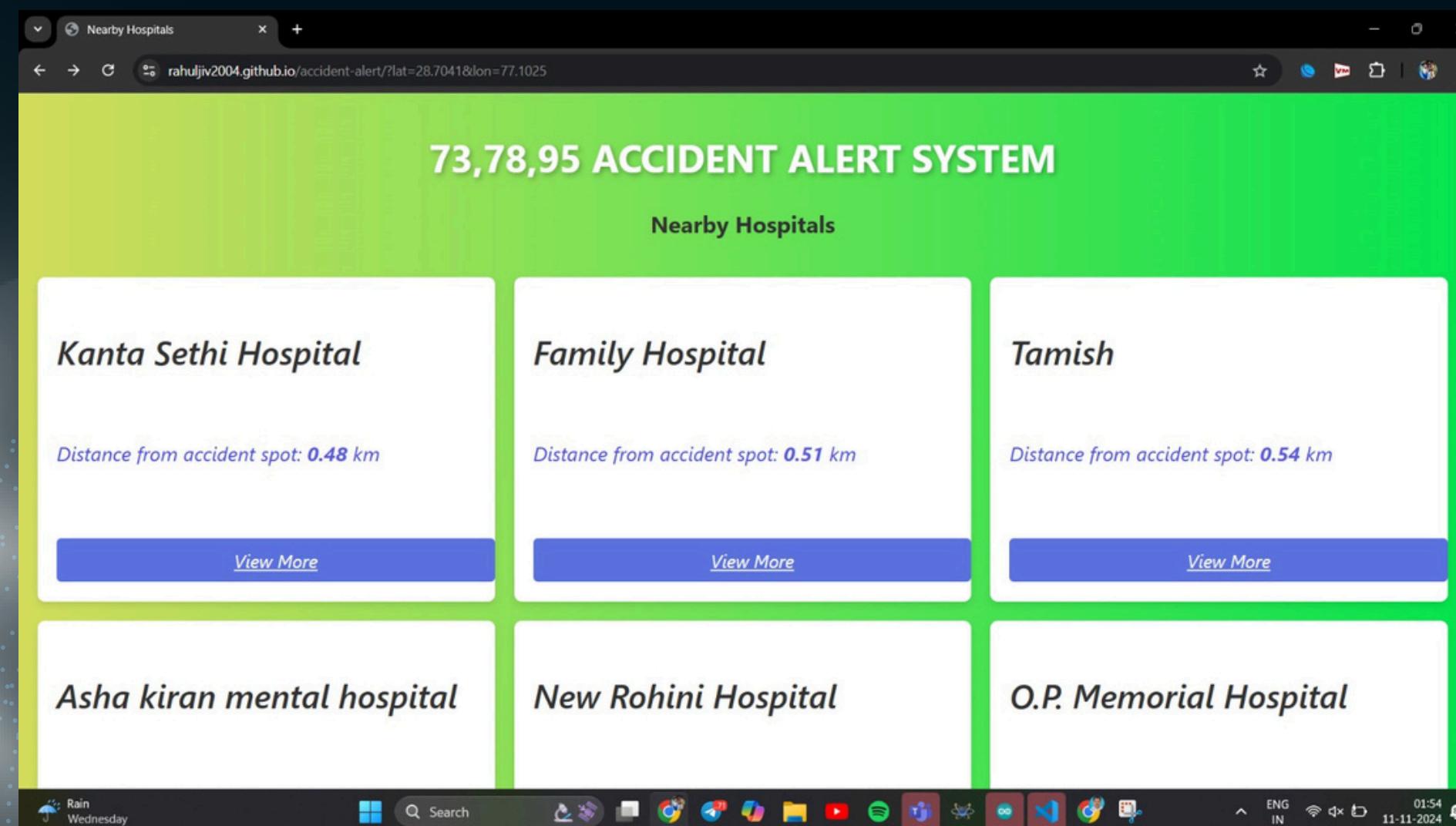
**Asha kiran mental hospital**

**New Rohini Hospital**

**O.P. Memorial Hospital**

Rain Wednesday

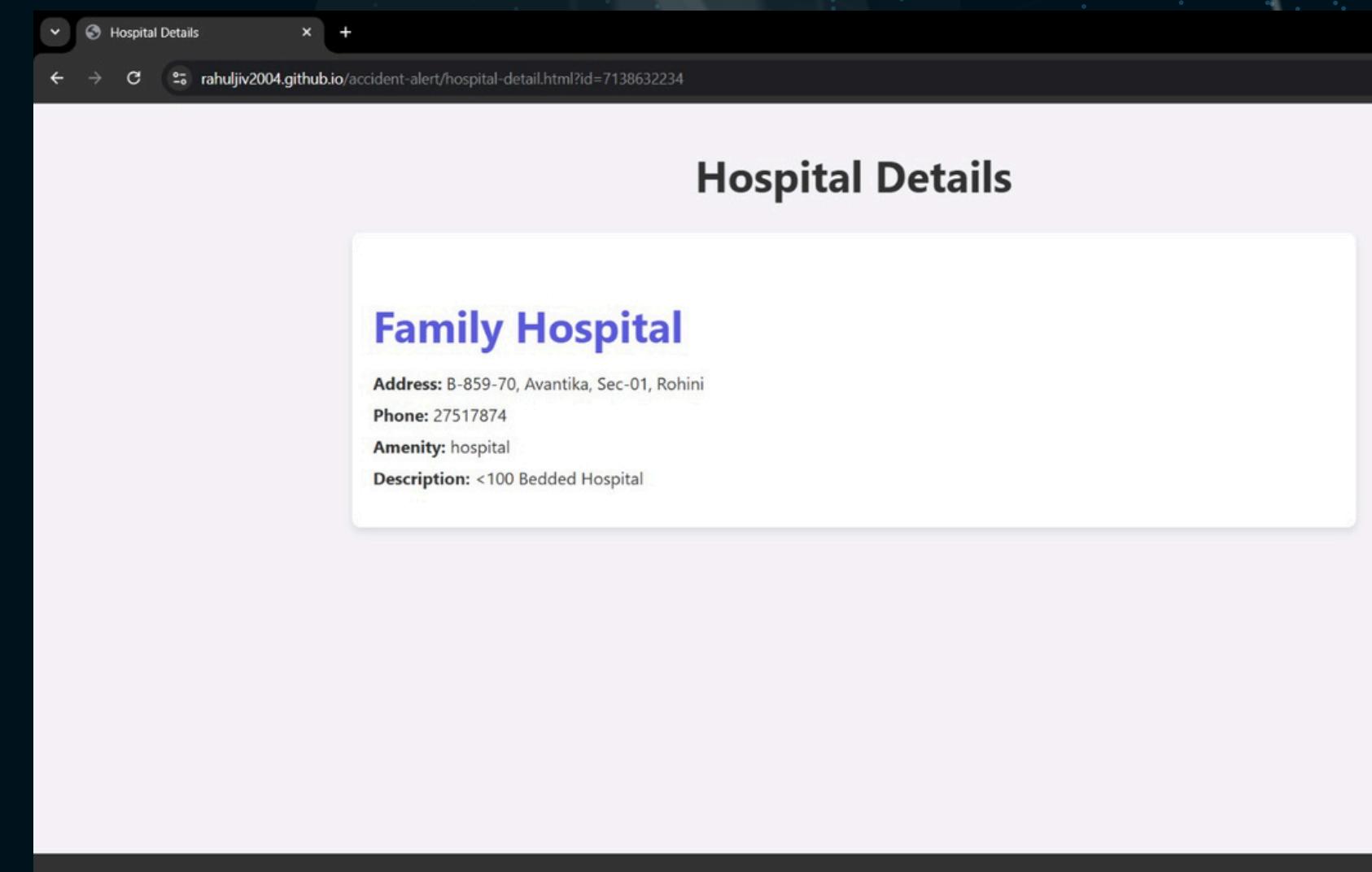
01:54 11-11-2024



Hospital Details

### Family Hospital

**Address:** B-859-70, Avantika, Sec-01, Rohini  
**Phone:** 27517874  
**Amenity:** hospital  
**Description:** <100 Bedded Hospital



Working

Use Cases and Applications

Schematics & WorkFlow

DashBoard

Future Scope

## Future Scope

- 1. MPU6050 Gyroscope Integration:** Replacing vibration sensors with the MPU6050 gyroscope and ML models can enhance accident severity detection.
- 2. Real-time Impact Analysis:** ML can predict injury severity, vehicle damage, and secondary collisions for better crash-response.
- 3. Predictive Prevention:** ML can forecast accidents based on driver behavior and vehicle data.
- 4. Autonomous Vehicle Integration:** ML systems will ensure safety in autonomous vehicles by detecting and assessing accidents.
- 5. Multi-sensor Fusion:** Combining sensor data can improve detection accuracy.
- 6. Crowdsourced Data:** Crowdsourced data can enhance ML models for real-time accident prediction.



## Literature Survey

- **Pachipala Yellamma (2021):** Yellamma, P. (2021). "Arduino-based Automatic Accident Detection and Location Communication System." International Journal of Engineering Research & Technology (IJERT), 9(4), 1–6.

This paper discusses a low-cost Arduino-based system for accident detection and communication.

- **Souvik Roy (2020):** Roy, S. (2020). "Automated Accident Alert System Using Arduino UNO." International Journal of Computer Applications (IJCA), 175(3), 22–26.

This research focuses on an automated system to alert family members during accidents using sensors and GPS.

- **Adnan M. Al-Smadi (2019):** Al-Smadi, A. M. (2019). "Collision Detection and Prevention System for Vehicles Using Ultrasonic Sensors." International Journal of Advanced Research in Computer Science and Software Engineering, 9(4), 25–30

This paper explores a collision detection system using ultrasonic sensors to prevent accidents.

- **P. Ramya (2018):** Ramya, P. (2018). "Driver Fatigue and Alcohol Detection System for Accident Prevention." International Journal of Science and Research (IJSR), 7(5), 56–60.

The study focuses on detecting driver fatigue and alcohol consumption to prevent accidents.



# THANK YOU

