# SAFEDRIVE

Car Collision Alert System

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## Problem Statement

Road accidents continue to be a major cause of fatalities and injuries worldwide, often resulting from inadequate awareness of a vehicle's surroundings, especially in reverse motion or confined spaces. Traditional systems lack the real-time capability to effectively prevent such incidents in all conditions.

There is a growing need for a compact, cost-effective, and efficient solution that can assist drivers by detecting potential obstacles or collisions before they occur. The system should not only warn the driver proactively but also simulate post-collision safety responses to minimize consequences. The objective is to bridge the gap between high-end vehicle safety systems and accessible technology for widespread adoption.

## Solution

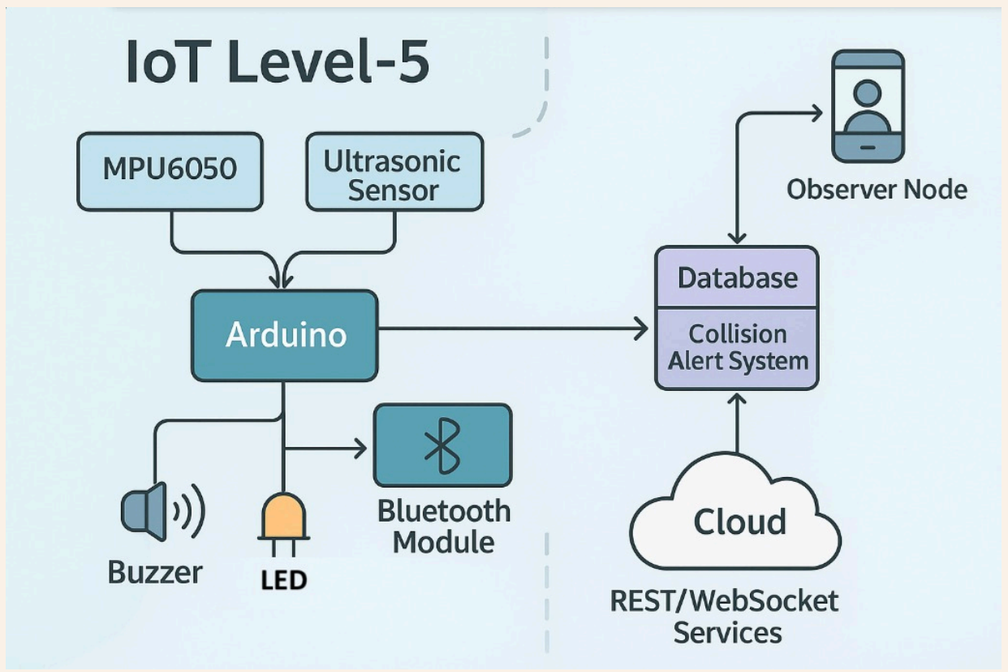
This project proposes the development of a prototype collision detection and alert system using affordable components such as Arduino, ultrasonic sensors, and motion detectors. The system continuously monitors the vehicle's surroundings to detect nearby obstacles.

When a potential collision is detected, it triggers preventive alerts using LEDs and buzzers. In case of an actual impact, the system simulates post-collision responses like airbag deployment and sends alerts via Bluetooth. This approach provides an affordable, scalable, and effective solution for enhancing vehicle safety in real-world scenarios.

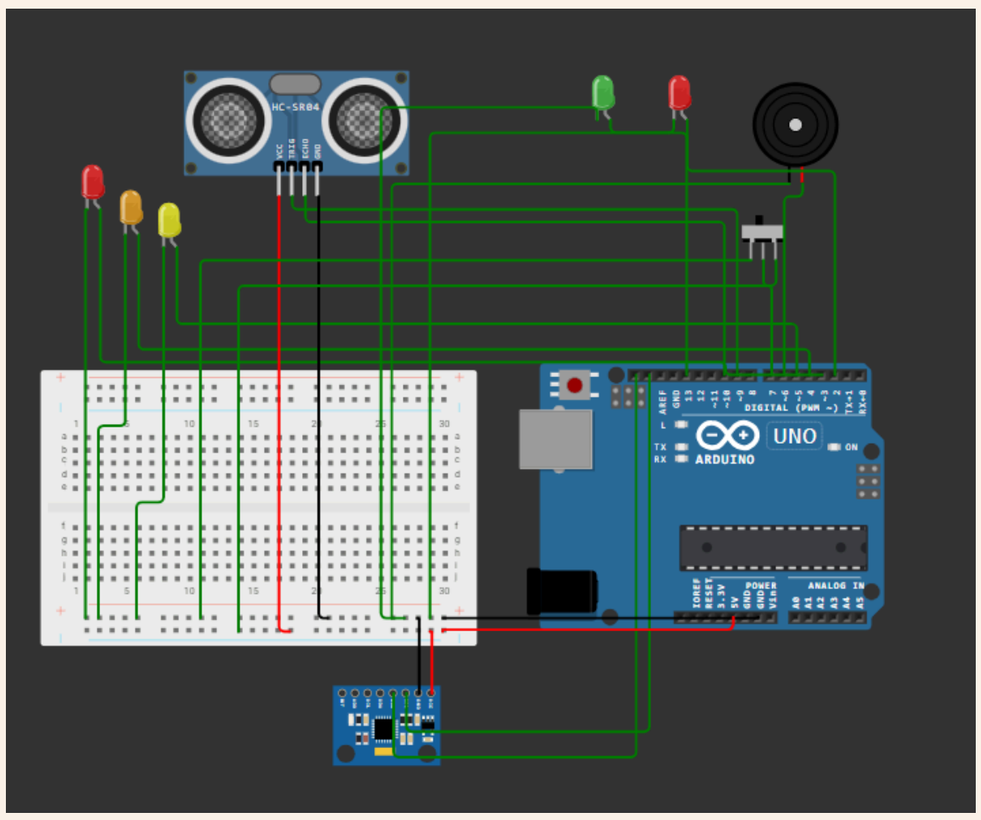
## Sensors and Actuators

| Component | Type | Purpose | Function |
|---|---|---|---|
| MPU6050 | Sensor | 6-axis motion sensor for detecting impact | To detect collisions on car |
| Ultrasonic Sensor | Sensor | Detect proximity to the barrier | Measure distance; triggers LEDs and buzzers |
| LED | Actuator | Alert indication | Turns ON appropriate LED according to vehicles nearby |
| Buzzer | Actuator | Alert indication | Buzzes rapidly according to alert level |

## IOT Level 5 Diagram




## Circuit Diagram




**Safety is not an accident; it's a choice enabled by awareness and technology**