AI-Based Smart Accident Detection and Emergency Alert System Using YOLOv8

1. Introduction

This project presents an AI-based system that detects road accidents and fire incidents in real time using computer vision and automatically alerts emergency authorities.

2. Problem Statement

Traditional systems rely on manual reporting, causing delays in emergency response. A smart automated solution is required.

3. Aim

To develop an intelligent system that detects accidents in real time and sends alerts automatically.

4. Objectives

Implement YOLOv8 detection, develop dashboard, store data in Firebase, and send alerts via GSM and email.

5. Proposed Solution

The system integrates AI, cloud database, web dashboard, and IoT hardware for real-time detection and alert generation.

6. Scope

Includes detection, monitoring, and alerting. Does not include physical rescue operations.

7. Methodology

Requirement analysis, design, model training, development, integration, testing, and deployment.

8. Tools & Technologies

YOLOv8, Python Flask, Firebase, HTML/CSS/JS, ESP32, SIM800L, Google Colab.

9. Expected Outcomes

Improved road safety, faster response time, and automated accident reporting.

10. Conclusion

The system provides a reliable AI-based solution for accident detection and emergency alerts.