ResQ: A Sensor-Based Mobile Framework for Automatic Road Accident Detection and Emergency Assistance

Aryan Khutwad[1], Divya Lalwani[2], Aarya Dangat[3], Bharti Dodmani[4],
Prof. Sampada S Kadam[5]
Student, Department of Computer Technology[1,2,3,4]
Lecturer, Department of Computer Technology[5]
Sou. Venutai Chavan Polytechnic, Pune, Maharashtra, India

Abstract: *Road accidents are one of the leading causes of fatalities worldwide, often resulting in severe injuries and loss of life due to delayed medical assistance. Rapid detection and timely emergency response are critical factors in reducing mortality rates. This paper presents a comprehensive sensor-based mobile framework for automatic road accident detection and emergency assistance using widely available smartphone sensors such as accelerometers, gyroscopes, and GPS modules. The proposed system continuously monitors motion and orientation data to detect abnormal patterns that indicate potential accidents. Upon detecting such events, the system triggers a 30-second confirmation timer, allowing the user to cancel the alert if no accident has occurred. If the user does not respond or explicitly requests help, the application automatically sends emergency alerts along with real-time GPS coordinates to emergency contacts, nearby hospitals, and emergency services. The system is designed to be cost-effective, scalable, and accessible without requiring additional hardware. Experimental results demonstrate improved detection accuracy and reduced response time. This framework aims to enhance road safety and minimize fatalities through intelligent mobile-based solutions.*

Keywords: *Accident Detection, Smartphone Sensors, Accelerometer, Gyroscope, Emergency Response System, GPS Tracking, Mobile Computing, Road Safety.*