

ABSTRACT

Title :

AI-Based Geo-Fenced Safety Monitoring System for Tourists in High-Risk Zones

Problem Statement :

Tourist destinations such as trekking routes, mountainous regions, and pilgrimage paths often contain **localized high-risk zones** due to landslides, rough terrain, unpredictable weather, and limited communication facilities. Tourists are generally unaware of these micro-level risk areas, which can result in accidents, prolonged inactivity, or delayed rescue during emergencies. Existing safety mechanisms lack intelligent real-time monitoring and automated risk detection, making timely intervention difficult. Hence, there is a need for a smart and proactive system that can continuously monitor tourist movement and identify potential risks early.

Proposed System

This project presents a **web-based AI-enabled tourist safety monitoring system** that uses geo-fencing to detect entry into predefined high-risk zones. The system continuously monitors user movement and provides alerts based on risk severity.

Methodology

User location data is collected at regular intervals and compared with predefined risk zone boundaries. If a user remains within a risky zone beyond a threshold time, movement patterns such as speed, inactivity duration, and route deviation are analyzed to assess potential danger.

AI and Machine Learning Integration

An **unsupervised machine learning model (Isolation Forest)** is used to detect abnormal movement behavior. The model learns normal movement patterns and identifies anomalies without requiring labeled emergency data, making it suitable for real-world safety monitoring.

Emergency Handling

A panic button feature allows users to instantly share their live location with authorized monitoring personnel and emergency contacts. Alerts are escalated based on anomaly confidence and risk level.

Conclusion

The proposed system offers an intelligent, scalable, and proactive solution for enhancing tourist safety in high-risk zones by combining geo-fencing with AI-based anomaly detection for early risk identification and timely intervention.