**A Project On**

**AI-Based Crowded Area Risk Prediction System**

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**Introduction**

The AI-Based Crowded Area Risk Prediction System is a real-time crowd monitoring solution designed to enhance public safety by detecting crowd density and assessing risk levels in crowded areas such as malls, stadiums, and transport hubs. Leveraging YOLOv5s , a lightweight AI model, the system detects and counts people using a Raspberry Pi camera, classifying crowd density into three risk levels: Low , Medium , and High . These thresholds are customizable, allowing users to tailor the system to specific venues via a web dashboard or mobile app. The system operates entirely on a Raspberry Pi , ensuring low latency, portability, and cost-effectiveness. It sends instant alerts via Telegram , SMS , or WhatsApp when high-risk situations are detected, notifying security teams and nearby users to prevent overcrowding. A dynamic heatmap visualizes crowd distribution, while live video streaming provides real-time situational awareness. A mobile app built with Flutter enables remote monitoring, offering features like push notifications, heatmap visualization, and live video feeds. This ensures security teams can monitor crowds on the go. The system also integrates Twilio APIs for SMS/WhatsApp alerts and supports edge AI processing for real-time performance without cloud dependency.

This project addresses critical challenges like overcrowding and stampedes, providing proactive risk management and enhancing public safety. Future enhancements include advanced heatmaps, IoT integration, and predictive analytics. By combining AI, IoT, and edge computing, this system transforms crowd management, making it scalable, user-friendly, and impactful for smart city initiatives and public safety applications.



