

ABSTRACT

This study developed an Internet of Things (IoT)-based flood monitoring system equipped with a real-time web dashboard and artificial intelligence (AI)-based prediction features, addressing the frequent flooding in Shah Alam, Malaysia, due to high rainfall and suboptimal drainage systems. The system employs the AJ-SR04M sensor to measure water level, the MH-RD sensor to detect rainfall intensity, and ESP32 and ESP32-CAM for data processing and image capturing. Collected data is transmitted wirelessly to a Django-based backend server and visualized through an interactive web dashboard. The backend also runs a time-series forecasting machine learning model to predict flood conditions five minutes ahead, with predicted and real-time data displayed side by side. Additionally, the system sends automated alerts via Telegram when sensor values exceed predefined thresholds. Testing results indicate that the system effectively detects and displays environmental data in real time, delivers accurate early warnings, and produces reliable predictions aligned with historical trends. This system has successfully supported effective flood risk mitigation in vulnerable areas by providing accurate sensor data and AI-based predictions that align with historical trends.

Keywords: flood monitoring system, Internet of Things (IoT), ESP32, AJ-SR04M sensor, MH-RD sensor, Seelab Kencana, Artificial Intelligence