



BurnWatch AI An AI-Based Open Burning Risk Prediction System for PM2.5

Monitoring

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Abstract

PM2.5 air pollution is a serious environmental and public health problem in Thailand, especially during the dry season. One important cause of PM2.5 pollution is open burning from agricultural areas and forest fires. Most existing air quality platforms mainly report current PM2.5 concentrations, but they do not clearly identify possible pollution sources or predict high-risk areas in advance. This project proposes BurnWatch AI, an AI-based open burning risk prediction system for PM2.5 monitoring. The system integrates satellite hotspot data, PM2.5 monitoring data, weather data, and geographic information to analyze risk factors such as fire hotspot density, wind direction, wind speed, humidity, rainfall, temperature, and air pollution trends. The processed data are used to calculate a burn risk score and visualize high-risk areas through an interactive map and dashboard. The system is designed to help users identify fire hotspot locations, predict areas that may be affected by PM2.5 pollution, and support early warning for schools, communities, and local authorities. BurnWatch AI demonstrates the application of artificial intelligence, geospatial analysis, data processing, and data visualization to support environmental monitoring and public health protection. The expected outcome is a prototype web application that provides useful information for decision-making and helps reduce the impact of PM2.5 pollution caused by open burning.

Keywords: PM2.5, Artificial Intelligence, Open Burning, Satellite Data, Risk Prediction