



# PROJECT REPORT

## PREDICTIVE FIRE RISK ANALYTICS USING NAÏVE BAYES CLASSIFICATION

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## ABSTRACT

*Disasters are inherently unpredictable and often strike without warning, with fires being one of the most destructive forms. Fire incidents arise from various sources, including human negligence and natural factors, and are typically detected only after visible flames or smoke are observed. This delayed detection increases response times, exacerbating damage and potential casualties. This research proposes an IoT-based fire detection system incorporating smoke, temperature, and flame sensors. The system employs the Naïve Bayes algorithm for probabilistic classification of fire conditions, enabling early detection and prediction of potential fire risks. By leveraging IoT technology, the system provides real-time monitoring and alerts through web interfaces and mobile notifications, ensuring rapid responses to fire hazards. The integration of multiple sensors enhances detection accuracy, while the Naïve Bayes algorithm's efficiency ensures reliable classification. This approach aims to significantly reduce fire-related damages and improve safety measures across various settings, demonstrating a robust and scalable solution for early fire disaster management.*

**Keywords** : Internet of Things, Fire Detection, Naïve Bayes Algorithm, Fire Risk Classification.

