

ABSTRACT

Fire is a catastrophic event that harms many living beings who experience it. Fires in Indonesia are widespread, and it is reported that in 2015 the frequency of fires in Indonesia reached 20 to 100 thousand events per year, with 20 to 100 fatalities. One way to detect a fire source is by developing machine learning that is used for information processing in the event of a fire by utilizing patterns or information from large data sets.

This study will develop an algorithm to detect fires by comparing the accuracy of the two algorithms, namely K-Nearest Neighbor (K-NN) and Naive Bayes. The two algorithms will be tested with training data and test data. The best accuracy will be sought between the two algorithms. The dataset was obtained from a fire simulation using NodeMCU ESP8266 and IR Flame Sensor, MQ7, and DHT 11 sensors by burning materials such as leaves, wood, grass, paper, and plastic in dry and wet conditions, respectively, with a time take 5 and 10 minutes. The dataset, after the process, obtained a total of 897 data.

The testing of the algorithm model in this study is based on the composition of the various training and test data; based on this composition, this study found the best algorithm was K-Nearest Neighbor, which was tuned were the best parameter was the 'Minkowski' metric, $K = 1$, $p = 1$, and weights 'Uniform' with a composition of 75%-25% with an accuracy of 96.44%, precision 96.48%, recall 96.44%, and F1-Score is 96.33%.

Keywords: Fires, K-Nearest Neighbor, Naive Bayes, Dataset