

## ABSTRACT

The problem with the Arduino microcontroller-based fire detection system with fire and smoke sensors is the detection distance. For example, in another research, it was stated that the maximum distance for fire detection on two pieces of paper that were burned was 140 cm. This means that if the fire point is at a farther distance, the system cannot detect a fire early, of course, this will be problematic if used in a wider room.

Based on these problems, a system is needed that can detect fires in large rooms. A method that can be used is detection using image classification. MobileNetV2 is a real-time model for classifying or detecting an object in an image.

In this study, the model was built using real-time based on the TensorFlow and Keras libraries. The system will use a laptop with an Nvidia GeForce MX130 GPU, a 48MP resolution smartphone camera, and the OpenCV library for the image classification process, as well as Telegram for sending fire notifications via the Requests library.

The test results obtained on burnt 80/90 motorcycle tires, the most optimal detection distance is 7 meters with an accuracy of 99.91%. While testing on two sheets of paper that are burned, the most optimal detection distance is 3 meters with an accuracy of 99.75%. The average response time obtained varies greatly from 74.5 ms to 117.1 ms, which depends on the internet network connection.

**Keywords:** classification, image, detection, fire, mobilenetv2