

### **Abstract**

Fire detection is one of the technological efforts to prevent fire incidents, this is very important because the damage caused by fires can be minimized by having a fire detector. There are two types of fire detection, namely traditional-based and computer vision-based. Traditional-based fire detection has many shortcomings, one of which requires a close fire distance for activation. Hence, computer vision-based fire detection is made to cover the shortcomings of traditional-based fire detection. Therefore, in this research, we propose a video-based fire detection using a Convolutional Neural Network (CNN) Deep Learning approach supported by You Only Look Once (YOLO) object detection model version four. This research used a dataset of various fire scenarios in the form of images and videos. The fire detection built in this research has an accuracy of above 90% with an average detection speed of 34.17 Frame Per Second (FPS).

**Keywords:** CNN, Deep Learning, Fire Detection, Object Detection, YOLO