ABSTRACT

A novel approach for early fire detection using a machine learning algorithm based on the Single Shot Detector (SSD) architecture, deployed on an unmanned aerial vehicle (UAV) or drone. The system utilizes a thermal camera mounted on the drone to capture real-time video footage of the area under surveillance. The captured video is then analyzed by the SSD algorithm, which is trained to detect fires based on their thermal signatures. The proposed system can detect fires from a distance, enabling timely response and potentially reducing the damage caused by fires. The SSD algorithm is a popular object detection algorithm that has shown promising results in various applications, including fire detection. In this paper, we trained the SSD algorithm on a large dataset of thermal images, which includes different types of fires and non-fire thermal signatures. Compared to traditional methods of fire detection, which rely on human operators to analyze video footage and make decisions, the proposed system can analyze video footage in real-time and alert the appropriate authorities immediately. This can help prevent the spread of fires and reduce the damage caused by them. In conclusion, the proposed system provides an effective solution for early fire detection using a machine learning algorithm based on the SSD architecture deployed on a drone. The system can be easily integrated with other systems and can be operated remotely, making it suitable for various applications.