
Abstract

Forest fires are one of the disasters that have occurred several times in Indonesia with considerable impacts and losses, both caused by fire propagation and smoke that can endanger the safety and health of affected living things. Currently, forest fire detection in Indonesia is generally carried out with sensor-based devices or through weather data analysis, so it is less real-time, its scope depends on the spread of sensors, and sometimes skips small propagations of fires that are actually potentially dangerous as well. Therefore, for better countermeasures, fast and precise detection of forest fires is needed to assist in handling them and prevent the spread of larger fire propagation. With the development of technology in the field of computer vision, effective and efficient forest fire detection can be done using image-based methods and the application of deep learning. In this study, semantic segmentation techniques were used to identify fire propagation in the forest to obtain precise detection results and can be easily and quickly conveyed to the community. In our implementation, we implemented FCN and U-Net models with multiple backbones and conducted experiments using publicly available datasets to quantitatively measure model performance. Testing of multiple aerial images randomly taken from the internet was also carried out to see the performance of qualitatively trained models. The best result obtained in this analysis is that the FCN model with the VGG16 backbone proved to be the model with the highest IoU mean value and can be called the most precise model for detecting forest fires compared to U-Net, with an IoU mean value of 0.824614.

Keywords : *Semantic Segmentation, Wildfire Detection, Computer Vision*
