ABSTRACT

The use of solar energy today is more common than 10 years ago and will continue to increase in the future. In order to make use of PV systems more common, development must arise in terms of price per watt, maintenance costs, or the life cycle of PV products. Although the energy sources obtained by PV grids will not run out in a finite amount of time, the tools used by PV grids can be damaged. The development which is the main focus of this research is to add the life cycle of PV grid by detecting hotspots on PV panels.

The algorithm used to detect hotspots in the PV system in this study is the Convolutional Neural Network (CNN) which is implemented to detect the location of fire in thermal camera images with object detection. This final project system design consists of machine learning with Mask-RCNN architecture to perform object detection as well as Image Segmentation.

Mask RCNN modeling goes through 2 stages before it can be used, namely dataset preparation and training to find solar panel hotspots in thermal images. The RCNN Mask model can detect the presence of solar panel hotspots in thermal images with confidence above 70% and an average IOU of 80%, so that this model can be considered feasible if it only uses data from dataset validation. In the future, the results of the model used in this study can be retrained to continue transfer learning on a more complete dataset to refine the model.

Keywords**:** *Titik Api, Panel PV, CNN, Object Detection.*