

ABSTRACT

Solar panel is a renewable technology that is used to produce electricity from the sun. However, in the operational, solar panel is easy to have a hot spot along the way, a condition where there has been a buildup from the hotness of the sun in some area of the solar panel. These Hot spots can cause the lack of efficiency and even a permanent damage on the solar panel. Thus, it needs a system that can detect the hot spots fast enough and accurate to anticipate and overcome this problem.

This hot spot detection system on the solar panel is using a machine learning method that is called YOLOv5 (You Only Look Once Version 5). This method is one of the object detection algorithms based on deep learning. With this method, it is possible for the system to detect the location of the hot spot on the solar panel by the help of a thermal camera, FLIR ONE Pro, to detect the temperature on the solar panel. System is also integrated with the website as a media to upload the data to be processed. Besides that, system can also notify the user by sending a notification through the Telegram app that can remind the user to solve the *hot spot* problem as soon as possible.

System that has been integrated with the website and the Telegram app can help the user to control the solar panel so that the lifetime of a solar panel can be maximized. The testing is using the data of a solar panel that has been taken before, from the Kaggle website and also from the solar panel in Building P Telkom University. The test results show that the *hot spot* detection system on solar panel using YOLOv5 Custom Architecture that has been integrated with the website and the Telegram app give a desired result with the accuracy score 72%. Meanwhile the average confidence score from the detection results is 69%.

Keywords: Deep Learning, Hot Spot, Object Detection, Solar Panel, YOLOv5.