

ABSTRACT

Object detection has become very popular in recent year, one of the popular implementation is detection on Unmanned Aerial Vehicle (UAV) or drone. Examples of implementing the detection object on drones are aerial mapping, and infrastructure inspection. However, the application of object detection on drones has several challenges, namely the presence of noise, blurring, low resolution, and the size of the detection target is quite small. Another thing that becomes an obstacle in object detection is the class imbalance. These problems will affect the results of the model's performance if it is not handled properly.

In this final project, modification of the hyperparameters contained in the focal loss is carried out to overcome the class imbalance. The network architecture used for object detection is CenterNet with Deep Aggregation layer as the backbone. The performance parameter measured in this final project is mean Average Precision.

The results of the study show that modifying the hyperparameters on the focal loss can improve the performance of the model. The highest mAP value was obtained at 23.1% by using flip augmentation at the time of testing the data. If you do not use flip augmentation, the mAP value obtained is 22.4%. The modified CenterNet network architecture was also compared with several other architectures trained using the VisDrone-2019 dataset.

Keywords: Object Detection, Unmanned Aerial Vehicle, CenterNet, Deep Layer Aggregation, class imbalance, focal loss.