ABSTRACT

Multiple object tracking (MOT) is a system for finding objects by using sequential frames to generate a continuous path. MOT is widely applied to intelligent monitoring, motion and behavior analysis, surveillance systems and automatic driving. In this final project, the application of MOT is implemented using YOLOv4 as object detection and DeepSORT as object tracking. Because the implementation of YOLOv4 in MOT has not been exploited, exploitation of deep layer parameters, shallow layer parameters and the architecture of YOLOv4 which is used in conjunction with DeepSORT to create the MOT model is necessary.

In this final project, a system is created that functions to exploit 64 combinations of parameters that affect the value of Multi-Object Tracking Accuracy (MOTA), Multi-Object Tracking Precision (MOTP), and Frame Per Second (FPS) using 3 deep layer parameters consisting of jitter, IoU normalizer, and IoU thresh as well as 3 shallow layer parameters consisting of momentum, decay and learning rate in YOLOv4 whose architecture is combined with DeepSORT.

This final project uses 25 datasets containing 24,879 training data as training data for the system and 22,236 testing data as performance test data. The combination of parameters from the YOLOv4 architecture used are jitter, IoU normalizer, IoU thresh, momentum, decay and learning rate. The performance parameters were analyzed using MOTA, MOTP, and FPS based on the MOT challenge. The total data used in this final project is 47,115 image data. From the results of this study, combination 61 is the best combination of 64 combinations with 26.2% MOTA performance, 78.5% MOTP, and 10.27 FPS. Where combination 61 has the following exploitation parameters: Jitter 0.1, IoU Normalizer 0.5, IoU Thresh 0.3, Momentum 0.7, Decay 0.0005, and Learning Rate 0.005.

Keyword: *Multiple Object Tracking, Multi-Object Tracking Accuracy, Multi-Object Tracking Precision, YOLOv4, DeepSORT.*