

ABSTRACT

In recent years, 3 dimensional (3D) object detection has been widely implemented and brought new innovations to the latest science and technology. One of them is on autonomous driving. Autonomous driving is a term for vehicles that can drive a vehicle without human control. Object detection algorithms play a major role in identifying and predicting objects around the vehicle. Security concerns and the need for accurate real-time estimates led to the emergence of detection systems using Light Detection and Ranging (LiDAR).

This final project analyzes the effect of hyperparameter modification of the algorithm used to improve object detection performance in autonomous driving. The object detection algorithm used is Complex YOLOv4. The input data for the Complex YOLOv4 method is a 3D point cloud from LiDar. The output of this research is a modified model of the Complex YOLOv4 network configuration with the best performance value. In this final project, the KITTI Vision Benchmark is used as a training dataset.

This final project testing scheme focuses on the performance of the two hyperparameters used, epoch and network size. The test scheme with the best performance was obtained in scheme III with an mAP value of 58.3%. Based on the results of the mAP, modification of the network size and the use of a high number of epochs can affect the performance of object detection for autonomous driving.

Keyword: Complex YOLOv4, Object Detection, Autonomous Driving, Epoch, Network Size