ABSTRACT

Congestion is one of the main problems in congested city, mostly on complicated roads and in busy times. It caused number of vehicles each year. Traffic lights represent one solution to reduce traffic jams at junctions, but the traffic lights needs to be approved to improve the function of the traffic lights.

Because the intersection is one of the causes of congestion on the highway, so a traffic light control system is needed based on vehicle density. If one of the road sections at the intersection has a density of vehicles, then the traffic lights on the road will turn green first. This final project use architecture YOLO to detect objects in real time, YOLO is one of the developments of Convolutional Neural Network (CNN) object detection algorithm. To count the vehicles, the object must cross a virtual line and tracking on the object using the Simple Online Realtime Tracking (SORT) algorithm. SORT is capable of tracking multiple objects in real time.

This final project uses a dataset of 624 training data and 156 data test. The performance parameters reviewed were Average Precession (AP) and accuracy. The highest AP value is 0,89 with a hyperparameter learning rate configuration of 0.0001, epoch 60, and batch size 4. The highest average accuracy value is 98,80% with a virtual line placed 30% from the top of the frame video.

Keyword : *Object Detection, You Only Look Once, Simple Online Realtime Tracking, CNN*