ABSTRACT

With the advancement of Artificial Intelligence (AI), Intelligent Transportation System (ITS) has been applied for several areas as such vehicle control, traffic prediction, and road safety. ITS is the application of advanced technology in the fields of electronics, computers, and telecommunications combined with principles of strategic management to improve overall transportation functions. This thesis is designed to improve the quality of ITS using object detection to improved surveillance camera to sever different body types of vehicles.

The used method for object detection in real-time in this thesis is You Only Look Once (YOLO). This thesis provides a demonstration of using the YOLOv3 algorithm to detect traffic conditions. The system is designed with Python software, OpenCV as the library to solve computer vision problems, and TensorFlow as the open-source machine learning platform.

The trained network for the system has 7 vehicle body type classes. Each vehicle has a dataset of 1.000 data train images with a total of 7,000 training data in this system. The system configuration is tested analyzing the performance by the parameters of accuracy, Intersection of union (IoU), precision, and mAP. The results of a model of detecting vehicle body type using the YOLO algorithm on digital images is successfully implemented with a total of steps 7,000 and 14,000 with the accuracy obtained is 99.43%, IoU 98.35%, precision 98.21%, and mAP 90.29%.

Keywords: Vehicle, Object Detection, Python, and YOLO