

ABSTRACT

On toll roads, there are several car drivers who often use the roadside of toll road as a lane for driving which should not be used unless there is an urgent situation, this can interfere with the interests of other road drivers who have more urgent interests who should use the roadside of the toll road, so far if this occurs violations on the roadside of the toll road, it is rare for toll officers to know the violation directly, it is still not effective enough because officers cannot go directly to secure the driver who commits a violation.

By using a system that is used to detect violations on the roadside of toll road using the Deep Learning Faster Region based Convolutional Neural Network (Faster R-CNN) algorithm. The way it works is by processing the video recorded from CCTV on the HK TOLL APPS application, then the system will detect the vehicle that has committed a violation, if it is proven to have committed a violation, the system will provide a notification to the toll road officer via a Telegram Bot.

The output obtained in this final project is the system can properly detect vehicles that violate the roadside of the toll road. By using the model results from testing with several data partition training test schemes and configuration variables testing, obtained the model that has the best value with 90%:10% data partition, and configuration variables with Learning Rate 0.0004, Batch Size 1, Epoch 100. With accuracy values 77.9 %, precision 71.1%, recall 73.6%, and Mean Average Precision (mAP) 77%.

Keywords: *Toll Road, Roadside of Toll Road, Faster Region based Convolutional Neural Network (Faster R-CNN), Violation Detection.*