ABSTRACT

In Law No. 22 of 2009 concerning LLAJ, there are regulations on the use of helmets for two-wheeled vehicle drivers. However, these drivers are often seen not wearing helmets. To prevent violations and improve driving safety, this study created detect drivers and detect helmet use model using YOLO11 architecture. The dataset used comes from a video recording on one of the highways in Semarang. The dataset consists of 284 images in png format. The dataset is annotated and becomes groundtruth. After that, the dataset is divided with the provisions of 60% training data, 20% validation data, and 20% test data. The driver detection model generate a driver bounding box. The bounding box be cropped and used as a dataset for the helmet use detection model. The detection model produced a driver precision of 97.7%, a recall of 97.4%, mAP50 of 99%, mAP50-95 of 93.7%. The helmet detection model yielded 95.2% precision, 93.7% recall, 94.9% mAP50, and 86.6% mAP50-95 for the helmet class. For the no-helmet class, it yielded 94.5% precision, 93.5% recall, 96.9% mAP50, and 83.3% mAP50-95. This value showed that detecting drivers model and helmet use model is capable of performing their task with high performance.

Keywords : driver detection, helmet wearing detection, YOLO11