ABSTRACT

Traffic violations by motorcyclists, especially violations of not wearing helmets, are still a serious problem in Indonesia. The Electronic Traffic Law Enforcement (ETLE) system that has been implemented has not been optimally integrated, especially in the process of recognizing vehicle license plates needed to identify violators. This study aims to develop a system that is able to detect two-wheeled vehicle license plates, as well as reading characters on the license plates and integrating them into a traffic violation management information system. The method used is CRISP-DM, with stages ranging from business understanding to deployment. YOLO11 is used as a vehicle license plate object detection algorithm, and EasyOCR is used to read license plate characters. The evaluation was carried out using precision, recall, F1-Score, and Character Error Rate (CER) metrics. The developed system showed high license plate detection performance with a precision value of 88.3%, recall 96.9%, F1-Score 92.4%, and accuracy 85.9%. Meanwhile, the image preprocessing method has a major effect on OCR accuracy. The use of Gaussian blur produces the lowest CER, which is 7% on black plates and 11.5% on white plates, compared to the thresholding method which tends to reduce accuracy. The results of the study show that the integration between YOLO11 and EasyOCR is able to produce an e-ticket system. This system is not only able to produce a vehicle license plate detection and reading system but also sends it to the backend of the traffic violation management system.

Keywords: *CRISP-DM*, *EasyOCR, ETLE, license plates*, *YOLO11*