

ABSTRACT

Traffic violations, particularly those related to helmet use by motorcyclists, are a major issue in efforts to enhance road safety in Indonesia. Data indicate that helmet violations ranked highest among all traffic violations, accounting for 27% of the total recorded violations in 2021. This study aims to develop a system for detecting traffic violations by motorcyclists who do not wear helmets using You Only Look Once (YOLO) version 8. YOLO V8 was selected due to its status as a cutting-edge object detection algorithm known for its high accuracy and efficiency in real-time data processing. The system is integrated within the CRISP-DM framework to manage the development process from the stages of business understanding, data understanding, data processing, modeling, evaluation, and deployment. The system is designed to detect both helmeted and non-helmeted motorcyclists. Evaluation results indicate that the developed YOLO V8 model achieved an accuracy of 86% for helmeted riders and 87% for non-helmeted riders, with a recall of 86% and a Mean Average Precision (mAP) of 0.856. These results demonstrate that the deployed system is effective for detecting motorcyclists who are not wearing helmets as well as those who are.

Keyword : E-tilang, Helmet detection, YOLO, CRISP DM, Flask