ABSTRACT

Illegal parking is a crucial problem in big cities such as Bandung, which disrupts traffic flow, endangers pedestrians, and reduces the quality of public space management. The current manual law enforcement system for parking violations has proven to be limited in terms of effectiveness, accuracy, and scope of supervision. Therefore, a technology-based solution is needed that can automatically detect violations in real-time. This study proposes a computer vision-based illegal parking violation detection system utilizing the YOLOv8 algorithm for object detection and tracking algorithms such as DeepSORT or OC-SORT to determine the duration of a vehicle's stationary state. Vehicles that stop in prohibited areas for more than 60 seconds will be considered to have committed a violation. The dataset used consists of 6,244 images classified into nine object classes: public transportation, buses, no stopping, no parking, cars, motorcycles, pickups, taxis, and trucks. This research applies the CRISP-DM (Cross-Industry Standard Process for Data Mining) methodology, which consists of six main stages: Business Understanding, Data Understanding, Data Preparation, Modeling, Evaluation, and Deployment. This approach was chosen due to its flexibility, iterativeness, and depth in understanding business problems, preparing relevant data, and implementing a system that can be used in real-world applications. Each stage of CRISP-DM is designed to ensure the success of the data processing project from problem formulation to model implementation in an interactive web application based on Streamlit. Evaluation results show that the detection system has high performance with a mAP@0.5 of 88%, precision of 83%, recall of 81%, and an F1-score of 82%. This system is expected to serve as an effective and efficient solution in supporting traffic law enforcement and increasing public awareness of parking regulations.

Keywords–***Computer Vision, CRISP-DM, Illegal Parking Detection, Object Tracking, YOLOv8.***