ABSTRACT

Market parking management often faces significant challenges in accurately recording the number of vehicles due to manual methods that are prone to errors, impacting data and revenue estimates. Some parking attendants also often ignore the number of vehicles on that day, even though the possibility of data collection can be used as a reference for the crowds of vehicles in that place, which in the future whether parking lots should be added or not. To overcome this, this study proposes an automated system based on CCTV video recordings that utilizes advances in computer vision and deep learning. This system uses YOLOv8 as a deep learning model architecture for accurate vehicle object detection, then applies the Line Crossing Method to automatically count vehicles entering and exiting based on the direction of movement across a virtual line. The purpose of this study is to develop an accurate system for counting the number of vehicles and verifying parking revenue, where the output is a re-recorded video with visualization of movement and calculation data, as well as an estimate of revenue on that day as cross-validation, significantly helping in calculating parking vehicles on that day and as a double check how much income should be from parking management. With several scenario trials where the appropriate camera placement and good lighting or not. With a success rate of 99% in 4 trials for the best scenario and no cars with odd shapes or lifting objects that cause ambiguity in YOLOv8 detection.

Keywords: *Object Tracking, YOLOv8, Vehicle Counting, CCTV Recording, Double Check, Data Accuracy.*