ABSTRACT

This research utilizes deep learning methods with the YOLOv8 model to detect human heads in small buses, building on previous findings that demonstrated YOLOv8's superior object detection performance compared to YOLOv5. The YOLOv8-p2-p6 model was selected as the primary model due to its outstanding results, achieving a precision of 93.5%, recall of 89.2%, mAP of 94.1%, and F1-score of 91.36% using three combined datasets (Scut Head Part B, Casablanca, Hollywood Heads). Additional testing with an overhead dataset further validated the performance of YOLOv8-p2-p6, reaching a precision of 92.8%, recall of 89.3%, mAP of 94.1%, and F1-score of 91.04%. This system was implemented on the NVIDIA Jetson Nano using a trained model with the overhead dataset. This was necessary because the Scut Head Part B, Casablanca, and Hollywood datasets do not include images with camera angles from above the head. The addition of the overhead dataset enabled the detection of heads from top-down camera angles, as it contains several images captured from above. The system demonstrated a passenger entry detection accuracy of 69.23% with an error rate of 28.57%. In contrast, the accuracy for detecting passenger exits was 28.57% with an error rate of 71.43%.

Keywords : YOLOv8, deteksi objek, *people counting*, NVIDIA Jetson Nano.