ABSTRACT

Human detection in public facilities presents a significant challenge in computer vision systems due to lighting variations, heterogeneous backgrounds, and occlusion issues. This research aims to analyze the performance of the YOLOv8 algorithm in detecting person and head objects to create a robust and adaptive monitoring system. The method employed is an experimental laboratory approach with hyperparameter optimization using a Grid Search strategy. The tested parameters include variations of epochs (50, 100, 150) and learning rates (0.1; 0.01; 0.001) to identify the most optimal model configuration. The results indicate that the combination of 150 epochs and a 0.1 learning rate yields the best performance, achieving a mean Average Precision (mAP50) of 0.96727. The model demonstrates a precision rate of 0.962 and a recall of 0.923, indicating stable detection capabilities with minimal false detection rates. Confusion Matrix analysis confirms that the model accurately distinguishes between person and head classes despite complex visual environments. This study proves that proper hyperparameter optimization within the YOLOv8 architecture can significantly enhance the reliability of human detection systems in public facilities.

Keywords : Human Detection, YOLOv8, Computer Vision, Object Detection, Grid Search