

ABSTRACT

Bhayangkara Sartika Asih Hospital in Bandung faces several challenges in medical asset management, particularly in real-time asset tracking, which is crucial for operational efficiency. This research aims to develop an object detection and tracking system based on the OSEMN Methodology (Obtain, Scrub, Explore, Model, iNterpret) that can accurately detect the position of hospital assets. The data consists of 16 categories of equipment with a total of 7,680 images (already augmented), divided into 88% training data (6,720), 4% test data (320), and 8% validation data (640). The detection and tracking model was developed using YOLOv8x for object detection and integration of the DeepSORT algorithm for real-time multi-object tracking, which includes the Kalman Filter and Hungarian Algorithm. The interpretation of the test results shows a precision of 89.9%, recall of 87.8%, F1-Score of 88.7%, accuracy of 94%, and an overall MOTA of 75.3%. The model created is capable of detecting and tracking medical equipment with high accuracy and precision, supported by the tracking efficiency of the YOLOv8 and DeepSORT combination. This implementation enhances the hospital's operational efficiency and supports the achievement of the Sustainable Development Goals (SDGs) in health and infrastructure.

Keywords: Real-Time Object Detection, OSEMN Methodology, YOLOv8 & DeepSORT