

ABSTRAK

Manajemen inventaris pakaian yang efisien sangat penting terutama bagi industri retail dan laundry. Proses pencatatan stok yang masih manual sering menimbulkan kesalahan dan keterlambatan. Penelitian ini bertujuan mengembangkan sistem otomatis untuk mendeteksi dan menghitung jumlah pakaian dalam tumpukan menggunakan algoritma YOLOv11 berbasis *computer vision*. Dataset terdiri dari 178 gambar asli yang diperluas melalui augmentasi menjadi 1.200 gambar. Proses pelatihan model dilakukan menggunakan *Google Colaboratory*, dengan evaluasi performa pada variasi epoch 20 hingga 200. Model terbaik diperoleh pada 200 epoch dengan precision 91,5%, recall 92,4%, mAP@0.5 sebesar 95,1%, dan mAP@0.5:0.95 sebesar 72,9%. Hasil pengujian terhadap gambar uji menunjukkan performa deteksi yang akurat dalam berbagai kondisi visual, termasuk pencahayaan redup, sudut miring, dan tumpukan rapat. Namun, terdapat beberapa kasus kesalahan deteksi seperti overdeteksi dan false positive, terutama pada latar belakang yang kompleks. Secara keseluruhan, sistem yang dibangun mampu memberikan solusi otomatisasi dalam pendeteksian jumlah pakaian secara efektif dan efisien, sehingga bermanfaat bagi pengelolaan stok industri pakaian maupun kebutuhan penelitian lebih lanjut.

Kata Kunci : *Computer Vision, YOLOv11, Tumpukan Pakaian, Deteksi Objek*

ABSTRACT

Efficient clothing inventory management is crucial, especially for retail and laundry industries. Manual stock recording often leads to errors and delays. This study aims to develop an automated system to detect and count the number of clothes in piles using the YOLOv11 algorithm based on computer vision. The dataset consists of 178 original images, augmented to 1,200 images for training. The model was trained using Google Colaboratory and evaluated across multiple epoch variations ranging from 20 to 200. The best performance was achieved at 200 epochs, with a precision of 91.5%, recall of 92.4%, mAP@0.5 of 95.1%, and mAP@0.5:0.95 of 72.9%. Testing on various image conditions—such as low lighting, angled perspectives, and dense clothing piles—showed accurate detection performance. However, some cases of over-detection and false positives were found, particularly with complex backgrounds. Overall, the developed system provides an effective and efficient automated solution for counting clothes, which is beneficial for inventory management in the clothing industry as well as future research.

Keywords: *Computer Vision, YOLOv11, Clothing Pile, Object Detection*