

ABSTRAK

Fakhri Faishal Rochdiana : Deteksi Produk Pangan Berbasis *Augmented Reality* Menggunakan *YOLOv8n*

Perkembangan teknologi *Augmented Reality* (AR) dan *Computer Vision* membuka peluang baru dalam penyampaian informasi secara interaktif. Penelitian ini bertujuan mengimplementasikan algoritma *YOLOv8n* pada aplikasi *Augmented Reality* berbasis Android untuk mendeteksi dan mengenali produk pangan olahan secara real-time.

Dataset yang digunakan terdiri dari 11 kelas produk pangan olahan, yaitu Ayam Bawang, Cappucino, Chokolatos, Creamy Latte, Extra Hot, Korean Spicy, Malkist, Mocafrio, Sambal Belacan, Thai Chili, dan Wafello. Setiap citra diberikan anotasi bounding box menggunakan Roboflow, kemudian melalui proses pre-processing dan augmentasi data untuk meningkatkan ketahanan model. Model *YOLOv8n* dilatih menggunakan metode transfer learning dengan variasi epoch sebanyak 20, 40, 60, 80, dan 100 menggunakan Google Colaboratory.

Hasil evaluasi menunjukkan bahwa model terbaik diperoleh pada pelatihan dengan 100 epoch, learning rate 0,0001, dan batch size 16. Model tersebut menghasilkan nilai mAP50-95 sebesar 94,01% serta mampu mencapai nilai akurasi, presisi, recall, dan F1-score sebesar 100% pada data pengujian. Model kemudian dikonversi ke format TensorFlow Lite (TFLite) dan diimplementasikan pada aplikasi Android berbasis AR. Hasil implementasi menunjukkan bahwa aplikasi mampu mendeteksi produk pangan olahan dan menampilkan informasi produk secara real-time. Meskipun terjadi penurunan performa dibandingkan hasil pengujian pada lingkungan pelatihan, model tetap mampu melakukan deteksi objek dengan baik pada perangkat mobile.

Kata kunci: *Augmented Reality*, *YOLOv8n*, Deteksi Objek, Produk Pangan Olahan, Android, TensorFlow Lite.

ABSTRACT

Fakhri Faishal Rochdiana : Augmented Reality-Based Food Product Detection Using YOLOv8n

The development of Augmented Reality (AR) and Computer Vision technologies has created new opportunities for delivering interactive information. This study aims to implement the YOLOv8n algorithm in an Android-based Augmented Reality application for real-time detection and recognition of processed food products.

The dataset consists of 11 processed food product classes, namely Ayam Bawang, Cappucino, Chokolatos, Creamy Latte, Extra Hot, Korean Spicy, Malkist, Mocafrio, Sambal Belacan, Thai Chili, and Wafello. Each image was annotated using bounding boxes in Roboflow, followed by preprocessing and data augmentation to improve model robustness and generalization. The YOLOv8n model was trained using a transfer learning approach with epoch variations of 20, 40, 60, 80, and 100 on Google Colaboratory.

The evaluation results indicate that the best-performing model was achieved using 100 epochs, a learning rate of 0.0001, and a batch size of 16. The model achieved a mAP50-95 score of 94.01% and obtained 100% accuracy, precision, recall, and F1-score on the testing dataset. The trained model was then converted into TensorFlow Lite (TFLite) format and deployed in an Android-based AR application. The implementation results demonstrate that the application can detect processed food products and display product information in real time. Although the performance slightly decreased compared to the training environment, the model remained capable of performing object detection effectively on mobile devices.

Keywords: Augmented Reality, YOLOv8n, Object Detection, Processed Food Products, Android, TensorFlow Lite.