

ABSTRAK

IMPLEMENTASI YOLOV8 PADA SISTEM NUTRI-GRADE UNTUK DETEKSI AREA LABEL NUTRISI

(2025 : |57 Halaman| + |30 Gambar| + |17 tabel| + Daftar Pustaka + Lampiran)

Peningkatan prevalensi diabetes mellitus di Indonesia akibat konsumsi makanan tinggi gula dan lemak jenuh menunjukkan pentingnya sistem informasi gizi yang dapat membantu konsumen memilih produk makanan dan minuman yang lebih sehat. Penelitian ini bertujuan mengembangkan sistem berbasis *computer vision* untuk mendeteksi area label nutrisi pada kemasan secara otomatis dan mengkategorikannya ke dalam skala Nutri-Grade (A–D). Penelitian ini merupakan penelitian terapan dengan pendekatan rekayasa sistem, menggunakan model deteksi objek YOLOv8 dan metode Optical Character Recognition (OCR) yang diimplementasikan pada perangkat *embedded* Raspberry Pi 4. Pengembangan sistem meliputi pengumpulan dataset sebanyak 345 gambar, pelabelan, augmentasi, pelatihan model, integrasi OCR, dan pengujian fungsional pada beragam kemasan produk makanan dan minuman. Evaluasi performa model menunjukkan hasil yang sangat baik dengan *precision* (97,4%), *recall* 86%, *accuracy* 84%, dan *F1-score* 91,3%. Pengujian sistem berhasil mendeteksi label nutrisi secara real-time dengan jarak optimal 10 cm serta klasifikasi Nutri-Grade yang sesuai berdasarkan kandungan gula dan lemak jenuh. Kesimpulannya, implementasi YOLOv8 dalam sistem ini efektif untuk mendeteksi area label nutrisi kemasan serta mendukung penerapan Nutri-Grade di Indonesia dengan berbasis teknologi.

Kata kunci: YOLOv8, Nutri-Grade, Raspberry Pi, Deteksi Label Nutrisi, OCR

ABSTRACT

IMPLEMENTATION OF YOLOV8 IN THE NUTRI-GRADE SYSTEM FOR DETECTING NUTRITION LABEL AREAS

(2025 : |57 Pages| + |30 Pictures| + |17 Tables| + References + Attachment)

The increase in the prevalence of diabetes mellitus in Indonesia due to the consumption of foods high in sugar and saturated fat highlights the importance of a nutrition information system that can help consumers choose healthier food and beverage products. This study aims to develop a computer vision-based system to automatically detect nutrition label areas on packaging and categorise them into the Nutri-Grade scale (A–D). This is an applied research study with a systems engineering approach, using the YOLOv8 object detection model and Optical Character Recognition (OCR) method implemented on an embedded Raspberry Pi 4 device. System development includes collecting a dataset of 345 images, labelling, augmentation, model training, OCR integration, and functional testing on various food and beverage product packaging. Model performance evaluation showed excellent results with precision (97.4%), recall (86%), accuracy (84%), and F1-score (91.3%). System testing successfully detected nutrition labels in real-time at an optimal distance of 10 cm and classified Nutri-Grade appropriately based on sugar and saturated fat content. In conclusion, the implementation of YOLOv8 in this system is effective for detecting the area of nutrition labels on packaging and supports the application of Nutri-Grade in Indonesia based on technology.

Keywords: YOLOv8, Nutri-Grade, Raspberry Pi, Nutrition Label Detection, OCR