

ABSTRAK

Tanggal kedaluwarsa pada kemasan makanan berperan penting dalam menjaga keamanan konsumsi, namun sering sulit terbaca akibat cetakan buram, dot-matrix, atau pencahayaan yang buruk. Penelitian ini merancang sistem otomatis untuk mendeteksi dan mengekstraksi tanggal kedaluwarsa menggunakan Efficient and Accurate Scene Text (EAST) dan Tesseract OCR. Proses dilakukan melalui pra-pemrosesan citra, deteksi teks oleh EAST, ekstraksi karakter dengan Tesseract, serta normalisasi dan validasi format tanggal. Evaluasi menggunakan Confusion Matrix menghasilkan Precision 81%, Recall 58%, F1-Score 68%, dan Accuracy 51%. Hasil ini menunjukkan sistem cukup andal pada kondisi ideal dengan precision tinggi, tetapi masih lemah pada cetakan dot-matrix, teks buram, dan pencahayaan redup. Sistem diimplementasikan pada aplikasi web berbasis Gradio, yang menunjukkan potensi sebagai solusi awal otomatisasi pembacaan tanggal kedaluwarsa, meski pengembangan lebih lanjut tetap diperlukan untuk meningkatkan robustnes di kondisi nyata.

Kata kunci: Tanggal kedaluwarsa, EAST, Tesseract OCR, Deteksi Teks, Pra-pemrosesan, *Computer Vision*.



ABSTRACT

Expiration dates on food packaging play a crucial role in ensuring consumer safety, but they are often difficult to read due to blurred prints, dot-matrix formats, or poor lighting conditions. This study designs an automatic system to detect and extract expiration dates using the Efficient and Accurate Scene Text (EAST) detector and Tesseract OCR. The process involves image preprocessing, text detection with EAST, character extraction using Tesseract, followed by normalization and validation of date formats. Evaluation using a Confusion Matrix achieved Precision of 81%, Recall of 58%, F1-Score of 68%, and Accuracy of 51%. These results indicate that the system performs reliably under ideal conditions with high precision but remains limited when handling dot-matrix prints, blurred text, and low-light scenarios. The system was implemented as a web-based application using Gradio, showing potential as an initial solution for automated expiration date reading, although further improvements are required to enhance robustness in real-world conditions.

Keywords: *Expiration date, EAST, Tesseract OCR, Text Detection, Preprocessing, Computer Vision.*

