

## **ABSTRAK**

### **RANCANG BANGUN ALAT PENYORTIR CERDAS UNTUK MENENTUKAN JENIS SAYURAN MENGGUNAKAN MODEL YOLOv5n BERBASIS *COMPUTER VISION***

**(2026: xiii + 80 Halaman + 36 Gambar + 11 Tabel + Daftar Pustaka +  
Lampiran)**

---

---

**ARYO DWI CAHYO**

**062330320613**

**JURUSAN TEKNIK ELEKTRO**

**PROGRAM STUDI TEKNIK ELEKTRONIKA**

**POLITEKNIK NEGERI SRIWIJAYA**

Penelitian ini merancang alat penyortir sayuran otomatis berbasis computer vision menggunakan Raspberry Pi CM4, kamera Web-CAM, load cell (HX711), dan LCD 16×2. Model YOLOv5n dilatih dengan 1.668 gambar (wortel, tomat, kentang) via Roboflow, 200 epoch di Google Colab, lalu dikonversi ke TFLite FP16 untuk edge computing. Hasil pelatihan: precision 80,4%, recall 82,2%, mAP50 84,7%, dengan tomat sebagai kelas terbaik. Pengujian real-time menunjukkan akurasi deteksi 80% pada kecepatan 3–5 FPS. Data otomatis terkirim ke Google Spreadsheet via N8N (latensi <3 detik) disertai notifikasi WhatsApp ke pemilik toko. Sistem terbukti mengurangi ketergantungan identifikasi manual serta meningkatkan efisiensi pencatatan transaksi di pasar tradisional.

**Kata Kunci:** *Computer Vision*, YOLOv5n, Raspberry Pi CM4, Penyortir Cerdas, Deteksi Sayuran, *Load Cell*, *Edge Computing*, Google Spreadsheet

## **ABSTRACT**

### ***DESIGN AND DEVELOPMENT OF AN INTELLIGENT VEGETABLE SORTER FOR DETERMINING VEGETABLE TYPES USING YOLOv5n MODEL BASED ON COMPUTER VISION***

***(2026: xiii + 80 Pages + 36 Figures + 11 Tables + References + Appendices)***

---

---

***ARYO DWI CAHYO***

***062330320613***

***ELECTRICAL ENGINEERING***

***STUDY PROGRAM OF ELECTRONICS ENGINEERING***

***STATE POLYTECHNIC OF SRIWIJAYA***

*This study designs an automatic vegetable-sorting device based on computer vision, using a Raspberry Pi CM4, a Web-CAM, a load cell (HX711), and a 16×2 LCD. A YOLOv5n model was trained on 1,668 images (carrots, tomatoes, potatoes) annotated via Roboflow, for 200 epochs on Google Colab, then converted to TFLite FP16 for edge deployment. Training results showed a precision of 80.4%, recall of 82.2%, and mAP50 of 84.7%, with tomatoes achieving the best class performance. Real-time testing showed an 80% detection accuracy at 3–5 FPS. Data was automatically sent to Google Spreadsheet via N8N (latency <3 seconds), accompanied by WhatsApp notifications to the shop owner. The system proved effective in reducing reliance on manual identification and improving transaction-recording efficiency in traditional markets.*

***Keywords:*** *Computer Vision, YOLOv5n, Raspberry Pi CM4, Intelligent Sorter, Vegetable Detection, Load Cell, Edge Computing, Google Spreadsheet.*