

ABSTRAK

PENGEMBANGAN SISTEM DETEKSI DAN *MONITORING* AKTIVITAS PEMBUANGAN SAMPAH SEMBARANGAN MENGGUNAKAN ARSITEKTUR MOVINET-A0 BERBASIS MULTI-CAMERA

(2026: xiv + 66 Halaman + 34 Gambar + 5 Tabel + Daftar Pustaka + Lampiran)

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Pembuangan sampah sembarangan di Sungai Sekanak, Kota Palembang, menjadi permasalahan lingkungan akibat keterbatasan pengawasan secara manual. Penelitian ini bertujuan merancang sistem deteksi dan *monitoring* aktivitas buang sampah secara *real-time* berbasis multi-camera menggunakan arsitektur MoViNet-A0. Sistem menggabungkan YOLOv11 untuk mendeteksi dan melakukan *cropping* area manusia sebagai tahap pra-pemrosesan, kemudian aktivitas diklasifikasikan oleh MoViNet-A0 ke dalam dua kelas, yaitu Buang Sampah dan Normal. Dua unit CCTV, masing-masing menggunakan koneksi *Power over Ethernet* (PoE) dan WiFi, digunakan untuk memperluas area pemantauan. Hasil deteksi ditampilkan secara *real-time* melalui *dashboard monitoring* berbasis Flask berupa video, *bounding box*, label aktivitas, dan nilai *confidence*. Pelatihan model dilakukan di Kaggle menggunakan dataset sebanyak 1.413 klip video. Hasil terbaik diperoleh pada konfigurasi 42 epoch dengan ukuran citra 224×224 piksel yang menghasilkan akurasi 91,51%. Hasil penelitian menunjukkan bahwa sistem mampu membedakan aktivitas membuang sampah dan aktivitas normal dengan baik serta berpotensi mendukung pengawasan lingkungan secara otomatis.

Kata Kunci: Deteksi dan *Monitoring*, Buang Sampah Sembarangan, MoViNet-A0, YOLOv11, Multi-Camera.

ABSTRACT

DEVELOPMENT OF DETECTION AND MONITORING SYSTEM FOR LITTERING ACTIVITIES USING THE MOVINET-A0 ARCHITECTURE BASED ON MULTI-CAMERA

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Littering in the Sekanak River, Palembang City, has become a significant environmental issue due to the limitations of manual monitoring. This study aims to design and develop a real-time littering activity detection and monitoring system based on a multi-camera architecture using MoViNet-A0. The system integrates YOLOv11 to detect and crop the human region as a preprocessing stage, after which MoViNet-A0 classifies the activity into two classes: Littering and Normal. Two CCTV cameras, connected via Power over Ethernet (PoE) and WiFi, were deployed to expand the monitoring coverage. Detection results are displayed in real time through a Flask-based web dashboard, including video streams, bounding boxes, activity labels, and confidence scores. Model training was conducted on the Kaggle platform using a dataset of 1,413 video clips. The best performance was achieved with 42 epochs and an input image size of 224×224 pixels, resulting in an accuracy of 91.51%. The results demonstrate that the proposed system can effectively distinguish littering activities from normal activities and has the potential to support automated environmental monitoring.

Keywords: *Detection and Monitoring, Littering, MoViNet-A0, YOLOv11, Multi-Camera.*