ABSTRAK

IMPLEMENTASI METODE PEMILAHAN JENIS SAMPAH MENGGUNAKAN *YOU ONLY LOOK ONCE* (YOLO)

Oleh

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Masalah sampah menjadi perhatian utama di berbagai daerah, termasuk Kota Bandar Lampung, yang mencatatkan timbunan sampah harian sebanyak 287,057,55 ton. Data dari SIPSN KLHK tahun 2022 menunjukkan bahwa jumlah timbunan sampah nasional mencapai 21,1 juta ton. Penelitian sebelumnya telah mengklasifikasikan sampah daur ulang menggunakan Support Vector Machine dan Local Binary Pattern. Penelitian ini bertujuan mengembangkan sistem implementasi pemisahan sampah organik dan non-organik menggunakan YOLOv8. Metode penelitian mencakup pra-pelatihan, pengumpulan data dari sumber seperti GitHub dan Kaggle (total 3021 citra), serta pelebelan manual menggunakan Roboflow dengan pembagian label organic dan non-organic. Prapemrosesan melibatkan pembagian dataset menjadi Train Set (70%), Valid Set (20%), dan Test Set (10%). Model YOLOv8 diimplementasikan dan dibandingkan dengan metode berbasis deep learning lainnya. Analisis kebutuhan perangkat mencakup perangkat keras dan lunak yang digunakan, termasuk spesifikasi perangkat keras dan perangkat lunak seperti YOLOv8s.pt, Google Colab, dan Roboflow. Evaluasi hasil penelitian mencakup pembagian dataset, deskripsi penelitian, dan evaluasi menggunakan API Roboflow. Hasil penelitian menunjukkan bahwa YOLOv8 berhasil dalam deteksi sampah organic dan non-organic, dengan pembagian dataset yang efektif. Penggunaan GPU dan API Roboflow memberikan kontribusi signifikan dalam percepatan pelatihan dan integrasi sistem. Kesimpulannya, penelitian ini memberikan kontribusi pada pengembangan teknologi untuk pengelolaan sampah yang lebih efisien di Kota Bandar Lampung dan bidang Computer Vision secara umum

Kata kunci: *Model YOLOv8, Deep Learning, Klasifikasi Sampah*

ABSTRACT

IMPLEMENTATION OF WASTE-TYPE SORTING METHOD USING YOU ONLY LOOK ONCE (YOLO)

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The waste problem is a major concern in various regions, including the Bandar Lampung City, which recorded daily waste accumulation of as much as 287,057.55 tons. Data from SIPSN KLHK in 2022 shows that the number of national waste pile reached 21.1 million tons. Previous research has classified recyclable waste used a Support Vector Machine and Local Binary Pattern. This research aims to develop a system implementation of separation of organic and non-organic waste using YOLOv8. Research methods include pre-training, data collection from sourced such as GitHub and Kaggle (3021 images in total), as well as manual labeling using Roboflow with the division of organic and non-organic labels. Preprocessing involves dividing the dataset into Train Set (70%), Valid Set (20%), and Test Set (10%). The YOLOv8 model is implemented and compared with other deep learning-based methods. Analyze device requirements including the hardware and software used, including specifications hardware and software such as YOLOv8, Google Colab, and Roboflow. Evaluation of research results including distribution of datasets, descriptions of research, and evaluation using the Roboflow API. The research results show that YOLOv8 is successful in detecting organic and non-organic waste, with effective dataset sharing. The use of GPUs and the Roboflow API makes a significant contribution to accelerating training and system integration. In conclusion, this research contributes to the development of technology for more efficient waste management in the Bandar Lampung City and the field of Computer Vision in general.

Keywords: *YOLOv8 Model, Deep Learning, Garbage Classification.*