

COVER LETTER

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Dear,

We wish to submit an original research article entitled "***Real-Time Deep Neural Network-based Waste Detection and Classification using a Camera Sensor***" for consideration by SINERGI.

We confirm that this work is original and has not been published elsewhere, nor is it currently under consideration for publication elsewhere. We promise not to withdraw this article after it has been processed by the Editorial Team. If there is a withdrawal, we are willing to pay a penalty of USD 150 (IDR 2000K) to the SINERGI Editorial Team.

In this paper, I/we report on / show that:

Field	:	Electrical Engineering
Topic	:	Artificial Intelligence
Brief Background	:	Waste generation is a growing environmental concern, with manual sorting methods often being inefficient and error-prone, particularly under varying lighting and environmental conditions. In Indonesia, waste is typically categorized into organic and nonorganic, yet existing automated classification systems lack real-time capabilities and robustness in dynamic settings.
Research Problem	:	Waste is an unavoidable part of human life because everyone creates and produces waste. In Indonesia, waste is generally classified into two types based on its composition: organic waste and nonorganic waste. Organic waste can be decomposed and further broken down with the help of other bacteria. By contrast, nonorganic waste, often a byproduct of human activities, is resistant to bacterial decomposition. Plastic waste remains an environmental issue that is still difficult to address effectively. The rise in plastic use is attributed to technological, industrial, and population growth. Waste management in Indonesia continues to be a problem; thus far, available trash cans are only those that rely on manual sorting by the community. Furthermore, many people are still unaware of the distinction between organic and nonorganic waste. This lack of awareness leads to careless disposal of garbage, resulting in ineffective waste management. Maintaining cleanliness is essential in any environment, starting with the immediate surroundings, such as the living environment and public spaces, which include schools, markets, and hospitals. A system that can educate and assist the

		community in distinguishing waste types is necessary, ensuring proper disposal using an accurate classification system.
Overview of Method	:	The system utilizes the ResNet-18 convolutional neural network architecture and is developed using Python. It is designed to distinguish between organic and nonorganic waste in real-time. Training was conducted over 30 epochs, and the system was tested under various lighting conditions—morning, daytime, afternoon, and nighttime.
Significant finding	:	Results show high accuracy: 95.24% in the morning, 95.24% during the day, 90.45% in the afternoon, and 86.90% at night, with an average accuracy of 91.96%. Performance was influenced by factors such as lighting intensity, distance, waste position, changes in organic waste, and occlusion by plastic. The proposed system offers a significant improvement over traditional and existing methods by enabling accurate, real-time waste classification under diverse conditions, contributing to more efficient and intelligent waste management.

We have no conflicts of interest to disclose.

Thank you for your consideration of this manuscript.

Sincerely,



Arsyad Ramadhan Darlis

AUTHORSHIP STATEMENT

I/We wish to submit an original research article entitled “[*title of article*]” for consideration by SINERGI.

All persons who meet authorship criteria are listed as authors, and all authors certify that they have participated sufficiently in work to take public responsibility for the content, including participation in the concept, design, analysis, writing, or revision of the manuscript.

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POTENTIAL REVIEWERS

Please send 3 (three) prospective reviewers (who are not yet registered in SINERGI) to speed up the review process who are competent for the topic and have a good reputation in the field. Please ensure that **they are willing to review** this paper.

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