

A Review Paper on: "Automated Waste Classification with Image Processing and Deep Learning for a Circular Economy"

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Abstract: *With the growing population and urbanization, solid waste generation is rapidly increasing, creating serious environmental and health concerns. Traditional manual waste segregation is slow, labor-intensive, and often inaccurate, leading to lower recycling rates and more pollution. To address this, we propose a Smart Waste Segregation System that uses image processing and Convolutional Neural Networks (CNNs) to automatically classify waste into recyclable, organic, and non-recyclable categories. This automated system improves accuracy, efficiency, and speed while reducing labor costs and human error. By integrating sensors and machine learning, the system enables real-time waste sorting at the source, promoting safer working conditions, better recycling, and a cleaner environment. Our results show high performance based on key evaluation metrics, supporting sustainable waste management and contributing to a circular economy.*

Keywords: Image Processing, Machine Learning, Recycling, Sustainability

