Camera Vision Based Trash Classification and Detection System using Deep Learning

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Abstract: *Trash generally refers to discarded or waste materials that are no longer considered useful or valuable. It encompasses various items and substances that individuals or organizations dispose of, typically with the intention of discarding or recycling them. The term trash is often used interchangeably with terms like garbage, waste or rubbish. Improperly managed waste contributes to environmental issues, including pollution and the release of harmful substances, impacting ecosystems and public health. Existing waste management faces challenges in sorting and disposal practices, leading to inefficiencies in the overall process. The increasing volume of waste in urban areas poses a growing challenge, demanding innovative solutions to handle the scale and complexity of modern waste streams. In response to these challenges, the Trash AI project leverages advanced technologies such as Convolutional Neural Networks (CNNs) and Temporal Convolutional Networks (TCNs) to introduce a smarter and more efficient waste management system. These technologies provide the foundation for accurate trash classification, real-time detection, and intelligent waste segregation. The goal is to revolutionize waste management, automating and optimizing processes for accurate trash classification, real-time detection, and intelligent waste segregation. Through the development of a Municipality Web App, Trash AI centralizes monitoring and decision-making, facilitating a more sustainable and efficient approach to waste management. This initiative is poised to transform urban waste handling, promoting environmental consciousness and sustainable practices for smarter, cleaner cities.*

Keywords: TCN: Temporal Convolutional Networks, CNN: Convolutional Neural Network.