

# Design and Development of Portable Waste Collection and Segregation System

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## Abstract:

Uncontrolled accumulation of municipal solid waste has become a critical challenge affecting environmental safety and public hygiene in modern communities. Existing waste management practices often separate collection and segregation, resulting in reduced efficiency and increased contamination. This paper presents a compact and portable automated system that integrates mechanical collection, airflow-assisted transport, and sensor-based segregation within a single platform. An ultrasonic sensor enables waste detection, while a soil moisture sensor differentiates wet and dry waste. An Arduino-based control unit actuates a servo-driven flap mechanism for real-time sorting. The proposed approach offers an efficient and scalable solution for decentralized waste management.

## Keywords:

Municipal Solid Waste, Automated System, Mechanical Collection, Sensor-Based Segregation, Ultrasonic Sensor, Soil Moisture Sensor, Arduino-Based Control, Decentralized Waste Management .