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AI-Based Waste Management System Using Image Recognition and Community Engagement

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Abstract: *The basic requirement for both public health and environmental sustainability relies on maintaining clean urban spaces. Effective waste management poses a major difficulty because traditional waste management systems find it hard to control growing waste volumes in rapidly expanding urban locations. The research explores an advanced technology-based system which combines community participation methods to improve waste management operations. The system offers users a user-friendly web platform which allows them to photograph and report waste conditions at roadsides by adding their location information. The platform uses artificial intelligence for image detection to both recognize waste accurately and simplify the reporting functionality. Verification is applied to reported cases before the authorities receive notification for required action. The system distributes garbage trucks according to real-time data so it delivers waste collection efficiency and gives users waste management health-related advice. Users are able to stay informed thanks to this system about how their reported cases are progressing through the system. Waste disposal efficiency gets improved through AI analysis combined with positioning telemetry and cloud storage systems which encourage public engagement and awareness activities. Waste management through technology-enabled civic engagement creates a framework that allows sustainable growth for urban cleanliness which leads to improved waste management accountability.*

Keywords: AI-driven waste management, Community engagement, Image recognition, real-time reporting, Route optimization, Sustainable urban environments

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