ID 38

A Systematic Review on Mobile-Based Garbage Collection and Decomposition System

KGR Minulka[1#] and DVDS Abeysinghe[2]

[1]Department of Information Technology, Faculty of Computing, General Sir John Kotelawala Defence University
[2]Department of Computer Science, Faculty of Computing, General Sir John Kotelawala Defence University

[#]39-bis-0016@kdu.ac.lk

Abstract

Garbage disposal and collection continue to pose significant global challenges, especially in developing countries, due to factors like rapid population growth, inadequate public awareness, and inefficient infrastructure. This review explores the potential of mobile-based garbage collection and decomposition systems that leverage cutting-edge technologies such as the Internet of Things (IoT) and artificial intelligence (AI) to optimize waste management. The paper analyses systems that incorporate smart bins with integrated sensors, AI-powered chatbots for enhanced public engagement, and GPS-enabled real-time route optimization. It examines the effectiveness of advanced algorithms, including Large Neighbourhood Search (LNS) for vehicle routing and Node2Vec for path optimization, in reducing travel time and fuel consumption. The review also evaluates how these solutions promote public participation in waste management through features like chatbot-based issue reporting and sustainable waste practices guidance. By integrating IoT and AI technologies, these systems present a cost-effective and environmentally sustainable approach to transforming urban waste management practices.

Keywords: *Mobile application, IoT-based waste management, Route optimization, Smart bins, GPS tracking*