ECOSORT AI-POWERED SMART BIN FOR WASTE SORTING

Revolutionizing Waste Management with Intelligent Automation

OUR TEAM

Suyog Lamsal

Kuber Pathak

Alisha Shrestha

INTRODUCTION

EcoSort is an innovative solution designed to tackle the pressing issue of improper waste segregation. Using cutting-edge AI technology, it can automatically classify and separate biodegradable and non-biodegradable waste in real-time. By promoting efficient recycling and reducing landfill overflow, this project aims to address environmental challenges and create a sustainable, eco-friendly waste management system for households, public spaces, and industrial applications.

PROBLEM STATEMENT

- Existing waste bins fail to facilitate sorting of solid waste at the point of collection.
- Mixed waste in bins complicates the manual sorting process.
- Results in labor-intensive, time-consuming, and hazardous manual sorting.

PROBLEM STATEMENT

- Overfilled bins lead to unhygienic conditions, impacting public health and economic activities.

SOLUTION

- Smart waste bins with integrated camera and AI for real-time tracking of waste which tracks if the waste is biodegradable or non-biodegradable.
- IoT device directs the waste to its respective slot based on the categorization.

SOLUTION

- Ultra Sonic Sensor tracks if the bin is full, providing timely alerts for waste collection.
- Automates the waste sorting process, reducing manual labor and enhancing efficiency in waste management.
- Helps optimize waste collection, promoting recycling and sustainable disposal practices.

OBJECTIVE

01 Automatically sorts biodegradable and non-biodegradable waste using AI

02 Integrates real-time detection and classification capabilities

03 Provides tracking and analytics for waste management

KEY FEATURES

- AI-Driven Sorting: Detects and classifies waste items in real-time
- Automated Mechanism: Physically separates biodegradable and non-biodegradable items
- Data Insights:
- Tracks the amount and type of waste collected by the help of ultrasonic sensors
- User-Friendly Interface: Easy-to-use and interactive design

WORKFLOW

01 Waste Item Dropped into Bin

02 Camera Captures Image

03 AI Model Classifies Item (Biodegradable/Non-Biodegradable)

04 Automated Sorting Mechanism Activated

05 Data Displayed on Dashboard

TECHNOLOGY STACK

- AI Model: Trained using TensorFlow
- Object Detection Algorithm: YOLOv8 for real-time classification
- Programming Language: Python, Node, Next
- Hardware Components:
- Camera for image capture
- Servo motors for physical sorting
- Microcontroller (Arduino) for bin operation
- Integration: OpenCV for image processing

APPLICATONS

- Households: Simplified waste segregation at source
- Public Spaces: Automated waste bins for parks, malls, and streets

CHALLENGES AND FUTURE WORK

CHALLENGES

- Improving detection accuracy for mixed waste.
- Ensuring durability in different environments.
-

THANK YOU