## Problem statement

House often struggle with properly sorting waste leading to contamination and inefficiencies in recycling. An autonomous trash can with waste sorting capabilities would simplify disposal and improve recycling efforts in homes

## B Team

|  |  |  |
| --- | --- | --- |
| Name of Team Member | Roles | Reason for Allocating the Roles |
| Humphrey Nzai | Software design | Good at mastering commands and implementing them correctly |
| Sande Angore | Electrical design | Expertise in wire connection and amazing in soldering the wires |
| Lincon Vincent | Mechanical design | Good at sorting out the parts suitable for which side and where in the design it suits |

## Technologies

* List the libraries, languages, platform, frameworks, hardware, books, resources that will be necessary to complete the project
* Computer version used to identify different types of wastes based on their characteristics, Sensors for easy detection of materials disposed, robotics for automation process
* Hardwares such as Raspberry Pi for running Ai models and sesors etc., camera to capture images of disposed wastes, Robotic arm for physically sorting the wastes.

**Challenge**

* Describe the problem the project is intended to solve

Struggling with proper sorting of waste products disposed in a waste can

* Explain what the project will not solve

It can not dispose off the trashes to the dumping sites on its own until its taken to the dumping site

* Explain who the project will help and/or who the users will be

This project favors those leaving in homes with many and more activities that includes the disposal of different types of materials that can be recycled for use and to avoid contamination.

* Is the project relevant or dependent on a specific locale?

Its dependent on steady power supply that facilitates the operational process of the technologies implemented for proper working of the components.

## Risk

* Describe the technical and non-technical risks. The potential impact of each and what strategies are in place to prevent negative outcomes

Since it reduces the risk of contamination it may not completely eradicate/eliminate contamination but may sometimes sort the trash incorrectly since its an Ai it may not work perfectly as intended but may have a fault.

## Infrastructure

* Describe your process for branching and merging in your team’s repository

Each team member cloned the repository to the local machine, each collaborator creates a new branch for the main to work on the assigned feature.

We made changes in the new branch and commited them to the local branch

Before merging the feature branch back, we switched to main and pulled the latest changes

After merging locally we pushed the changes to the remote repository after which we created a pull request or a merge request

* Describe your strategy for deployment

Prototype and testing phase-test the hardware and software in controlled environment

Staging deployment just test their performance and gather user feedback and monitor for errors

Full scale deployment- Connect the can to a centralized monitoring system

Maintenance and support-implement automated diagnostic and schedule regular maintainace to ensure long term functionality

Post deployment monitoring and scaling-continuously track performance Metrix and user feedback

* Describe what tools, automation or process you will use for testing

Hardware testing-use tools like multimeters, oscilloscopes and environmental test chambers

Software testing-implement unit testing, integration testing etc.

AI OR ML test sorting algorithms using frame works like ROS

End to end testing-use robot frame work for system integration testing and simulate waste sorting scenarios

Performance testing-conduct usability tests with tools like lookback.io for feedback or interaction

## Existing Solutions

* List any similar products or solutions that currently exist

Smartcan

Wastebot

* For each item in your list, explain similarities and differences

Similarities

Waste sorting \_ all products focus on automating of sorting waste management

Automation\_ both use the technology of automation the whole cotrill process

Differences

A smartcan typicslly refers to a wastebin equipped with sensors and features to manage wastes within a fixed location while a wastebot is a mobile robotic system designed to autonomously collect,sort or transport wastes from various location

A smartcan are stationary and are placed in a specific location while wastebots are mobile and can move around environments