



## Introduction

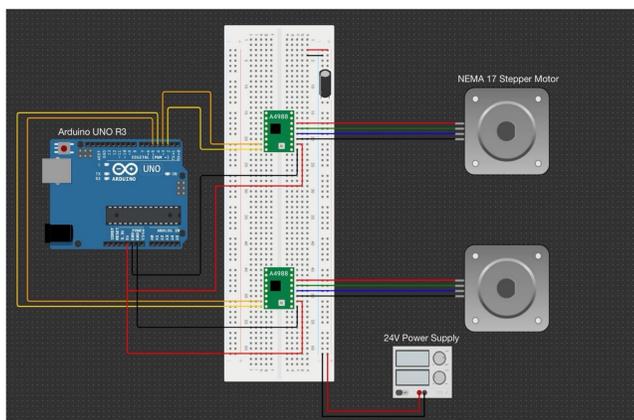
The Automatic Waste Sorter project is the development of a machine capable of identifying and sorting waste into recycling, compost, or landfill categories through the integration of image processing and machine learning. The system utilizes a camera and a convolutional neural network to analyze waste items based on their visual features. Once classified, robotic components direct the waste to the appropriate bin for disposal.

## Objectives

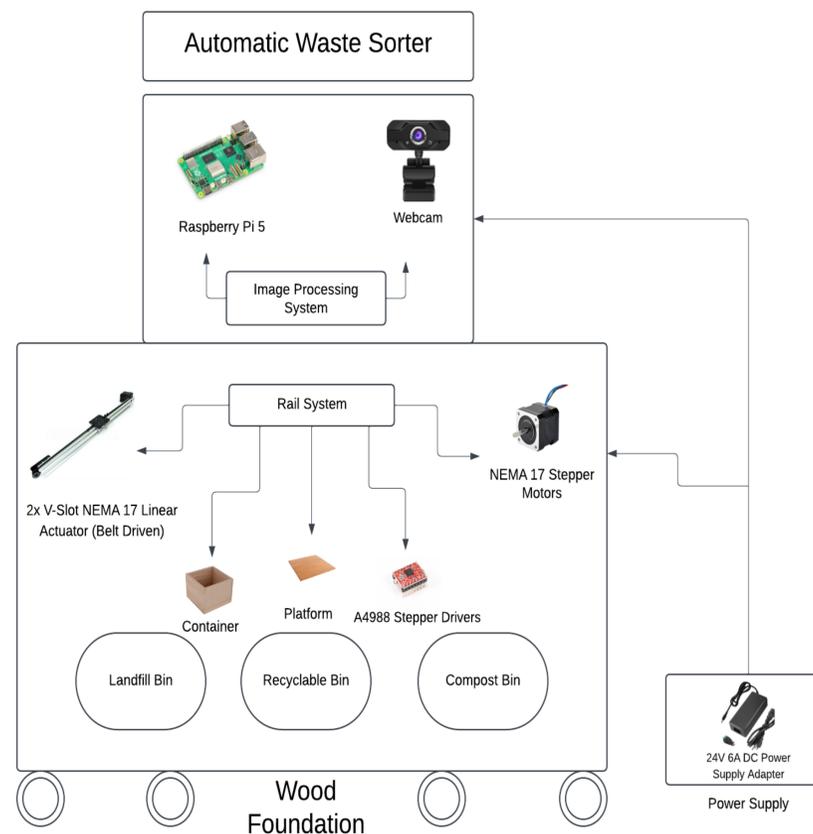
- Efficient waste classification; make the system perform the sorting quickly and automatic
- Sort individual pieces of trash into their specific bin (recycling, compost, landfill) utilizing OpenCV (Computer Vision Library) and YOLO (You Only Look Once) model for object detection.
- User friendly operation; minimal human interaction

## Benefits

- Improved recycling rates
- Reduction in landfill use
- Reduced need for landfill space
- Reduced wildlife harm
- Efficient separation of contaminants



## Design Details



## Object Detection

### 1. Purpose of Object Detection

- Identifies different types of waste (landfill, compost, recyclables).
- Ensures accurate sorting to reduce contamination and improve recycling efficiency.

### 2. Machine Learning Model

- Recognizes materials such as plastic, paper, metal, and organic waste.
- Can run efficiently with low latency and real-time inference

### 3. Benefits of Using AI for Sorting

- Faster and more accurate than manual sorting.
- Reduces contamination in recycling streams.
- Enhances sustainability by improving waste management.

