Waste Sorting Machine

Ameya Vikram(160102008), Amritansh Sharma(160102009), Ekagra Ranjan(160102023)
Department of Electrical Communication Engineering, Indian Institute of Technology, Guwahati-781039, India
Under the guidance of Prof. M.K.Bhuyan

Abstract

- Our project involves building an automated machine for sorting wastes.
- Items are put on a conveyor belt which is analysed using a camera above.
- Objects are detected using computer vision model which signals the motor driver.
- Motor driver activates the mechanical arm to push the object of interest from the remaining waste.

Working Principle

- The waste sorting machine aims to segregate various types of waste with least human effort.
- In our setup the conveyor belt moves forward continuously while newly acquired waste objects are put on it.
- As the waste material moves forward along the belt, a camera is used to monitor the waste objects along it.
- Computer vision algorithms were used to segment all the objects on the belt.
- If the object is of a particular shape and size, then the belt is stopped and mechanical arm is activated which pushes the object out of the belt else allows it to pass.

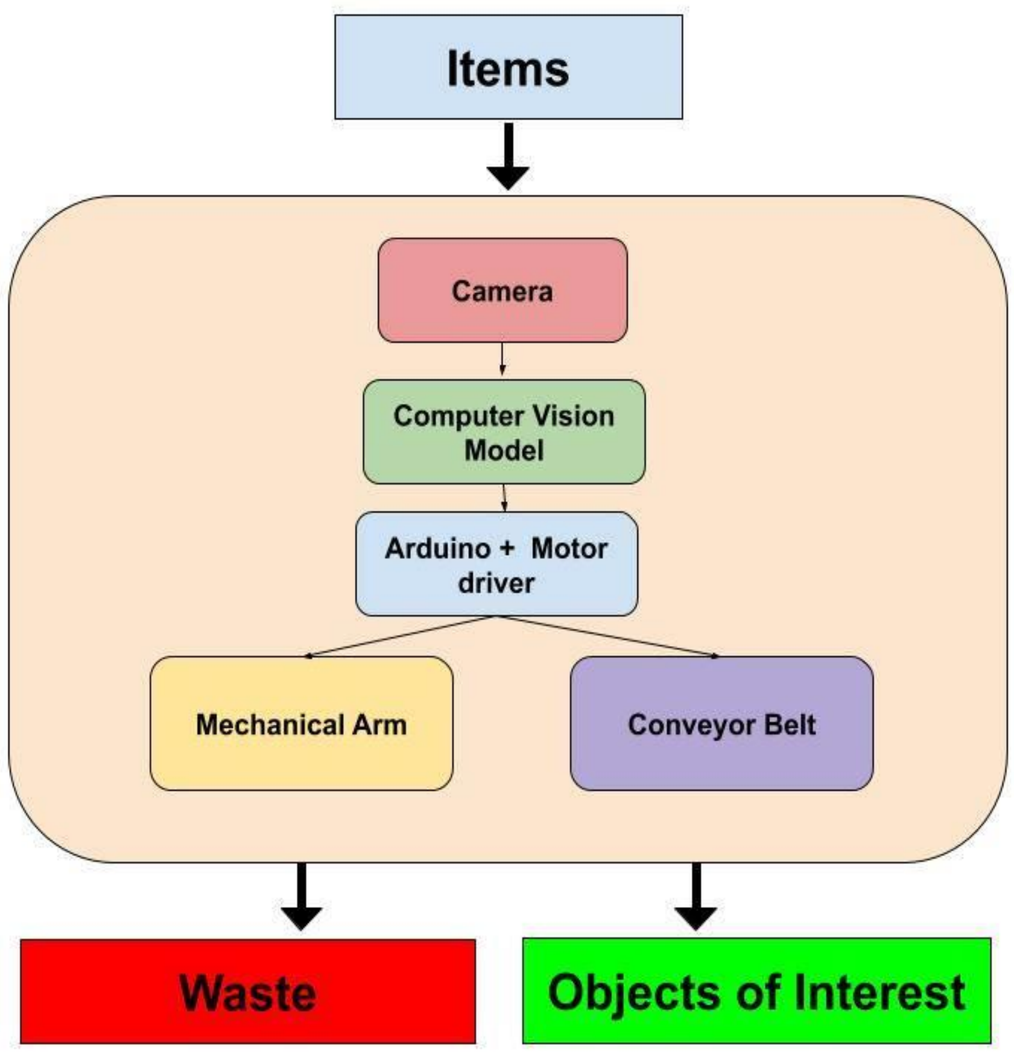

Fig 1: Functional Block Diagram

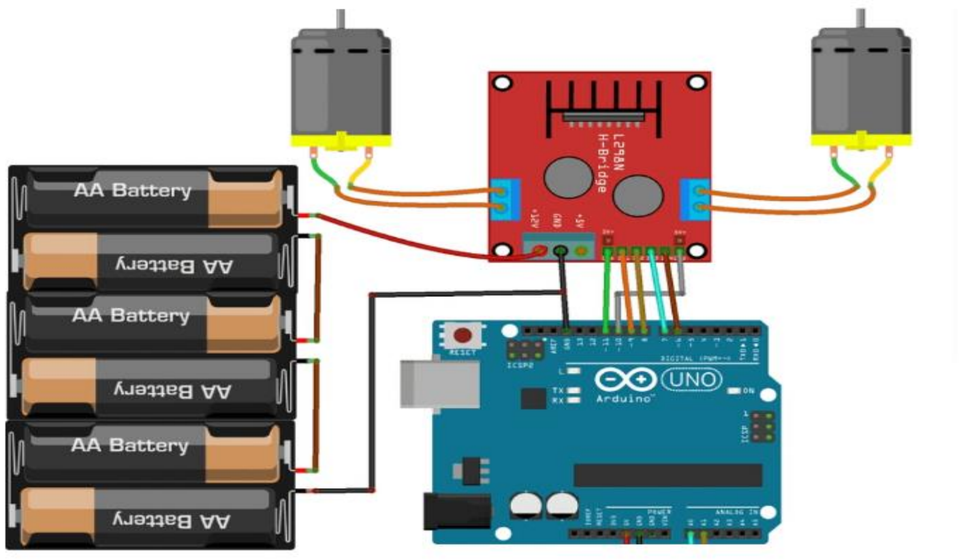

Fig 2: Circuit Connection for LM298N Motor Driver

Main Results

- The conveyor was able to support and move light objects forward along the belt.
- The arm was able to push the segregated objects off the conveyor belt quickly.
- The arm takes **1s** to push the object and come back to its place.
- Repeated operations also didn't result in any deterioration of the speed or stability of the mechanism.
- With a little support to the conveyor belt in the middle part, it was able to support objects without toppling over

Summary and Future Work

- We made a waste sorting machine that separates particular type of objects from the rest of the waste.
- To be of practical use in an industry setting, our project can be scaled up by using multiple arms belt to segregate the waste at a higher speed and with better accuracy.
- We can also use wider and stronger conveyor belt to enable the machine to process heavier and larger sized waste