

Waste Recognition System

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Introduction

Getting rid of waste is an essential component of our day-to-day lives. Waste removal is something that as humans we are constantly doing. The purpose that we take part in the removal of waste is to make sure that we maintain a clean and safe environment for both humans and animals alike. The Waste Recognition System is a device which can identify and sort recyclable bottles and trash automatically.

Purpose

The purpose of the Waste Recognition System is the create a more seamless recycling process. By creating a device which can make the first step of the recycling process automatic, it can lead to a lot more recycled bottles in the long run.

Block Diagrams

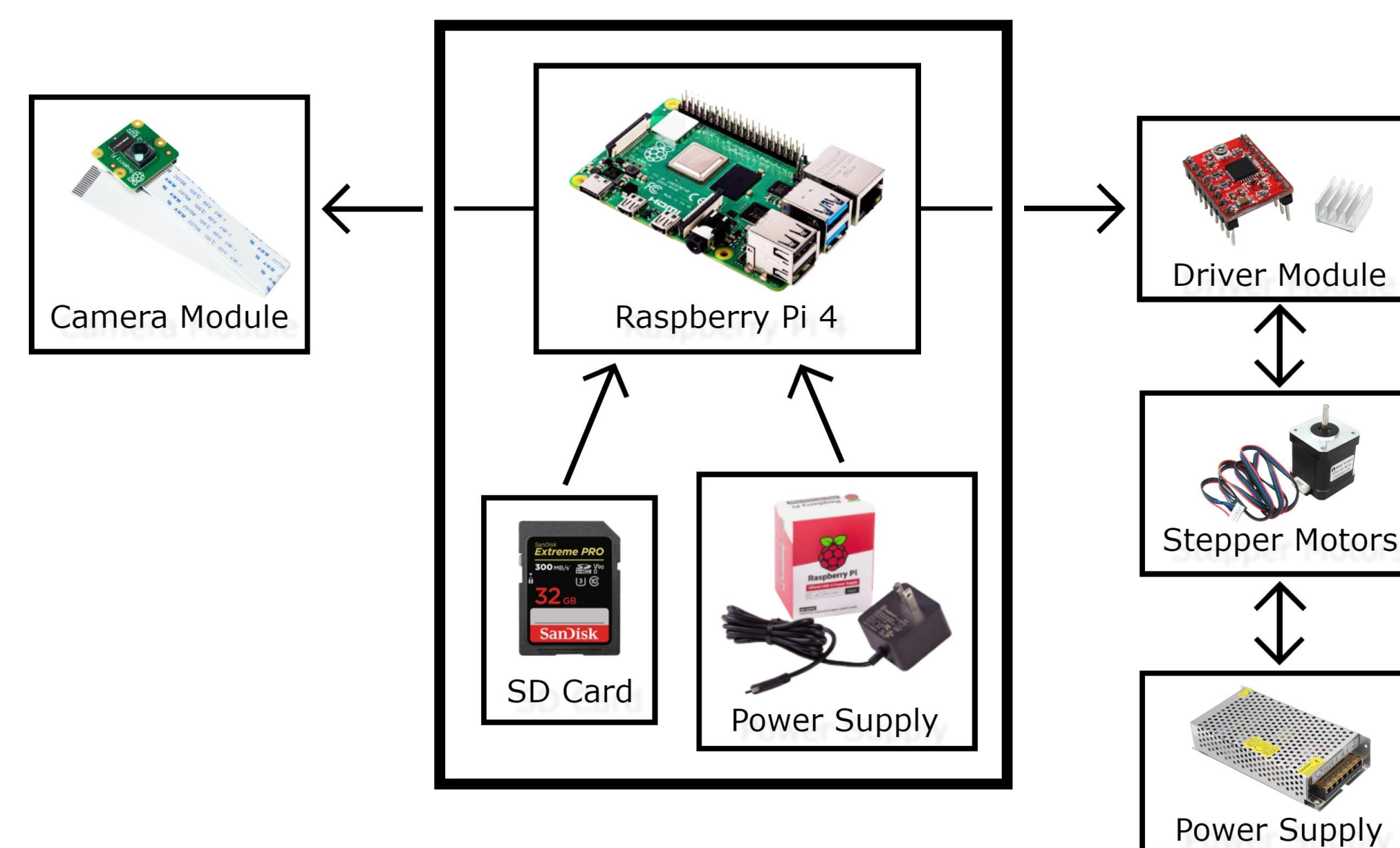


Fig.1: Object Recognition & Sorting Mechanism Flow Chart

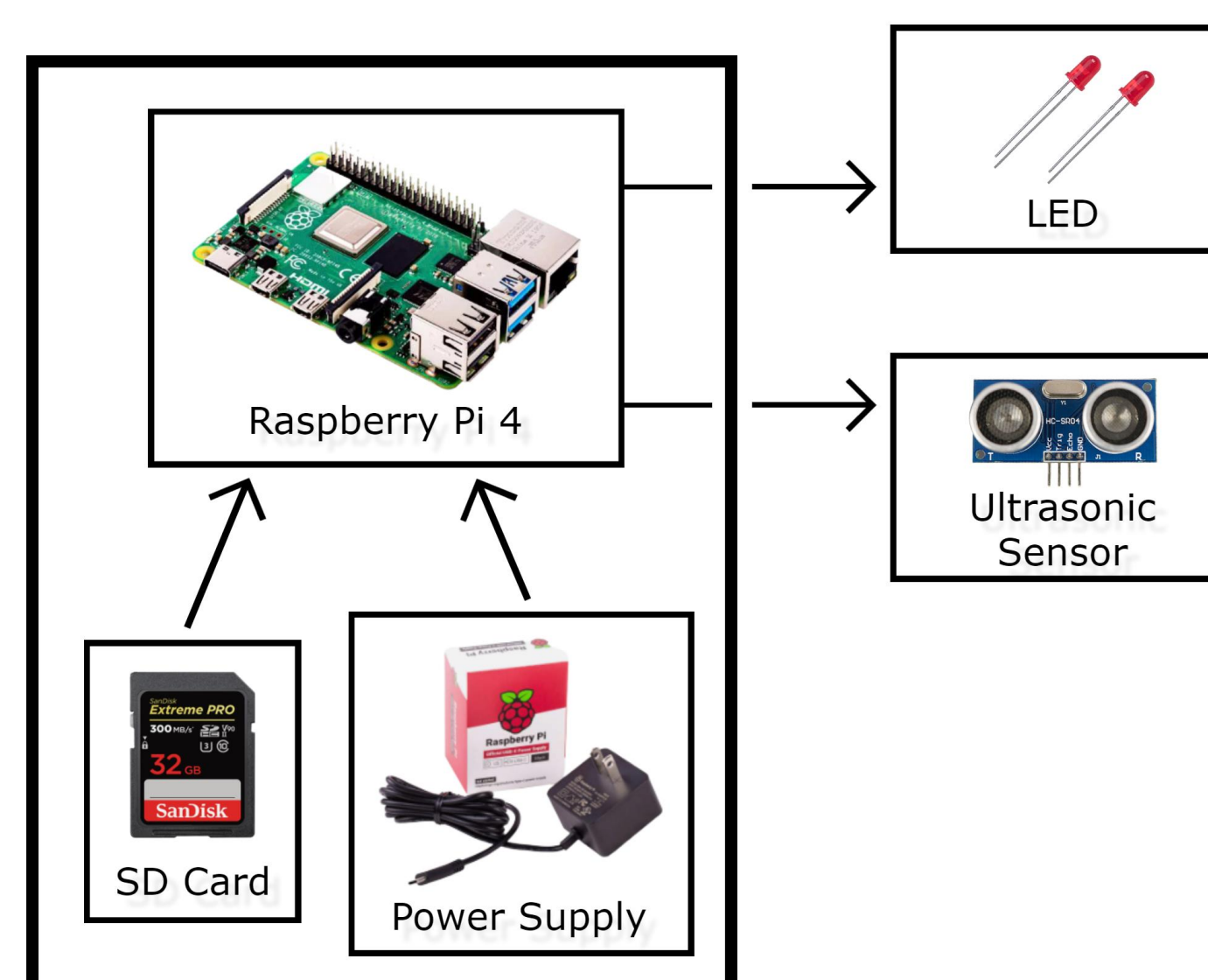


Fig.2: Ultrasonic Sensors & LEDs Flow Chart

Case & Sorting Tray

The casing and sorting tray was built out of ½” Virola wood. This provided a strong foundation for all components to be built into our system. The sorting tray has custom brackets which house a dual stepper motor setup. A gear is attached to each stepper motor which sits on a custom build tracking for the stepper motors to run nicely on. The casing all provided area to house all electronic components: camera, camera mount, raspberry pi, ultrasonic sensors, LEDs, and wirings.



Fig.3: Waste Recognition System (Top Cover On)



Fig.4: Waste Recognition System (Top Cover Off)

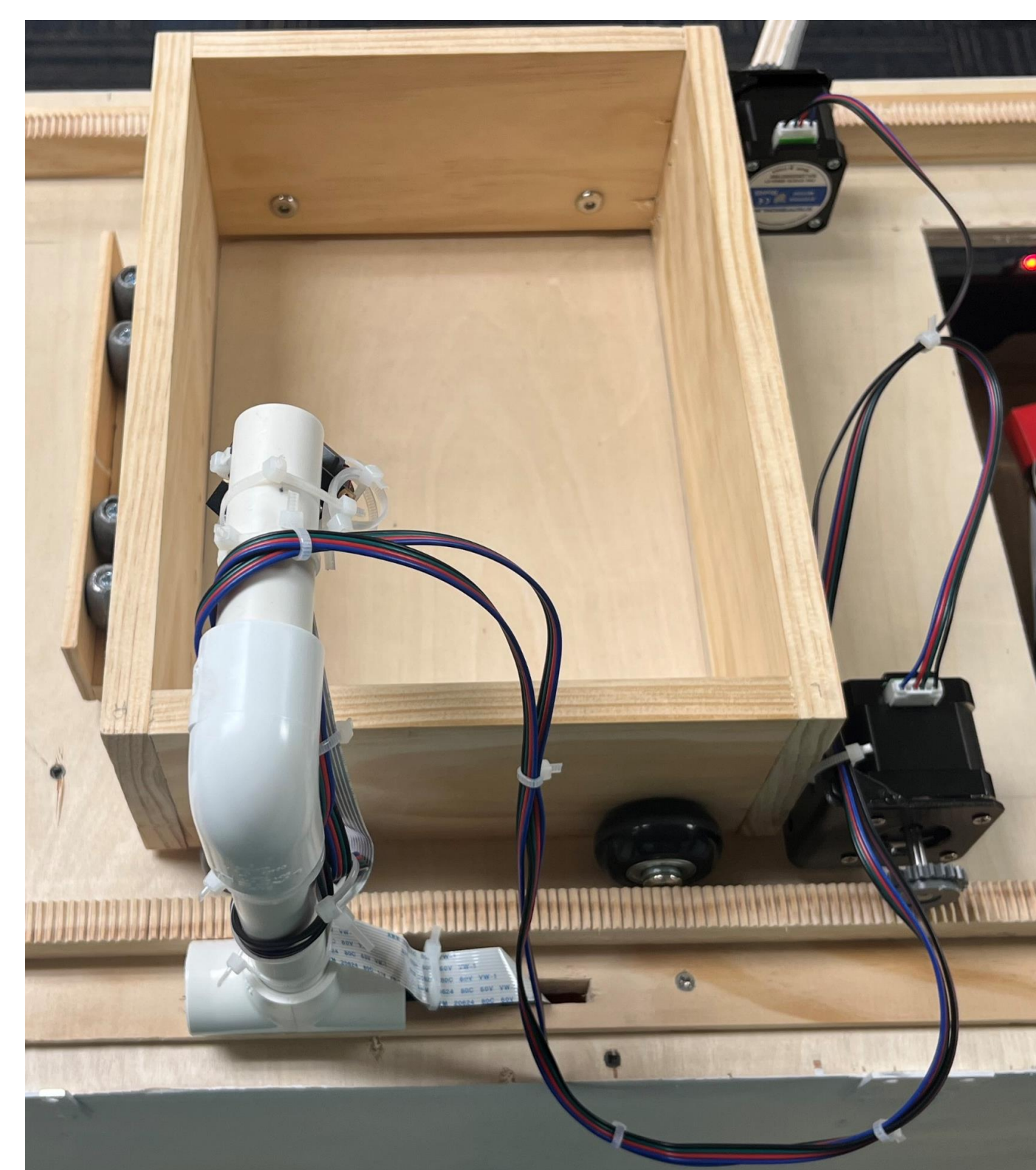


Fig.5: Sorting Tray (Top View)



Fig.5: Sorting Tray Gear and Tracking

Final Implementation

When a user approaches the Waste Recognition System, they will place a single trash item into the opening which can be seen in Fig.3. Then the object recognition process will begin using the components and circuit which can be seen in the flow chart in Fig.1. This will then send a signal to the motor control section of our system to move the sorting tray to its desired direction. The tray then retracts itself to its starting location, ready for another item to be dropped. After many trash items have been disposed properly, the ultrasonic sensor system of our project will then be used to tell the user if a bin is full via an LED, this can be seen in Fig.2.

Conclusion

Recycling is an important process that must go on to help our planet and ecosystems. It is a process that has a large impact on not only our livelihoods as humans but also all the animals which live on earth. Our mission with out project was to create a device which can make recycling easier and more accurate for every people and the team of the Waste Recognition System really believes that was accomplished. The project consisted of many mockups, sketches, constant debugging, and many hours of trail and errors to finally reach our end goal. The Waste Recognition System is a stand-alone device which makes the recycling process automatic.

Acknowledgements

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