

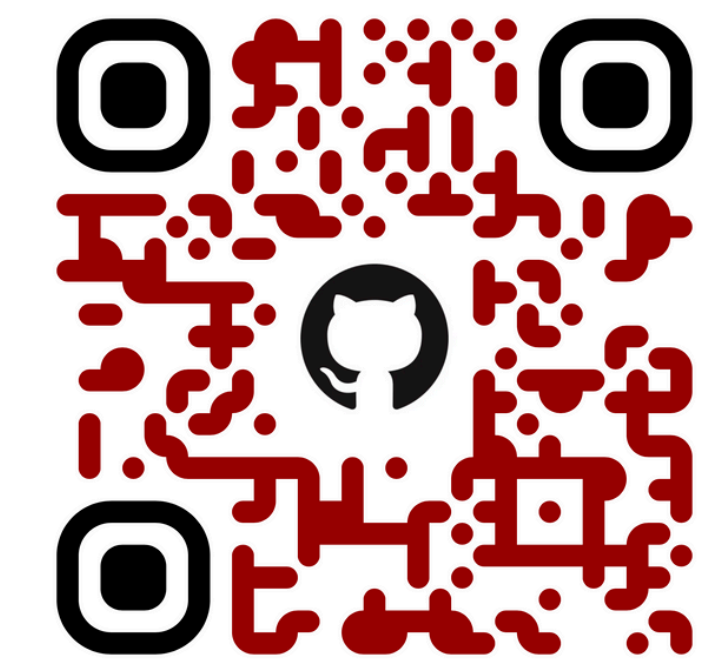


WPI

Automated Disc Analysis and Inventory System

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Introduction

The stakeholder wants to create an online store that replicates an in-person shopping experience at a disc golf pro-shop. The stakeholder needs an autonomous machine to collect sufficient data and cosmetic photos of discs to quickly inventory for online retail.

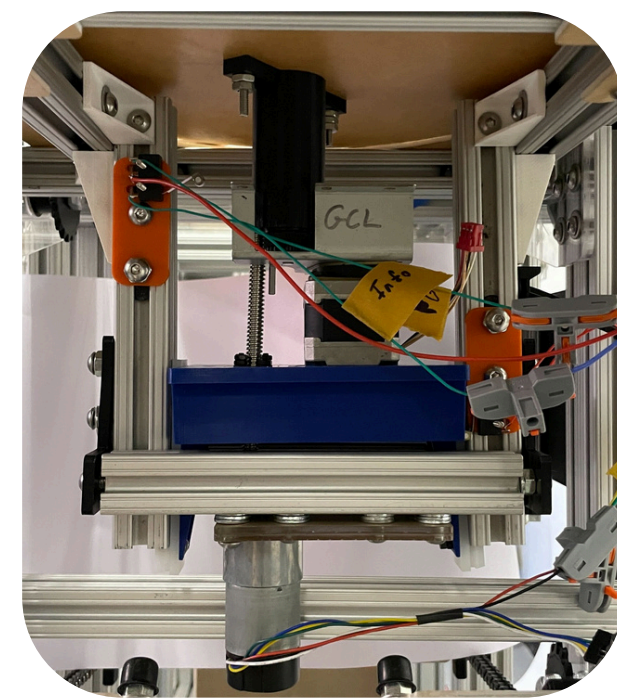
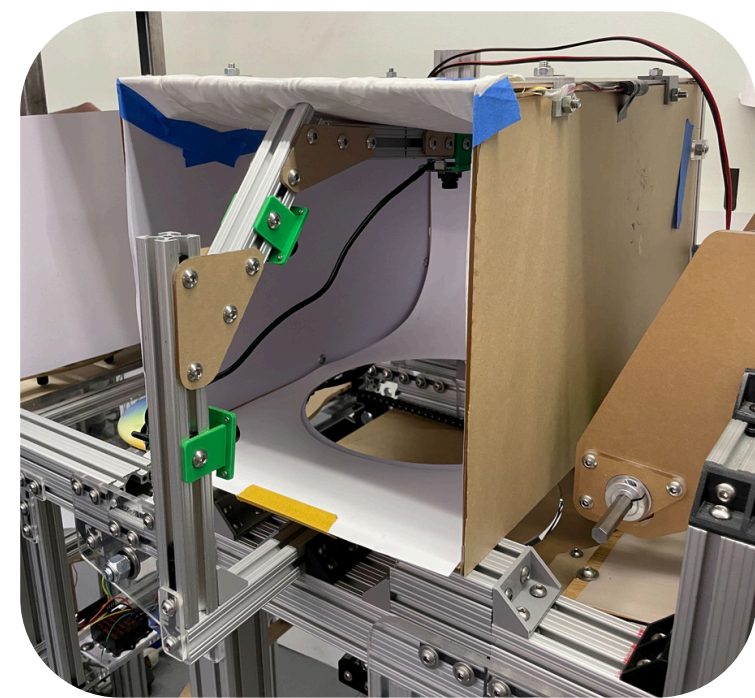
Requirements

Multiple requirements were presented by the stakeholder to create a machine that could process the discs how they wanted. This included autonomous collection of accurate data for use in an online store, seamless interaction with a machine operator, and efficient storage of each disc and its corresponding data.

Measurement Modules

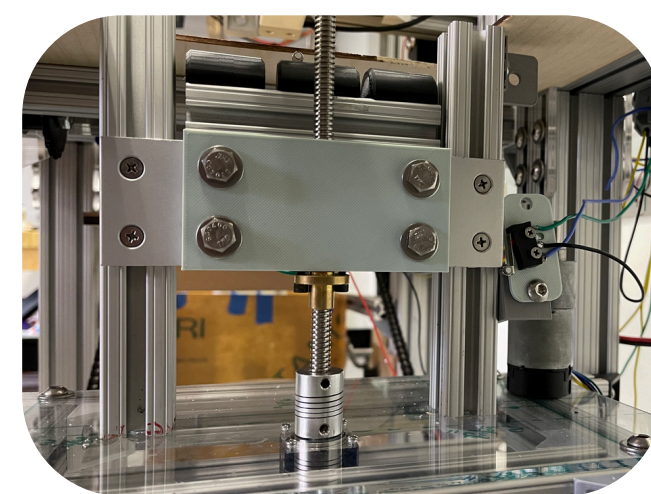
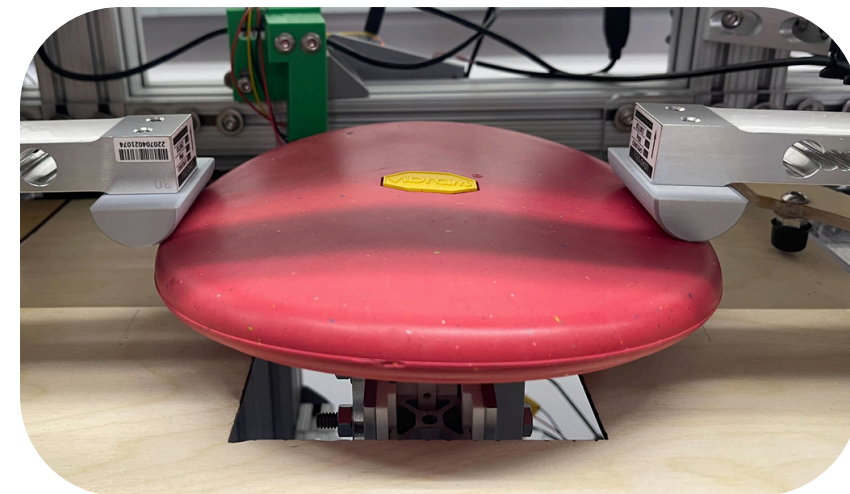
Turntable & Camera System

The camera and turntable system lifts discs up into a photo booth to take pictures and store them to create a 3D rendering.



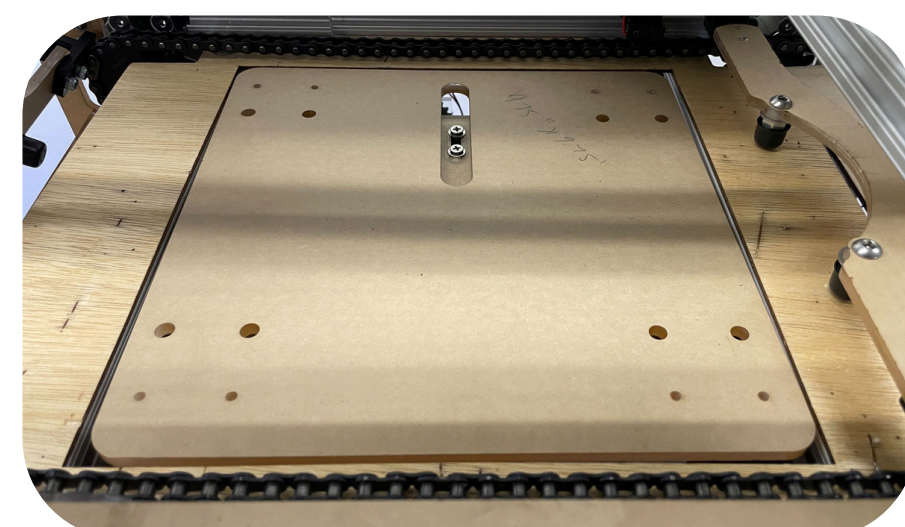
Flexibility System

The flexibility system uses load cells and limit switches to measure the stiffness and height of the discs.



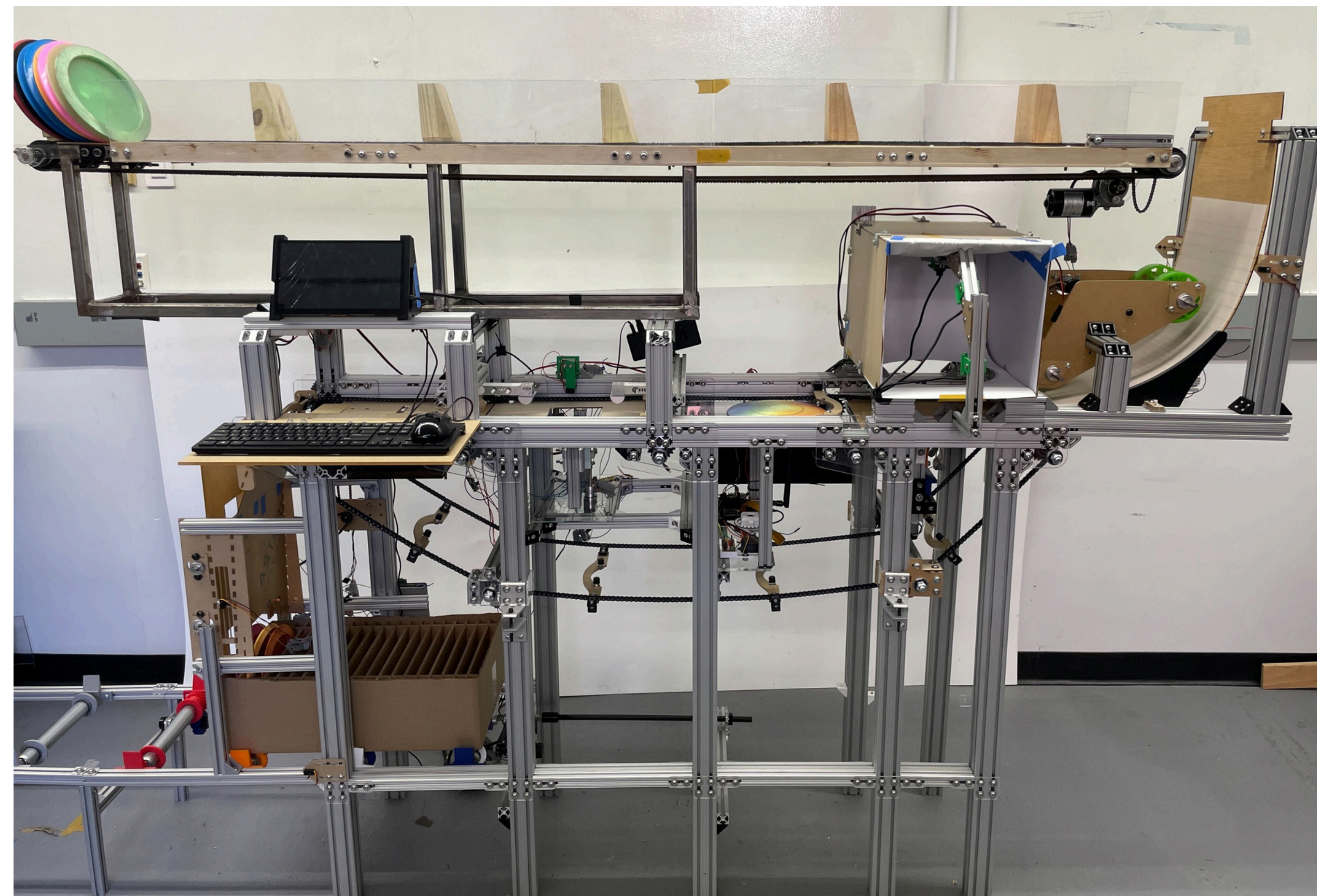
Weight Measurement System

This system measures and records the weight of the disc using a rewired RS232 scale.



Project Objectives

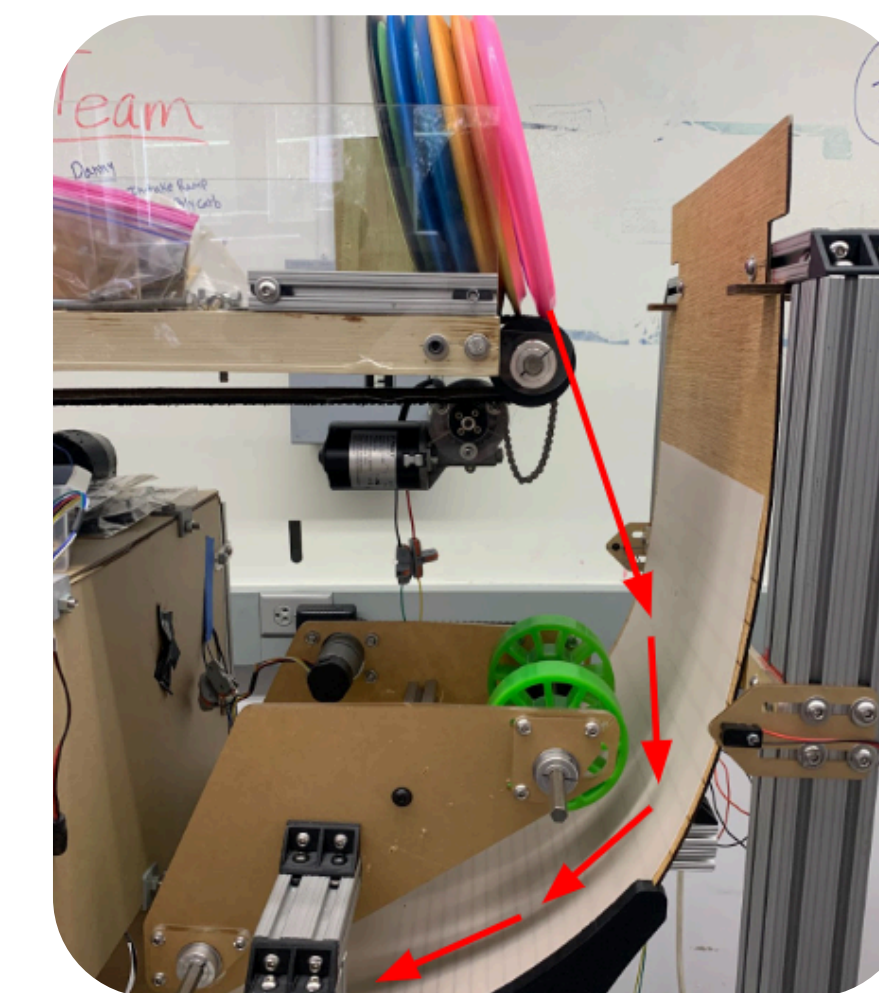
The team aimed to complete a modular design to ensure adjustability while also striving to create a machine with the necessary requirements. The main objectives were to enable measurement upon button activation, achieve disc motion through the conveyors, and prototype mechanical and electrical module designs.



Motion Modules

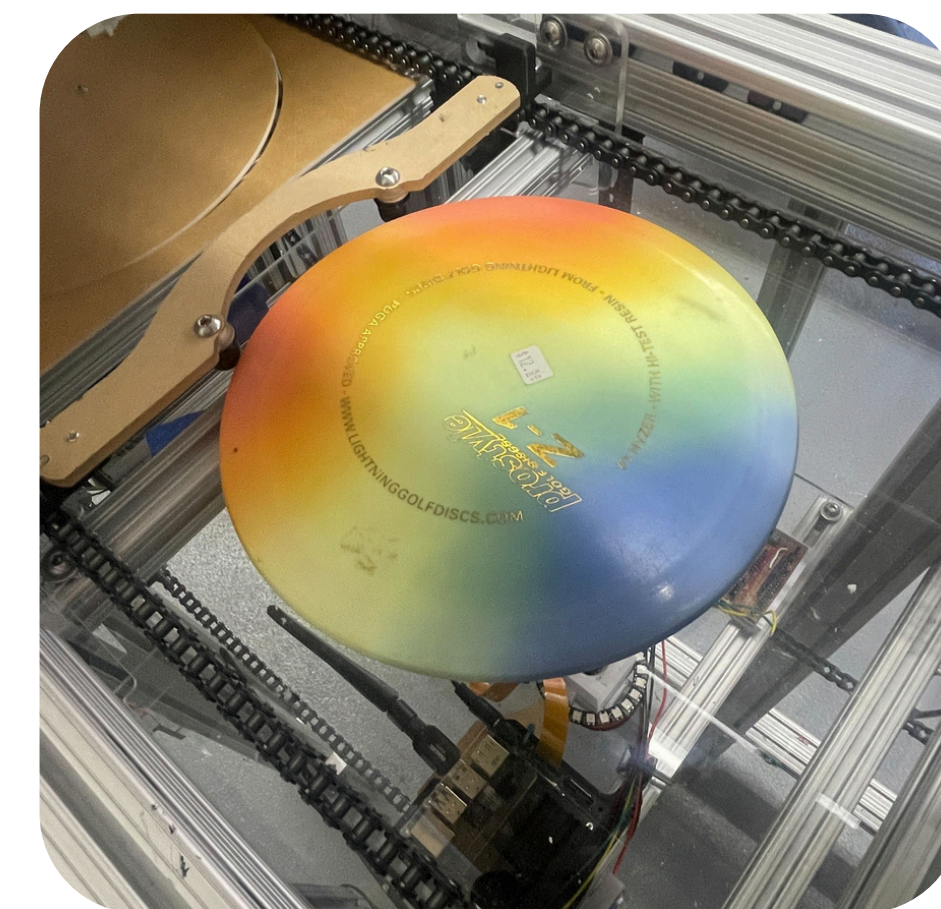
Intake System

The intake system serves as the connection between the disc queue and the main conveyor.



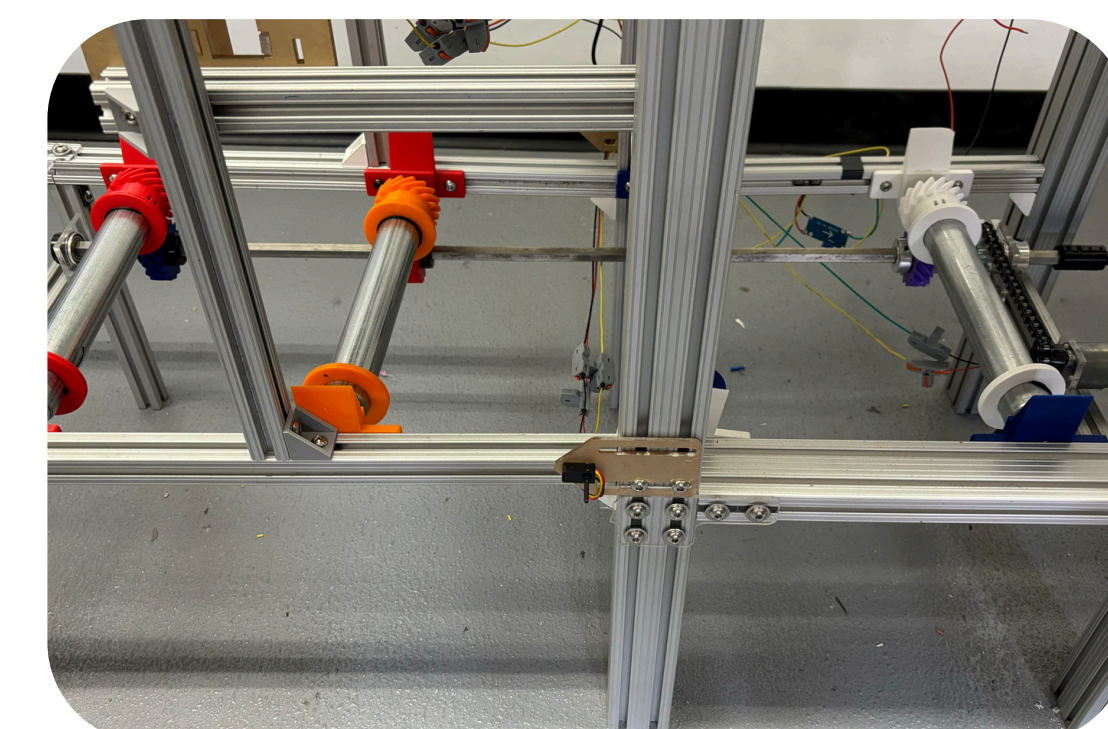
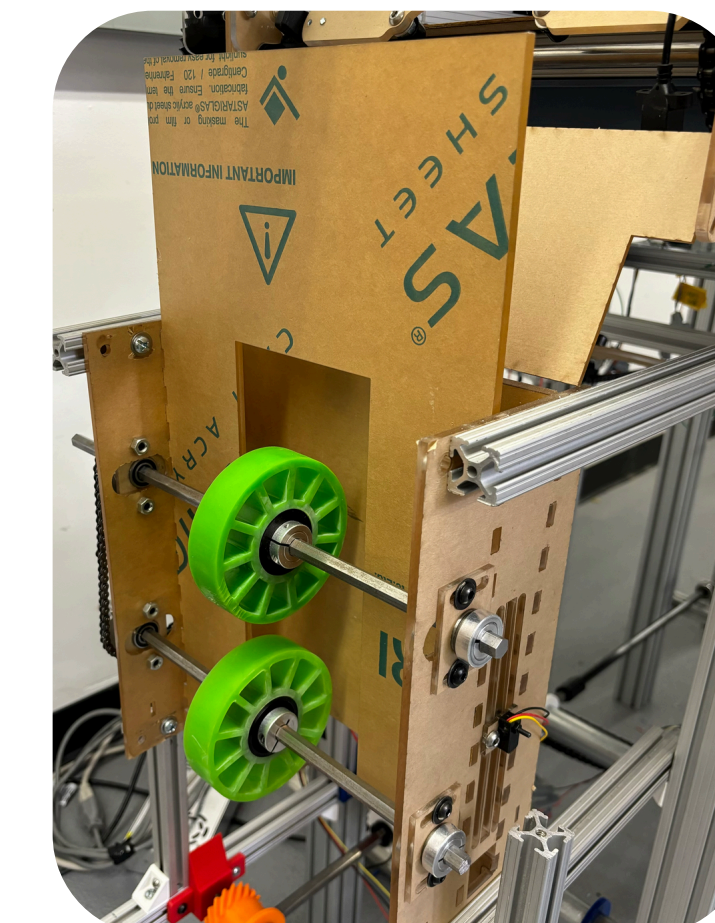
Main Conveyor System

This conveyor system provides a reliable and repeatable way to autonomously move discs through the machine.



Outtake System

The outtake system sorts the measured discs into independent slots within a box using multiple sensors and motor controllers.



Recommendations

- Additional modules can be added to perform new measurements.
- User interface (GUI) can be improved to provide the users with a seamless and intuitive interaction with the machine.
- Exporting data online and storing images directly to an online store.