



Project Description

Problem Statement:

The manufacturer, Johnson Matthey, is currently doing quality control of marker bands (small radiopaque metal bands) via manual inspection under a microscope. This process is tedious and time consuming, thus a streamlined and automated sorting method is desired.

Project Requirements:

- Bulk feeder that accepts a batch of parts
- Parts must not be damaged during processing
- Parts delivered 1 at a time
- Parts are all aligned in the same orientation
- Must be completely flat (+/- .01")
- Part viewing box of 0.95" x 0.95" x .08"
- Parts must completely stop moving in the viewing box
- Cycle time per part must be less than 5 seconds
- Must be no vibration in system during measurement
- Must have 'triggering' system that removes 'bad' parts
- Mechanism to collect good and bad parts separately

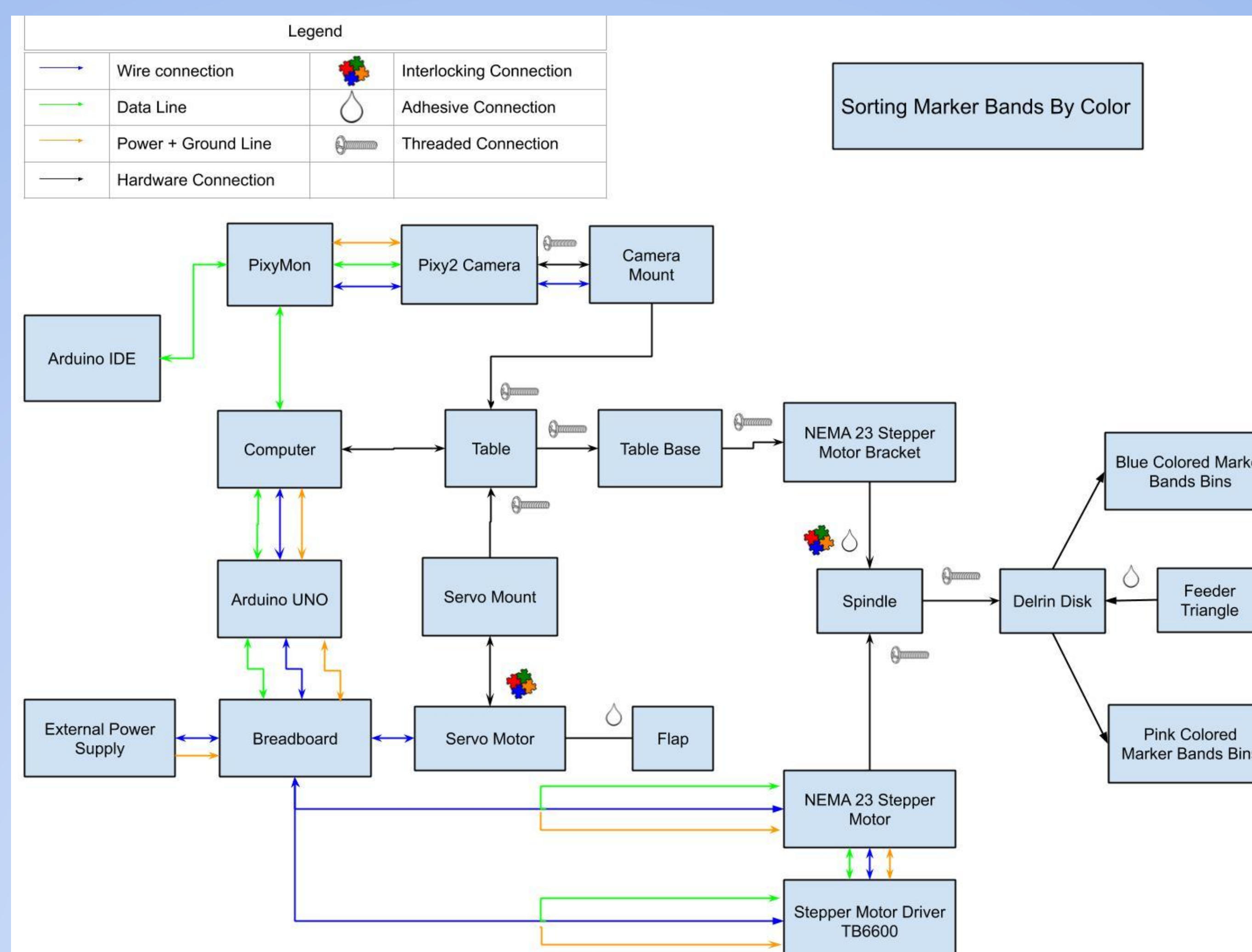
Our Solution:

An automated, machine vision sorter that sorts marker bands based on color, utilizing a Pixy2 Camera. This sorter is designed to be interchangeable with a Keyence XT-24 3D scanning camera, capable of measuring band length tolerance. In addition, this sorter will allow a bulk amount of marker bands to be automatically sorted into separate containers.

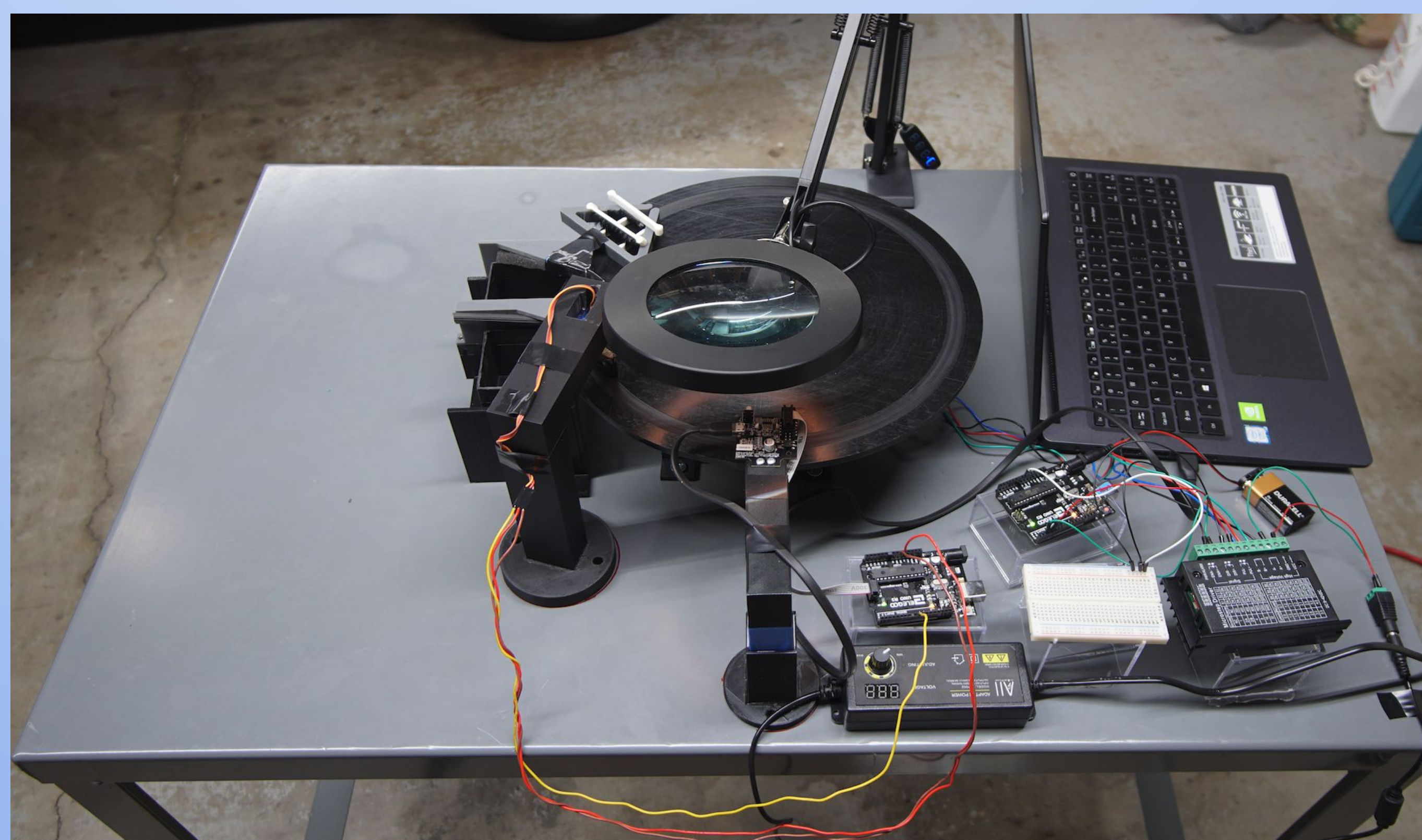
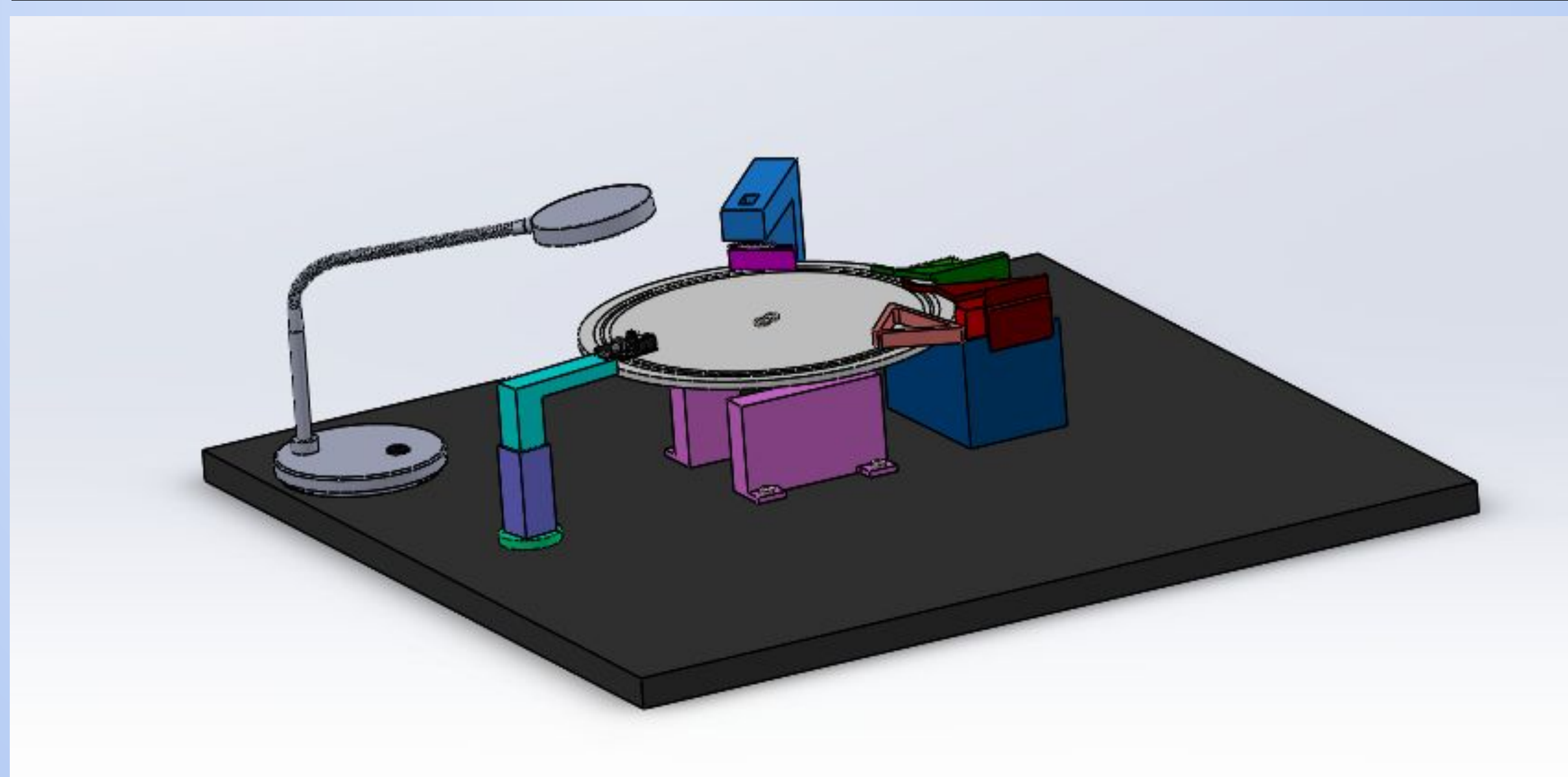
Main Components

- Pixy2 Camera
- Two Arduino Unos
- Delrin Disk (12" diameter x 0.25")
- Table base (for the Delrin Disk to rest on)
- Nema 23 Stepper Motor
- Nema 23 Stepper Motor Bracket
- TB6600 Stepper Motor Driver
- Feeder Triangle (with bristles)
- Magnifying LED Lamp
- Servo Motor with Flap
- Collection Bins
- 3V - 24V Adjustable DC Power Supply
- Crayola Washable Kids Paint Set, 10 Count (to paint marker bands so Pixy2 Camera can detect them)

System Level Diagram



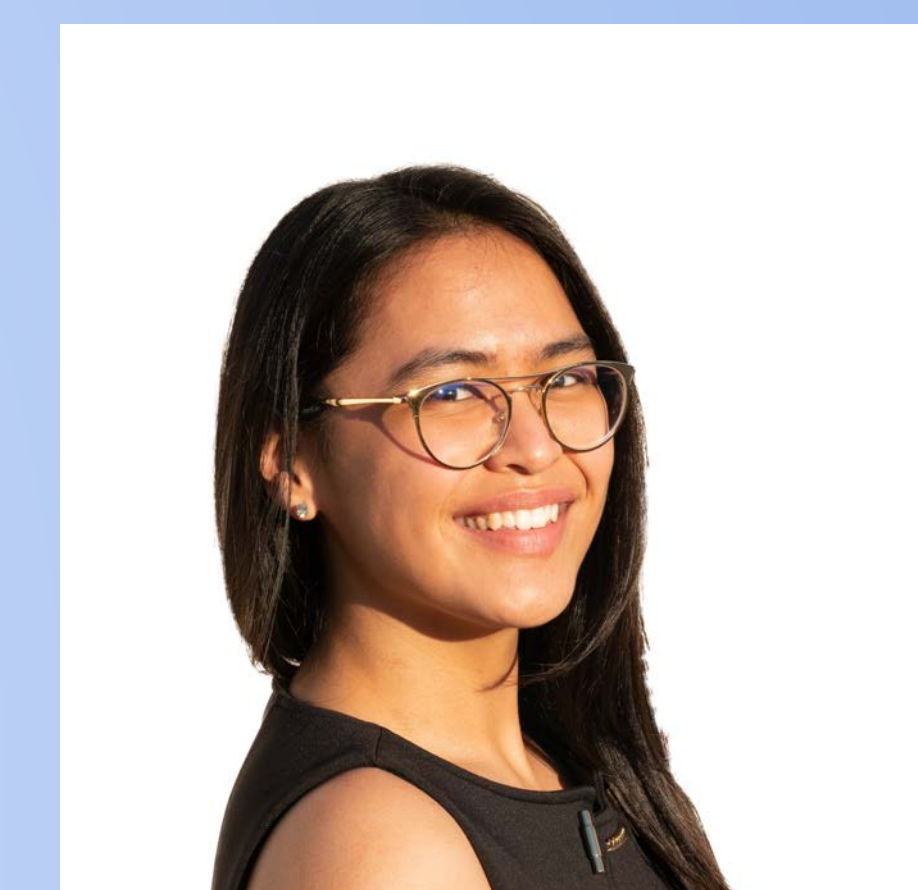
Final Product



About The Sponsor

Johnson Matthey is a multinational pharmaceutical, chemical, and sustainable technologies company that focuses on cleaner, more efficient uses of natural resources. Some of their specialties include automotive catalysts that reduce hydrocarbon output, active pharmaceutical ingredients for life-changing drugs, and advanced processes for recycling platinum group metals. In addition, Johnson Matthey is one of the leading suppliers of radiopaque marker bands used in the medical industry.

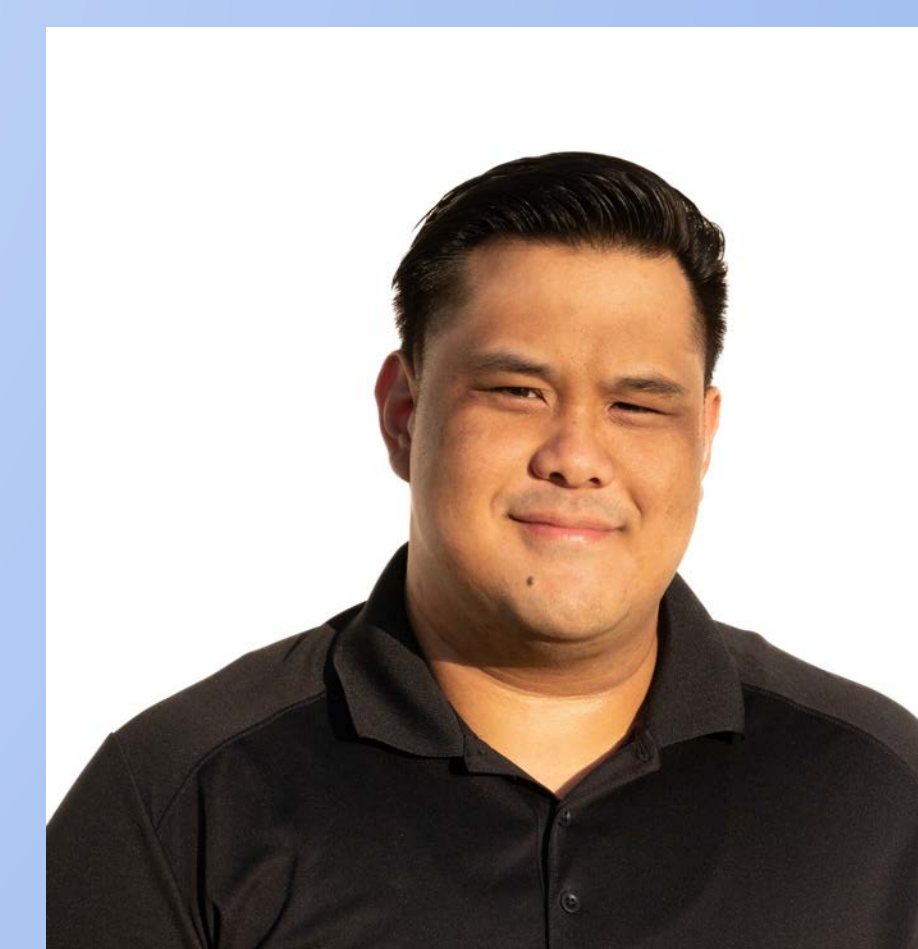
Team Members



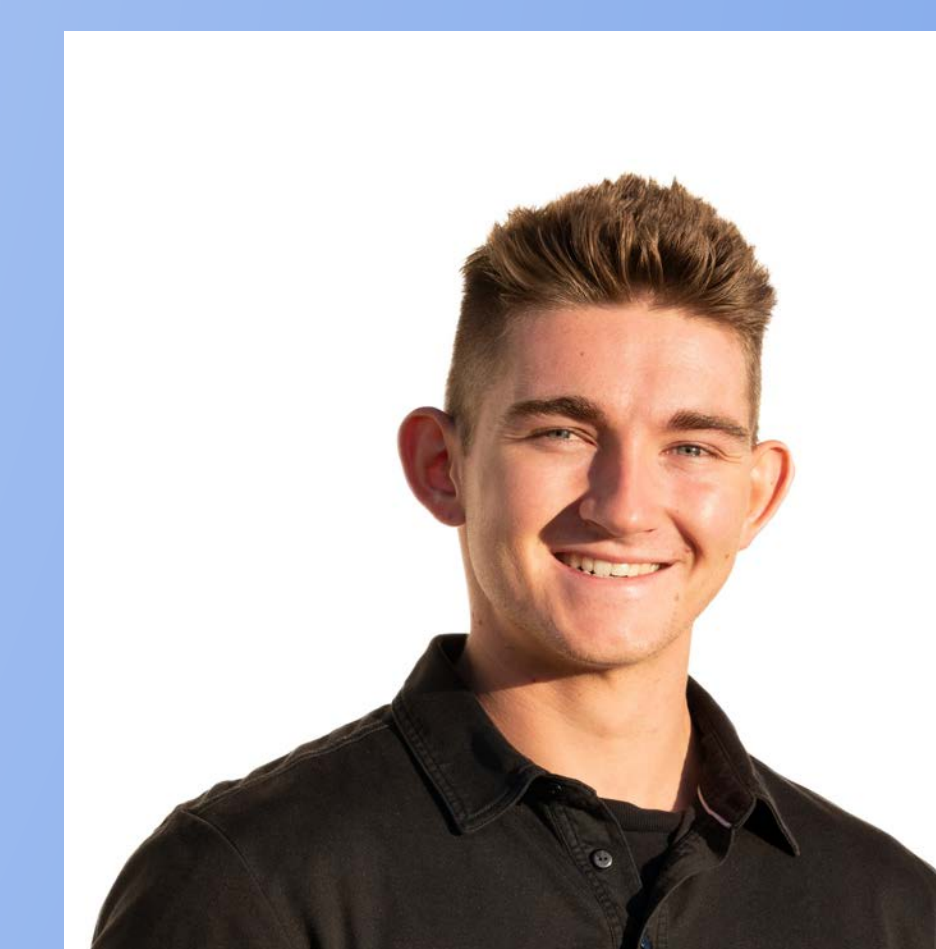
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