Robotics Club Responsbilities

Robotics Documentation

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Date: August 2019 – June 2022

2022 Robot: Buckets:

Position: Team Captain (Hardware Lead)

Onhshape CAD link:
https://frc971.onshape.com/documents/cee779e8be37afc9ef4b37a2/v/6fda885e7d1dc42af7b6f9ed/e/92518adfc48321371c540722?aa=true

CAD Files link:
https://drive.google.com/file/d/1uxvK76aKDBNADwnMVxl_oWVrOt-Dhy2k/view?usp=drive_link

Responsiblites:
- Was Captain of the Team this year, led the entire mechanical side, and also worked on design, prototyping, and assembly
  - Held Weekly leadership meetings with future plans and current progress
  - Addressed missed deadlines and subsytem conflicts
  - Was point of contact between student and mentor support
- Worked on intake design and prototype aside from managing mechanical
  - Had five iterations of possible intakes and preformed quantitative testing to statistically find best design
  - Assigned team members to help assist with manufacturing and assembly
- Worked on schematics of the entire design
  - Calculated Design constraints, Degrees of freedom
  - Communicated with subsystems to seamlessly integrate each part into robot before constructing
  - Understanding FRC rules to avoid disqualification
- Worked on PCB assembly of electical raspberry pi camera lidar sensors
  - Was an alternative solution to the "Limelight" sensor
  - Involved in inital testing and calibration of these modules
- Worked with Electrical and Code Team to assign inputs to our custom made PCB
  - Designed schematic of electrical diagram, including PCB, Power Supply and VRM
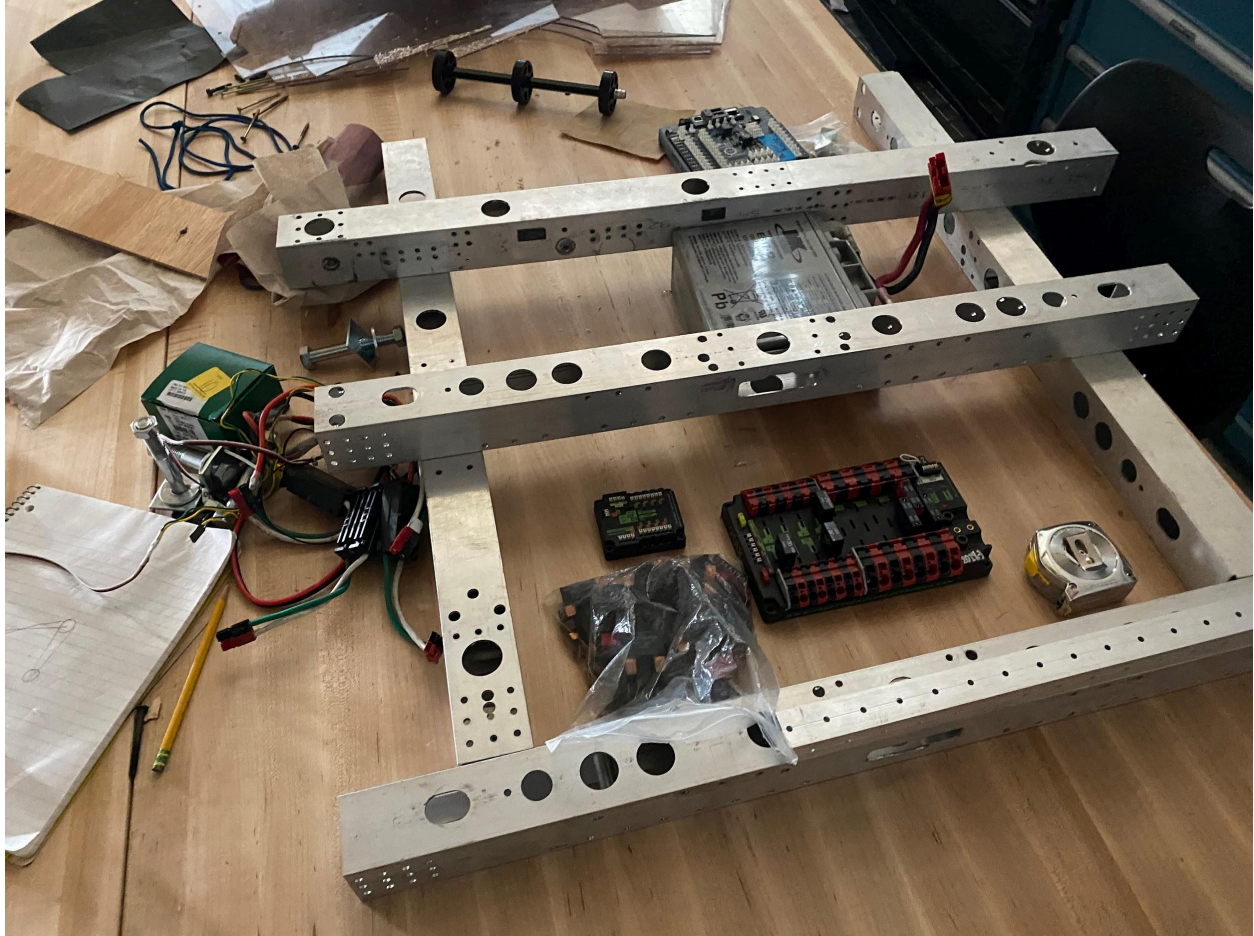 - IMU and encoder placement

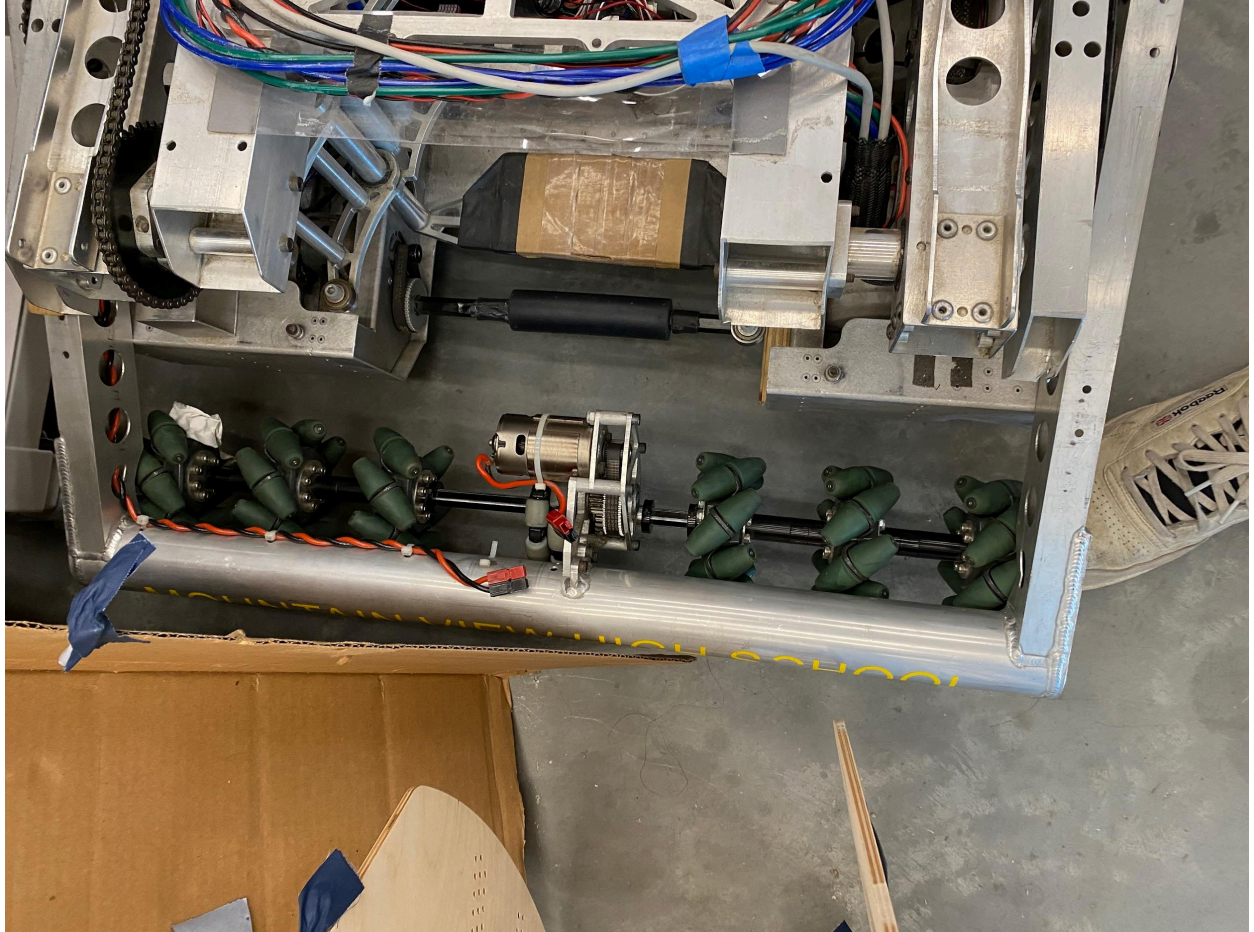**Figure 1.1:** Initial Schematic of robot design
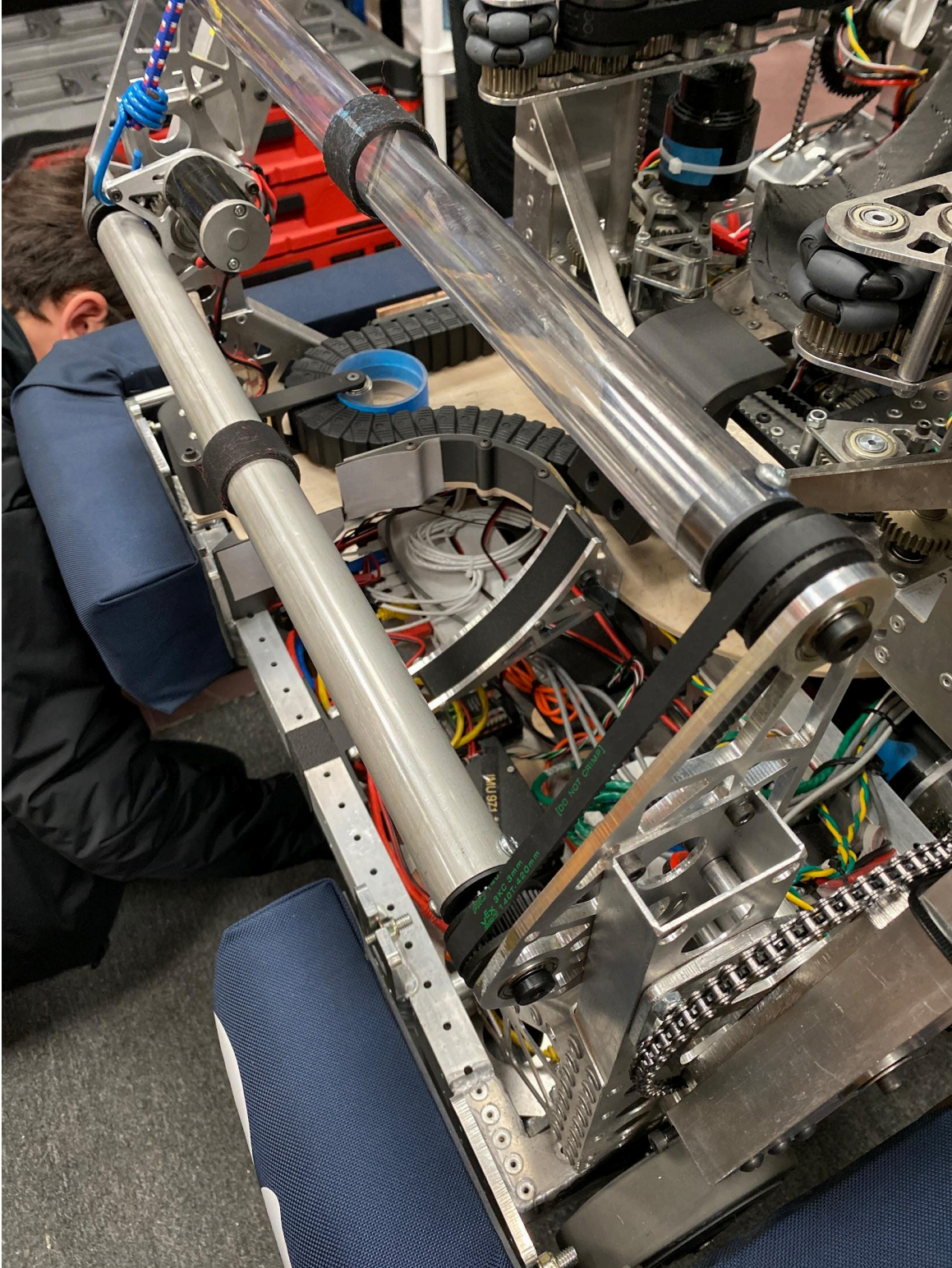
Figure 1.2: Initial prototype design of Intake
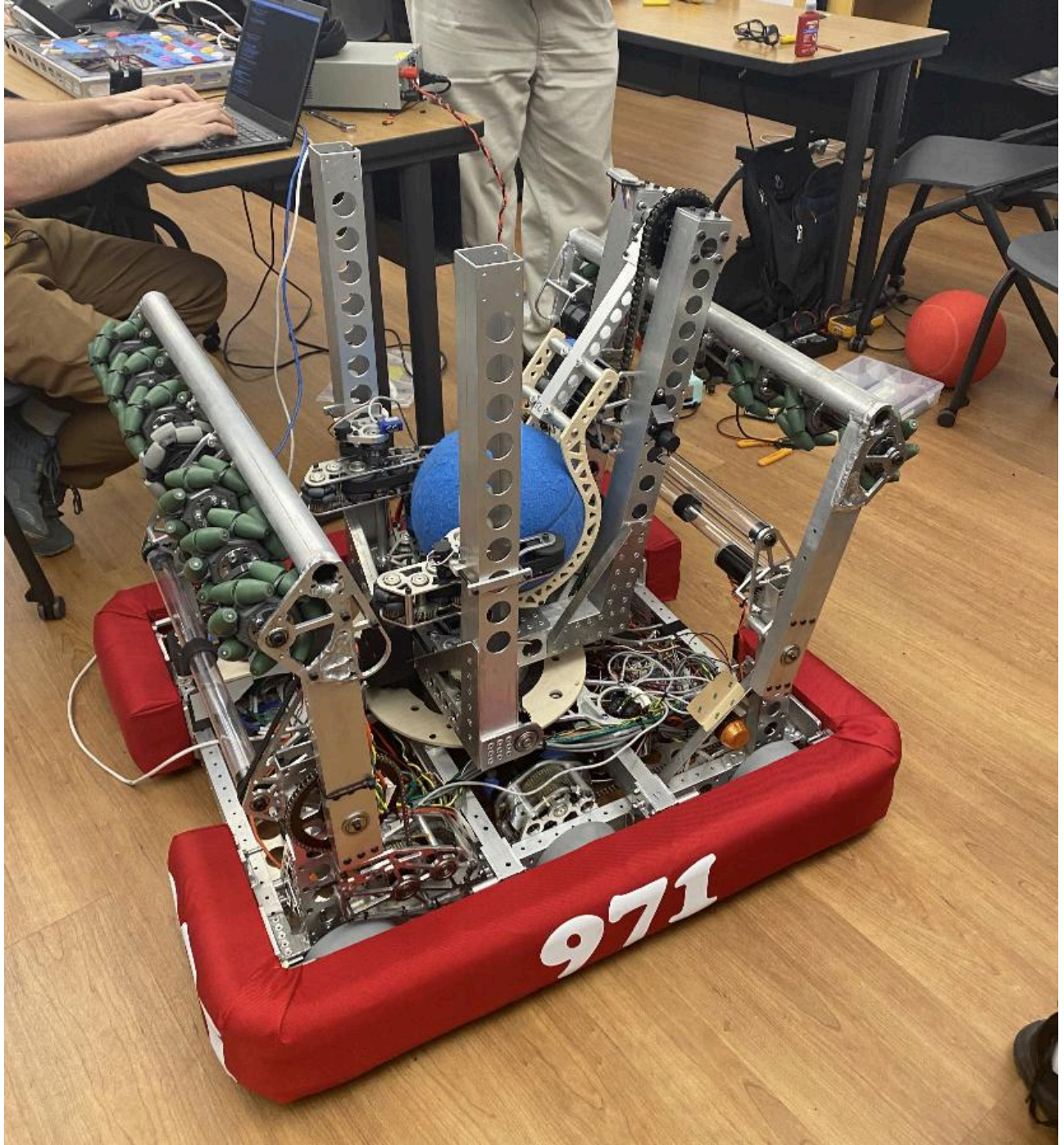
Figure 1.3: Inital intake design
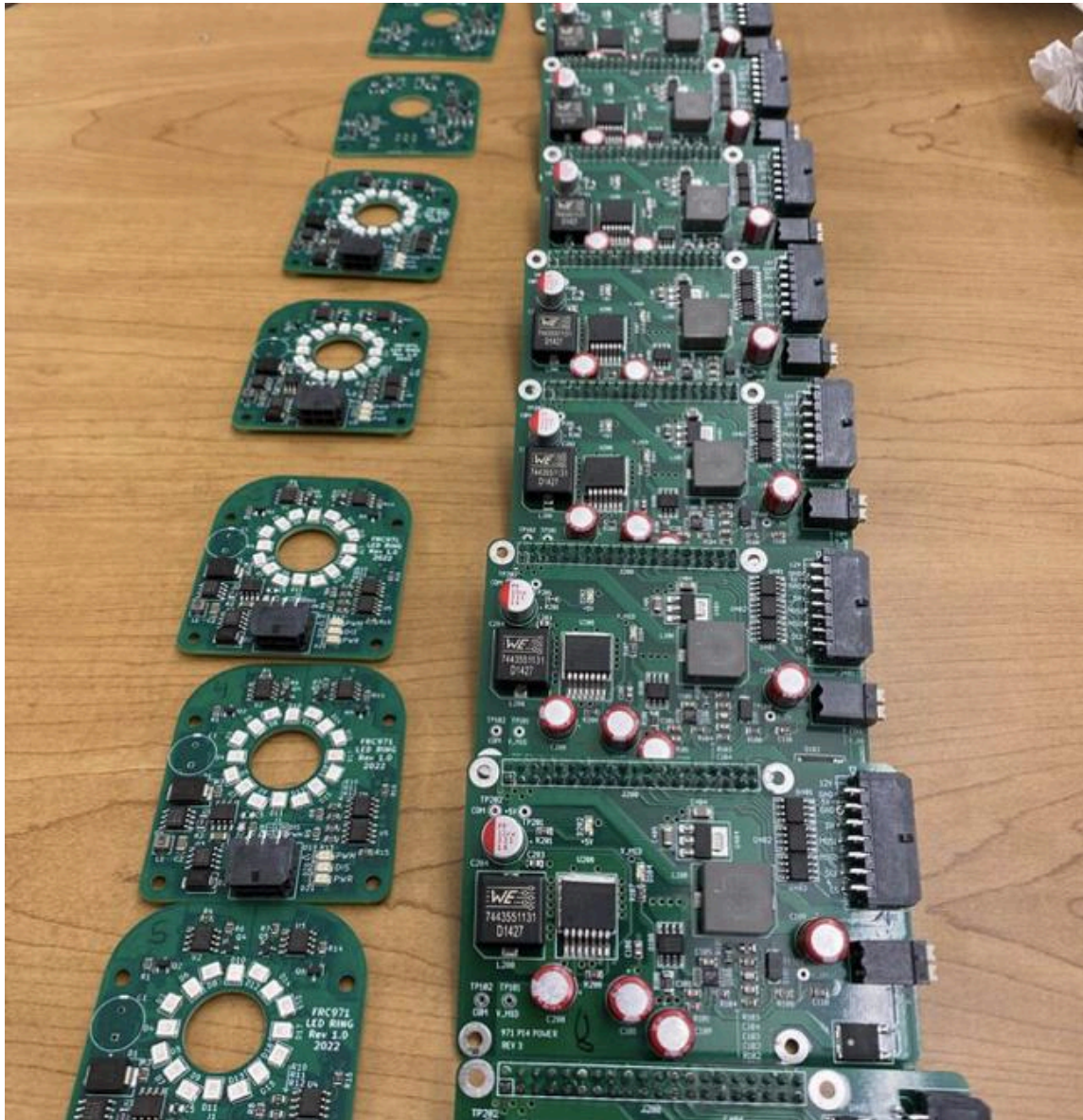
Figure 1.4: Final Robot Iteration

Figure 1.5: Raspberry Pi Sensors

2020-2022 Robot (COVID):

Position: Electrical Lead, Code Team, Prototype Lead

Responsibilities:
- Worked on Electircal design and schematics
  - Designed the schematic of electrical layout of the robot and assigned inputs to PCB and VRM
  - Communicated with code team to inform respective inputs
    - Required understanding of how their code functions
- Worked on initial prototype and camera calibration testing
  - Inculded gathering data among different subsystem tests
- Worked on the code for Spline UI in python
  - Robot will follow spline during autonomous runs
  - Basic knowledge of calculus and interpolation needed
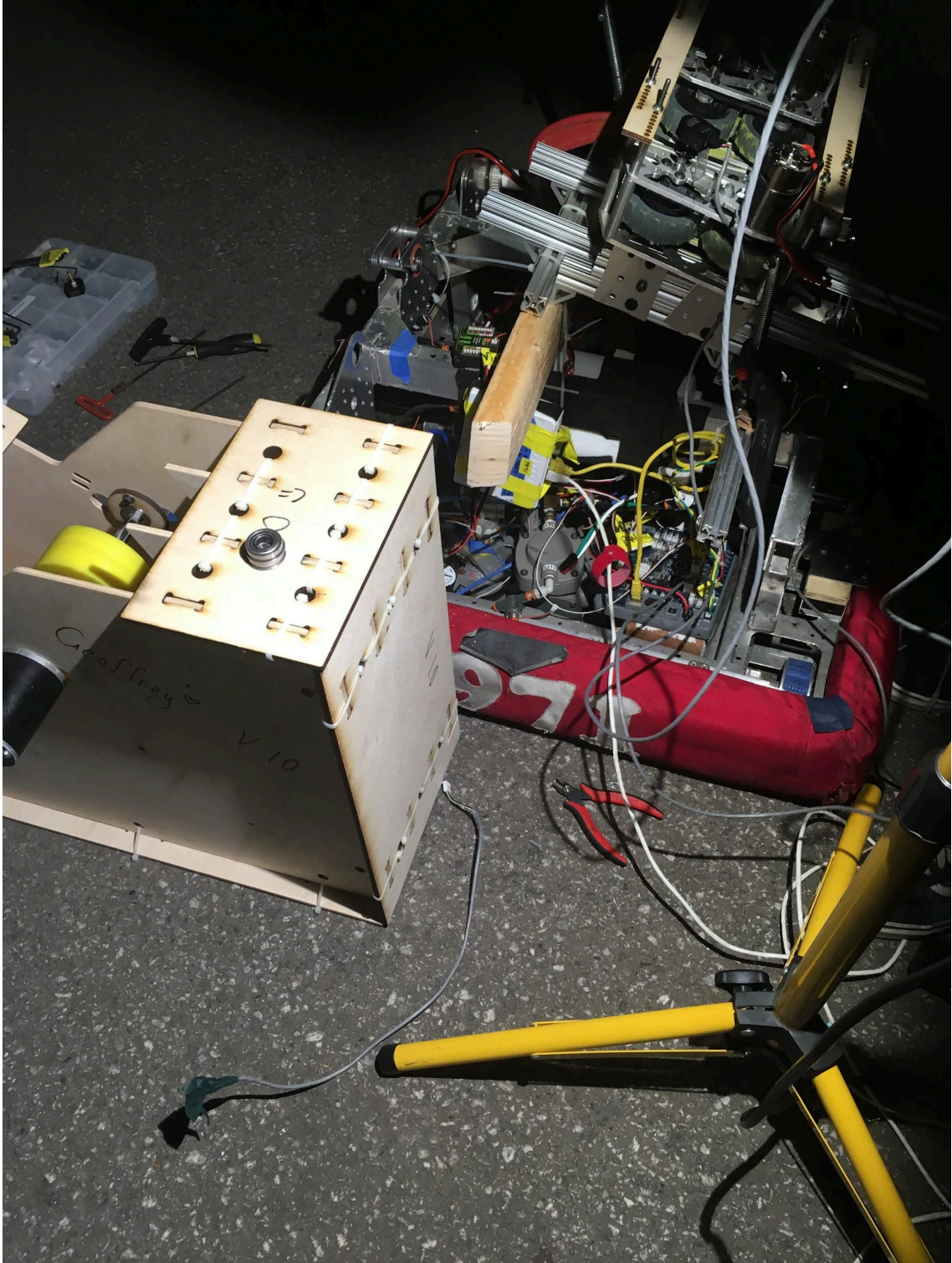- Presented at City's Technology Showcase

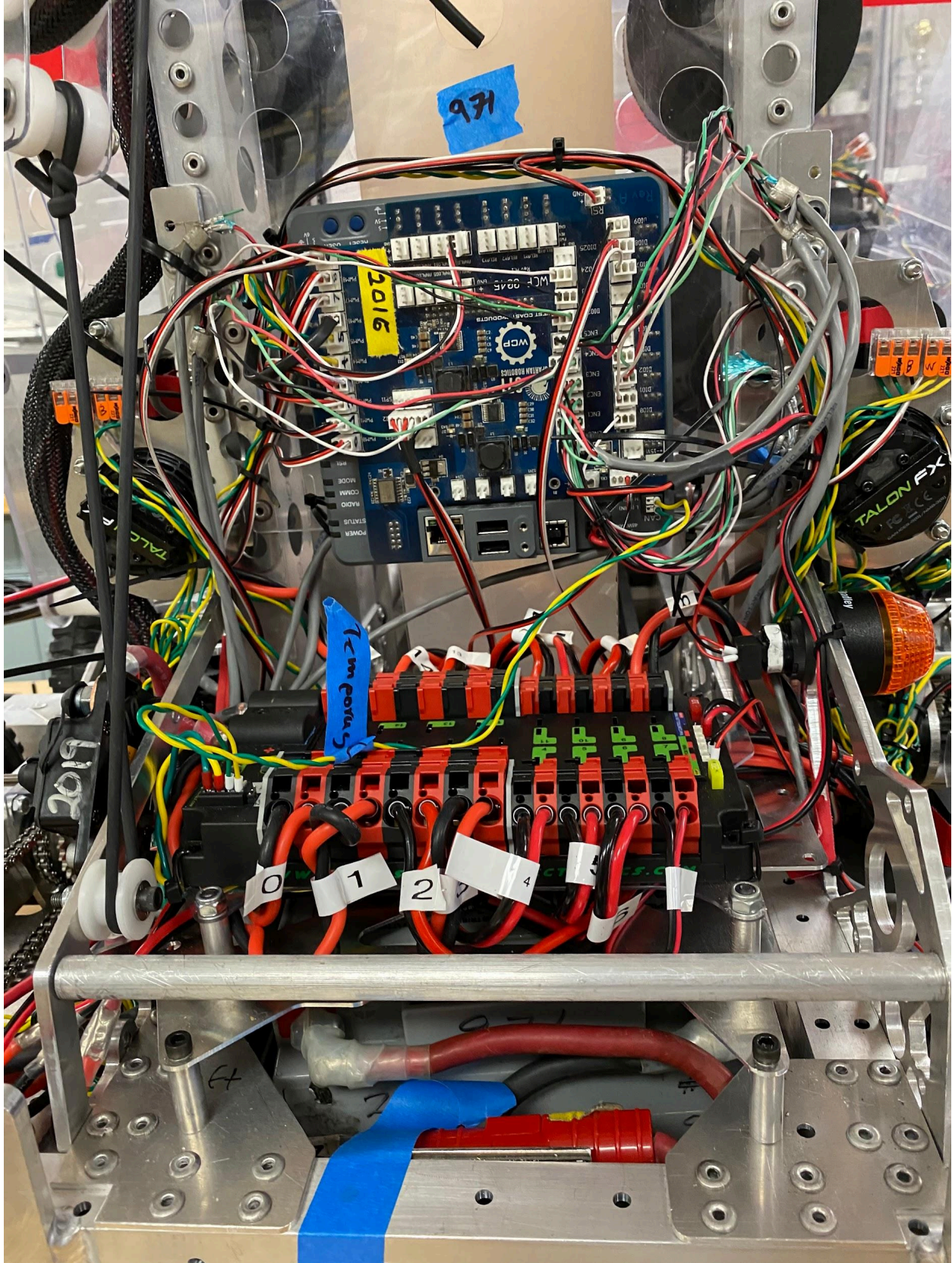**Figure 2.1: Initial Prototype Testing for Each Subsystem**

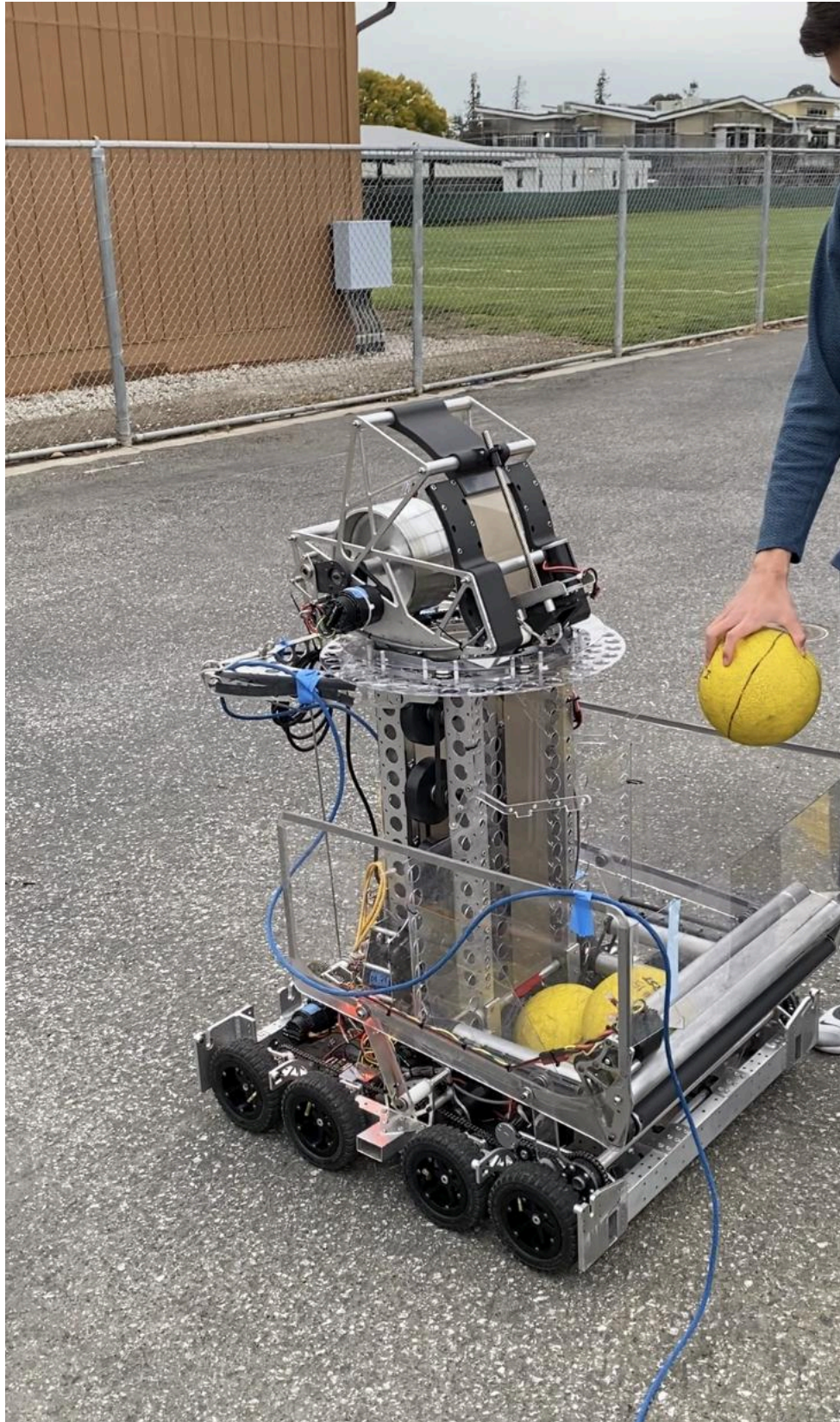**Figure 2.2: Electrical Schematic of Entire Robot. Power Supply and PCB**

Figure 2.3: Gathered testing data of final Robot for code team to calibrate

2019 Robot Tachyon:

Position: Suction Prototyping

CAD Download link:
https://drive.google.com/file/d/15uidvXHQ3VIanO0loUZjGLo0wPPWoyRn/view?usp=drive_link

Responsibilities:
- Worked on different testing methods of suctioning balls in the game field
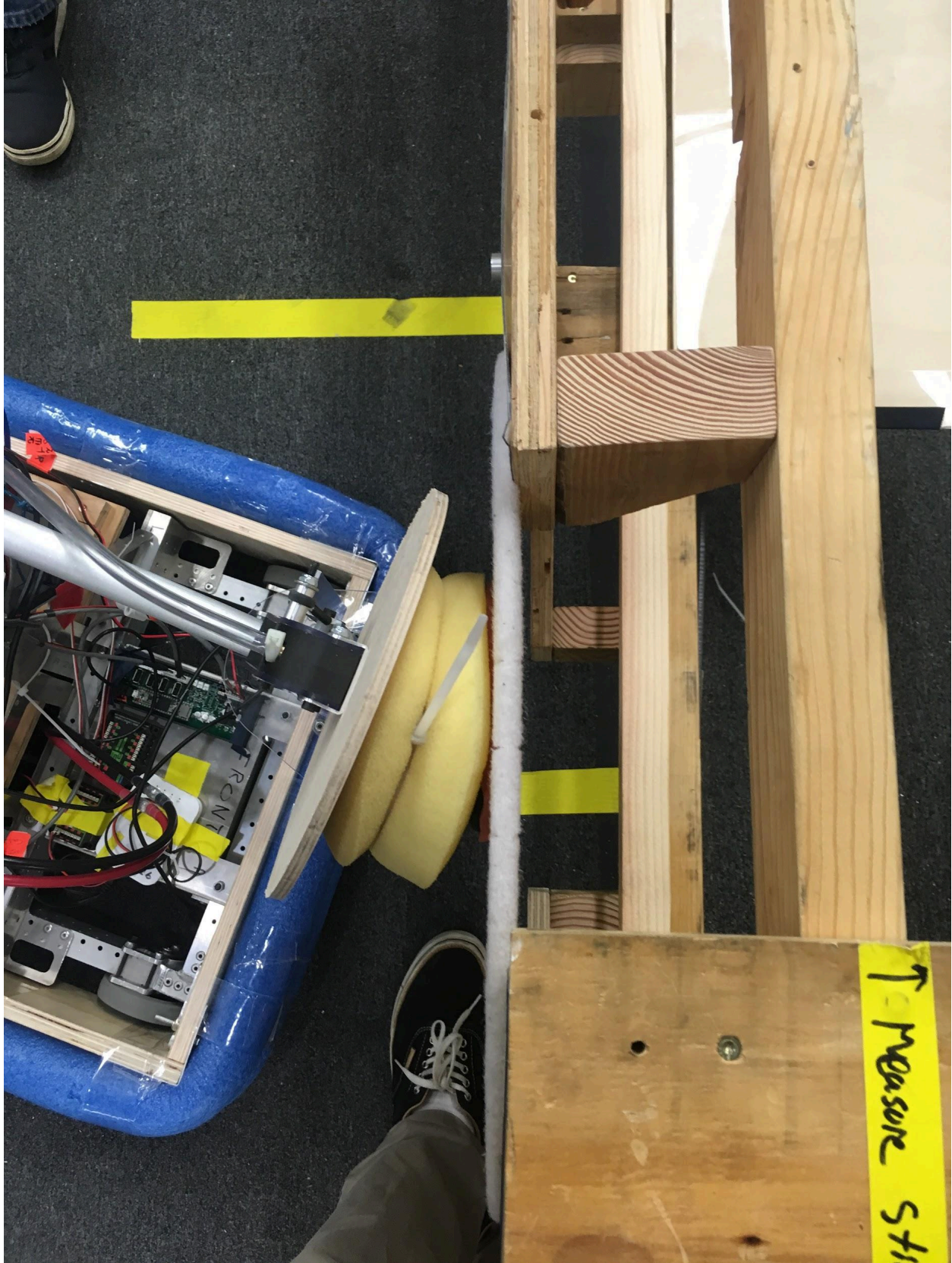- Tested different materials as well as angles of intake

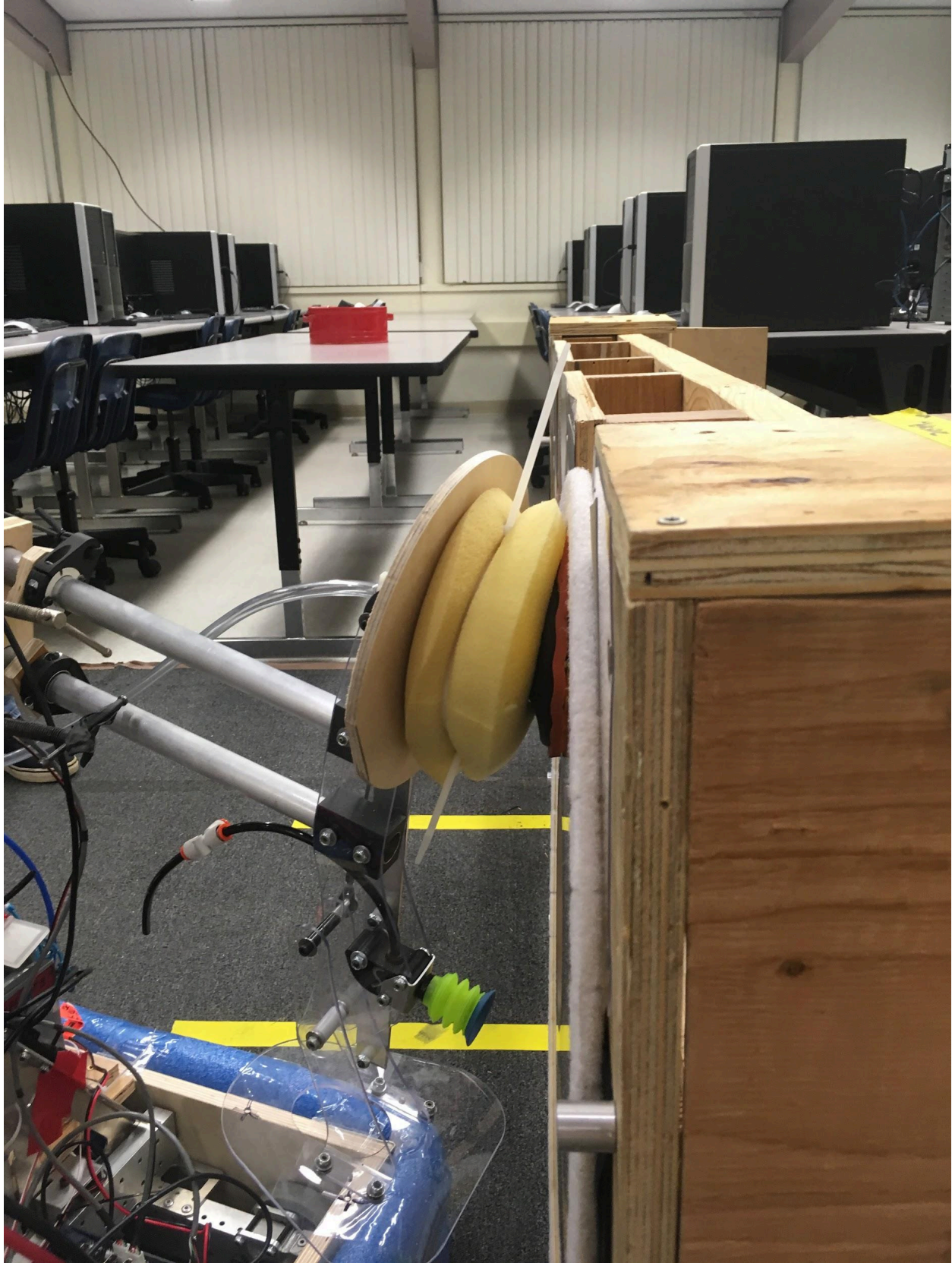**Figure 3.1: Testing Phase of Prototype of Suction**

Figure 3.2: Side angle of Suction

Figure 3.3: Final Iteration