



SDP 305: Robotic Arm For NES Power Glove

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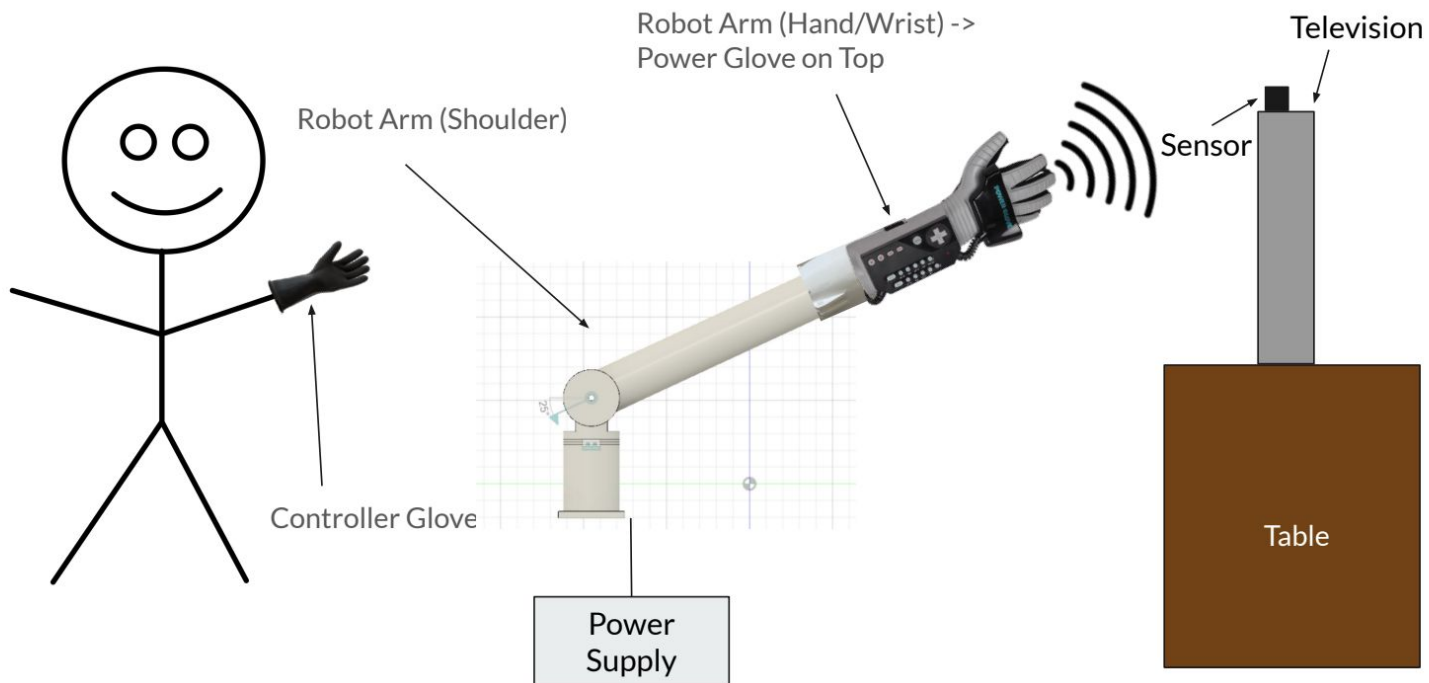


What is the NES Power Glove?

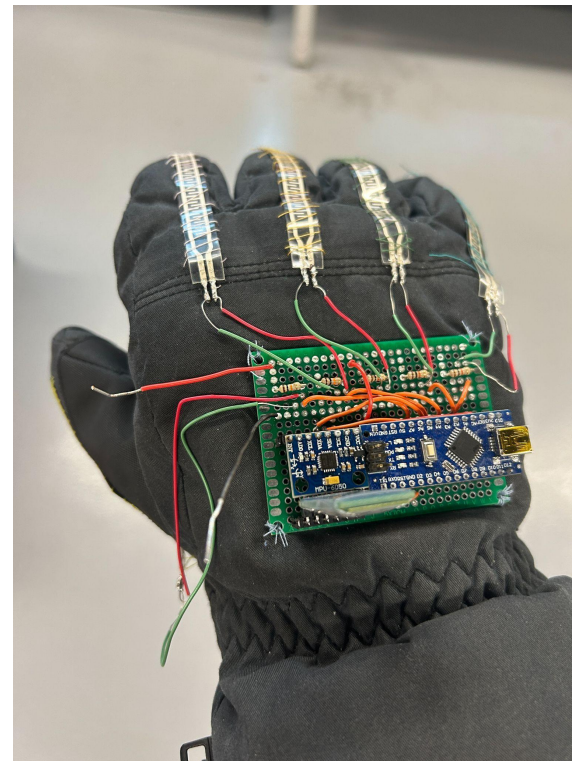
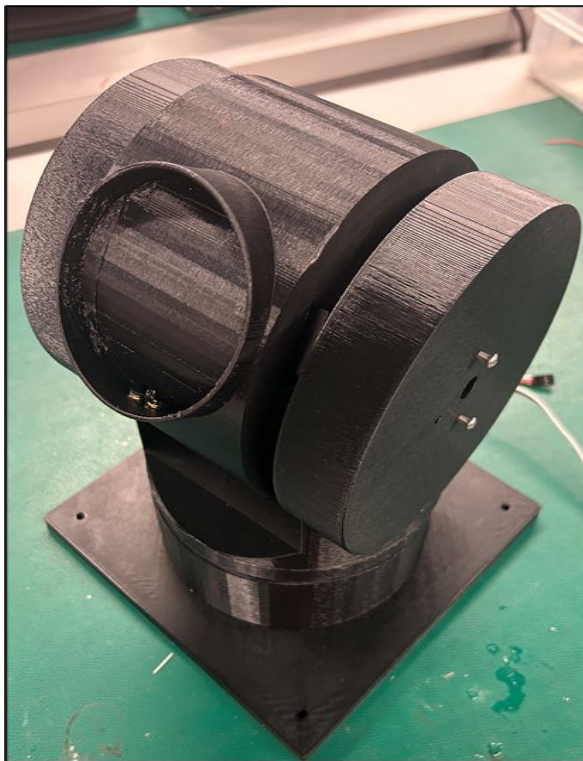
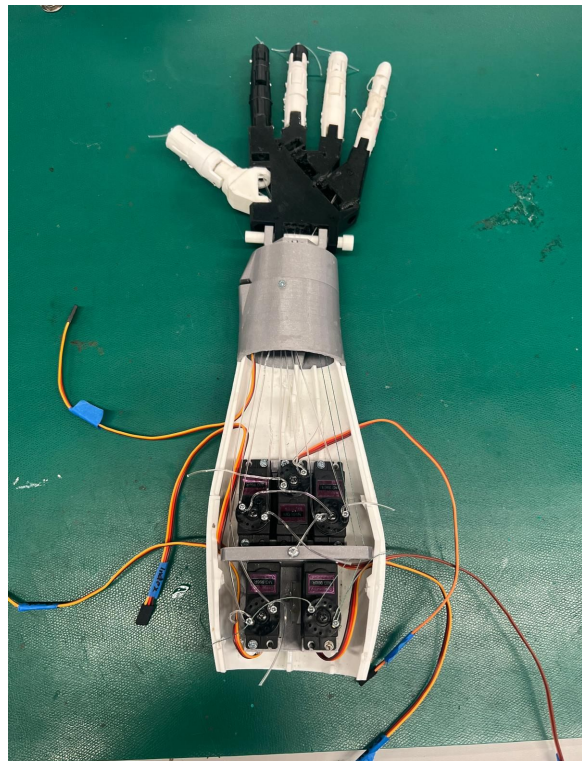
- 2-bit sensor per finger (minus the pinky)
- Transmits signal to motion sensor
- Turns inputs from hand movement to controller inputs



Project Concept



Last Years Design - ECD 416





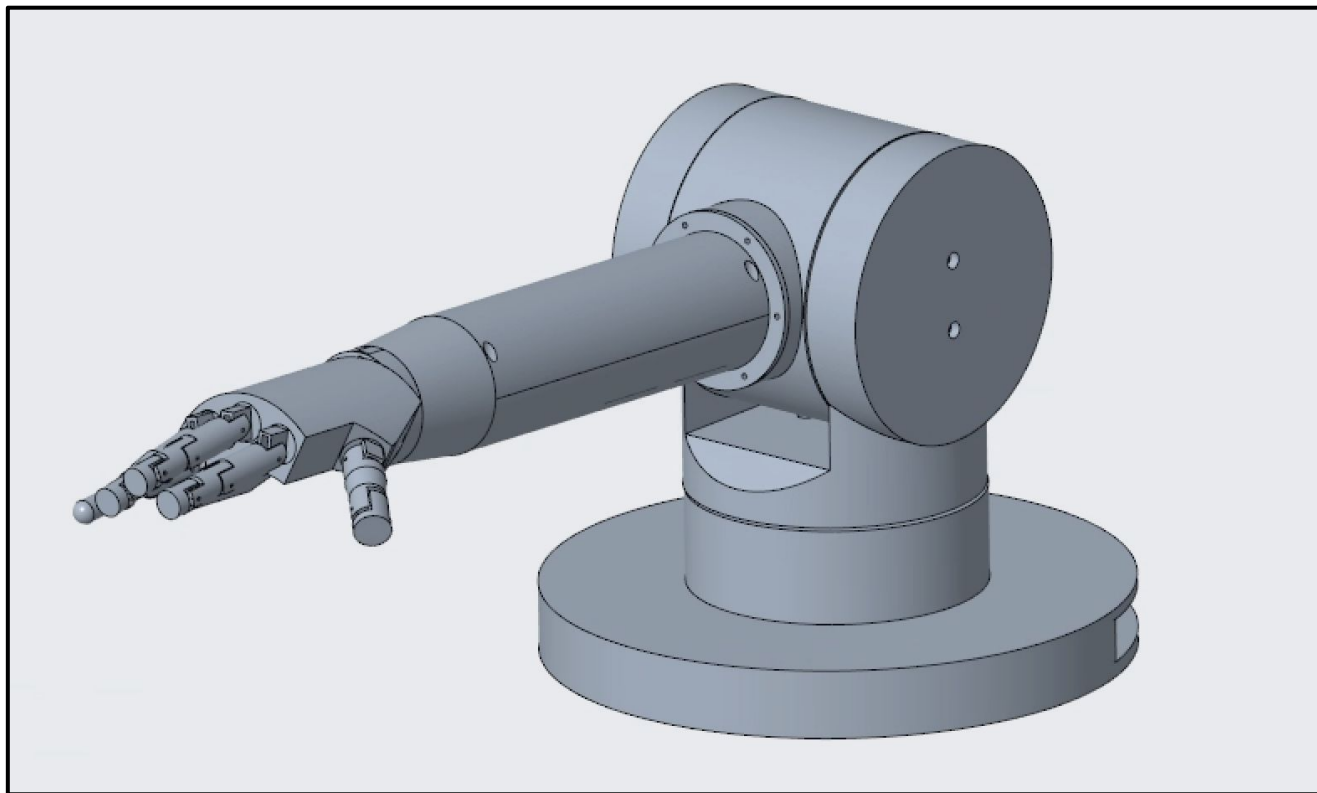
Project Requirements and Specifications

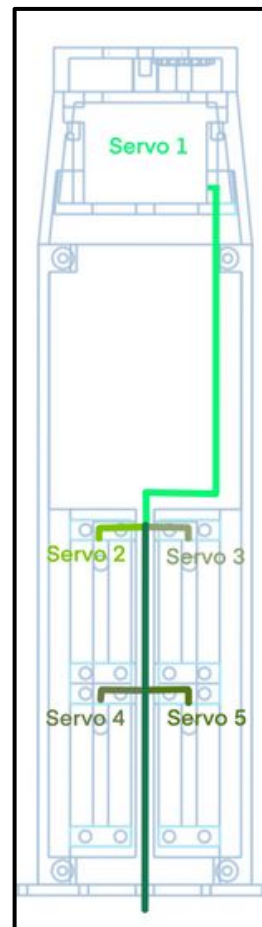
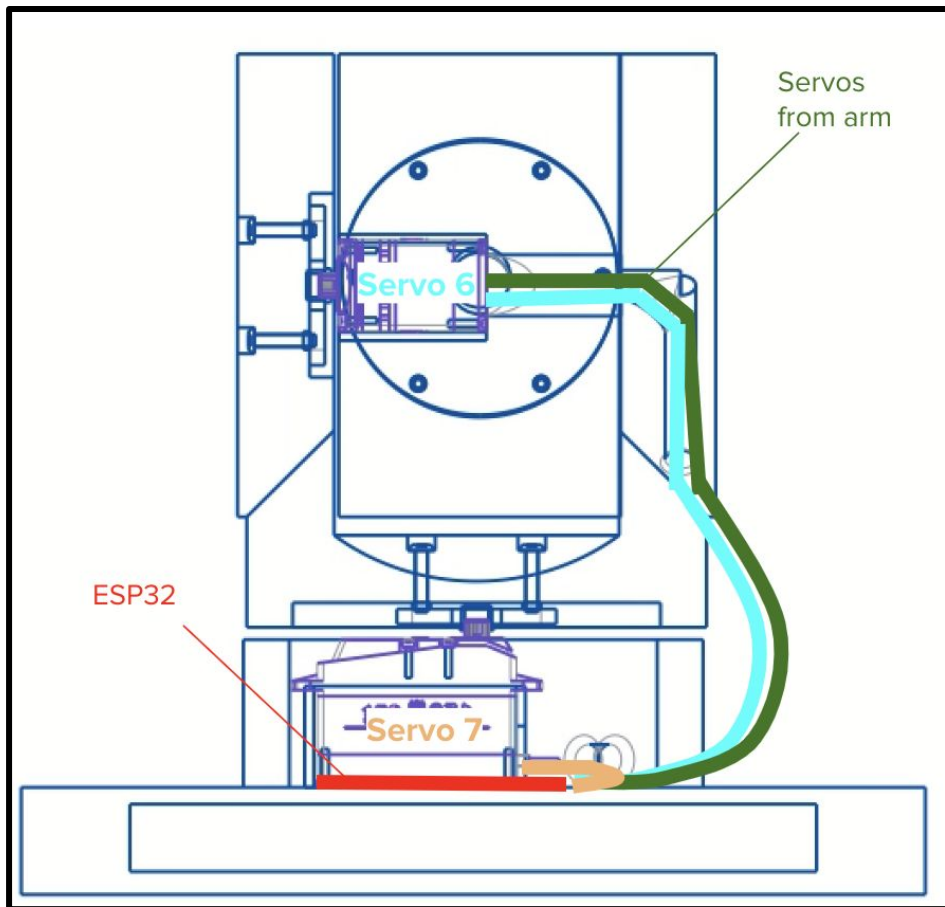
Requirements:

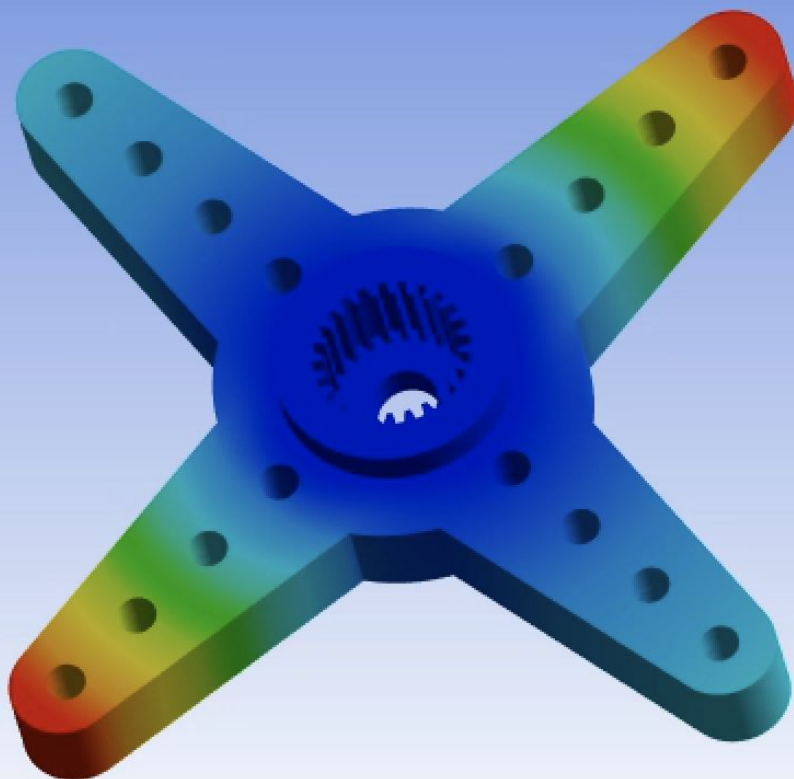
- To fix the issues present in arm and shoulder parts of last years design.
- Arm controller is designated to ECE 526.

Specifications:

- [MESDP-305-01] The robotic arm fingers shall extend outwards to 180 degrees.
- [MESDP-305-02] The robotic arm fingers shall curl 90 degrees to each joint on the finger.
- [MESDP-305-03] Wrist mechanism of the arm shall rotate +/- 90 degrees.
- [MESDP-305-04] The arm pitch shall be +/- 90 degrees.
- [MESDP-305-05] The arm yaw shall be +/- 90 degrees.
- [MESDP-305-06] The arm shall fit the NES power glove.
- [MESDP-305-07] Movement of the arm shall be uninterrupted.





**A: Static Structural**

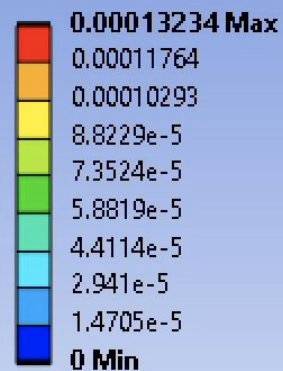
Total Deformation

Type: Total Deformation

Unit: m

Time: 1 s

12/5/2024 2:57 PM



Max deformation =
0.13 mm



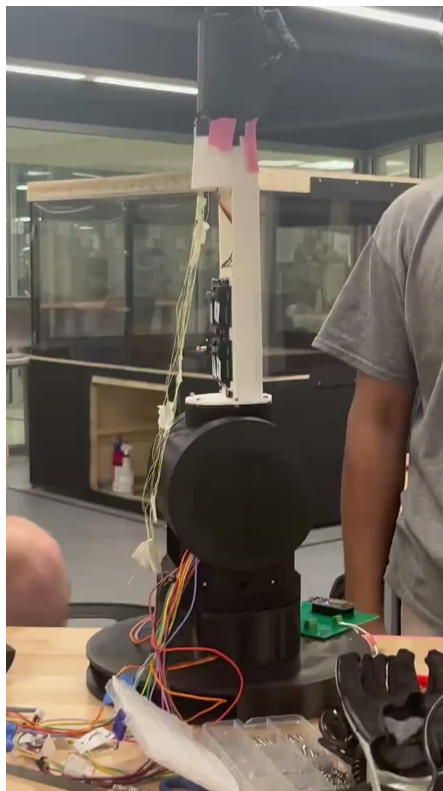
Moving Parts

3 Main Systems



1) Wrist Rotation

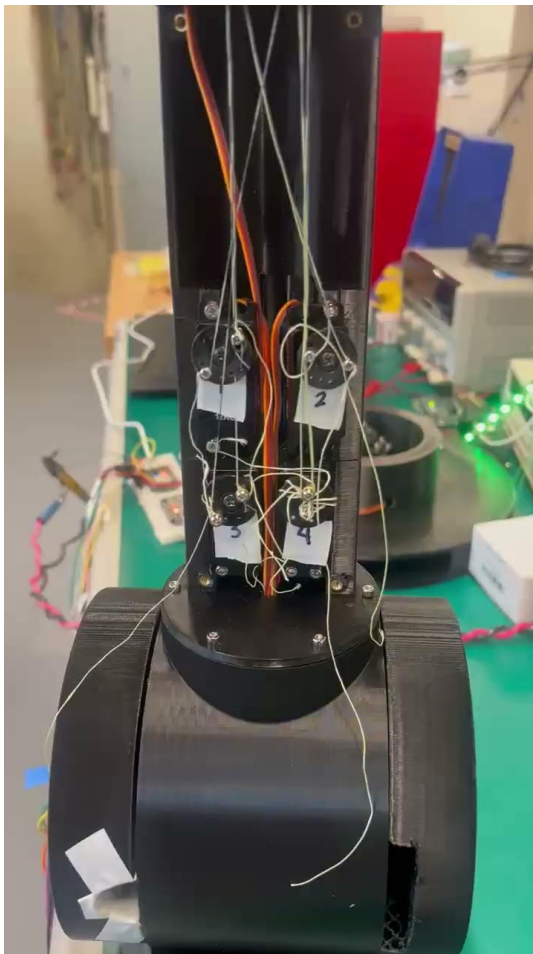
Parts worked separately, issues arose when integrating all moving parts together





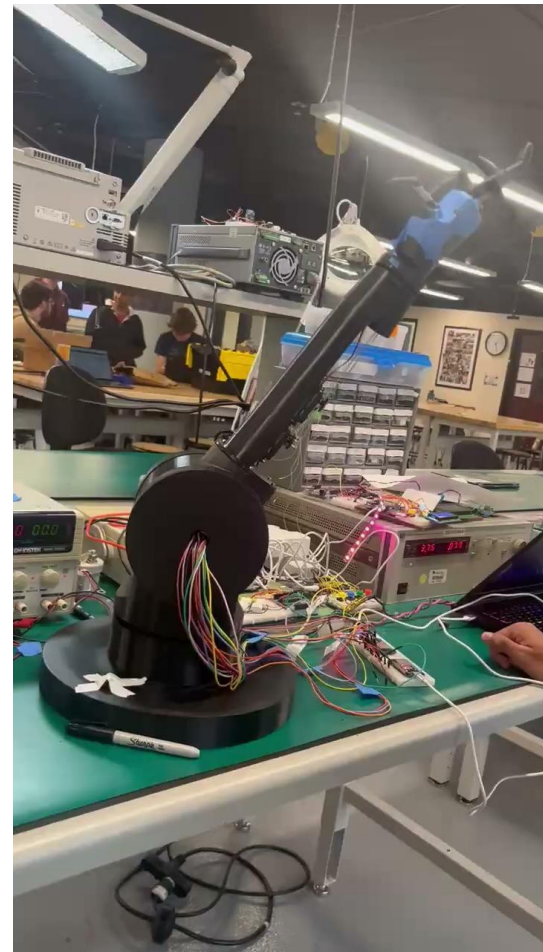
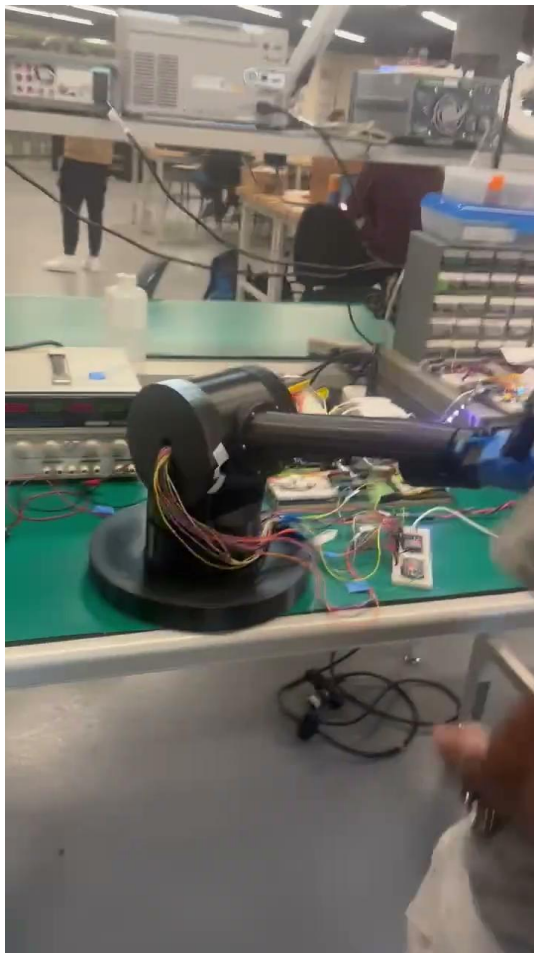
2) Finger Movement

Finger movement currently not fully extending, initial prototyping worked for full finger movement



3) Shoulder Movement

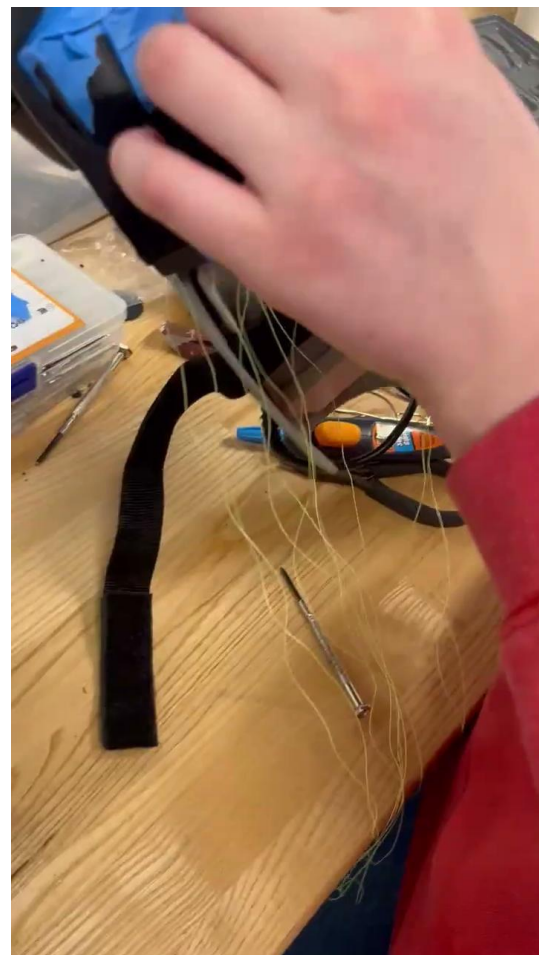
Shoulder functional in current iteration, both pitch and yaw





Glove Fitting

The power glove fitting over
the hand



Issues

- Wrist and fingers could not operate at the same time, too much tension in the finger lines
- Unable to integrate with ECD 526 transmitter glove due to unsuccessful build
- Multiple broken parts



Future Improvements

- Move wrist rotation into base of forearm
- Continue current finger movement plan, requires finer calibration

