

EXO1



STATIC STRUGGLES



HEALTHCARE



ASSEMBLY
WORK



AGRICULTURE





HEALTHCARE

- Alleviating static muscle fatigue during surgery for the nurses
- Maintaining the dignity of the old or infirm when needing to be moved
- Simplifying small scale logistics





ASSEMBLY WORK

- Allieviate strain while working in awkward positions
- Provides assistance while carrying heavy loads





AGRICULTURE

- Alliviates strain while picking fruit or caring for plants overhead
- Provides assistance while carrying heavy loads



WHAT DO WE HAVE TO WORK WITH?



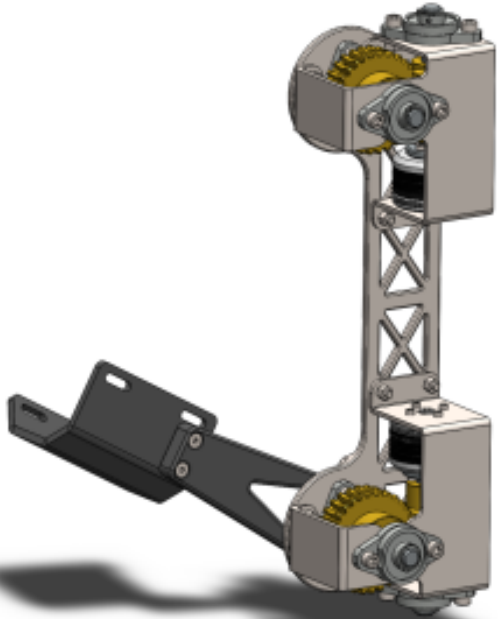
What is already done?



What kind of resources/material are we working with?

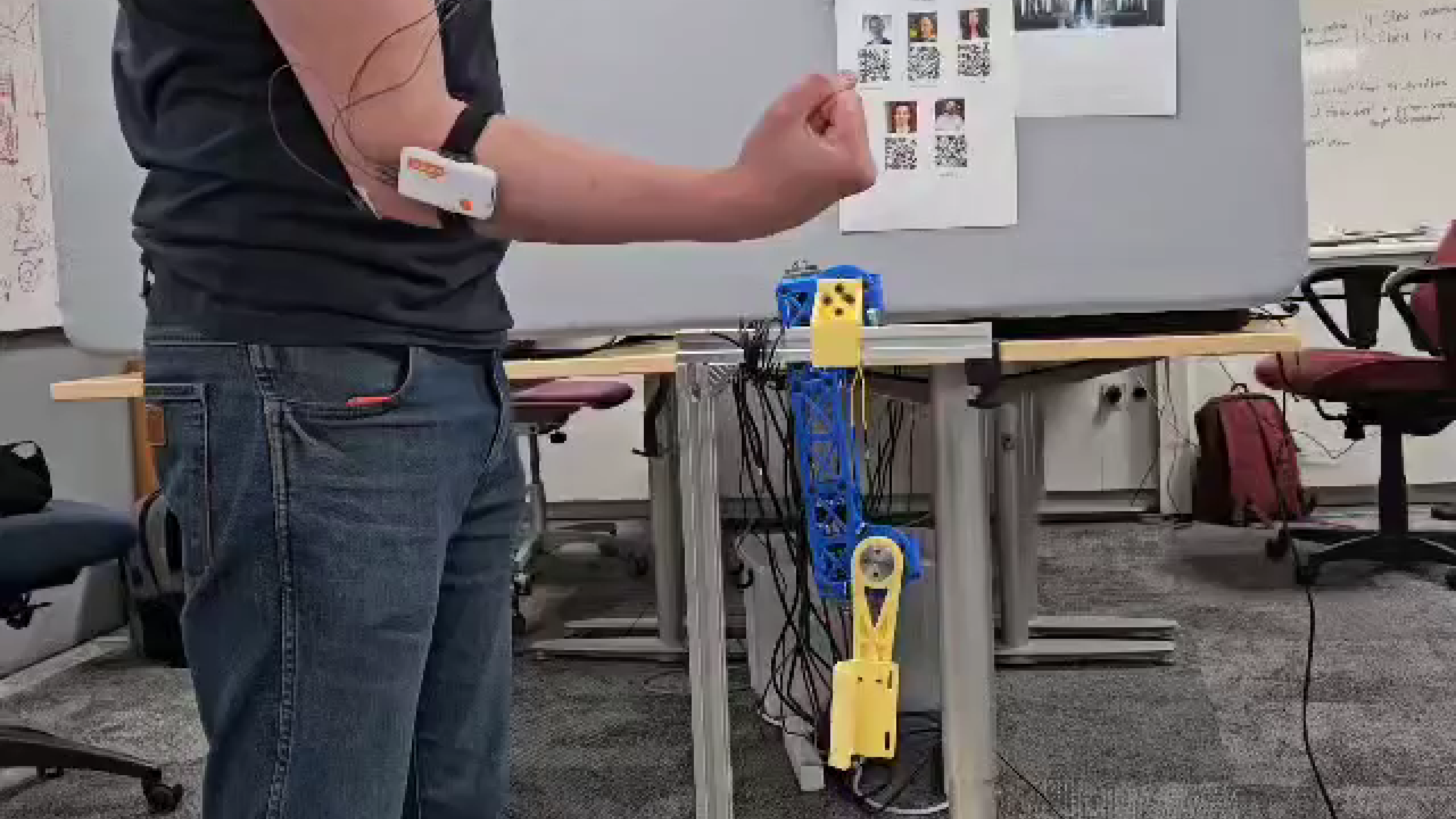


EXO SKELETON



- Current design of the Arm
- Adapted to specific person
- Remotely controlled
- PLA instead of steel
- One degree of freedom in software



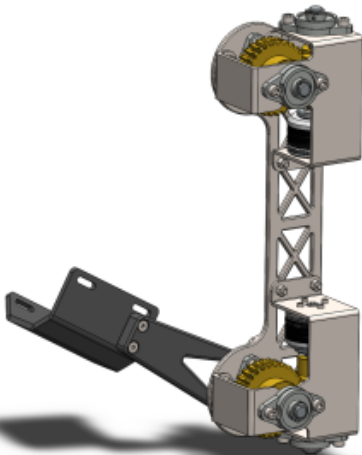


BACKGROUND

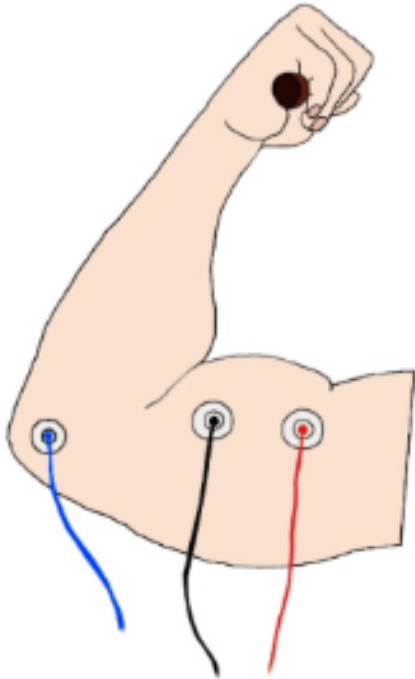


EXO SKELETON TYPES

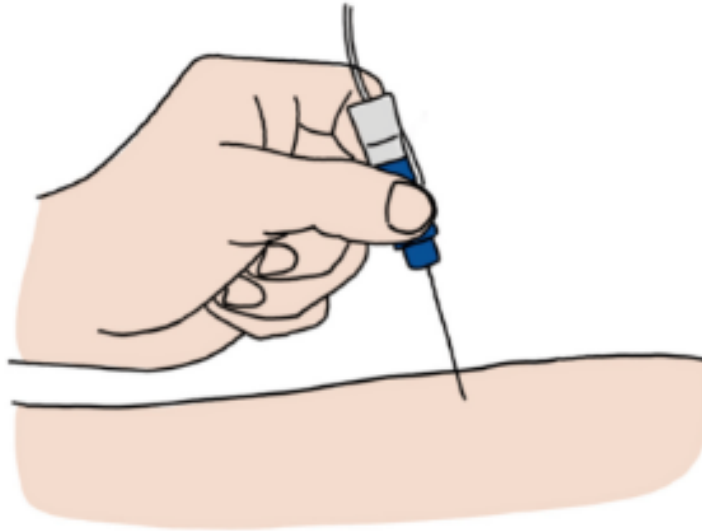
- Powered
- Passive
- Partial
- Full body



EMG ELECTROMYOG RAPHY



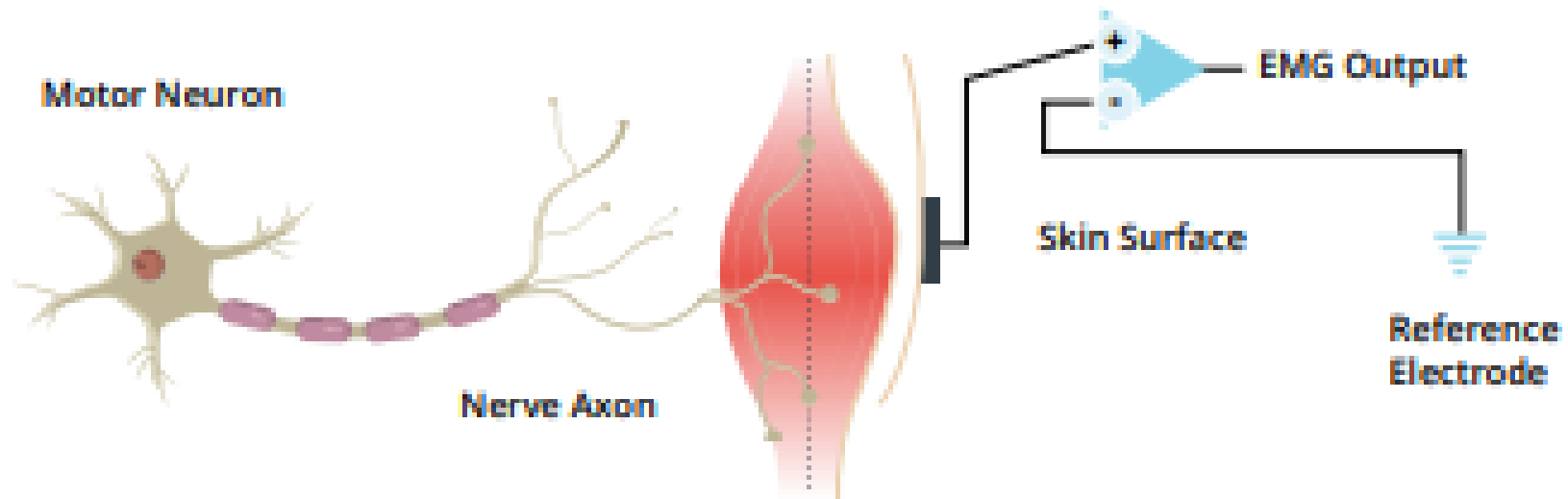
(a) Surface EMG



(b) Needle EMG

- Needle EMG
- Invasive
- Inserted directly into the muscle
- Surface mounted
- Silver/Silver Chloride





ELECTROMYOGRAPHY PATH

Brain->Motoneurons -> Muscle-> Electrode ->EMG Output

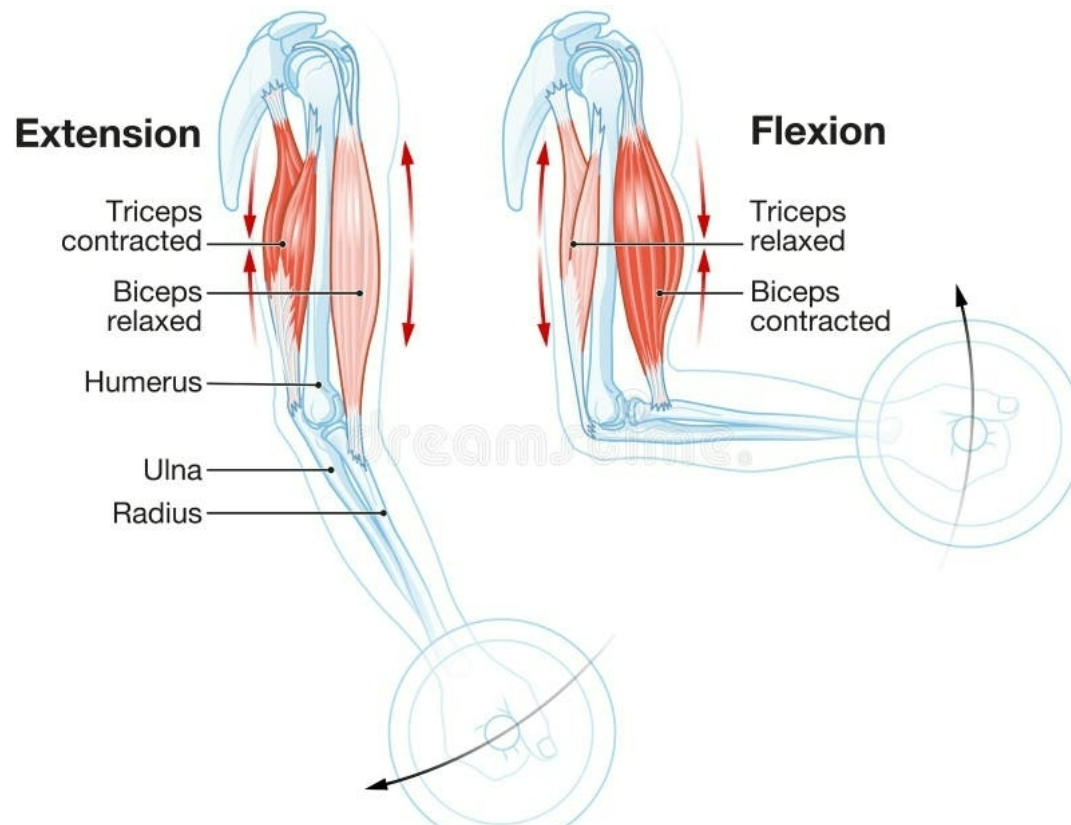


RESEARCH QUESTIONS



UP N' DOWN... STOP!!!!

NOW

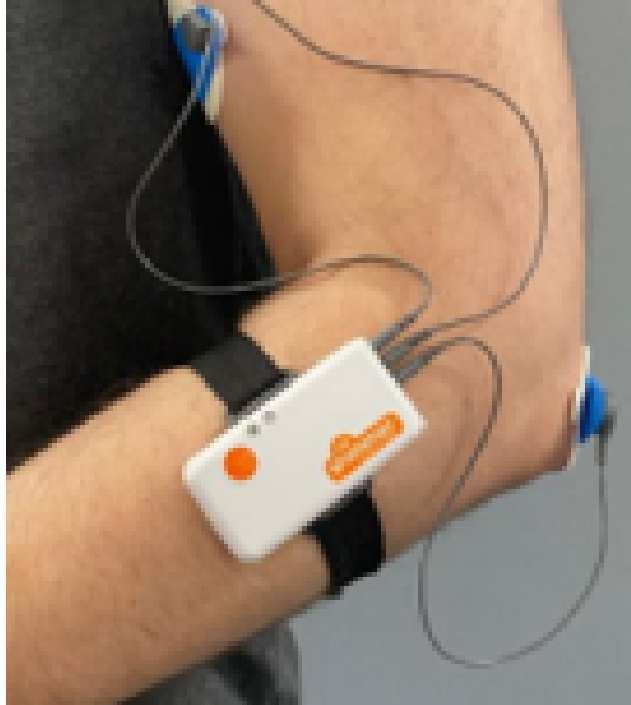


Strength based
on strain



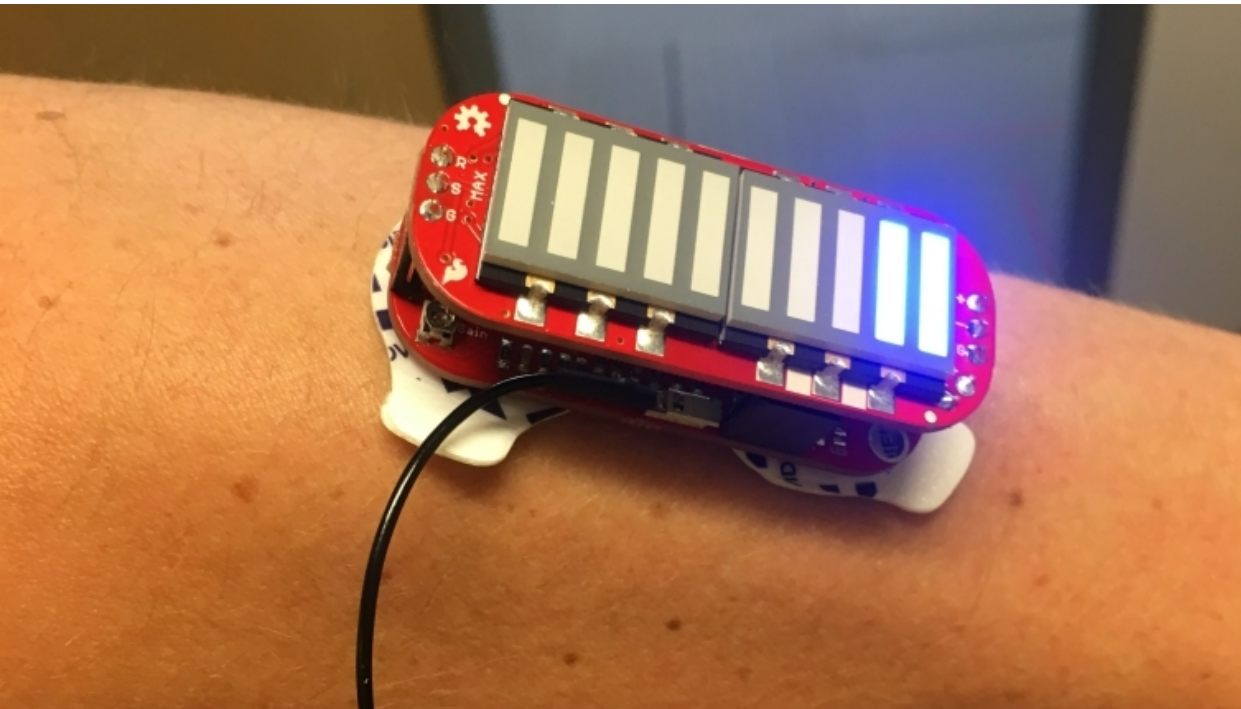
Strong while
relaxed?





EMG SENSORS

- Previously Shimmer 3
 - BlueTooth Classic 2.0
 - Different positions
- Now Myoware 1.0
 - Modern BlueTooth
 - Same positions

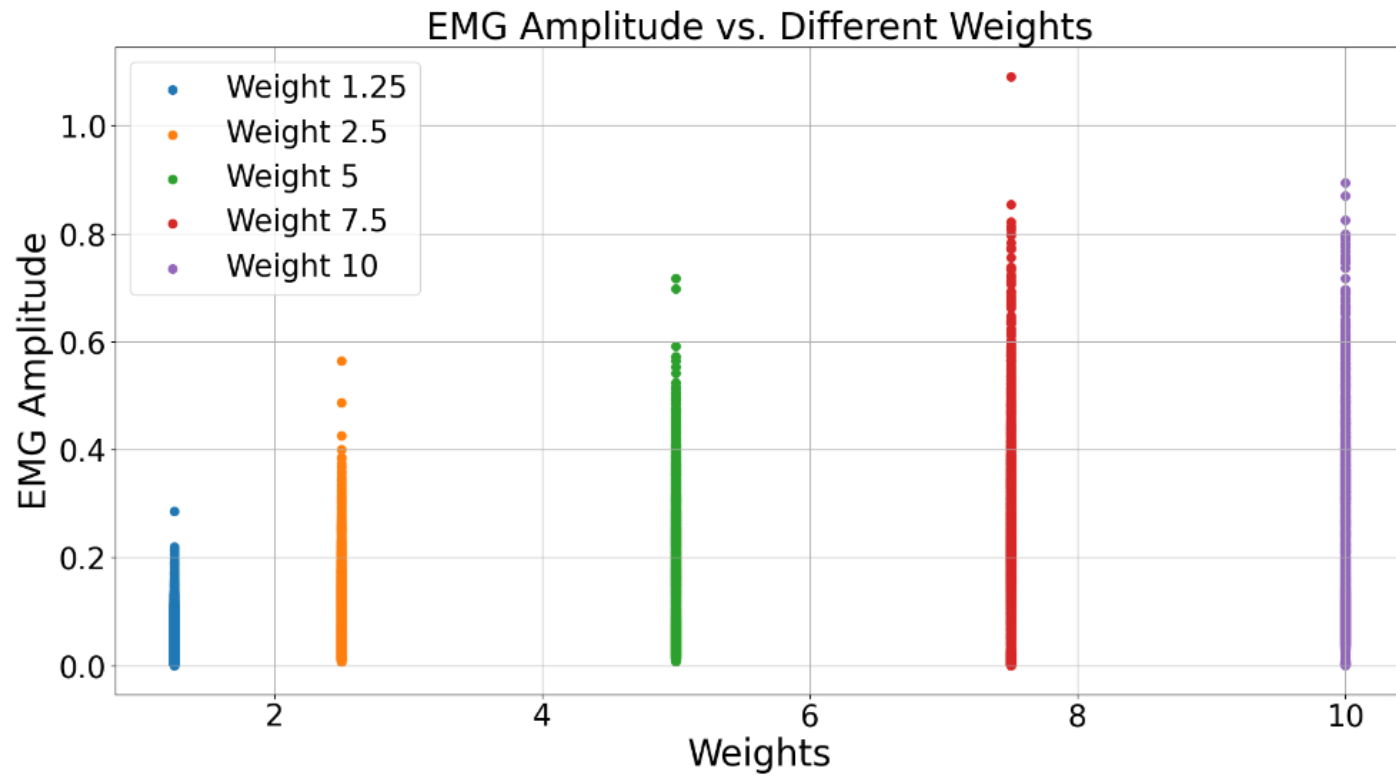




WEAR IT

- Current design
 - Mounted on a stand
 - Made to fit smaller individuals
- Objective: make it "forearm wearable"





NEED 4 SPEED

- Current design moves at constant speed
 - Contraction predicted= 1
 - Contraction not predicted = 0
- Previous group suggests that signal amplitude might correspond with desired speed



PLANNING

Start point week 17

- Learn to use the equipment – 2-3~ days
- Make the new joint to the stand – 1-2~ days
- Prepare for and collect data acquisition – 2-3 weeks
- Make and train AI – 2-3 weeks





THANKS FOR LISTENIN G!

Any Questions?