

Progress Report # 7

UW Adapted Fitness: Grip Strength Improvement Mechanism

Client: Dr. Kecia Doyle

Advisor: Prof. William Murphy

Team:

Simon Nam (Team Co-Leader and BSAC)

Sarah Kendall (Team Co-Leader)

Nicolas Maldonado (Communicator)

Owen Noel (BWIG)

Joey Dringoli (BPAG)

Date: 10/24/24

Problem Statement

A longtime Adapted Fitness client and mechanical engineer has worked consistently on stimulating his hand with lesser grip strength. The client would like a custom mechanism that would help an adapted fitness client improve his grip function and enable him to better grip on daily objects and workout equipment.

Brief Status Update

We met with our new client along with Dr. Doyle on thursdays' UW Adapted Fitness program session from 12:05-2:05 pm. We introduced ourselves and discussed the scope of our project to our client. Our client mainly needs help with extending their hand and then also creating a tight grip.

Along with that, our team members were assigned to different tasks to focus on the subcomponents of the skeleton glove design.

Summary of Weekly Team Member Design Accomplishments

- TEAM
 - Finalized and compiled list of materials and tools necessary for ordering with considering the budget allowance from the department.

- Divided up roles and responsibilities to proceed fabrication and to initialize prototype for further testing
- Simon
 - Finalized the materials needed for electronics component of the design
 - Met with the new client on Thursday to discuss the project and finalized design to get it confirmed and received direct feedback.
 - Collected the dimensions and volumes of the client's hand
 - Consulted with Dr. Nimunkar for suggestions about the directions of programming and use of Arduino Nano for controlling the motor-thread system
- Sarah
 - Finalized materials used to fabricate the silicone glove-exterior. Found available materials in the Teaching Lab and ordered the remaining materials.
 - Drafted fabrication plan for creating the hand mold of the client's hand.
 - Met with our new client at the Adapted Fitness studio to ask initial questions.
 - Communicating with HIPAA coordinator to ensure we undergo proper HIPAA training.
- Nicolas
 - Worked on materials needed for motor and pulley system
 - Collected dimensions of clients hand (we can move on with design now)
 - Talked to maker-space and ECB about what is in the realm of possibility for this project
- Owen
 - Met with Sarah and Joey to discuss materials and plans for upcoming glove fabrication
 - Began researching different ways to test the glove
- Joey
 - Finalized glove materials and fabrication planning with Sarah and Owen
 - Ordered the hand-molding kit
 - Finished drafting and submitted the budget request form
 - Finished Intro to Machining training

Weekly/Ongoing Difficulties

Due to the recent substitution of the actual client because of unforeseen circumstances, our team was unable to begin fabrication as we originally planned to do at an earlier stage. However we aim to acquire all the necessary materials and achieve a working mechanism with our design's electronics and motor-thread system along with a structured outer layer of skeleton glove design before the Show & Tell session occurs next week.

Upcoming Team and Individual Goals

- TEAM
- Simon
 - Acquire the ordered materials and begin assembling parts for electronics

- Prepare for the Show and Tell with initial progress made on the design and possible questions to ask to other BME peers to get more suggestions and helpful feedbacks for design
- Update on the current progress to advisor, Dr. Doyle, and the client
- Sarah
 - Meet with the client to fabricate their hand mold. Will practice the hand-molding process before meeting with the client.
 - Draft a fabrication plan for creating the silicone glove exterior. Research the desired viscosity that ensures flexibility.
- Nicolas
 - Finalize the materials list needed for the motor pulley system
 - Decide what kind of motors would be best for this project
 - Begin on the motor pulley prototype
- Owen
 - Begin creating testing plans for different specs of our project and continue testing research
 - Work on beginning the glove fabrication
- Joey
 - Order the rest of the electronics for Nicolas and Simon
 - Work with Sarah on getting the hand mold and silicone mold complete

Project Timeline

Project Goal	Deadline	Team Assigned	Progress	Completed
Background Reading and Prep for First Client Meeting	9/12/2024	All	Complete	Yes
PDS Draft 1	9/19/2024	All	Complete	Yes
Design Matrix w/ at least 3 ideas	9/26/2024	All	Complete	Yes
Preliminary Presentations	10/4/2024	All	Complete	Yes

Preliminary Deliverables (Report, Notebook, Peer Eval)	10/9/2024	All	Complete	Yes
Final Poster Presentation	12/6/2024	All	Not yet started	No
Final Deliverables	12/11/2024	All	Not yet started	No

Materials & Expenses

Link to [spreadsheet](#)