

## **Progress Report # 6**

### **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: 10/17/24

#### **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**

The team met with Dr. Doyle this week to discuss the budget and share our final design. However, we received news that our client was in an accident and we are no longer able to fabricate the glove for them. Dr. Doyle is working with us to find another client with similar grip strength problems so we can continue with the fabrication of the intended glove. Until we receive another client, we are proceeding with designing the proposed glove and will make appropriate changes once we receive further updates and confirmation.

#### **Summary of Weekly Team Member Design Accomplishments**

- TEAM
  - Discussed and agreed upon developing better communication and emphasized on supporting each other when performing tasks for course deliverables

- Distributed and assigned roles for fabrication procedure along with analyzing more on the material choice usage
- Met with the client on Thursday morning to discuss the finalized design and next phases of the project
- Simon
  - Developed new strategies for better communication and teamwork
  - Planned next stages for fabrication and testing to prepare in advance for “Show & Tell” happening on Nov 1st.
  - Met with Dr. Doyle to discuss further about the finalized design and fabrication plans including getting a mold of hand as a replica
  - Researched further on how to incorporate electronics with the motor-wiring system for the device
- Sarah
  - Research traumatic brain injuries and their effect on grip strength.
  - Found equations to calculate the exerted grip force from a similar grip-strength improvement device.
  - Communicating with the supervisor of HIPAA training to enroll our team in the Canvas course.
  - Working on creating a hand mold of the client’s left hand so we can fabricate the device using their exact dimensions.
- Nicolas
  - Planned for the beginning of fabrication
  - Continued to research and think about the next steps in the design/fabrication process
  - Began designing the motor pulley system that will be used for our design
- Owen
  - Met with the client to discuss the budget and new options for the project
  - Began working on testing plans
- Joey
  - Met with clients to discuss budget and showcase the finalized design idea to get input
  - Researched various materials and fabrication methods: silicone-coated wire, glove materials,(polyethylene, cotton) actuators, and SMA material.
  - Completed required trainings

### **Weekly/Ongoing Difficulties**

We are still working on finalizing the budget after getting final confirmation from our client. Once our budget is set, we would be able to begin actual fabrication with purchasing necessary materials.

### **Upcoming Team and Individual Goals**

- TEAM
  - Begin ordering required materials and acquire tools and permits (if needed) to begin working on fabrication.
  - Set up agreed times to meet in person among group members to work on their assigned components for the development of device

- Everyone must complete HIPAA training.
- Receive our new client and meet with them.
- Simon
  - Work on electronics and find ways to use mounted wall power sources to test viability of supporting the mechanical movements for motor and wire.
  - Complete the HIPAA training
  - Research more on Brain Traumatic Injury (TBI)
- Sarah
  - Meet with the client to fabricate their hand mold using alginate and plaster.
  - Write fabrication protocols for the silicone exterior of the glove.
  - Complete HIPAA Training.
- Nicolas
  - Have a design for the motor system ready by next week
  - Research compact motor designs that could be used as inspiration for our design
  - HIPAA training
- Owen
  - Continue working on testing plans and meet with Joey and Sarah for material work
  - Do HIPAA training
- Joey
  - Order materials
  - HIPAA training
  - Work with Sarah to start fabricating the glove portion of our design

### 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**

n/a