Digital traction with Japanese finger sleeves

Progress Report 2

Client: Mr. Pape Samb

Advisor: Dr. Justin Williams

Date: 9/11/2025

Team:

Ilia Mikhailenko	imikhailenko@wisc.edu (Co-leader)
Nathan Hansen	ndhansen@wisc.edu (Co-leader)
Nathan Klauck	nklauck@wisc.edu (BSAC)
Ben Willihnganz	bwillihnganz@wisc.edu (BWIG)
Mariamawit Tefera	mstefera@wisc.edu (Team Communicator)
Sam Dudek	dudek4@wisc.edu (BPAG)

Problem Statement

Design a device that allows for precise digital control and support of the components of the human hand through the use of Japanese finger sleeves or a similar more universal type support. This device will be designed to allow for controlled and stable traction during relevant procedures so that proper positioning of the hand can be attained with minimal manual effort.

Brief Status Update

The team had their first meeting with the client and established groundwork for the project and expectations. The PDS for the project was written.

Weekly/Ongoing Difficulties

- None to report currently

Current Design

- None to report currently

Materials and Expenses

- None to report currently

Summary of Past Week Accomplishments

- Ilia Mikhailenko
    - Worked on the Customer, Patient-related concerns, and Competition sections for the PDS Draft.
    - Analyzed past research I had done for competing designs to understand the gaps our team's new design will fill.
    - Met with the client over Teams to get better acquainted with the project.
- Nathan Hansen
    - Researched clinical workload, biomechanics thresholds for pressure and friction, as well as OR environmental standards, to define service life, shelf life, operating environment, and ergonomic requirements for the project.
- Nathan Klauck
    - Met with BSAC and discussed changes to BME training curriculum and proposal selection process
    - Conducted research relevant to the project
- Ben Willihnganz
    - Performed research on price comparison between existing topic designs and looked into potential struggles the project could face.
    - Worked on Product Design Specification draft under Quantity and Price sections.

- Mariamawit Tefera
    - Reviewed two different designs of the digital traction device
    - Worked on safety and performance requirements in the PDS document
    - Expanded and clarified the client requirements

- Sam Dudek
    - Conducted research relevant to the project
    - Found two standards regarding materials coming in contact with skin, as well as materials that must come in contact with MRI machines
    - Worked on PDS report sections size, weight, materials, aesthetics, appearance, and finish.

Upcoming Team and Individual Goals:

The current team goals include furthering individual research and considering design ideas to move forward with.

- Ilia Mikhailenko
    - Study the information related to the old model that was originally used in the Senegal Hospital.
    - Brainstorm ideas for how we can create a system enabling individualized traction for each finger.
- Nathan Hansen
    - Brainstorm and sketch preliminary design ideas
    - Research potential materials
    - Construct a design matrix
- Nathan Klauck
    - Prepare for BSAC meeting
    - Brainstorm design ideas
    - Further research
- Ben Willihnganz

    - Brainstorm, sketch, and think through potential design ideas that meet the goals of our client
    - Continue to update project website
    - Understand different hand/wrist surgical procedures to better understand our projects needs
- Mariamawit Tefera
    - Research standards/regulations relevant to digital traction devices (medical device safety, etc.)
    - Make a design plan based on the technical document we will receive for the previously used device.
- Sam Dudek
    - Brainstorm and flesh out design ideas that comply with our clients needs
    - Research further competing designs

Activities Timesheet

Team Member	Time for the Week	Total Time for the Semester
Ilia Mikhailenko	4	8
Nathan Hansen	4	7
Nathan Klauck	3	7
Ben Willihnganz	3	6
Mariamawit Tefera	4	6
Sam Dudek	3.5	5.5

Preliminary Project Timeline:

Task	Sep			Oct					Nov				Dec	
	12	19	26	3	10	17	24	31	7	14	21	28	5	10

Project R&D														
Brainstorm														
Research														
Prototyping														
Testing														
Deliverables														
Progress Reports														
Prelim presentation														
Final Poster														
Meetings														
Client														
Advisor														
Website														
Update														