

Project Title: Digital Traction with Finger Sleeves

Client: Mr. Pape Samb (asamb@jamarek.org)

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BPAG: Anem Karthik (kanem@wisc.edu)

Date: 10/8/26 - 10/15/26

Problem Statement

The objective of this project is to create a digital traction device using finger traps that precisely pulls the patient's hand, wrist, and forearm into a comfortable, neutral position while holding a stable static load about 1/10th of the patient's weight. To be feasible for Idrissa Pouye Hospital, the device must be portable and usable in both the plaster casting room and the operating room. This requires a compact device that can be transported easily between spaces and provides unobstructed access to the forearm for casting and arthroscopy. It must tolerate routine sterilization without degradation and maintain its mechanical material properties. In addition, the design must be simple enough to fabricate, assemble, and repair using materials and processes available in or near Dakar so that the hospital can maintain a reliable inventory even as individual devices are lost or damaged over time.

Brief Status Update:

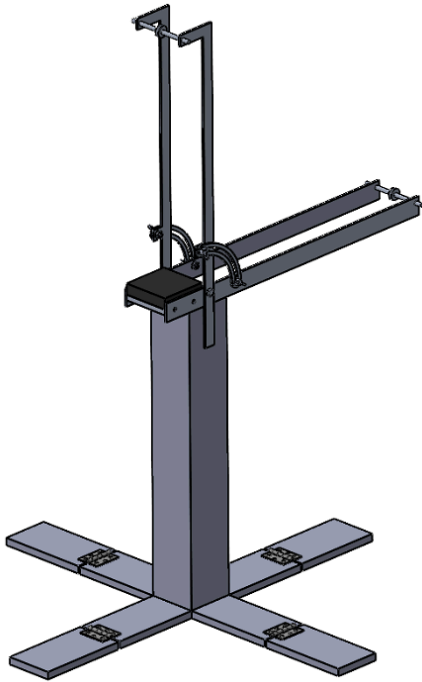
The team had a design consultation meeting which led to changes in the final preliminary design. Some of the main changes are listed below:

- Aluminum T-slotted frames for the device's main frame structure instead of waterjetting aluminum sheet metal
- Adding a mechanism to allow for wrist rotation with compressive spring
- 2 pulley strings attached to mounting plate instead of just 1 pulley string

Weekly/Ongoing Difficulties:

Dr. Soumah was not able to make it to the client meeting this week so our questions related to the current procedure process and specific traction loads are still left unanswered. We have emailed those questions to him.

Current Design



Final Preliminary Design: Guillotine Pulley traction mechanism with new base design.

Summary of Weekly Team Member Design Accomplishments

Team:

This week the team had a design consultation meeting to get advice on our final design. We also had a client meeting to discuss our next steps. Additionally, we did research to improve our testing procedures.

Individual:

- ❖ Amy Dang:
 - Design Consultation Meeting
 - Client meeting
- ❖ Sean Carey:
 - Design Consultation Meeting
 - Client Meeting
 - Updated Design Model
 - Materials Research
- ❖ Anshpreet Sohal:
 - Client Meeting
 - Started Solidworks for Improved Base Design
- ❖ Patricia Prakasam:

- Completed Strain Gauge research
- Intro to Machining online training finished
- Biosafety, Chemical training finished
- ❖ Henna Razeq:
 - Materials/Protocols Research
 - Online Design Innovation Lab Training
- ❖ Karthik Anem:
 - Client Meeting
 - Materials/finger dislocation research
 - Made Clamp

Upcoming Team and Individual Goals:

Team: The team hopes to create solidworks assemblies of the new final preliminary design and create a material list to send to the client.

Individual:

- ❖ Amy Dang:
 - Complete human subjects safety training
 - Create solidworks for wrist rotation mechanism
 - Create material list for client
- ❖ Sean Carey:
 - Continue to update model
 - Put together materials list for ordering
 - Update Fabrication Protocol
 - FEA Analysis on model
- ❖ Anshpreet Sohal:
 - Continue to update base design
 - Redo fabrication protocol for updated model
 - Complete BME 300 Training
- ❖ Patricia Prakasam:
 - Complete Intro to Machining in-person training
 - Update Testing Protocol based on feedback from tomorrow's advisor/team meeting
 - Help w/any solidworks (if needed)
- ❖ Henna Razeq:
 - Complete BME training in the shop
 - Research more on protocols and safety measures
 - Begin Fabricating
- ❖ Karthik Anem:
 - Finish up on clamp

- Complete BME training
- Put Material orders into spreadsheet
- Update clamp in SolidWorks based on dimensions of the base.

Project Timeline:

Project Goal	Deadline	Team Assigned	Progress	Completed
Product Design Specifications	09/18	All	Started	Yes
Design Matrix	09/25	All	Started	Yes
Preliminary Presentations	10/02	All	Started	Yes
Preliminary Deliverables	10/07	All	Started	Yes
Show and Tell	10/30	All	Not Started	No
Final Presentation	12/04	All	Not Started	No
Final Deliverables	12/09	All	Not Started	No

Timeline

Task	September				October					November				December		
	4	11	18	25	2	9	16	23	30	6	13	20	27	4		
Project R&D																
Research	X	X	X	X	X	X	X									
PDS	o	o	X	X	X	X	X									
Design Matrix	o	o	o	X	X	X	X									
Prototyping	o	o	o	o	o	o	o									
Testings	o	o	o	o	o	o	o									
Deliverables																
Progress Reports	na	X	X	X	X	X	X									
Prelim presentation	o	o	o	X	X	X	X									
Final Poster	o	o	o	o	o	o	o									
Meetings																
Client	na	o	X	o	X	o										
Advisor	X	X	X	X	X	X	X									
Website																
Update	X	X	X	X	X	X	X									

Filled boxes = projected timeline

X = task was worked on or completed – o = Not completed

Expenses

N/A

Activities Time

Team Member	Date	Activity	Time (h)	Weekly Total (h)	Semester Total (h)
Amy Dang	10/13 10/14	Design Consultation Client Meeting	2 hr 1 hr	3 hr	36 hr
Sean Carey	10/13 10/13 10/14 10/15	Design Consultation Materials Research Client Meeting Updated Design Model	2 hr 0.5 hr 1 hr 3 hr	6.5 hr	43 hr
Anshpreet Sohal	10/14 10/14	Client Meeting Base Design SolidWorks	1 Hr 1 Hr	2 Hr	36 hr
Patricia Prakasam	10/15 10/15	Research Trainings	1 hr 1.5 hr	2.5 hr	29.5 hr
Henna Razeq	10/14 10/14	Research Design Innovation Lab Training	1 Hr 1 Hr	2	30.5 hr
Karthik Anem	10/13/26 10/14/26 10/12/26	Research Client Meeting Solidworks	2 Hr 1 Hr 5 Hr	8 Hr	35 hr