

Project Title: Digital Traction with Finger Sleeves

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

Advisor: Prof. Randolph Ashton (rashton2@wisc.edu)

Co-Team Leader: Amy Dang (adang9@wisc.edu)

Co-Team Leader: Sean Carey (srcarey@wisc.edu)

Communicator: Anshpreet Sohal (sohal2@wisc.edu)

BSAC: Patricia Prakasam (pprakasam@wisc.edu)

BWIG: Henna Razeq (razeq@wisc.edu)

BPAG: Anem Karthik (kanem@wisc.edu)

Date: 10/15/26 - 10/22/26

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.

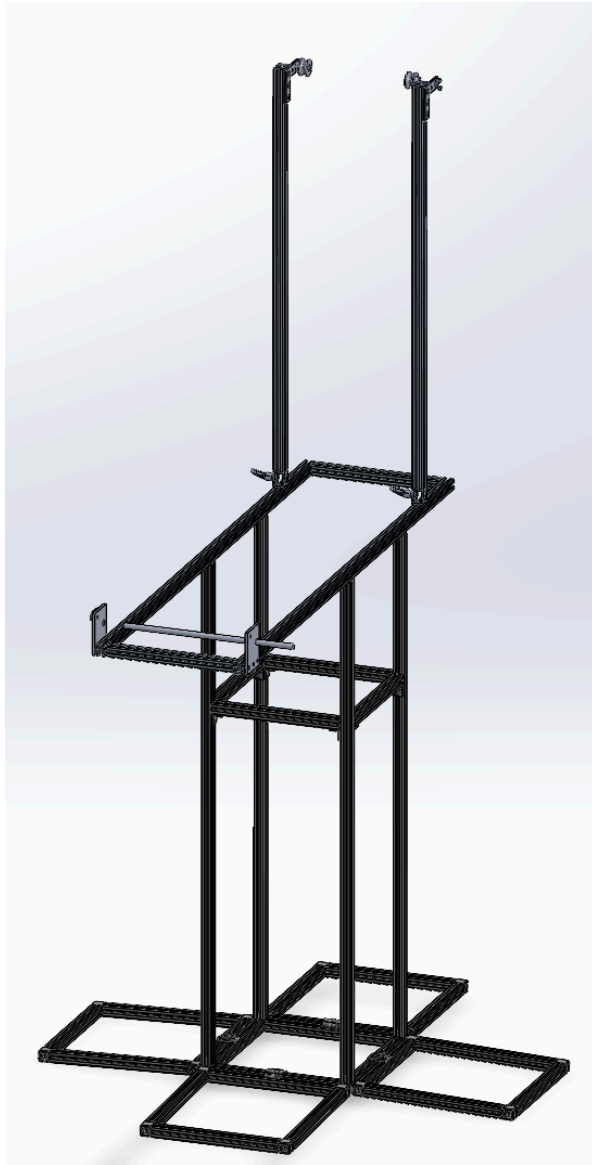
Brief Status Update:

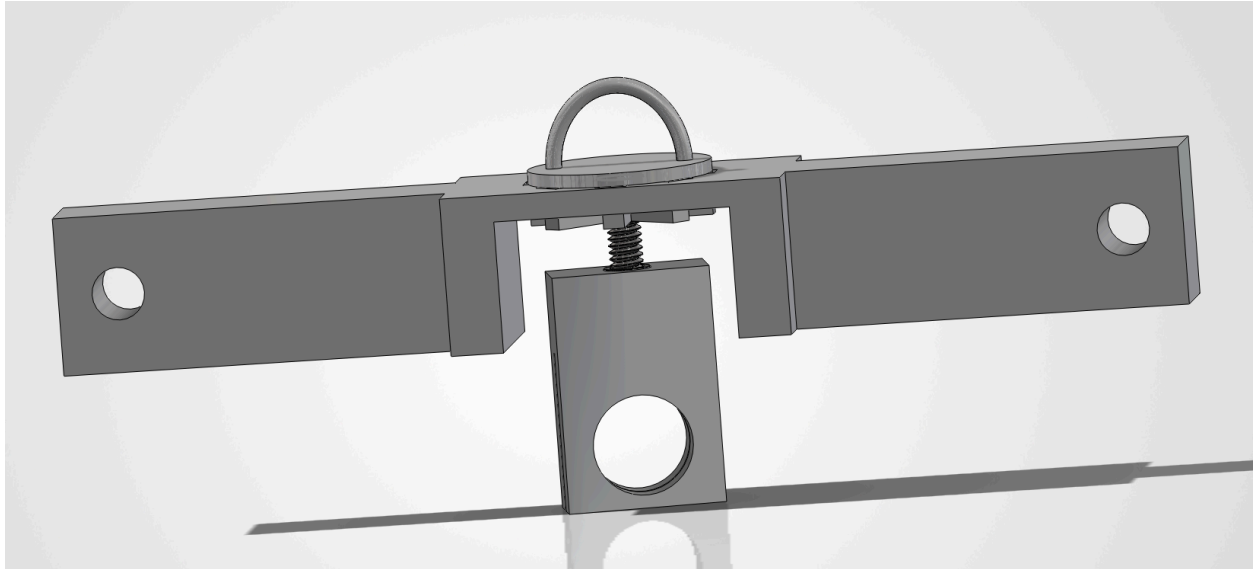
New solidwork parts and assemblies have been created for the updated design. The team has sent a material list to the client. There is a client meeting scheduled for Saturday to discuss and order the materials along with questions we still have about the design requirements.

Weekly/Ongoing Difficulties:

There was a list of questions for the client sent via email on 10/14/26 that have not been answered.

Current Design





New Final Design: Guillotine Pulley traction mechanism with new base design (top image) and wrist rotation mechanism (bottom image).

Summary of Weekly Team Member Design Accomplishments

Team:

The team worked on completing their training for the semester, updating solidwork parts and assemblies, and creating a material list. We also 3D printed a couple test parts.

Individual:

- ❖ Amy Dang:
 - Created and revised solidwork parts and assembly for wrist rotation design.
 - Helped 3D print wrist rotation design
- ❖ Sean Carey:
 - Updated Solidworks parts and Assembly
 - 3D printed test parts
 - Created materials list
- ❖ Anshpreet Sohal:
 - Revised base design in solidworks using T slot rails
 - Created materials list for base design
- ❖ Patricia Prakasam:
 - Completed intro to machining online training
 - Scheduled appointment for lathe and mill for next week
 - Looked at BSAC agenda for this week to see if team has any input to give
- ❖ Henna Razeq:
 - Worked on part of mill and lathe.
 - Did more research on fabrication protocols
- ❖ Karthik Anem:

- Completed all required trainings
- Took care of accounting for expenses

Upcoming Team and Individual Goals:

Team:

Fabricate traction device for show and tell and complete training for the semester.

Individual:

- ❖ Amy Dang:
 - Help fabricate wrist traction design
 - Complete semester training
- ❖ Sean Carey:
 - Begin Fabrication
 - Update Fabrication Protocols
- ❖ Anshpreet Sohal:
 - Help fabricate base and traction designs
 - Complete Human Safety Training
- ❖ Patricia Prakasam:
 - Finish up Intro to Machining training next week
 - Assist with any fabrication
 - Update testing protocols as soon as possible
- ❖ Henna Razeq:
 - Finish Intro to Machining
 - Help with fabrication
 - Update Fabrication protocols
- ❖ Karthik Anem:
 - Help with fabrication of wrist traction design
 - Finish up clamp design

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	X								
PDS	o	o	X	X	X	X	X	X								
Design Matrix	o	o	o	X	X	X	X	X								
Prototyping	o	o	o	o	o	o	o	X								
Testings	o	o	o	o	o	o	o	o								
Deliverables																
Progress Reports	na	X	X	X	X	X	X	X								
Prelim presentation	o	o	o	X	X	X	X	X								
Final Poster	o	o	o	o	o	o	o	o								
Meetings																
Client	na	o	X	o	X	o	X	o								
Advisor	X	X	X	X	X	X	X	X								
Website																
Update	X	X	X	X	X	X	X	X								

Filled boxes = projected timeline

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

Expenses

Item	Description	Manufacturer	Mft Pt#	Vendor	Vendor Cat#	Date	QTY	Cost Each	Total	Link
Print										
Part 1	CF-PLA	DI Lab	X	X	X	10/19/2026	1	\$2.61	\$2.61	
Part 2	CF-PLA	DI Lab	X	X	X	10/19/2026	1	\$0.11	\$0.11	
Part 3	CF-PLA	DI Lab	X	X	X	10/19/2026	1	\$0.35	\$0.35	
Brackets Test	CF-PLA	DI Lab	X	X	X	10/21/2026	1	\$0.55	\$0.55	

Traction Device										
T-Tube	Single Four Slot Rail, Silver, 20 mm Square, Solid			McMa ster Carr	5537T82		4	\$35.73 / 10ft	\$142.92	https://www.mcmaster.com/5537T101-5537T504/
T-tube rotating joint	Locking Pivot for 20 mm Single Rail			McMa ster Carr	5537T82		2	\$23.49	\$46.98	https://www.mcmaster.com/5537T82/
Aluminum Unthreaded Spacer	10 mm OD, 22 mm Long, for M5 Screw Size			McMa ster Carr	94669A342		2	\$2.50	\$5.00	https://www.mcmaster.com/94669A342/
Zinc-Plated Steel Pan Head Phillips Screws	Zinc-Plated Steel, M5 x 0.8 mm Thread, 55 mm Long			McMa ster Carr	92005A737		1	\$13.80 / 10	\$13.80	https://www.mcmaster.com/92005A737/
Zinc-Plated Steel Wing Nut	Class 5, M5 x 0.8 mm Thread			McMa ster Carr	94300A320		1	\$4.61 / 25	\$4.61	https://www.mcmaster.com/94300A320/

Multipurpose 6061 Aluminum Rod	10 mm Diameter, 1 ft.			McMaster Carr	4634T 36		1	\$3.87	\$3.87	https:// www. mcmas ter.co m/463 4T36- 4634T 361/
Hinge	Rail-to-Rail Hinge for 20 mm High Rail, Silver			McMa ster Carr	5537T 859		4	\$13.89	\$55.56	https:// www. mcmas ter.co m/553 7T859 /
18-8 Stainless Steel Pan Head Phillips Screws	M5 x 0.8mm Thread, 14mm Long			McMa ster Carr	92000 A324		1	\$11.90 / 50	\$11.90	https:// www. mcmas ter.co m/920 00A32 4/
End-Fee d T-Slotted Framing Fasteners	Nut for 20 mm Rail, Center Hole, M5 Thread, 0.126" Thick			McMa ster Carr	4976N 25		6	\$2.27 / 10	\$13.62	https:// www. mcmas ter.co m/497 6N25/
18-8 Stainless Steel Pan Head Phillips Screws	M5 x 0.8mm Thread, 8mm Long			McMa ster Carr	92000 A318			\$1.00 / 50	\$8.50	https:// www.m cmaste r.com/9 2000A3 18/
								TOTAL:	\$310.38	

Activities Time

Team Member	Date	Activity	Time (h)	Weekly Total (h)	Semester Total (h)
Amy Dang	10/16-10/21 10/21	Solidworks 300 Mtg	6 hr 1 hr	7 hr	43 hr
Sean Carey	10/16-21	Solidworks + Materials Research	12 hr	12 hr	55 hr
Anshpreet Sohal	10/17-20 10/21	SolidWorks 300 Team Meeting	8 hr 1 hr	9 hr	45 hr
Patricia Prakasam	10/20	Intro to Machining Online training	2 hr	2 hr	31.5 hr
Henna Razeq	10/19 10/22	Intro to Machining Research	3 hr 1 hr	4	34.5 hr
Karthik Anem	10/19-10/20 10/22	Intro to Machines Accounting details	5 hr 0.5 hr	5.5 hr	40.5 hr