BME Design: 200, 300, 301, 400 and 402

SteadyHand Progress Report #8

Date: 10/29/26

Client: Dr. James Sohn
Advisor: Dr. Shawn Gomez
Team:
- Anna Wood
- Tess Brazee
- Mara Van Dyke
- Sam Anderson
- Ben Pytlik
- Miti Patel

Problem statement

Severe joint pain in the hands due to arthritis and other inflammatory conditions is now frequently treated using low-dose radiation therapy (LDRT). Current LDRT protocols require high setup reproducibility across 6 treatment sessions. Existing positioning systems are overly complex, use complicated indexing systems, and compress digits 2-5 together. This causes significant discomfort for patients and creates unnecessarily long setup times.

This project aims to develop a hand positioning device to be used in a clinical setting that minimizes setup time and patient discomfort while ensuring exact hand placement for each treatment session.

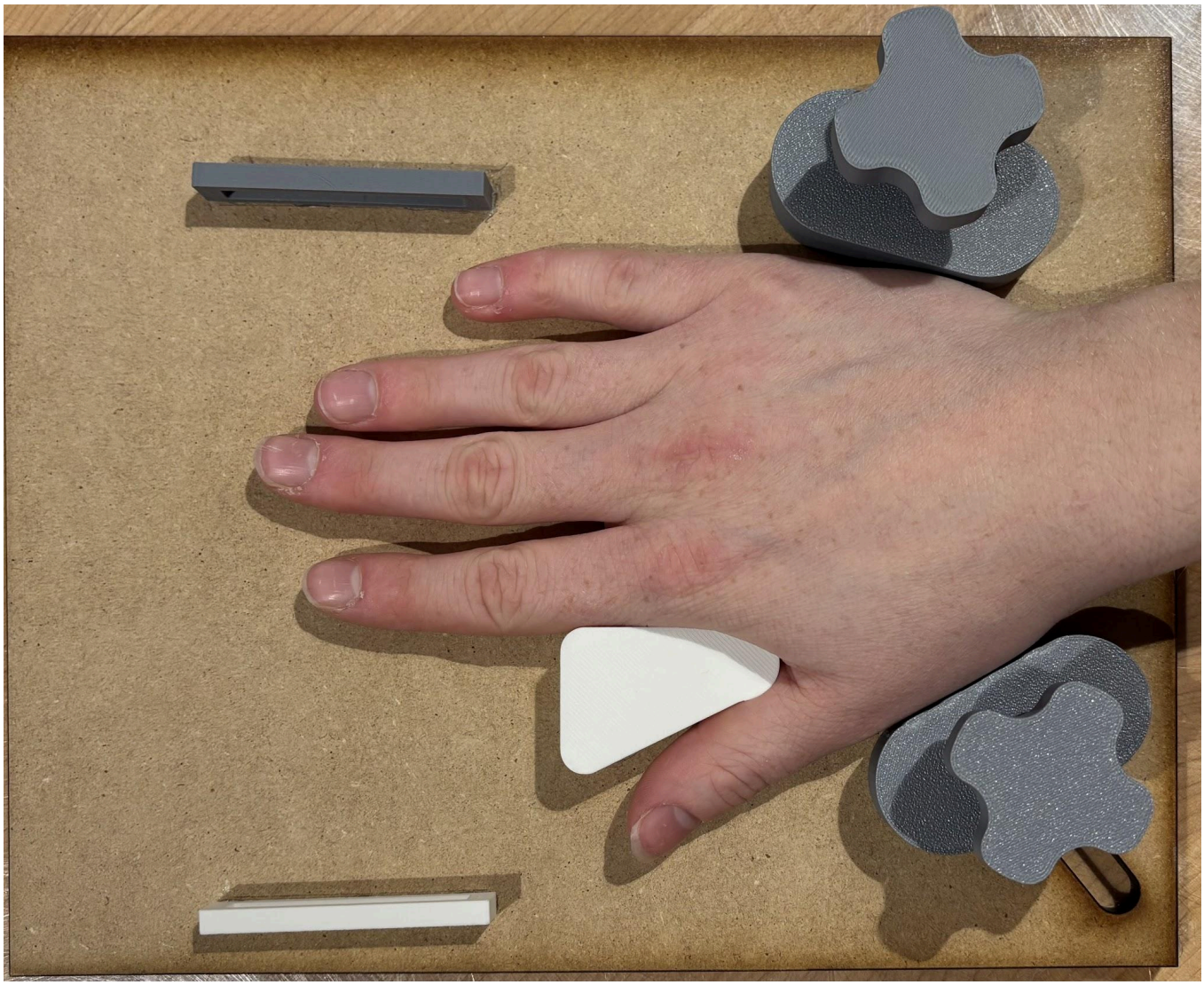
Brief status update

This week, our team reevaluated our ideas based on feedback from Dr. Sohn and Dr. Gomez at our respective meetings. Our group progressed on our design ideas and fabrication plans by 3D printing and laser cutting an initial prototype for our project. Our team will be presenting our prototype at show and tell to other BME 200 and 300 students and obtain feedback about our product so far. The team will continue to make adjustments with the feedback we will receive at show and tell.

Difficulties / advice requests

Current design

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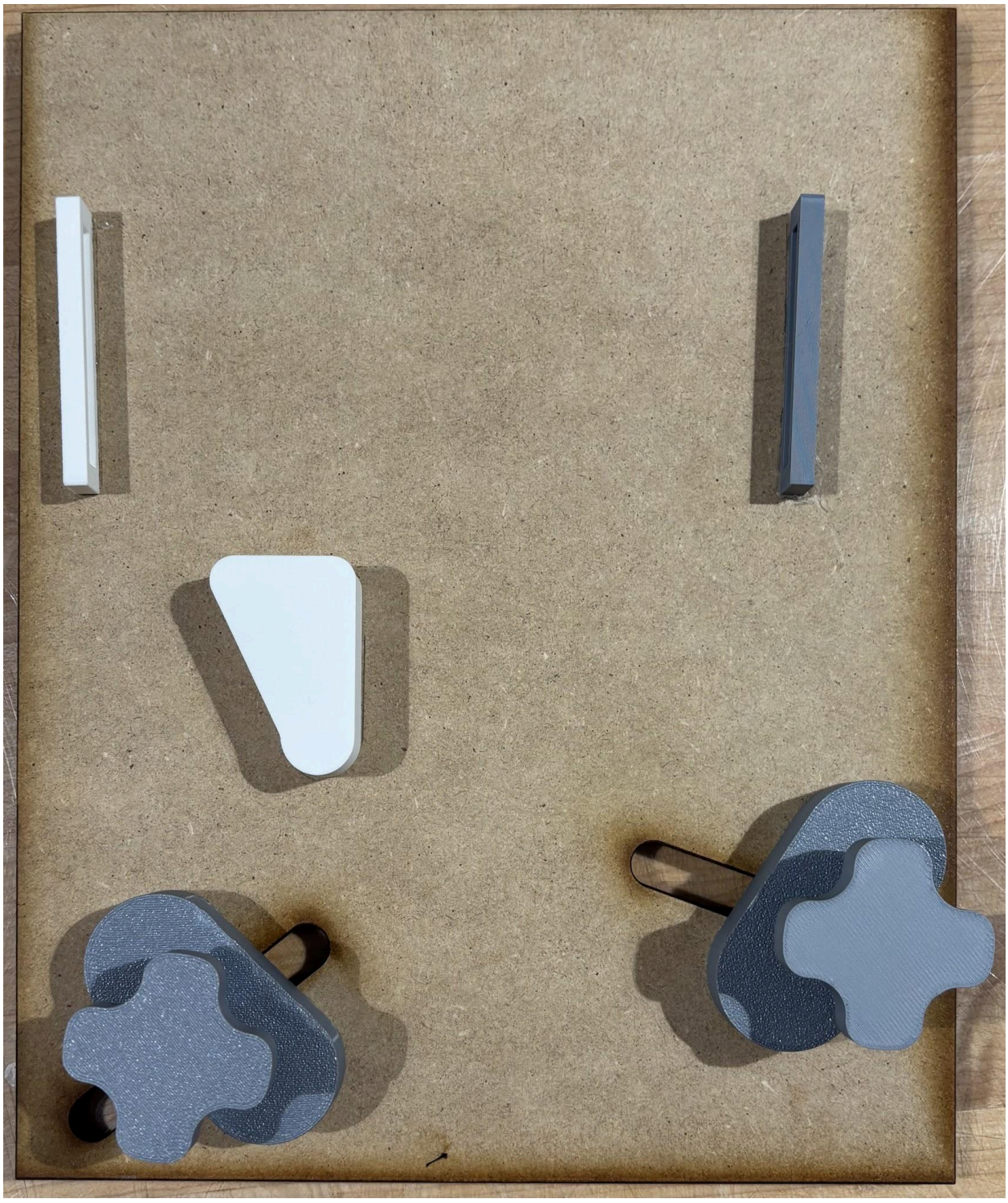


Figure 1. Current prototype featuring an HDF base plate and 3D printed components

Materials and expenses

Item	Description	Manufac-turer	Mft Pt#	Vendor	Vendor Cat#	Date	#	Cost Each	Total	Link
Wendt										
3D printing	Individual components for plate			Wendt				$1.26	$1.26	
Plastic screws	Plastic screws for securing hand braces			Wendt				$0.20	$0.20	
Category 2										
									$0.00	
									$0.00	
								TOTAL:	**$1.46**	

Goals

Major team goals for the next week

1. Continue making adjustments to our prototype
2. 3D print other components to try out with our current prototype
3. Continue updating PDS and other relevant documentation

Next week's individual goals

- Anna Wood
    - Present the current prototype at show and tell and get suggestions from peers
    - Continue to make design iterations and improvements
    - Look into slider tightening mechanisms (T nuts or TPU washers)
    - Develop a more in-depth testing protocol
- Mara Van Dyke
    - Get feedback on prototype at show and tell and ask about ideas to secure hand braces in indexed positions on the board
    - Improve sliding mechanism to prevent rotation of blocks and secure them at indexed positions
    - Improve size of board and components based on universal metrics for hand size
- Tess Brazee
    - Present prototype at show and tell and receive feedback
    - Improve prototype based on feedback and continuing prototyping
    - Improve testing protocol
- Sam Anderson
    - Show our prototype at "Show and Tell" and walk around to give others feedback on their prototypes
    - Continue to iterate on our design
    - Finish creating the design in CAD or update if we decide to change the dimensions

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- Ben Pytlik
    - Begin prototyping new device with feedback from the “show and tell”
    - Present product at “show and tell” and give feedback to others
    - Fix the adjustable slider mechanism by researching more about relative hand sizes
- Miti Patel
    - Present designs at show and tell and give other groups feedback on their designs
    - Make changes to our design based on the feedback given at show and tell
    - Finish creating additional CAD designs
    - Complete additional research as necessary

Timeline

Task	Aug.	Sept.				Oct.				Nov.					Dec.
	30	6	13	20	27	4	11	18	25	1	8	16	22	29	6
Project R&D															
Empathize	X	X	X												
Background…				X	X				X						
Prototyping						X	X	X	X	X					
Testings															
Deliverables															
Progress Reports			X	X	X	X	X	X	X	X					
Prelim presentation						X									
Final Poster															
Meetings															
Client		X		X					X						
Advisor	X		X	X			X	X	X						
Website															
Update	X	X	X	X	X	X	X	X	X	X					

Filled boxes = projected timeline
X = task was worked on or completed

Detailed accomplishments

Previous week’s goals and accomplishments

- Anna Wood
    - Modeled design components in CAD
    - Laser cut a base plate and modified printed 3D components/assembled prototype
- Mara Van Dyke
    - Modeled base plate and components to secure the hands using CAD and 3D printed components for assembly and testing
    - Constructed base plate using laser cutter
    - Completed additional training through the curriculum
    - Updated BPAG spreadsheet with purchases

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- Tess Brazee
    - Completed required training
    - Began brainstorm to prototype 3D printed and laser cut design
- Sam Anderson
    - Began to help prototype the 3D printed design
    - Completed required trainings
    - Assisted in the CAD modelling of the prototype
- Ben Pytlik
    - Helped to CAD parts for the first prototype
    - Printed CAD elements
    - Completed trainings
    - Worked with others to begin fabrication of the device
- Miti Patel
    - Helped prototype CAD design
    - Completed required trainings

Activities

Name	Date	Activity	Time (h)	Week Total (h)	Sem. Total (h)
Anna Wood	10/29	Modeled device in CAD and fabricated the current prototype with teammates.	3	3	24.5
Mara Van Dyke	10/29	Made CAD models, 3D printed components, laser cut base, completed trainings	4.5	4.5	24.5
Tess Brazee	10/29	Completed required training, assisted in initial CAD design for 3D print	1.5	1.5	21
Sam Anderson	10/29	Assisted with the 3D CAD modelling of the device, prototyped with the 3D printed parts, fabricated parts of the device	2.5	2.5	22.5
Ben Pytlik	10/29	Helped CAD design elements of the prototype, helped print the CAD design elements, completed required trainings, fabricated device	3	3	24.5
Miti Patel	10/29	Aided beginning stages of CAD design, completed required trainings, worked on progress report	1.5	1.5	23