

Dynamic Balance Device

Date: 04/19/2026 - 04/25/2026

Client: Mr. Daniel Kutschera

Advisor: Professor Monica Ohnsorg

Team:

Kat Sattel - Team Leader (sattel@wisc.edu)

Therese Kalt- Communicator (tkalt@wisc.edu)

Noor Awad - BSAC (nawad2@wisc.edu)

Freyja Heggeland - BWIG/BPAG (heggeland@wisc.edu)

Problem statement: Patients that have suffered strokes have a 25-30% rate of developing spatial neglect syndrome. Symptoms of spatial neglect syndrome include loss of awareness of the body in space. Our client, Dr. Kutschera, a physical therapist, helps patients to regain strength and balance following a stroke. The client seeks to develop a device that can be used to improve visual scanning and balance training that is an update from the previous yard-stick design. The device should be mutli-functional so as to help patients with varying degrees of need and be effective in the rehabilitation treatment.

Brief status update: This week, the team completed fabrication, performed MTS and fatigue testing, and created the final poster!

Difficulties / advice requests: None to report

Current design:

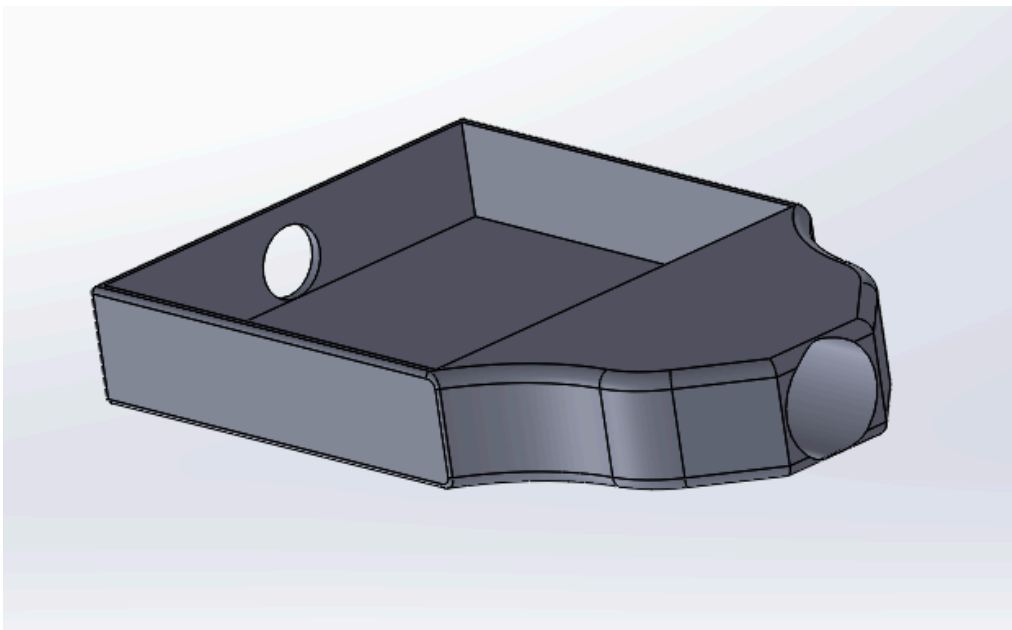


Figure 1: CAD model of the display portion of the design

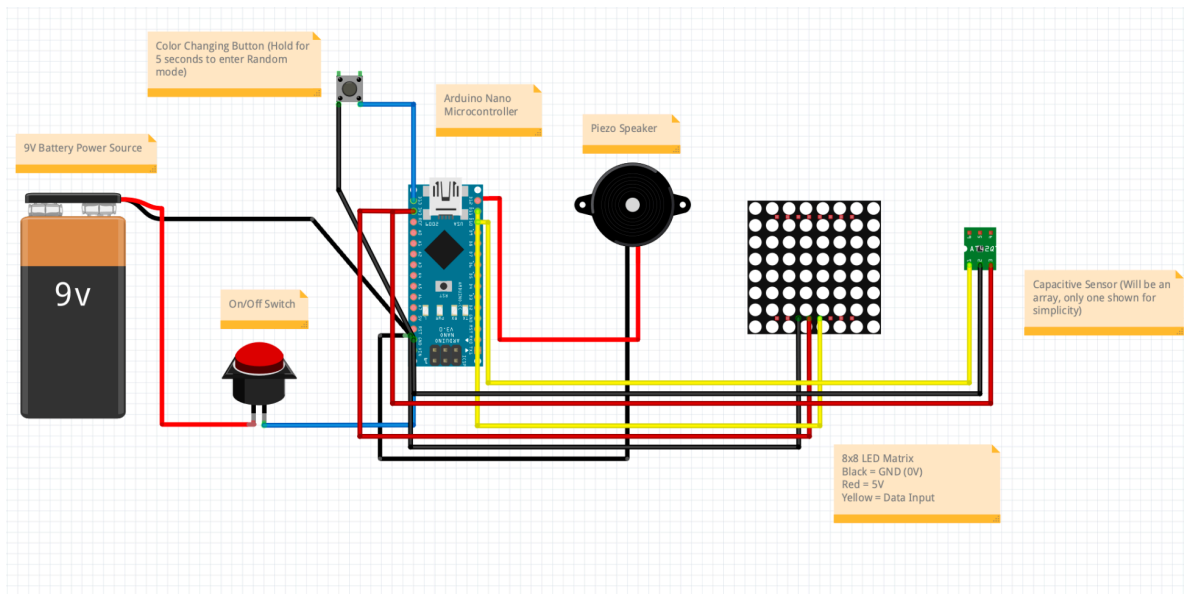


Figure 2: Fritzing diagram of final circuitry for the entire device

Materials and expenses

See table below:

Item	Description	Manufacturer	Mft Pt#	Vendor	Vendor Cat#	Date	#	Cost Each	Total	Link
Materials										
Carbon Fiber Tube	1m long, 20mm outer diameter, 18mm inner diameter	CHZDPP	B0DJ JTX3 SQ	Amazon	B0DJJT X3SQ	3/9/202 6	1	\$48.49	\$48.49	Amazon.com
3D Filament	3D Printed portion	Makerspace	n/a	Makerspace	n/a	3/18/20 26	1	\$5.17	\$5.17	https://making.engr.wisc.edu/
Metal rod	Metal rod	Makerspace	n/a	Makerspace	n/a	3/20/20 26	1	\$0.00	\$0.00	https://making.engr.wisc.edu/
arm band	arm band	All in Motion	19754 31110 24	Target	082-02- 2568	4/8/202 6	1	\$11.66	\$11.66	https://target.com
Super glue	Clear super glue	Gorilla	52427 78203 80	Target	081-22- 7899	4/8/202 6	1	\$5.39	\$5.39	https://target.com
Vinyl Sheet	Vinyl Sheet	Makerspace	n/a	makerspace	n/a	4/11/20 26	1	\$0.15	\$0.15	https://making.engr.wisc.edu

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Vinyl Stickers	Inch markers	Shunyinlai	B0FLXM9H8C	Amazon	B0FLXM9H8C	4/12/2026	1	\$14.75	\$14.75	amazon.com
Electronics										
Capacitive Touch Sensor Switch	Sensor	Arduino	TTP223B	Ebay	TTP223B	3/9/2026	1	\$8.32	\$8.32	Ebay.com
9v battery	Battery	Vetco Electronics	VUPN8981	Shopify	VUPN8981	3/9/2026	1	\$0.75	\$0.75	Vetco Electronics
Tactile switch	Button	Vetco Electronics	TEA-5144	Shopify	TEA-5144	3/9/2026	2	\$0.89	\$1.78	Vetco Electronics
Waterproof Switch	On/Off switch	Vetco Electronics	NTE-54-250W	Shopify	NTE-54-250W	3/9/2026	1	\$9.99	\$9.99	Vetco Electronics
Speaker Module	Speaker	Vetco Electronics	VUPN6344	Shopify	VUPN6344	3/9/2026	2	\$4.21	\$16.21	Vetco Electronics
Arduino Nano	Microcontroller	Arduino	A000005	Amazon	A000005	3/25/2026	1	\$21.69	\$21.69	amazon.com
Braided Cable Sleeve	Cable Sleeve	Alex Tech	704256851316	Amazon	B071G5L29C	4/11/2026	1	\$17.47	\$17.47	amazon.com
								TOTAL:	\$161.82	

Major team goals for the next week

1. Complete final report
2. Submit team final notebook

Next week's individual goals

- Kat Sattel
 - Complete sections of final report
 - Update LabArchives with all testing activities
- Therese Kalt
 - Complete sections of final report
 - Update LabArchives notebook
- Noor Awad
 - Complete sections of final report
 - Update LabArchives for final notebook check
 - Meet with client
- Freyja Heggeland
 - Complete final report

- Update LabArchives with testing protocols and active testing metrics
- Deliver poster presentation
- Meet with client

Timeline

Task	Week				Week					Week				Week	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Project R&D															
Empathize	X														
Background...	X	X	X	X	X	X									
Prototyping						X	X	X		X	X				
Testings											X	X			
Deliverables															
Progress Reports	X	X	X	X	X	X	X	X		X	X	X			
Prelim presentation				X											
Final Poster												X			
Meetings															
Client		X		X		X		X							
Advisor	X	X	X	X	X	X	X	X		X	X	X			
Website															
Update	X	X	X	X	X	X	X	X		X	X	X			

Filled boxes = projected timeline

X = task was worked on or completed

Previous week’s goals and accomplishments

- Kat Sattel
 - Completed final fabrication
 - MTS testing
 - Fatigue testing
 - Data analysis
 - Completed poster
 - Wrote elevator pitch + rehearsed
- Therese Kalt
 - Completed final fabrication
 - MTS testing
 - Analyzed data and created graphs for fatigue testing
 - Data analysis
 - Completed poster
 - Worked on final report
- Noor Awad
 - Completed fabrication

- Finalized code by testing
- MTS testing
- Fatigue testing
- Analyzed MTS testing data
- Finalized poster
- Freyja Heggeland
 - Completed MTS and fatigue testing with group
 - Finalized design function
 - Completed poster
 - Assisted in code completion
 - Started writing final report
 - Analyzed testing data

Activities

Name	Date	Activity	Time (h)	Week Total (h)	Sem. Total (h)
Kat Sattel	4/21/26	- Completed fabrication: sealed measurement lines, painted arm band, glued everything in place, worked on code	5	12	61.5
	4/22/26	- Completed testing + data analysis	5		
	4/23/26	- Wrote + practiced elevator pitch	2		
Therese Kalt	4/20-4/22	- Completed fabrication	2	11	55
		- Completed testing and data analysis	5		
		- Worked on poster	2		
		- Worked on final report	2		
Noor Awad	4/20-4/22	- Finalized fabrication and code	4	14	52.5
		- Completed testing	5		
		- Data analysis	2		
		- Wrote script and practiced	2		
		- Finalized poster	1		
Freyja Heggeland	4/21/26	- Previewed MTS testing, wrote more for fatigue testing protocol	2	10	54.5
	4/22/26	- Performed MTS and fatigue tests, finalized fatigue	5		

	4/23/26	protocol, analyzed data, poster edits - Practiced final presentation, reviewed past work	3		
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