Dynamic Balance Device

Date: 03/20/2026 - 03/27/2026

Client: Mr. Daniel Kutschera
Advisor: Professor Monica Ohnsorg

Team:

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

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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 met with the client to go over feedback from show and tell, ordered a smaller microcontroller, and continued making updates to the CAD model(s).

Difficulties / advice requests: None to report
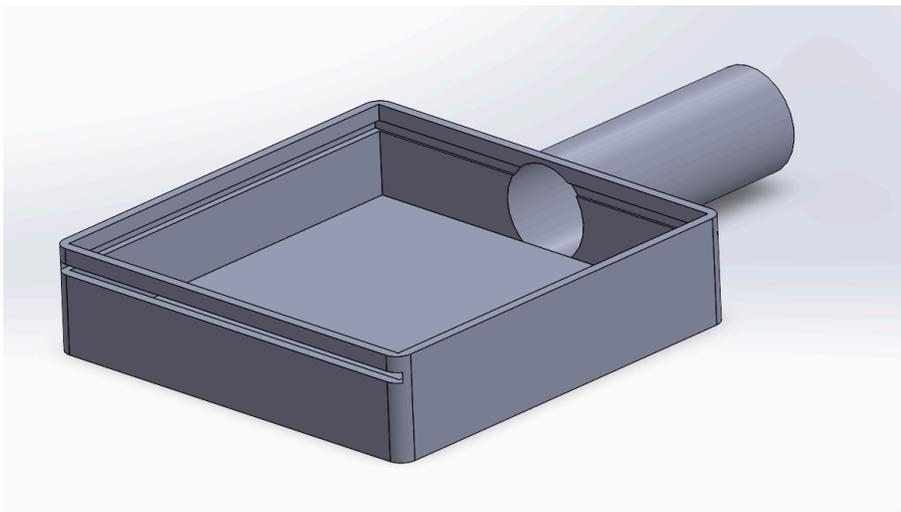
Current design:

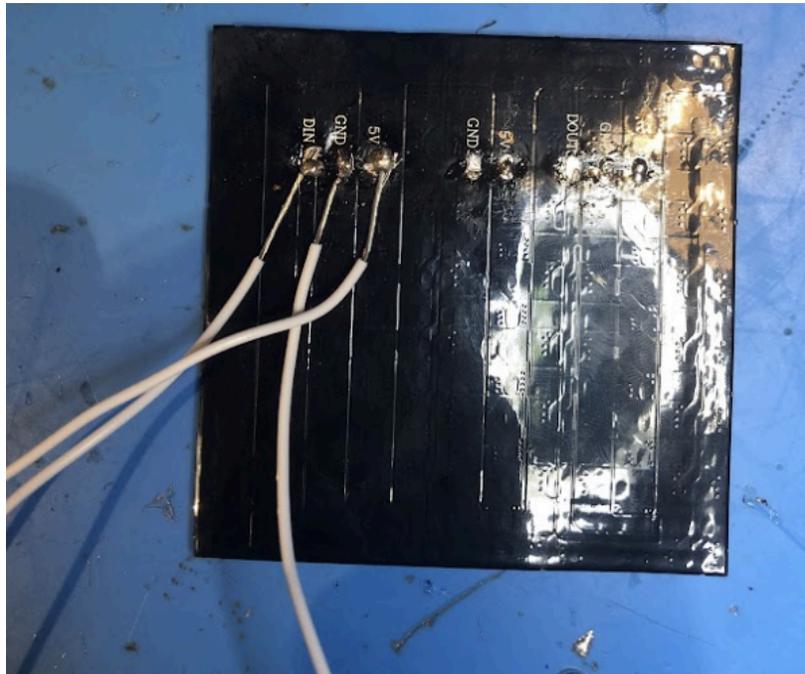Figure 1: CAD Model of the Display Portion of the Design

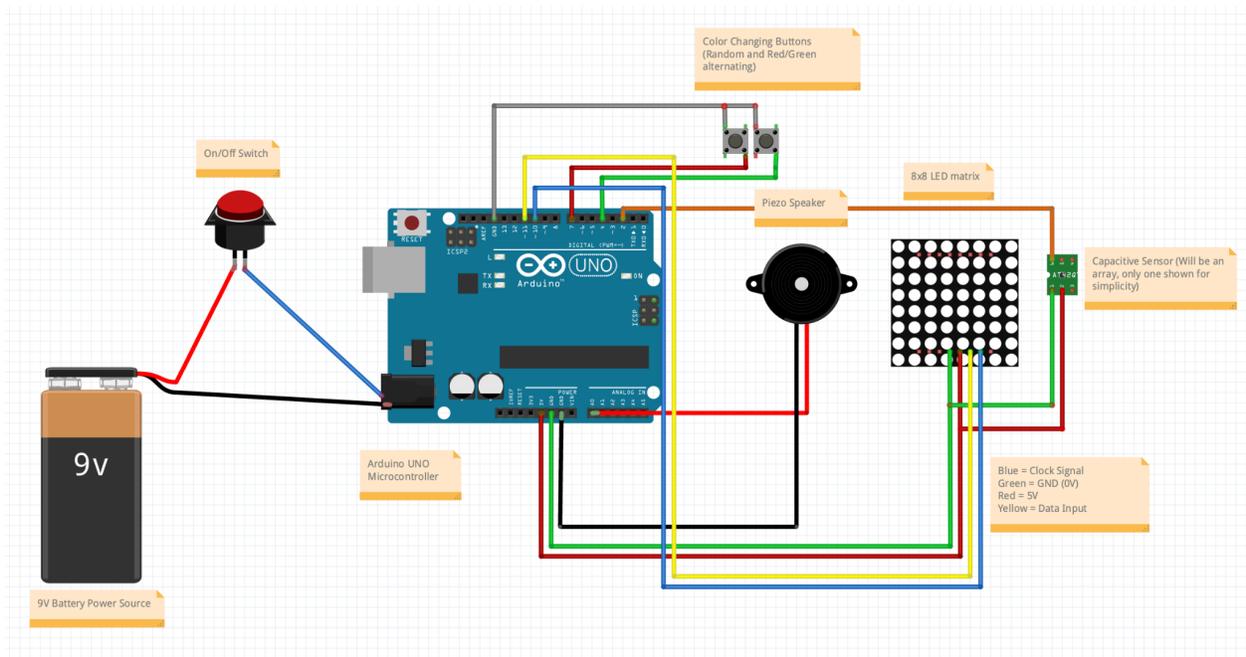Figure 2: Backside of the LED Display with Soldered Wires.

Figure 3: Fritzing Diagram of Circuitry for the Entire Device

Materials and expenses

See table below:

Item	Description	Manufac-turer	Mft Pt#	Vendor	Vendo r Cat#	Date	#	Cost Each	Total	Link
Materials										

	1m long, 20mm outer diameter, 18mm inner diameter	CHZDPP	B0DJJTX3SQ	Amazon	B0DJJTX3SQ	3/9/2026	1	$48.49	$48.49	Amazon.com
Carbon Fiber Tube										
3D Filament	3D Printed portion	Makerspace	n/a	Makerspace	n/a	3/18/2026	1	$1.89	$1.89	https://making.engr.wisc.edu/
Metal rod	Metal rod	Makerspace	n/a	Makerspace	n/a	3/20/2026	1	$0.00	$0.00	https://making.engr.wisc.edu/
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	
								TOTAL:	**$109.12**	

Major team goals for the next week

1. Finalize testing protocols
2. Finalize fabrication protocols
3. Update Arduino code

Next week's individual goals

- Kat Sattel
  - Finish writing testing protocols and make survey form
  - Work on updating arduino code
  - Update Fritzing diagram
- Therese Kalt

- - ○ Work on testing protocols
    - ○ Continue working on CAD for either the circuit box or handle
  - ● Noor Awad
    - ○ Help with testing protocols
    - ○ Assemble circuitry with sensors
  - ● Freyja Heggeland
    - ○ Help with testing protocols
    - ○ Make survey form
    - ○ Update arduino code and help with circuitry

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							
Testings															
Deliverables															
Progress Reports	X	X	X	X	X	X	X	X							
Prelim presentation				X											
Final Poster															
Meetings															
Client		X		X		X		X							
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

Previous week's goals and accomplishments

- ● Kat Sattel
  - ○ Met with client
  - ○ Ordered Arduino Nano
- ● Therese Kalt
  - ○ Met with client
  - ○ Worked on the display portion of the design in SolidWorks
- ● Noor Awad
  - ○ Met with client and prepared client questions
  - ○ Continued to research Arduino code
  - ○ Work on executive summary

- Freyja Heggeland
  - Met with client
  - Updated Arduino code

Activities

Name	Date	Activity	Time (h)	Week Total (h)	Sem. Total (h)
Kat Sattel	3/23/26 3/25/26	- Met with client - Ordered materials	0.5 0.5	1	31.5
Therese Kalt	3/23/26 3/24/26	- Met with client - Worked on the display	1 1	2	30
Noor Awad	3/23/26 3/24/26	- Prepared for and met with client - Research	2 1	3	26
Freyja Heggeland	3/23/26 3/23/26	- Met with client - Updated Arduino code	0.5 2	2.5	34