

Smart Walker

Client: Mr. Daniel Kutschera

Advisor: Prof. Justin Williams

Team Members: Nicolas Maldonado, Shreya Venkatesh, Navya Jain, Xicheng Yang

Name	Email	Role
Nicolas Maldonado	namaldonado@wisc.edu	Leader
Shreya Venkatesh	svenkatesh9@wisc.edu	Communicator
Navya Jain	njain52@wisc.edu	BPAG & BWIG
Xicheng Yang	xyang622@wisc.edu	BSAC

Problem statement:

The client, a physical therapist working in neuro-rehabilitation, has several patients with traumatic brain injury who use walkers as transition devices. He needs a smart walker for his patients that can objectively measure gait speed, distance walked, and the weight/force applied through the walker. Data is required by Medicare to demonstrate progress and efficacy, but can also help improve clinical assessment and motivate patients as they work to reduce device dependence. Currently, quantitative measurements are taken manually, which is time-consuming and incomplete, as there is no way to measure weight-bearing. Two prototypes have been made by modifying an existing walker, but this compromises structural integrity and is not viable for patient testing. The main goal is to develop a safe, attachable assessment device that provides real-time, clinically relevant gait and weight-bearing data for use with standard walkers by clinicians and patients.

Brief status update:

As a team, we are prototyping our hardware circuitry and making plans for soldering. We are writing up testing protocols to perform by next week and completed the executive summary draft.

Difficulties/advice requests:

Nothing at the moment.

Major team goals for the next week

1. Outline testing methods
2. Soldering
3. Begin market research and get feedback

Next week's individual goals

Navya:

- Research and develop testing protocols
- Write fabrication protocols
- Begin testing

Shreya:

- Research and write up testing procedures
- Begin initial overall circuitry plan with online design

Nicolas:

- Assemble the smart walker system
- Assemble the circuits required for the smart walk system

Xicheng:

- Draw the fritzing cable connection illustration
- Assemble the walker

Timeline

Task	January		February				March				April				
	23	29	5	12	19	26	5	12	19	26	2	9	16	23	29
Project R&D	/	/	/	/	/	/	/	/	/	/	/				
Empathize															
Background...		X	X	X	X	X	X	X	X						
Prototyping							X	X	X	X	X				
Testings															
Deliverables															
Progress Reports		X	X	X	X	X	X	X	X	X	X				
Prelim presentation						X									
Final Poster															
Meetings															
Client			X				X								
Advisor		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

Complete 3D printing, outline hardware fabrication, order materials.

Activities

Name	Date	Activity	Time (h)	Week Total (h)	Sem. Total (h)
Nicolas Maldonado	07/04/26 09/04/26	Prototyping 3D printed components Executive summary	1 1	2	19.5
Shreya Venkatesh	02/04/26 08/04/26	Executive summary Prototyping circuitry	1 1	2	19.5
Navya Jain	06/04/26 08/04/26	Worked on executive summary Worked on executive summary	1 0.5	2	19.5
Xicheng Yang	09/04/26 09/04/26	Executive summary Flash the radar firmware	1 1	2	

Current design

No current design to report.

Materials and expenses

Other files

[Product Design Specification](#)

[Design Matrix](#)

[Preliminary Presentation](#)

[Preliminary Report](#)

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

[Executive Summary](#)