

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 spent time understanding the problem statement, purpose, and topic. We each did background research, had a client meeting on February 2, and completed the first draft of the Product Design Specification.

Difficulties/advice requests:

Nothing at the moment.

Major team goals for the next week

1. Finish ordering of materials
2. Start discussing new design ideas
3. Begin on the design matrix

Next week's individual goals

Navya:

- Brainstorm design ideas
- Work on the design matrix
- Finalise materials that need to be ordered

Shreya:

- Do research on sensors in the market to order
- Brainstorm design ideas for attachments

Nicolas:

- Design possible designs in CAD to get a rough idea of possible directions
- Model all existing components, including end caps, walker, etc.

Xicheng:

- Design matrix
- Finalize items needing upgrade (UWB, bluetooth, pressure sensor)

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

Website												
Update	X	X	X									

Filled boxes = projected timeline

X = task was worked on or completed

Previous week's goals and accomplishments

Get to know teammates, outline roles and responsibilities, create a communication plan.

Activities

Name	Date	Activity	Time (h)	Week Total (h)	Sem. Total (h)
Nicolar Maldonado	02/02/26 03/02/26 02/02/26 04/02/26	Client meeting PDS work Did research on possible load sensors at different price points Explored the possibility of integrating a load sensor into the existing end cap	0.5 1 0.75 0.75	3	4.5
Shreya Venkatesh	02/02/26 02/02/26 05/02/26 05/02/26	Client Meeting Completion of PDS sections PDS review Research on real-time monitoring attachments	0.5 1 0.5 1	3	5.5
Navya Jain	02/02/26 03/02/26 04/02/26	Client Meeting Worked on PDS More research on UWB sensors	0.5 1 0.5	2	2
Xicheng Yang	01/30/26 02/04/26 02/05/26	BSAC meeting PDS part 3 miscellaneous Competitive design research	1 1.5 1	3.5	6

Current design

No current design to report.

Materials and expenses

No current design to report.

Other files

[Product Design Specification](#)