

Smart Walker

Client: Mr. Daniel Kutschera

Advisor: Prof. Darilis Suarez

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 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 it 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 clinicians and patients to use with standard walkers.

Brief status update:

As a team, we worked on our preliminary presentation and evaluated our next steps and design changes.

Difficulties/advice requests:

Nothing at the moment.

Major team goals for the next week

1. Load cell recalibration
2. Reprint of electrical housing with new 3D print material
3. mmWave radar program research and software changes.

Next week's individual goals

Navya:

- Load cell calibration
- Walker leg angle design ideas

Shreya:

- Load cell calibration
- Evaluate material reorder or replacement
- mmWave radar non-linear research

Nicolas:

- Load cell housing cable management
- Walker leg angle → Fix load cell housing to account for it

Xicheng:

- Start load cell cable management
- Software changes

Timeline

Task	September			October					November				December	
	10	17	24	1	8	15	22	29	5	12	19	26	3	10
Project R&D														
Empathize	X	X	X											
Background...	X	X	X											
Prototyping														
Testings														
Deliverables														
Progress Reports	X	X	X	X										
Prelim presentation				X										
Final Poster														
Meetings														
Client		X												
Advisor	X	X	X											

Website														
Update	X	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)
Nicolas Maldonado	27/09/26 30/09/26 30/09/26	Prelim presentation Cable management design Team practice	0.5 0.5 1	2	6.5
Shreya Venkatesh	27/09/26 29/09/26 30/09/26	Worked on prelim presentation Script for prelim Team practice	0.5 0.25 1	1.75	5.5
Navya Jain	26/09/26 30/09/26	Worked on prelim presentation Practiced prelim presentation	0.5 1	1.5	7
Xicheng Yang	27/09/26 30/09/26 02/10/26	Work on prelim pre Team online practice In person practice	1 .5 .5	2	8

Current design

No current design to report.

Materials and expenses

No current design to report.

Documentation

[Product Design Specification](#)

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

[Design Matrix](#)

[Preliminary Presentation](#)