

## 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 each did research on ideas for our design matrix. We made two design matrixes: one for a new distance sensor and one for some end cap designs. We have also made a plan for purchasing materials and will get that started early next week.

### Difficulties/advice requests:

Nothing at the moment.

## Major team goals for the next week

1. Finish ordering of materials
2. 3D print the new end cap design
3. Create a design timeline with chosen items for the course of the semester

## Next week's individual goals

Navya:

- Begin ordering materials
- Begin 3D-printing
- Work on preliminary presentation

Shreya:

- Help with modelling all existing design components
- Start 3D printing/purchasing the chosen design ideas

Nicolas:

- Decide on design direction
- Design winning design in cad and begin rapid prototyping
- Order materials

Xicheng:

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## Timeline

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

<b>Website</b>															
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	11/02/26	Design matrix meeting	1	3	7.5
	12/02/26	Design matrix individual work	1.5		
	12/02/26	Sensor research	0.5		
Shreya Venkatesh	10/02/26	Complete some research for distance sensors	0.5	2	7.5
	11/02/26	Design matrix team meeting	1		
	12/02/26	Fill out design matrix criteria	0.5		
Navya Jain	10/02/26	Researched designs for design matrix	0.5	2.5	6.5
	11/02/26	Design matrix meeting	1		
	12/02/26	Worked on design matrix	1		
Xicheng Yang					6

## Current design

No current design to report.

## Materials and expenses

No current design to report.

## Other files

[Product Design Specification](#)

[Design Matrix](#)