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 CAD designs for the end cap design matrix options. We also completed the preliminary presentation, which we will be doing on Thursday. 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:

- Order materials for sensors
- Work on preliminary report
- Start developing testing plans

Shreya:

- Help with picking brands to purchase for sensors
- Begin with 3D printing

Nicolas:

- 3D print components for test fit
- Work on preliminary report

Xicheng:

- Search for exact sensor brands and models
- Continue research on testing plans

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

Website													
Update	X	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	13/02/26 15/02/26 18/02/26	Worked on preliminary presentation Practiced preliminary presentation CAD Design for integrated design	1 1 0.5	2.5	10
Shreya Venkatesh	13/02/26 15/02/26 19/02/26	Updated the preliminary design slides Create preliminary design CAD Practice preliminary presentation	0.5 1 1	2.5	10
Navya Jain	13/02/26 14/02/26 17/02/26 19/02/26	BPAG Meeting Worked on preliminary presentation Practice preliminary presentation Team prelim presentation practice	0.5 1 1 1	3.5	10
Xicheng Yang	13/02/26 17/02/26 19/02/26 19/02/26	BSAC meeting Preliminary presentation final design & future work page TBI & Testing research Practice preliminary presentation	1 1 1 1	4	10

Current design

No current design to report.

Materials and expenses

No current design to report.

Other files

Product Design Specification

Design Matrix

Preliminary Presentation