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 purchased materials and discussed designs for hardware circuitry. We also had a meeting with our client to discuss fabrication plans and provide a brief status update on what we have been up to for the last couple of weeks.

Difficulties/advice requests:

Nothing at the moment.

Major team goals for the next week

1. Outline testing methods
2. Remove not required materials from the old smart walker
3. Begin other fabrication processes

Next week's individual goals

Navya:

- Purchase all remaining materials
- Research and come up with testing procedures
- Begin writing fabrication plans

Shreya:

- Research and write up testing procedures
- Begin modeling hardware plans

Nicolas:

- Finalize sizing for the load cell housing
- Begin modeling hardware enclosures so that they are secure within the design

Xicheng:

- Setup a basic react native app framework
- Modify current arduino code

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

Website															
Update	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	02/29/26 03/02/26 03/03/26 03/04/26	Inital housing design Test fitting Team meeting Housing reiteration + printing	1 0.5 1 0.5	3	16
Shreya Venkatesh	03/03/26 04/03/26 05/03/26	Team meeting & materials research Client meeting & makerspace convo Research on mmwave radar options	1 1 0.5	2.5	15.25
Navya Jain	28/02/26 03/03/26 04/03/26 05/03/26	Researched where to purchase materials from Team meeting and materials research Client meeting Research alternative mmwave radars	0.5 1 0.5 0.5	2.5	15
Xicheng Yang	27/02/26 03/03/26 04/03/26 05/03/26	BSAC meeting Team meeting and code research Client meeting Research on react native	1 1 0.5 0.5	3	16.5

Current design

No current design to report.

Materials and expenses

Other files

Product Design Specification

Design Matrix

Preliminary Presentation

Preliminary Report