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 have been testing the load cell, mmWave radar, the entire circuitry system,soldering final connections, and completing all tasks for the poster presentation.

Difficulties/advice requests:

Nothing at the moment.

Major team goals for the next week

1. Final Report
2. User feedback
3. Additional testing (if time permits)

Next week's individual goals

Navya:

- Work on final report
- Make sure everything is up to date in lab archives
- Patent research

Shreya:

- Complete final report
- Edit final notebook
- Look for patent process

Nicolas:

- Complete final report
- Final notebook
- Patent research

Xicheng:

- Final report
- Edit final notebook

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

Client			X				X								
Advisor		X	X	X	X	X	X	X	X	X	X	X	X	X	
Website															
Update	X	X	X	X	X	X	X	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	21/04/26 22/04/26 23/04/26	fabrication Fabrication Presentation work	2.5 6 2.5	11	36.5
Shreya Venkatesh	17/04/26 20/04/26 22/04/26 23/04/26	Worked on poster Load cell and mmWave radar testing mmWave radar testing Worked poster and printing	0.5 4 3 2.5	10	33.5
Navya Jain	19/04/26 20/04/26 21/04/26 21/04/26 22/04/26 23/04/26	Worked on poster Load cell and mmWave radar testing mmWave Radar testing Research for judging speech Worked on poster Worked on poster	0.5 4 3 1 1 0.5	10	33.5
Xicheng Yang	20/04/26 21/04/26 22/04/26 23/04/26	Testing Testing Fabrication and testing Practice poster pre	1 3 6 1	11	

Current design

No current design to report.

Materials and expenses

Other files

Product Design Specification

Design Matrix

Preliminary Presentation

Preliminary Report

Executive Summary

Final Poster