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 3D-printed the new load cell holders and soldered the load cell system into them, so it is ready to share for show and tell. We are also still working on getting IRB approval.

Difficulties/advice requests:

Nothing at the moment.

Major team goals for the next week

1. Load cell recalibration
2. mmWave radar program change
3. mmWave radar testing

Next week's individual goals

Navya:

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Shreya:

- Complete load cell testing and recalibration
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Nicolas:

- Complete load cell testing

Xicheng:

- Try to grab a physical android device from library to test the app
- Help load cell soldering and calibration works
- Help IRB and outreach paperwork preparation

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	X	X	X	X	X						
Background…	X	X	X	X	X	X	X	X						
Prototyping					X	X		X						
Testings														
Deliverables														
Progress Reports	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						
Website														
Update	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

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	26/10/26 27/10/26 29/10/26	Soldering work design/print components Load cell housing assembly	2 2 2	6	23
Shreya Venkatesh	26/10/26 29/10/26	Unsoldering the old load cell components, and evaluating 3D print Soldered components onto new 3D print IRB meeting	2 1 0.5	3.5	12.5
Navya Jain	28/10/26 29/10/26	Worked on IRB application IRB Meeting	1 0.5	1.5	19.25
Xicheng Yang	23/10/26 23/10/26 28/10/26 29/10/26 29/10/26	BSAC meeting Soldering preparation meeting Release app v0.2.0 Release app v0.2.1 IRB meeting	1 .5 1 2 .5	5	26

Current design

No current design to report.

Materials and expenses

Material Expense Sheet

Documentation

Product Design Specification

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

Design Matrix

Preliminary Presentation

Preliminary Report