Smart Walker
Progress Report 8: 10/30/2025

Client: Mr. Daniel Kutschera
Advisor: Duc-Huy Nyugen
Team:

- Leader: Nicolas Maldonado
- BSAC: Carolyn Randolph
- Communicator: Aidan Burich
- BWIG: Nial Donohoo
- BPAG: Henry Salita

Problem Statement: Mr. Daniel Kutschera a physical therapist working in neuro-rehabilitation needs objective, real-time data from walker use to guide therapy and meet documentation needs required by medicare. Today these metrics are gathered manually (wheel + stopwatch) and do not quantify load, making measurements inconsistent and hard to track. Earlier attempts to add sensors by modifying frames have compromised walker safety and usability. We need a small, lightweight, clip-on module for common walkers that shows speed, distance, and how much weight the user puts through the walker in real time, saves a short session summary after each use, and doesn't change how the walker is used or folded. Our budget to complete this is $500.

Brief Team Status Update: Team has continued prototyping the circuitry for the load cells and LiDAR as well as 3D printing the encasements.

Summary of Weekly Individual Design Accomplishments:

- Nicolas Maldonado: Worked on the load sensor and got it to be functional but not working properly yet.
- Carolyn Randolph: Worked on LiDAR circuitry and coding.
- Aidan Burich: Worked on lidar code and load cell code.
- Nial Donohoo: Finished required trainings, met multiple times as a group to work on lidar and pressure sensor wiring and code
- Henry Salita: Worked on Lidar and load cell coding as well as updated purchasing and BME 200 trainings in Lab Archives.
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Weekly/Ongoing Difficulties: We are currently troubleshooting drift issues with the weight sensors and connectivity issues with the LiDAR.

Upcoming Team Goals:

Upcoming Individual Goals:

- Nicolas Maldonado: Finalize the circuits to start working on the hosing for electronic components
- Carolyn Randolph: Make design changes and improvements based on suggestions from show and tell.
- Aidan Burich: In the coming week I want to finish coding for the load cell and work more on the lidar code.

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- Nial Donohoo: Figure out issues code and wiring for load cell and lidar. Work on housing for components.
- Henry Salita: Purchase a laser pointer to assist with lidar sensor, and help figure out the load cell code.

Project Timeline

Project Goal	Deadline	Team Assigned	State of Completion
Initial Research	9/12	All	The team will continuously research throughout the semester.
Product Design Specifications	9/18	All	The PDS has been completed
Design Matrix	10/3	All	Complete
Preliminary Presentation	10/3	All	Complete
Preliminary Report	10/8	All	Complete
Customize Load Cell sensor holder	10/24	Henry Salita	First iteration is done
Initial Fabrication - Circuitry and Coding	11/7	All	In progress

Expenses

Item	Description	Manufacturer	Part Number	QTY	Cost Each	Total	Link
Walker	2-wheel walker, **gifted** by client	Performance Health Supply, Inc.	081561703	1	$136.73	$0	Performance Health
Load Cell initial 3D print	3D print of End-Cap 2.0 design **gifted** by friend with printer.	bambu lab a1 mini	N/A	1	$1.60	$0	N/A

Load Cells + HX711	4 50 kg load cells with HX711	Nextion	702795764555	1	$16.85	$16.85	https://a.co/d/2wlwmol
LiDar	Sensor Optical 3-200CM 12C	DigiKey	DigiKey part number : 1568-14032-ND	1	145.93	145.93	DigiKey
TOTAL:							**$162.73**