Smart Walker
Progress Report 7: 10/23/2025

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 started prototyping the circuitry for the load cells and 3D printing the encasements.

Summary of Weekly Individual Design Accomplishments:

- Nicolas Maldonado: working on the circuit for the load sensors including arduino, sauntering, and wiring.
- Carolyn Randolph: Purchased the LiDar and continued to revise the report.
- Aidan Burich: Revised the report and worked on coding for the load cells with the Arduino
- Nial Donohoo: Looked into coding for the sensors, and worked on the wiring of the load cells and Arduino
- Henry Salita: Modified the weight sensor holder to better hold the sensors we purchased as well as try help with coding of the sensors.

Weekly/Ongoing Difficulties: We are currently troubleshooting coding our weight sensors.

Upcoming Team Goals: We plan to 3D print the first prototype of our housing design in order to see if our components fit correctly. After the team feels happy with their design, they will move forward with testing and improvements

Upcoming Individual Goals:

- Nicolas Maldonado: Continue to develop the code to get it in working order
- Carolyn Randolph: Work on wiring and coding the LiDAR sensor ahead of show and tell.
- Aidan Burich: Figure out coding for the load cells and start coding the lidar sensor
- Nial Donohoo: Finalize component housing for electronics and work on figuring out pressure and lidar sensor

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- Henry Salita: Print a final prototype for the weight bearing design and help finish figuring out the coding for the weight sensors.

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/2

							wlwmol
LiDar	Sensor Optical 3-200CM 12C	DigiKey	DigiKey part number : 1568-14032-ND	1	145.93	145.93	DigiKey
TOTAL:							**$162.73**