Smart Walker
Progress Report 10: 11/13/2025

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: The team has made significant progress in terms of circuitry. We have the LiDAR sensor in mostly working order and are approaching the testing phase. We have created custom molds for the load sensors and will continue to develop them.

Summary of Weekly Individual Design Accomplishments:

- Nicolas Maldonado:
- Carolyn Randolph: Continued troubleshooting with the load cells.
- Aidan Burich: worked on load cell coding
- Nial Donohoo: Worked on trying to get the load cells to work. Added to component housing design.
- Henry Salita: Continued troubleshooting with the load cell, and modified the button piece to fit to the face of our sensors better..

Weekly/Ongoing Difficulties: We are currently troubleshooting the load sensors in order to get them calibrated correctly

Upcoming Team Goals: Finish all circuits and begin testing and housing development

Upcoming Individual Goals:

- Nicolas Maldonado:
- Carolyn Randolph: Get the load cells to work.
- Aidan Burich: continue to work on load cell coding
- Nial Donohoo: Get the load cells to work! Continue working on housing for lidar and components

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- Henry Salita: Get load cells to work and add a mechanism that allows the load cells to click in and out of the add on attachment.

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
Load Cell initial 3D print	3D print of End-Cap 2.0 design	Bambu lab	N/A	1	$1.04	$1.04	N/A
Arduino Uno Rev 4							
TOTAL:							**$163.77**