

Smart Walker

Progress Report 10: 11/20/2025

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: Worked on finalizing the circuit and began initial testing
- Carolyn Randolph: Combined sensors into one circuit began adding Bluetooth modules and getting the app to work.
- Aidan Burich: Worked on combining code and bluetooth for data
- Nial Donohoo : 3d printed component housing and made adjustments to design.
- Henry Salita: Added load cell house features and attempted to print in TPU and learned that is not a reliable material for future 3D fabrication.

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: solder together the circuit and put it in the housing
- Carolyn Randolph: Finish with app and testing.
- Aidan Burich: finish app and construct prototype
- Nial Donohoo: reprint component housing with modifications!

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- Henry Salita: Print the load cell final design in a non TPU material as well as collect receipts from group members to get a total of money spent.

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	Complete (need some tweaks)
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 +	4 50 kg load cells with	Nextion	702795764	1	\$16.8	\$16.8	https://a

