

Smart Walker

Progress Report 5: 10/09/2025

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 need 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 finished the first draft of the report.

Summary of Weekly Individual Design Accomplishments:

- Nicolas Maldonado: worked on preliminary report and gave preliminary presentation
- Carolyn Randolph: Worked on the preliminary report and created a circuit block diagram.
- Aidan Burich:
- Nial Donohoo: Worked on the preliminary report, updated website to include project overview and description, met with client and discussed walker specifications.
- Henry Salita: Worked on multiple sections in the preliminary report, and 3D printed and initial prototype for End-Caps that will hold the load cells.

Weekly/Ongoing Difficulties: We had no notable difficulties this week.

Upcoming Team Goals: We plan to move forward with the initial fabrication steps this forthcoming week. We will order components as needed and begin 3D printing prototypes. Additionally, we will complete the preliminary report.

Upcoming Individual Goals:

- Nicolas Maldonado: continue to develop the design and order components
- Carolyn Randolph: Look into the coding aspect of the project and integration of the lidar sensor.
- Aidan Burich:
- Nial Donohoo: Begin purchasing components which will allow us to finalize our design. Plan how to house the electronic components and battery.

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- Henry Salita: Customize End-Caps to specifically fit our load cells, and update financial information as we start purchasing materials.

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	
Initial Fabrication - Circuitry and Coding	11/7	All	

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

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TOTAL:							\$0.00