

Smart Walker

Progress Report 3: 09/25/2025

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: This week the team continued our research and drafted our Product Design Specification, laying out the requirements and next steps for our projects. Individually we have started to sketch and model our initial designs for the project, on paper and on CAD!

Summary of Weekly Individual Design Accomplishments:

- Nicolas Maldonado: created some preliminary models of both the pressure sensing component and the acceleration + gyroscope housing.
- Carolyn Randolph: Sketched two potential designs.
- Aidan Burich: This week, I created a model in Onshape of a design that would go around the handles of the walker to sense the weight put on the walker. I also did research on a rotary encoder which could be used as a way to track the distance of the walker. I picked up the walkers from the client too.
- Nial Donohoo: Did additional research on how load cells work and how to wire them. Drew a preliminary design for project
- Henry Salita: Did research into accuracy of pedometers for slow moving individuals. As well as contribute to our design matrix in order to help decide what's important in our preliminary designs. Modeled a little more on CAD and on paper.

Weekly/Ongoing Difficulties: No notable difficulties.

Upcoming Team Goals: Present preliminary presentation. Decide on what design to move forward with. Start preliminary designs of prototype.

Upcoming Individual Goals:

Smart Walker

Progress Report 3: 09/25/2025

- Nicolas Maldonado: decide on components to order and continue developing the design in CAD.
- Carolyn Randolph: Work on preliminary presentation.
- Aidan Burich: continue to refine designs to make them presentable for our preliminary presentation
- Nial Donohoo: Continue to research how different components work and draw additional models and work on the preliminary presentation.
- Henry Salita: Is to continue to research topics that will help the progress of our project as well as model some of our preliminary designs in OnShape.

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	
Preliminary Presentation	10/3	All	
Preliminary Report	10/8	All	
Initial Fabrication - Circuitry and Coding	11/7	All	

Expenses

Item	Description	Manufacturer	Part Number	QTY	Cost Each	Total	Link

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TOTAL:	\$0.00						