Project Goals

MECHTRON 4TB6 - Mechatronics and Software Engineering Capstone Design Project
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Group #2 – Modern Mobility

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Problem Statement

Many individuals find themselves requiring the use of medical walkers in their everyday lives. Most commonly used by the elderly, walkers provide support for those requiring stabilization while standing and walking. Examples of those who can benefit from walkers are individuals afflicted with muscle atrophy, osteoporosis, arthritis, or lower body injuries. There is an increasing demand for medical walkers as the baby boomer generation is getting older, resulting in an older population.

Medical walkers come with a variety of mechanical features including wheels, built-in seats, baskets, and brakes for walkers with wheels. With the current demand and available features, there has been little effort in integrating modern technology into walkers to improve the user experience. With the technology available, medical walkers can be improved upon so they are more intelligent, while including more safety features.

Project Proposal

The objective of this project is to create a smart, semi-autonomous, medical walker. The lists below include the primary and secondary goals identified for this project. These goals are the anticipated features for the target user within this design project.

Assumptions

A few assumptions are identified within the development process and the capabilities of the customer. They are:

1. The development team will modify a current market medical walker, purchased in its final product form, and structurally safe.
2. User has limited experience interacting with technology.

Primary Goals

1. Modify a standard walker to autonomously drive itself away to a ‘station’ when the user no longer requires the walker. The walker can autonomously track, navigate, and move to the a predefined ‘stations’.
2. User can remotely prompt the walker to return to them from the product’s current location.
3. The walker will be capable of actively braking upon detecting any rapid changes in elevation. For example, if a steep slope, stairs, or a sudden drop in the ground is detected.
4. Maintain the primary functionalities of the common medical walker while augmenting its functionality by adding features in line with the above goals.

Secondary Goals

1. Walker automatically recharges itself at the docking station. This would decrease user maintenance while ensuring the battery is always being charged when the walker is not being used.
2. Uses global position system (GPS) technology to track the location of the walker on a remote device so that caregivers can find users who may require assistance.
3. Increases the user's mobility with the walker by implementing GPS navigation.
4. Capable of changing braking resistance while on a gradual change in elevation to aid users in navigating inclines.
5. Actively assists the user with walking around, whenever needed.