RoboWalk: A Solution to Help the Elderly

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PROBLEM
Defining the Problem

The risk of falling within the homes of the elderly is a common problem because they are very weak, and these falls can be fatal, resulting in a broken bone or fracture. In fact, falling is one of the leading causes in elderly fatal injuries (“Falls”). According to the Center for Disease Control and Prevention, three million older people, those who are at least 65 years old, are “treated in emergency departments per year” (“Important Facts”). This problem is important because the projection of the number of senior citizens who live alone is perpetually increasing. The American Psychological Association (APA) reported that nearly 12 million older adults live alone. The constant reminder of the risk of my grandparents falling without the assistance of a family member allowed the idea of RoboWalk to arise. The medical costs accumulate due to these accidents, provoking my attempts of RoboWalk to be as affordable as possible to its consumers.
Existing Solutions and Background Research
Zora is a robot introduced to a hospital in France that allowed the innovators to help assist and care for elderly patients through the use of robots. It cost around $18,000. The main attribute to the creation of Zora is that it offers a sense of companionship to senior citizens in hospitals who are lonely or with mental conditions because their families are busy, and they might not be able to afford assistive care. Nonetheless, the Zora Bot provides a source of entertainment to occupy the sick patients. Zora, however, is controlled from a laptop, and it is very small in size. The main intention of ZoraBots is to relieve the sense of loneliness.
Specify Requirements
Physical Requirements

- Wheels automatically lock
  - If the senior citizen needs to walk, they would need to hold on a button. This will prevent easily preventable accidents.

- Adjust to the pace of the elderly citizen’s walking speed, which allows the user to feel comfortable with RoboWalk

- Sensors along the bottom wheels that will alert the user if there is something impeding its path

- Sensors located where the patient holds on to the RoboWalk
  - Measures the heart rate
  - If the patient feels tired or exceeds normal heart rate, the robot will alert him or her and encourage the patient to sit down and relax

- Handle heavy weight that will provide a basic structure

- Be able to fit in narrow walkways (hallway)

- Fingers that the user can easily grip without slipping
More Requirements

- Sturdy enough to balance or hold
- Fingers made of cloth or non-slippery material
- Flat head with a cup holder
  - Allows the patient to carry additional items or place food on the robot while it walks
- Screen of a mobile device on the face of the square head that allows the patient to see family members through digital communication
- Speakers that allow the RoboWalk to remind the patient
- Human size so the user does not have to bend over to reach for support
Financial Requirements

The RoboWalk must be very affordable because the purpose of this is for senior citizens to have this resource to help them walk without falling or without having a caretaker. It should be more affordable than having to hire a home caretaker or purchasing more advanced robots. The project will cost a lot of money, more than a few thousand dollars, and to fund the robot, I hope to reach out to other organizations or maybe the government can contribute to the growth of this project.
Brainstorm, Evaluate, and Choose Solution
The size of the RoboWalk will be much larger than the already existing ZoraBot. It will be adjustable to the human height with a minimum height of five feet, and the legs can extend to satisfy the user's height. The arm, which is where the consumer will be holding on to, will be durable to sustain and balance the weight of at least 90 pounds. The tighter the grip on the robot, the robot will realize the stress in the patient thus wrapping its hands to support the patient. It will have a flat-top head that will allow the consumer to transport additional items as he or she walks with the RoboWalk. It will adjust to the pace and speed of the patient to allow the user to feel comfortable. Additionally, the robot will be moving on wheels that will sense and alert the patient if something impedes the path of its walkway. The wheels will automatically lock until the patient holds onto the hand of the robot (button) to provide a sturdy base for the patient, so he or she will not fall. The primary intention of RoboWalk is to allow the patient to hold on to it while walking as if a human was there to support him or her, thus preventing falls and accidents.
Developing and Prototyping the Solution
Testing the Solution

Strengths

The RoboWalk allows its patients to feel safe and secure from their fear of falling. It has various features that makes the patients comfortable, like the automatic locks that prevent the robot from moving, and it allows the user to feel as if a human is there for support.

Weaknesses

One possible weakness is that the RoboWalk might still tip over when the patient puts too much weight on one side of the robot, thus losing its balance. Additionally, the width of the RoboWalk might not be accustomed to extremely narrow hallways.
The purpose of the RoboWalk is to assist the elderly with walking because they can be weak. My goal is to protect senior citizens from easily preventable accidents. Therefore, with the presence of this solution, we can limit the number of fall death rates, thus relieving the stress and anxiety of the senior citizens and their loved ones.
Works Cited


