Dynamic Balance Device, BME 200/300

Client: Mr. Daniel Kutschera

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Problem Statement

Many elderly people–especially those who have suffered from strokes–sustain lasting mobility problems as they attempt to recover and return to "everyday" life. Currently, the solutions for physicians to use in addressing this issue are either too expensive to easily acquire, or are inadequate and are too hard to use while giving sufficient attention and support to the patient. The goal of this project is to provide a solution that remedies the issues with current designs at an affordable cost.

Brief Status Update

This week, the team continued the fabrication and development of the display box and circuit components of the design. In order to add an audio feedback feature, the team has been looking into sensors and speakers to incorporate into the circuit. Additionally, the team is working on developing a display box design to 3D print.

Summary of Weekly Team Member Design Accomplishments

- Team:
    - Continued to design the display screen box.
    - Continued to research components for the circuit.
- Gabriela:
    - Did more research on pressure sensors based on feedback
    - Made modifications to the handle designs on Onshape
    - Brainstormed testing methods for the different components of the design

- Gracie:
    - Continued to fabricate the circuit design and worked on including a sensor and speaker component.
    - Began creating testing protocols for the various components of the device.
- Jack:
    - Researched and found frosted acrylic screens for the display case
    - Continued handle redesign and display box design
- Kyle:
    - Looked into Indium Tin Oxide screens
    - Began putting together testing procedures

Weekly/Ongoing Difficulties

An ongoing difficulty is finding time for our group to meet. We all have very busy schedules and we are entering midterms this and next week. Many aspects of our design require hands-on work, so it is difficult for the team to make a lot of progress on the design when we have trouble finding times to meet.

Upcoming Team and Individual Goals
- Team:
    - Meet to finalize handle and display box designs and print them out.
    - Order necessary materials for the circuit design.
    - Keep putting together testing procedures.
- Gabriela:
    - Fabricate new versions of the handles
    - Finalize display box design and figure out the best way to house all electronic components
    - Start testing
- Gracie:
    - Finalize the circuit design and begin plans to incorporate the circuit into the device.
    - Continue to develop the display screen design.
- Jack:
    - Finalize and 3D print handle and display box
    - Order acrylic screen
- Kyle:

- Order ITO screen
- Meet up and decide on final pieces to print out
- Look into what kind of Arduino or microchips we could use.

Project Timeline

Project Goal	Deadline	Team Assigned	Progress	Completed
Preliminary Presentations	Oct 4	All	Completed	Yes
Preliminary Deliverables	Oct 9	All	Completed	Yes
Show and Tell	Nov 1	All	Completed	Yes
Poster Presentations	Dec 6	All	–	No
Final Deliverables	Dec 11	All	–	No

Expenses

Item	Description	Manufacturer	Part Number	Date	QTY	Cost Each	Total	Link
Component 1								
LED Matrix	An LED matrix that should be easy to wire and Arduino, the main component of display panel.	Loamlin	WS2812B	10/17/2024	1	$12.51	$12.51	link
Component 2								
Carbon Fiber Shaft	Piping that we're using for the length of the rod itself, carbon fiber casing, should be lightweight yet very durable	Carbon Kevlar Supply	843728109361	10/17/2024	1	$47.46	1	link
Component 3								
Arduino Buzzer	Buzzer that we should be able to hook up to a capacitive sensor to create an audible feedback for the patient	Arduino Store	C000143 107020000	10/31/2024	1	4.14$	$4.14	link
TOTAL:							**$59.97**	