

PROJECT DESCRIPTION

HOW ARE YOU FEELING TODAY?

Ari Bowman, Fall 2023

1. Project Overview

I plan to create a simple, humanoid, telerebotic prototype using Arduino, Raspberry Pi, and web pages. The robot itself will be constructed with one inch wide aluminum square tubing, 28BYJ-48 stepper motors and ULN2003 drivers, one inch wide hinges, flange shaft couplings, screws, and possibly welding. The steppers will be coded through the Arduino stepper library. Furthermore, I plan to add an element of user interactivity by using image map webpages and PHP to edit the code the Arduino is running by using the Raspberry Pi as a web server. Steppers will be utilized in five spots – both shoulder and hip joints, as well as a point in the center of the hip shaft to allow for lower body rotation. I plan to later add a sixth stepper in the middle of the shoulder shaft to allow for head movement, after casting a custom head in aluminum next semester. The lower arms and legs will be connected to the upper parts with one inch wide hinges which should hopefully allow for gravitational movement based on the positions of the upper limbs. Each limb, ideally, will move in an erratic, jerky way, and will have 4 movement loops that can be changed relative to the image map web pages. As the project title suggests, the question “how are you feeling today?” will be asked on a web page accessible via QR code with four button options, including the title: “i’m alright,” “i’m doing ok,” “not great,” “i’ve been better.” Each button will alter the movement of the robot by changing the code that the Arduino is running – by clicking the question at the top of the page, the robot turns off. The total height of the robot will not exceed two feet.

2. Purpose/Concept

As someone living with a lifelong genetic disability, I am often interested in creating artworks surrounding Disabled experiences. By creating a small, humanoid robot, I create an entity that in many ways is a “blank slate” – it could represent myself as the artist, the viewer, or nobody specific. I lean most heavily into my intended concept with the webpages. By posing the question, “how are you feeling today?” and the only answers being “i’m alright,” “i’m doing ok,” “not great,” and “i’ve been better,” the audience is forced to consider these options, and only these options, and to consider why other options are unavailable. In my life, when someone asks how I am feeling, I tend to jump between these four responses. There has honestly been no time in my life in the past three years where I have felt “good” physically, but at the same time, it is hard to balance these truths that non-disabled people often don’t want to hear,

with not wanting to be dishonest – hence the lack of options to either extreme. Furthermore, the erratic movement of the robot is something that is intentional – tremors and spasticity are common symptoms of many different medical conditions. It also harkens back to my own experiences, as the condition I have causes joints to easily dislocate and sublunate, causing my body to sometimes move in odd ways and giving me a larger range of motion than most people, with obvious drawbacks. I consider and reconsider every movement I make. All in all, the robot is meant to be a visual, conceptual manifestation of what it can be like living with a long-term physical disability.

3. Project Complications

Throughout the project process I've run into a number of issues that have complicated the creation of the piece, the most obvious of which being time. It's difficult to find time to work in the metalshop due to the fact that it's a monitored space, and hard to access when there are classes in there, leaving me only a few hours a week to work on the structural components. Furthermore, the time of having to figure out the right supplies and materials to purchase and then waiting for said materials to arrive limited the overall amount of time I had to work on the project.

Another complication that came up near the end of the project was the revelation that it was unlikely that I could get the steppers to work in the way that I wanted to, so I had to switch to using DC motors. This affected not only the code that I was working on but also the construction of the robot as the steppers were much bigger than the DC motors. Coding the DC motors came with some hiccups but I was eventually able to figure it out, however I soon realized to complete the construction with the DC motors I would need a 3D printed part to connect the motors into the aluminum tubing. I have no experience 3D printing, so this is a job that will be done over break. I then had to shift my goal for the semester from getting the construction and Arduino code done, to focusing on the Arduino code and PHP/Pi web server and not the construction, as to maximize my time in the class.

how are **you** feeling today?

i'm alright...

i'm doing ok...

not great...

i've been better...

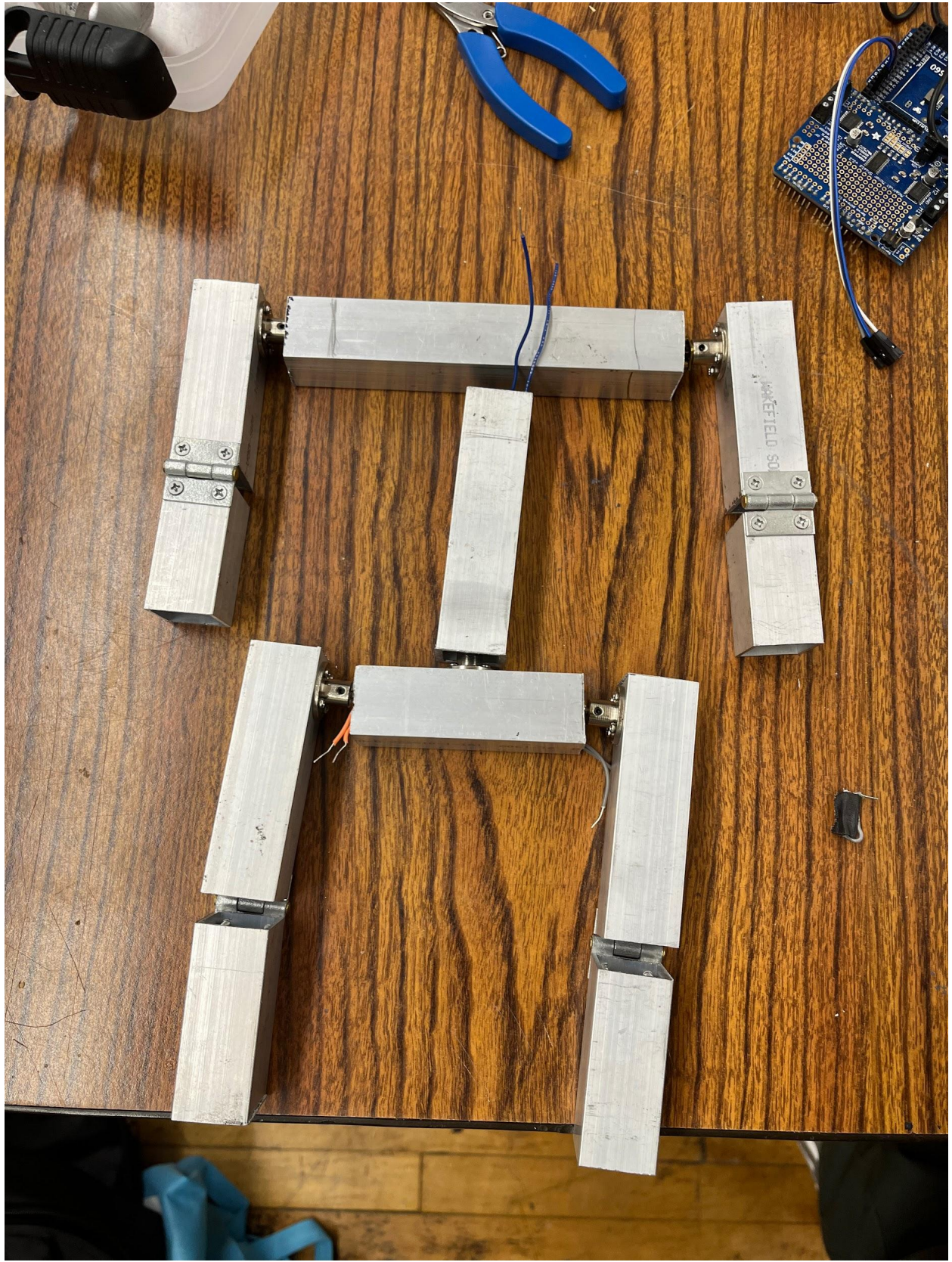
how are **you** feeling today?

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9/15/22 - NETWORK & INTERACTIVITY THOUGHTS - WGS, PROJECT IDEAS, BRAINSTORMING, ETC.

- Using network to control something tangible - sculptural puppet? very interested in ideas surrounding human relationship to technology.
iPad kids -> tech baby toys? can this be incorporated?
separately -> disability identity + autonomy in the VR ideas of passing over
background for added pt. - audience controls something like putting
plan in the position to think about their position in
larger is not.

↓
Separately -> toy projects -> turning kids toys into objects that can
control lighting, sound, etc. part of a larger project so no specific
meaning for this piece.
I want to consider + expand on this one more that one is pretty straightforward.
this one is more complicated conceptually and probably technically too.

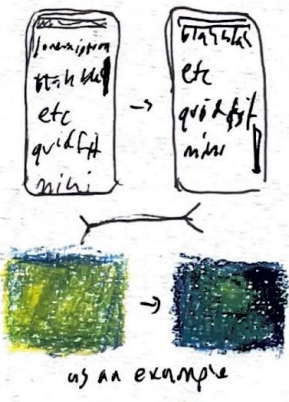
"theoretical body"
maddukna abukinuwiz



something that can be controlled via webpage
→ led lights

me see my ~~work~~ ~~my~~ ~~desires~~.

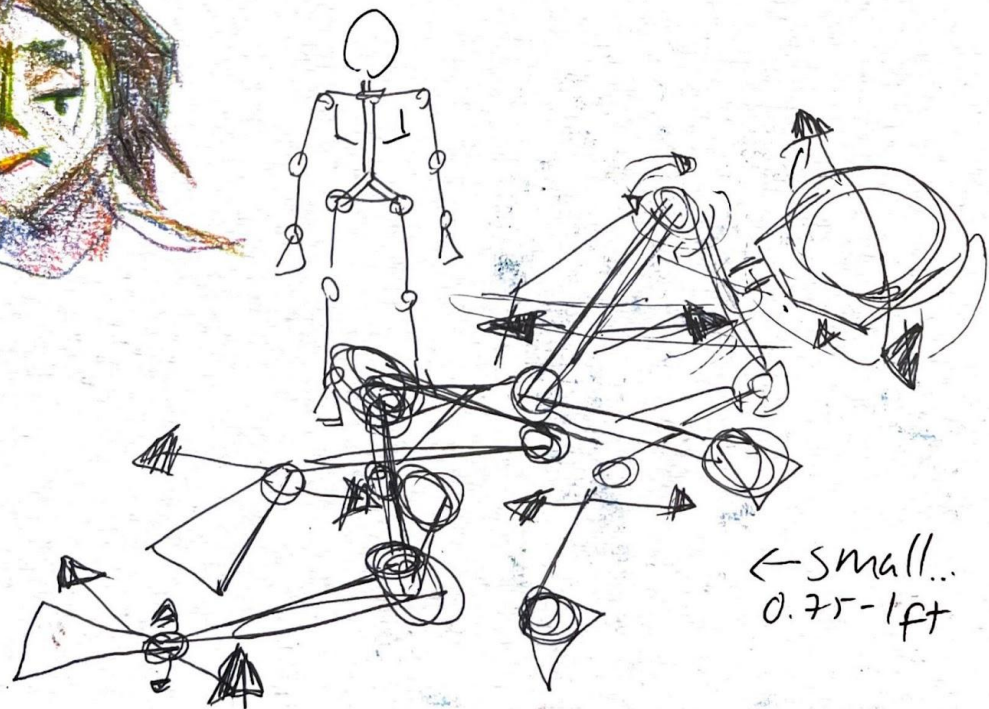
maybe taking the website I've constructed and using the ~~strat~~ element to change something related outside of the website?
soundscape changing too? → Max/msp? or maybe that sound designer thing with the VR ~~is~~ is there a way to make it so that the sound is dependent on variables arising within the webpage? if so what variables? obviously the scroll px. but what else? clickable graphics!
Using a program that generates imagery based on pre inputted data set as well as website data? making the imagery appear outside webpage would null the problems I had with using scroll library on both the text & the background
Visual planning-



load images/digital collages into a program that can be responsive to inputted data and execute changing factors in a live format

option 2... back to an earlier idea
~~map that controls~~ some sort of puppetlike sculpture controlled by a system of motors, pulleys etc that are all controlled through a mobile website accessible via QR code

essentially, a really sad robot with no self control, all of its actions influenced by actions of viewers via website

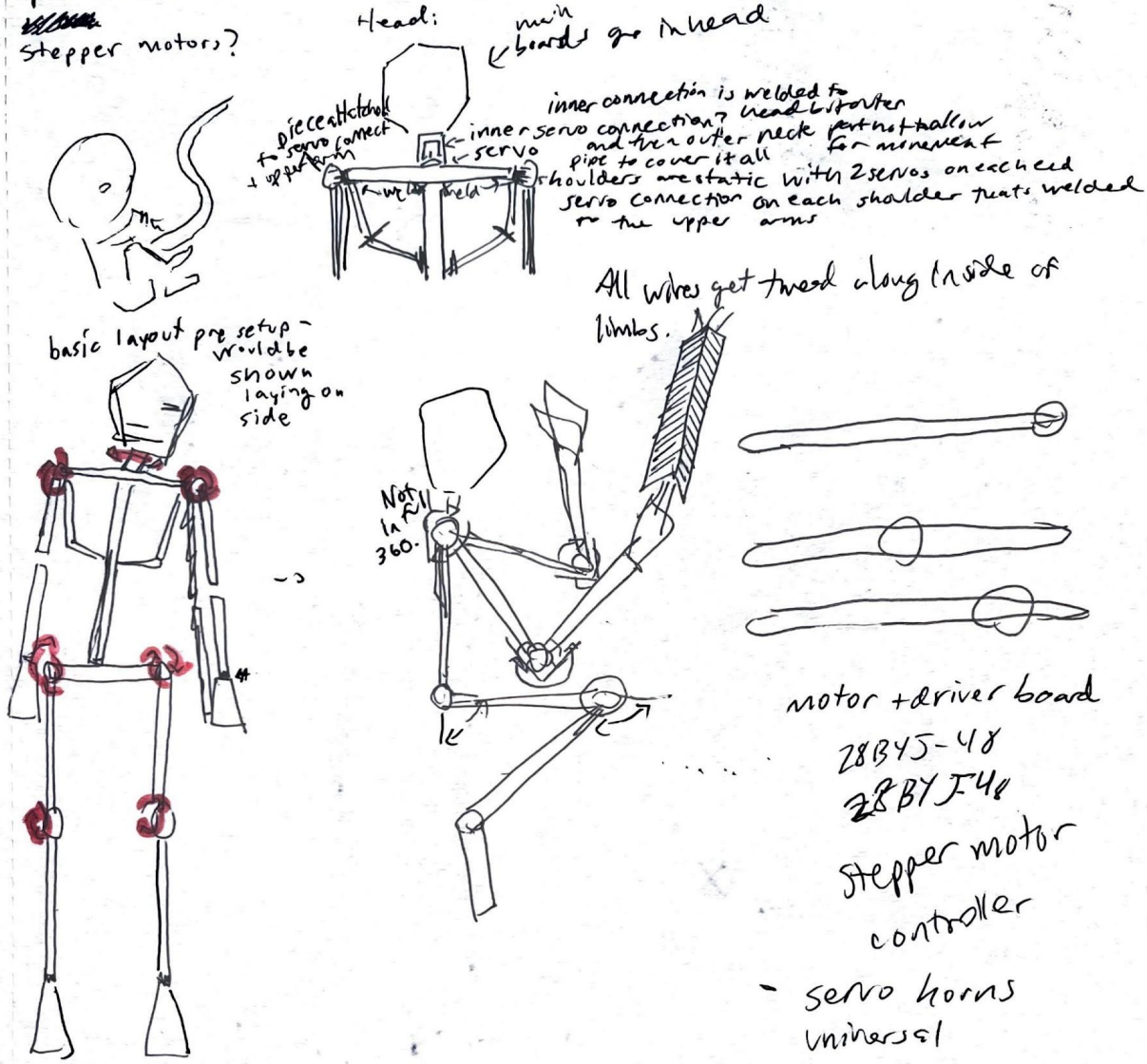


← small...
0.75-1ft

Networked Interactivity Robot final project: getting into the nitty gritty of it all.

- Servo motors - 12 on most Arduino boards and 48 on Arduino Mega. 16 on Raspberry Pi and up to 62 boards can be chained together for a max of 746 servos

Stepper motors?



Modifying content of code data.txt
 using php
 Arduino catches what rpi sends instead
 of being read by GPIO pins