Musical Mechanics

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What problem are we trying to solve with “Musical Mechanics”?

- The original idea of this project was to use a wearable device (in our case, a ESP32 PICO-D4) that would connect with a HTML file’s audio code. In detail, the accelerometer of the PICO-D4 would connect to Arduino and then the file; once that connection was secure, we would program the device to control the audio play (i.e. Starting the song, Pausing the song, etc.) with a simple movement of the device.
- The inspiration for this project was dance choreography; dancers tend to have to pause the routine they are working on. A small device they could turn on with a button would be a great help so that they could remain in their position and still start, pause or restart their music; for our demo, we are hoping that the PICO-D4 will suffice in bringing the idea to light.
- This could also prove helpful for those with physical disabilities; a wireless device that could start, restart, pause and even skip songs on a playlist could be a great accommodation for easier, thoughtful technology for all.

What are the components of our system?

- ESP-PICO-D4: This microcontroller is the key of our project; the wearable device that will act as a demonstration of a wireless communication tool that will work alongside an HTML file to control the audio with simple movement.
- Arduino: This program and its libraries are used to upload the code into the PICO-D4.
- Visual Studio Code: This program was used to create the HTML file, CSS file for the colors and wrapper, and edits of the JavaScript code. The audio file is “Lease” by Takeshi Abo, with some bitcrush edits on REAPER Media.

How do they interact with each other?

- The PICO-D4 device, connected to Arduino, will use Bluetooth and connect to the website via the HTML file. Then, with further programming towards the audio controls, the music controls will change based on the PICO-D4's movement. Examples include the ability to start or pause a song instead of clicking on the browser.

What are the tradeoffs you have made in your design?

- We had the idea to add a streamdeck to our project using HTML and JavaScript to showcase the connecting accelerometer data in real to our audience! However, due to coding issues, we did not include this addition, sadly.
- However, we have included an edited song rather than a song in its original quality: a bitcrushed version of “Lease” by Takeshi Abo.

What challenges have we faced during programming?

- We had some trouble in the beginning after creating the HTML and CSS files and getting them to connect properly with Arduino, but after much trial and error, they were able to connect!