Project Proposal: How Visual and Audio Stimuli Affect Sway of the Human Body

Group: Thragg's Hairline

We will be using the dataset from Body Sway When Standing and Listening to Music Modified to Reinforce Virtual Reality Environment Motion, which we found from the repository at PhysioNet.
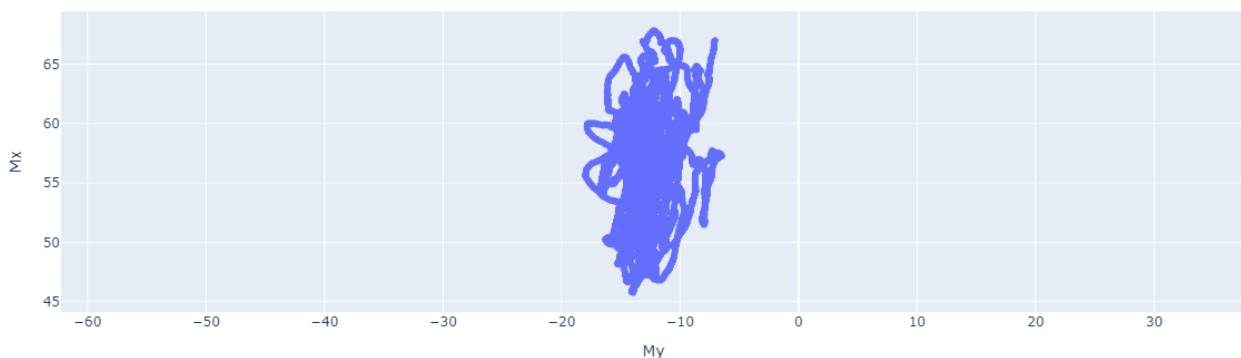
Writeup

This study was done to see how different stimuli can affect how the human body sways. Subjects put on an Oculus Rift that displayed a town street as an environment, and they listened to music (or didn't), specifically Mozart's Jupiter. Our visualization will display the movement of the subjects on the Medial/Lateral and Anterior/Posterior axes in real time by updating the position of an icon on a grid. We will also incorporate Mozart's Jupiter and play the music in sync with the movement of the subject. There will be dropdowns by which the user will control the environmental variables. This includes the loudness (or absence) of music, whether the subject has their eyes closed, and whether the environment is moving. Smaller line graphs will display these variables and others update in real time, like a seismograph. We will also have a selector for subjects, and we are considering having up to 3 subjects' data displayed at a time. On a separate webpage, we may show all subjects, each with their own line graphs, and with the same selectors as before, display one variable updating real time for all subjects.
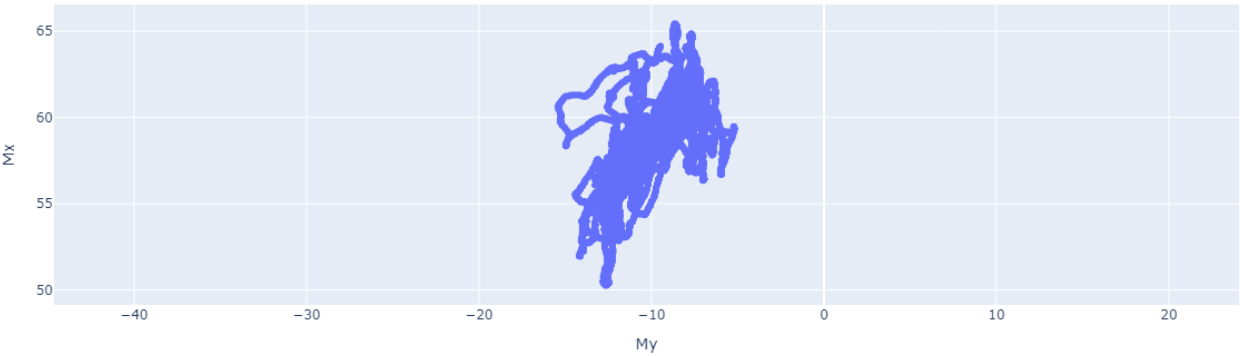
Static Visualizations

1. We first wanted to see how a subject moved when the environment was moving and the music was unmodified.
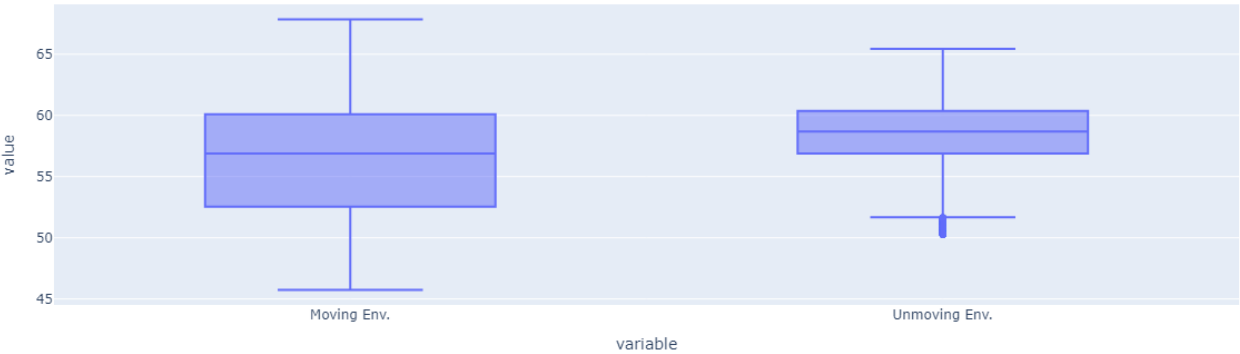

2. We looked at the same subject, with an unmoving environment and unmodified music.

Env. Unmoving, Unmodified Music, Subject 1

3. We wanted to see the spread of these trials, and sure enough, the moving visual stimuli seems to have
   made Subject 1 sway more compared to the unmoving virtual environment.

Comparing the Spread of Movement (Median Lateral Axis) for Subject 1
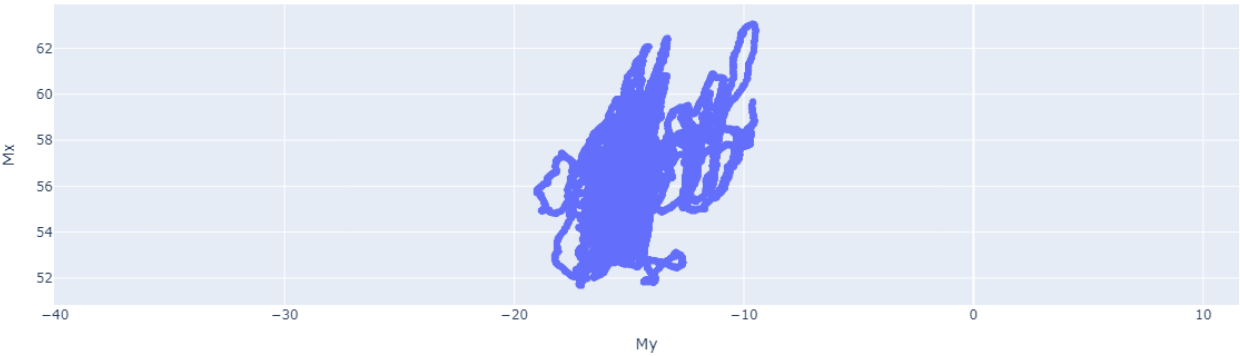

4. This is what the dynamic line graph may look like for showing three subjects at a time.

Env. Moving in Anterior-Posterior Direction, Unmodified Music, Subjects 1-3

5. We also wanted to see the movement of Subject 1 without visual stimuli.

Eyes closed, Unmodified Music. Mvmt. of Subject 1

6. We also wanted to see if loudness had an effect on how much Subject 1 moved.

Eyes closed, Loudness Shift 0.25Hz Mvmt. of Subject 1