ELLIPSE

The entirety of my project was inspired by projects that didn’t require an explanation when you walked up to them. I just wanted the user to explore and figure out for themselves how to interact with something by their choice. So I figured including simple inputs like buttons and a joystick was a playful setup to create that kind of an environment for exploration on the user’s part.

The first part was designing the program in the earlier weeks, and that was basically me fiddling around with the code I already had and seeing if I could have the user distort these designs on a screen. I started narrowing down my ideas and then I got particularly interested in the ellipse; an ellipse was such a simple shape that could turn complex in a variety of ways, so I decided this would be a good theme to focus on in the project. Through this, all my designs could collectively portray the ellipse in different ways, almost as a challenge to myself to see how creative I could get wit one shape.

I first created one program that had six designs, and they all had an ellipse in the center and very basic designs on a white background. It was a start, but what was most intriguing to me was the sphere I implemented into one of the codes.

I discovered the third dimension.

After I started checking out some example codes on Processing (linked below), I decided to see how I could make even more designs on a 3D plane. On top of this discovery, I started interacting with Lorenz transforms, and then I talked to Scott about Generative Design and the ways people have used 3D design to create insane animations (also linked below) just by manipulating the sine and cosine equations related to ellipses.

Processing Examples I used for 3D Processing:

<https://processing.org/examples/primitives3d.html>

<https://processing.org/examples/rotatexy.html>

<https://processing.org/examples/sine.html>

<https://processing.org/examples/shapetransform.html>

Generative Design Codes I worked off of:

<http://www.generative-gestaltung.de/P_2_0_01>

<http://www.generative-gestaltung.de/P_2_0_03>

<http://www.generative-gestaltung.de/P_2_2_3_01>

<http://www.generative-gestaltung.de/M_1_2_01>

So in all of these discoveries, I more or less trashed the code I was working on, and took the ideas I got from it to create something different. I made a bunch of dummy programs that was working with rotating things on a 3D space, as well as orienting the camera function (where the viewer is in the 3D space to see the objects) and translating the spheres I created. I then checked out Generative Design and read through the first few simpler codes that worked with ellipses on a 2D surface. I took the coding they used for sine and cosine, threw those on to my 3D planes, and spent a few nights just messing around and playing with these codes until I was able to get these modes that cohesively worked together and were fun and interactive for the user. By this point I had about 3.5 modes, which wasn’t a crazy amount, but a lot of research went into learning more about 3D modes and understanding the codes I read off of in Generative Design to be able to change them for my own designs.

The research brought me up to the Wednesday before the exhibition, when I had a decent number of themes and now wanted to construct the board that connected between the modes I created to some buttons and a joystick. By this point, all my designs could be easily manipulated just by moving your mouse and mapping the mouseX and mouseY values, and then pressing different keys on the keyboard to retrieve different modes.

While constructing my board, I was now up to 4.5 modes, and I was planning on having a board with 5 panels when I talked with Mateo and we decided it would be even cooler if I made 7 modes and then used 3 buttons that would turn on different modes based on the sequence of the buttons you pressed. So I got to work on finishing the fifth one and would take work breaks from the hardware to code during the process.

The three button setup fulfilled my idea of exploration even more beautifully; so we printed out a circular board with three simple slots for buttons along with a joystick opening. Over the weekend I tried soldering, which turned out to be one of my weaker skills, however I successfully soldered the buttons and then found it was way easier to use clip wires for the joystick in order to get it to work without short-circuiting. For aesthetic appeal I decided to use all white wires which also turned out to be a living nightmare and totally not worth it.   
  
If I could go back, I would have arranged to spend more time soldering the circuitry to a board instead of using the breadboard. Nothing fell out during the exhibition, thankfully, but just for stability that could have been smarter.

Then I found some recycled materials later in the evening and with some simple gluing I made a nice acrylic stand for my ellipse board. The acrylic was hilariously flexible, but when leaned up against a table, people walked up to it with a lot of curiosity and interest. It in some ways enhanced this experience of walking up to a controller and exploring with it; and really connecting with the designs I created.

I had six designs by this point, and was just figuring out the debugging, which was actually a really simple process just to make sure that altering the combinations to get different designs. Then I readjusted all the designs so that they had a central sphere in the middle.

(Note, a little earlier on, Dean and I came to the conclusion everything looks cooler with a black background, leading up to my black background-themed project).

The whole construction process took an entire weekend, and a few instances of blood, but was otherwise very successful. Everything turned out exactly how I wanted it to. I ended up with 6 modes, so I repeated my favorite one, and 6 seemed like enough to entertain people for a solid amount of time. Most people just found their favorite mode and messed around with it until they broke the cap of the joystick off out of excitement anyway.

If I had a few things I’d want to change for this project, it would be to add another mode, and then also solder everything. There were some moments when my program freaked out, and James attributed it to some short circuiting in the board panel. I was able to wiggle those and make that from happening, which is far from a permanent solution. Finally, in my pulsation mode, I made it so that if the joystick values indicate the joystick isn’t being used, the pulse will randomly pulse until someone moves the joystick. This worked great, except every 15 minutes the joystick’s central values would drastically change. I never figured out why, but it just meant every once in a while I had to alter these parameters. Otherwise, everything was smoothly working.

Here’s some photos of my work, and I attached my code to this blog post as well. If anyone wants me to know more about 3D Processing, or the cool shit you can do with Generative Design, I’ll probably be locking myself away in a room for the next four years messing around with this stuff too. 