

Heather Chester

40215280

Professor Lee Wilkins

CART 263

April 4, 2024

Final Project Proposal: Particle Board

For my final project, I propose to work with ml5 and p5.js to create a program that manipulates static points on the screen with sound and hand recognition. While my AI-Jam experimented with sound manipulated by hand gestures, inspired by the works of Imogen Heap, I wanted to create something that with more emphasis on visuals and less on sound. For this iteration, I am inspired by Chladni plates and the cymatic patterns that form patterns or shapes with a material, like sand in the case of Chlandi plates, and frequency vibrations.

While building the prototype, I started by modifying the code that I initially made for the AI-Jam activity. While I was unsure of where to start with this prototype, I started to reference past material from CART 253 to create static particles within a class but ran into technical challenges attempting to direct the thousand or so particles to group together to form shapes. My initial approach was to directly link the static points to handpose annotations for the thumb that I had previously used in my AI-Jam, however, I had no event that would control how the particles were moving. Researching and testing various methods, I found examples for vectors that relate to what I was trying to achieve. Following the application of vectors through the p5.js reference documentation as well as explanations and examples from Daniel Shiffman's *Coding Train*, "The Nature of Code," unit 1.1 through 1.6 video series on Youtube, I managed to use vectors to create movement and shapes with the particles. However, to connect the hand recognition and particles, I implemented sound to move the particles depending on the output, triggered by the hand.

From this process, I plan to further experiment with vectors to create points on the canvas where the particles can gravitate. I envision replacing the current hand annotation, where it is dependent on the thumb, to represent a variety of gestures that can trigger these different gravitational points. I additionally hope to experiment with Perlin noise in this process as I have seen many examples of generative art applying this method and I could use it in conjunction with the vectors that I have created. An example of which I hope to explore is Daniel Shiffman's *Coding Train*, "Coding Challenge #24: Perlin Noise Flow Field." All that being said, because of the experimental nature of this project, I anticipate much exploration into these methods to work around how they might apply to my final program.

Although I am inspired by the generative abstract patterns that are possible with programming, I have not yet tackled a project like this and anticipate significant challenges. Despite reaching some amount of success with creating patterns and shapes with the particles, one of my main issues is rooted in the production of sound and the if-statement that tells the particles to move. There is not much control with this method and I hope that having distinct gestures and gravitational points might manage my dissatisfaction with this in the long run. Furthermore, the audio produced by the program sounds quite sad and weak, giving out when the hand is not detected. I foresee solving this issue by writing some code that might sustain and/or fade the sound out when the hand is not detected. Overall, this project poses its technical challenges which I am extremely excited to tackle to see what I can produce. Below I have included an image of the Chladni plates that have inspired this project and links to the videos I have previously mentioned. Because this is a generative art coding project, I chose not to include any sketches.

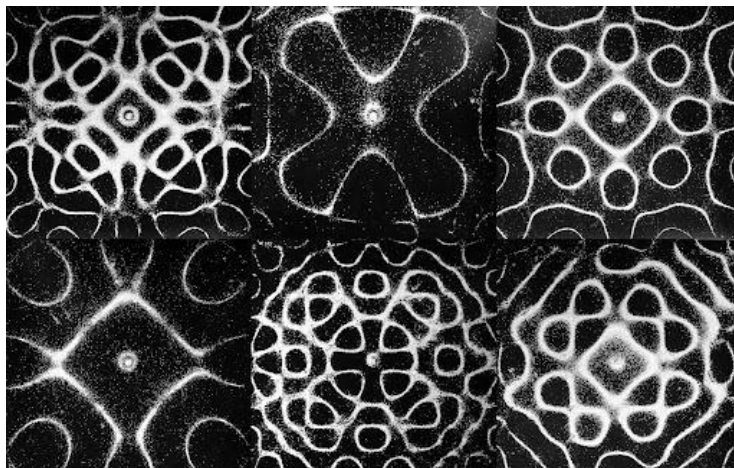


Image of Chladni Plates. Courtesy of Dragicevic, Pierre. “1787 - Chladni Plates,” *List of Physical Visualizations and Related Artifacts*. Last accessed April 4, 2024.
<http://dataphys.org/list/chladni-plates/>.

Additional resources mentioned

Daniel Shiffman, “Coding Challenge #24: Perlin Noise Flow Field,” *The Coding Train*, June 27, 2016, Youtube. https://youtu.be/BjoM9oKOAKY?si=Yl06_LIJSPEe3hr.

Daniel Shiffman, “The Nature of Code,” *The Coding Train*, The Nature of Code 2, 1.1 - 1.6, March 2020.
https://youtube.com/playlist?list=PLRqwX-V7Uu6ZV4yEcW3uDwOgGXKUUsPOM&si=_DFAAIBIFgXTUIRW.