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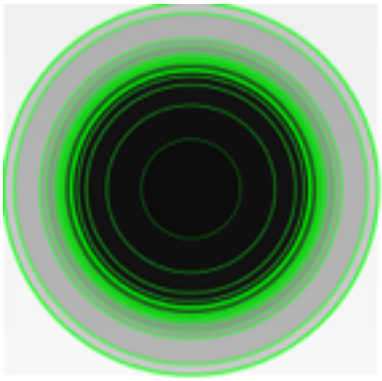
MART 191 01
Creative Coding I
Final Project Paper

My final project is a music visualizer based around different frequencies within the music it uses. This project took three to four weeks to complete and, although challenging, was a labor of love from beginning to end.



Wied, Audio Visualizations with JavaScript

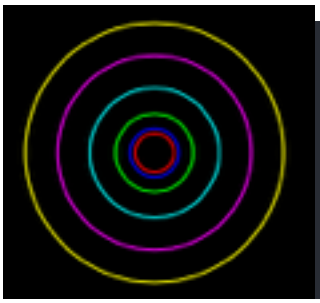
The research phase of this was intimidating, mostly because I had only a very vague idea of what exactly I wanted from this project. I knew that I wanted to make a music visualizer, but I didn't know if I wanted to use direct sound input from a microphone, one song, or multiple songs. When I finally decided on music as the source of my data, I still wasn't sure how I was going to get that information into my code or what I would do with it once it was there. I wanted to figure out what I wanted out of the piece visually before I started trying to build.

One of the first sources of inspiration and information that I found was Patrick Wied's website, which included, among other things, a sample of music visualizations that he's created. Originally, I wanted to use something similar to his pulse visualization design.

From there I started on my code with the intention of further developing a solid design along the way. To do this, I started out with many smaller experimental sketches of things that I might want to potentially integrate into my final design. Before I could start on that, I had to have music. I compiled a list of mp3 files within my computer that I could later use in my sketches.

I began by experimenting with the p5 sound library; browsing through the different functions available for use, learning how to play the files I had, and just generally getting better acquainted with the tools I could use. Originally, I worked with a single song for each sketch.

I began with a simple pulse, much like the one above, the only difference being that all of the ellipses in the pulse were working off of the same numbers. The diameter of each ellipse was dependent on the amplitude of the song multiplied by increasing numbers.



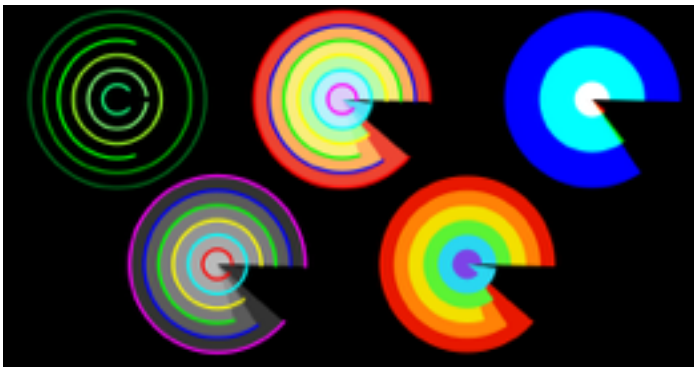
```
var size = map(level, 0, 10, 0, height*0.9);

background(0);

//Circle1
stroke(255,0,0);
noFill();
ellipse(width/2, height/2, size, size);
```

Next, I experimented with ellipses using the centroid function. When that wasn't visually pleasing to me, I started working with FFT. This is where I really found the flexibility and control that I wanted for my project. I had the freedom to base different aspects of the sketch on different frequencies within the song, which would end up making the different parts of the sketch a lot more interesting to look at. Originally, I used FFT with quadrilaterals to move each point individually.

```
fft.analyze();
var bassEnergy = fft.getEnergy("bass");
var trebleEnergy = fft.getEnergy("treble");
var lowMid = fft.getEnergy("lowMid");
var mid = fft.getEnergy("mid");
var highMid = fft.getEnergy("highMid");
var centroid = fft.getCentroid();
var bass = map(bassEnergy,0,300,0,width);
var treble = map(trebleEnergy,0,200,0,width);
centroid = map(centroid, 0, 10000, height, 0);
lowMid = map(lowMid,0,300,0,width);
mid = map(mid,0,250,0,width);
highMid = map(highMid,0,200,0,width);
```

I still felt like ellipses had a great visual appeal, so I started with those again, this time utilizing FFT. However, with an ellipse all I really had access to were the location and size of it, which were still not enough for me.

This is where I started working with arcs, which were what ultimately made it into the final sketch. By making arcs with varying strokes and fills and layering them on top of each other, I could achieve a more dynamic appearance with the frequency detection. In 4 of the 5 circles, there are six arcs each, controlled from inside to outside by treble, high mid, mid, low mid, and bass frequencies, followed by one arc controlled by centroid. This allows them to all move independently of one another, and for the viewer to identify the relationship between certain sounds and their accompanying movements. The top right circle uses only treble, mid, and bass frequencies, and overlaps their arcs. I set the blending mode to ADD, which creates the multicolored effect seen in the final sketch.



If I were to continue to develop this project or expand on the idea, I would like to create something that picks out frequencies more specifically. I would also like to see what other types of things I can work with when visualizing frequency. Another thing I had experimented with

somewhat was bars to visualize sound. This, while simple, was something that got a very positive response from everyone who saw it. In terms of this sketch itself, I think that the code itself would be a lot easier to manage if each circle was brought in as its own individual object instead of all of them being built within the same draw function on the sketch.

Overall, I am very proud of my work on this piece. I am pleased with the way it turned out and although it is not perfect, it serves its purpose and I learned a great deal while working on it. I hope that I can continue to develop my skill and ability in the future.

References

Wied, Patrick W-labs. "Audio Visualizations with JavaScript." Audio Visualizations with JavaScript. N.p., n.d. Web. 11 Dec. 2016