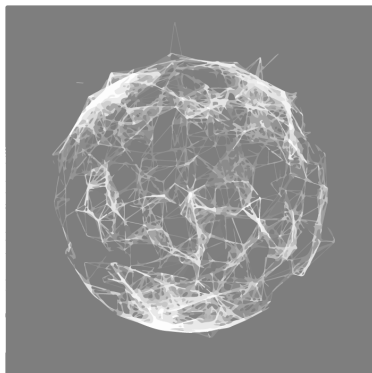


Ana-Maria Arrese
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Research Evidence and UML Diagram
Presented to Rilla Khaled

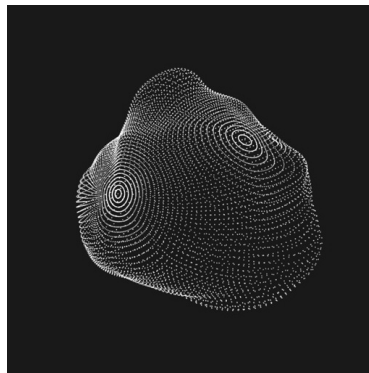
CONCEPT | Audio-reactive 3D world

The concept that I am choosing to explore and apply for my final project takes into consideration two main things: textures and sound. Essentially, my idea is to create an interactive and audio-reactive 3D world that is made out of two different textures: particles and mesh lines. The goal is to have the 3D sphere move and warp to the beat of a soundtrack, (creating music visuals) in different ways. The sphere will be shifting textures depending on what the sound is. It will also change its shape slightly as a way of reacting to the music. I really want the viewer to see how the music affects the texture's movement; this is one of the main objectives. The interactive part of this project is that I want to give the user the ability to distort the sound by moving the sphere's body or texture. If the user just wants to enjoy the music visuals made from the sphere, then they simply do not have to do anything to the shape. However, if they choose to distort the sound, I will implement ways for them to modify the music. This can be by dragging a part of the shape, or pressing a key. The distortion will only last a few seconds. Thus, this will end up being both a piece one can enjoy, as well as distort to their own liking.

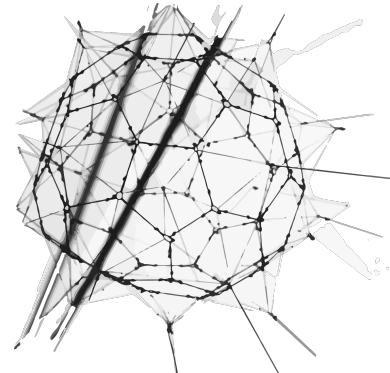
CONCEPT | Visual Examples



Mesh



Particles



Mesh

RESEARCH SOURCES AND INSPIRATIONS |

- <https://vimeo.com/73850791> - "A quest for new sounds and reactive visuals." Visuals by Rodrigo Carvalho. This video was one of my inspirations for this project because of the synchronization between the sounds and the distortion and movement of the particle landscape. One really feels as if it is the music that is controlling the surface. This is one of the things I really intend on applying to my object; I want to focus on making my visuals

make sense with the music and blend with it instead of having random movements for every different sound frequency.

- <https://www.openprocessing.org/sketch/402629> - WavesOnSphere by KaijinQ - This is an interactive piece that really caught my eye one day as I was scrolling through openprocessing.org. The fact that I could distort the sphere and make it move in such a natural and organic way was really something that I knew I wanted to implement in my project. This is what gave me the idea of the sound distortion; as the user “messes” with the object, they mess with the sound as well, giving them a bit of power in my piece.
- <https://vimeo.com/132681854> - Karplus String Cubes Ocean by Vincent Houze - Vincent Houze’s work is very inspiring to me as he has the ability to move particles so fluidly and in such an organic way. The square particles in this piece seem to move like they would in real life. The particles that I will have on the world (sphere) will be inspired by this. I want them to move very fluidly to the beat of the music.
- <https://vimeo.com/65475425> - OSCILLATE by Daniel Sierra – This piece blends perfectly together the way particles move to the sound of music, and this was one of the video’s that really made me want to create something visually reactive to music. OSCILLATE shows how smoothly sound waves work with particle movement.

SIMILAR WORK BY OTHER ARTISTS |

- <https://vimeo.com/85638890> - Revolving Sphere by Visiophone.
- <https://vimeo.com/137693753> - Music Visualization Experiment_7 by Hung Chung Ding. (Start at 2:00 min)
- <https://vimeo.com/115056235> - Music Visualization Experiment_4 by Hung Chung Ding. (Start at 1:00 min)
- <https://vimeo.com/68161863> - Visualizing Sound - Audio Responsive Generative Visuals by Joelle.

PROJECT SCOPE |

For this project, I want to push myself while also being realistic with my time. I am giving myself an objective that I know will both make me learn at the same time as making me enjoy creating these interactive visuals. I will start by learning to create my main shape, the sphere, in 3D. Then, I plan on focusing on creating that same shape but with the two different textures: one sphere made out of particles, and one made out of small spheres and mesh lines. Once that is done, I need to figure out how to modify and distort the sphere, both with the music, and when the user will click on it. The sound will come towards the end, in order to use what I have learned about movement in 3D and match it with the right sound. The final thing that I plan on implementing is the switches that enable the sound to distort. This includes both the mouse movement that the user will need to do to modify the 3d sphere, as well as the distortion of the sound that will be emitted for every time the user modifies the shape.

COMPUTATIONAL COMPONENTS OF THE CONCEPT |

For the creation of the 3D sphere, I will surely have to change my shape to P3D, in order to give the circle a z-axis. As for the particles texture, I am thinking of finding a way of make each particle follow a vector on the 3D sphere casing, while setting this casing to have no color, thus only the particles would be displayed. For the dots and lines mesh, I am thinking about adding tiny 3D spheres to each mesh line intersection. I will have to find a way to change from one texture to another, perhaps by setting a timer during the song. As for the sound, I know processing has a sound library with various functions to help modify the audio inputted. This is what I will be using for when the user distorts the sound. As for the visuals of the particles and the mesh, I am thinking of creating methods that will execute along the audio file, some more than once. For the interactivity, it will be important for me to know where exactly on the canvas the user has clicked or dragged with their mouse. With this information, I will thus know where to modify the sphere to apply a distortion (on sphere while the user clicks or drags and then on sound as an after effect).