A#: Music Visualizer

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Overview

We find that the typical music visualization does fine at looking good alongside the music, but fails to go beyond and provide actual interpretation or insight into the song**. The goal of our project is to create a visualizer that accurately represents the characteristics of music.**

The main question we set out to answer are:

(1) What shapes/surfaces should we use to model our visualizer?

(2) How can we use animation to represent features of a song?

(3) What features of a song should we consider?

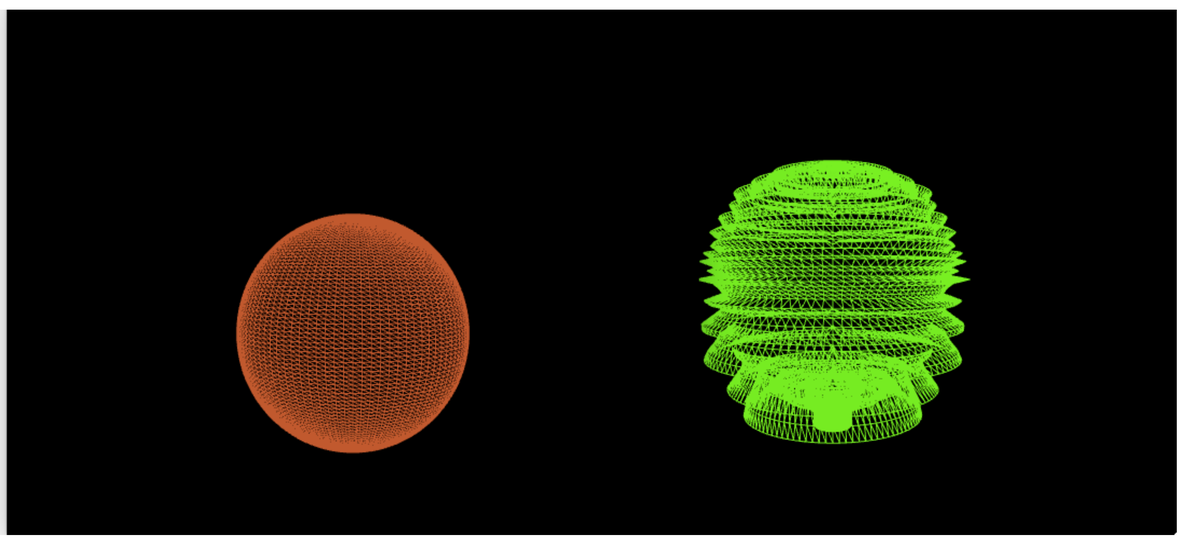

Figure 1. On the left: our visualizer at rest (no music). On the right: our visualizer at work!

Implementation/Software Design

Our codebase is divided into two main parts:

(1) Sound Analysis – the specified song file is loaded and various data about features of the song are obtained

(2) Graphics – data from the sound analysis is used to determine the appearance of the sphere

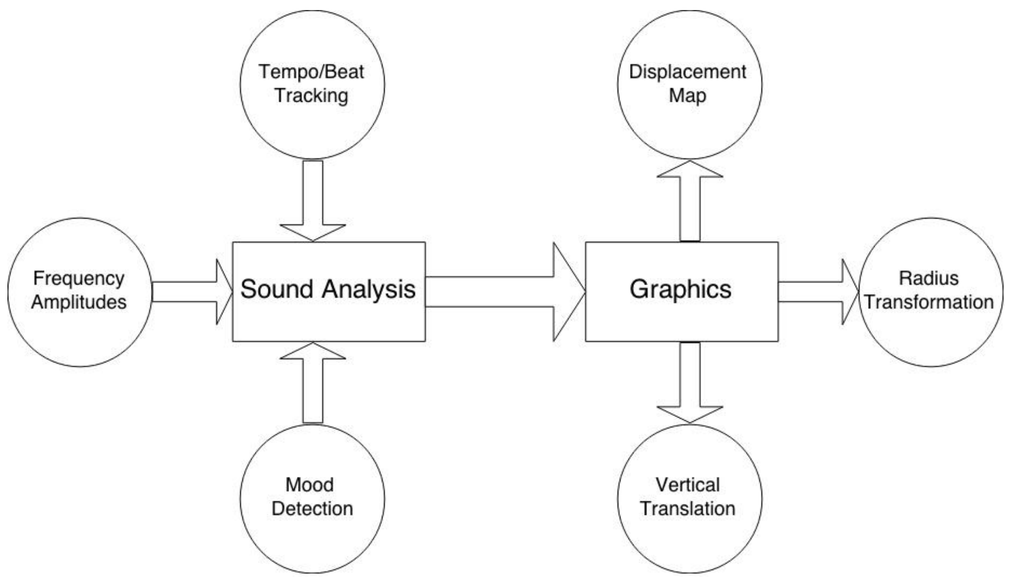

Figure 2. An illustration of our software architecture

Sound Analysis

Each song is analyzed in a variety of ways:

- Tempo/Beat tracking
- Frequency Amplitudes
- Mood Detection

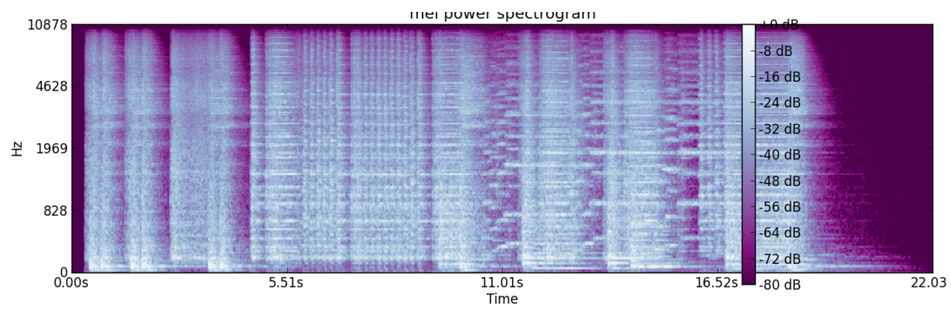

Figure 3. A mel spectrogram showing frequency amplitudes over time

Modeling/Animation

We decided to model a single sphere using a triangle mesh in our visualizer. Animations on the sphere include:

- Radius adjustment
- Displacement Mapping
- Vertical Translations

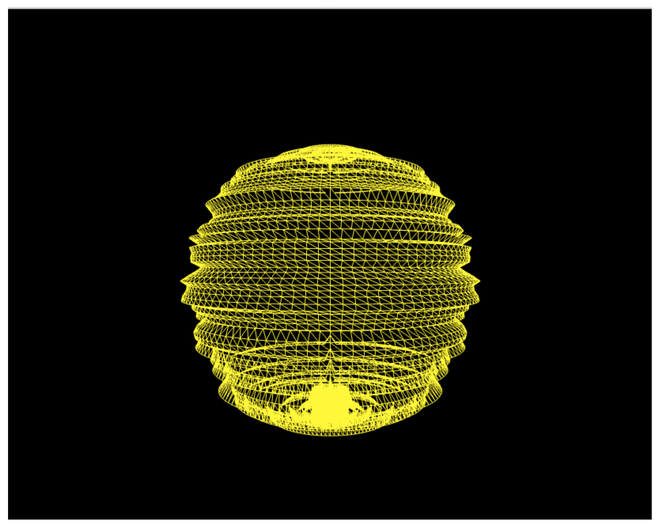

Figure 4. An illustration of a dynamically generated texture map (for frequency amplitudes)

Conclusions & Further Steps

Our visualizer does a good job of representing volume and beat tracking. It also provides an accurate (and really cool) visualization of amplitudes of different frequencies in a song.

In the future, we would like to extend our visualizer to include color as a representation of the mood of a song. We would also like to come up with a better way to integrate translations of the sphere to characterize musical features.