Visualization of Music through Animation

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Abstract ---- **Music and visual art have had a long standing relationship, despite their distinct differences as methods of expression. This paper posits that through pre-existing cultural associations and cross-medium characteristics, one can identify a piece of music they haven't heard based on a brief animation.**

Index Terms --- **Animation, Music, Visual Art, Synaesthesia**

I. INTRODUCTION

This project aims to create an animation set to music which will attempt to convey certain characteristics of the song, to the point where the viewer will be able to identify the song after having seen the animation.

Music has long been a source of inspiration for me. Productions such as Fantasia have had a lot of influence in my own work as an illustrator. Having the opportunity to explore animation as a medium of art and being able to work with music are areas in which I have not dabbled, but am eager to do so.

While initially wanting to just set an animation to music, It got me thinking as to what aspects of animation currently are and could be used to convey certain aspects of sound. I've always found it interesting that despite being very different products art and music are described and categorized in similar ways. My next thought was that I would be able to use those in order to animate, initially believing that it would be a project in itself but eventually realizing it may be better served as the methodology in the project rather then the project itself. From there it made me wonder if people could identify the music to which an animation is set simply by watching the animation without sound first based on a variety of factors such as pre-existing cultural associations, and fundamental cross-modal elements, specifically rhythm, texture and harmony.

II. RESEARCH

My first question was in regards to how people have visualized music in the past. In Weimar Germany, Jazz was a fairly new cultural phenomenon which the germans embraced [1]. Jazz had emerged as a visual style of art primarily because of advertising, which was wider spread then the music. The imagery represented the frantic nature of the music, as well as its origin as an African-American style of music. It drew from the then-popular style of art, dada, with which it shared a counter cultural attitude [1]. All these elements combined to create a visual style that was unique to the music.

Having covered cultural associations, how can visual stimuli convey the dynamics of sound while not providing any audio? A study from the University of Tokyo explored whether text could convey nonverbal sounds by altering the appearance and location of text on a screen. The attempted to convey the sounds made by racecars as they passed the camera and found that in doing so they could show the origin of sounds as well as the sound's dynamics [5]. If this is possible through the use of words, then perhaps simple representational imagery could be used to a similar effect.

The next challenge is to find the common ground between music and visual art, these selected principles to emphasize are Rhythm, Harmony, and Texture. In music, Rhythm is the arrangement of music in time, whereas in art it is a repetition of forms or shapes [2]. If shapes were to repeat themselves at regular intervals in an animation, this synchronise rhythm cross-medium, and visually represent the beat of the music, clueing the viewer in. Amanda Duthie at the University of Iowa attempted to see if there was a correlation between pitch in music and value in art within artistic movements happening concurrently in the same country. By comparing the art and music of french impressionism which tends to be higher in pitch and brighter in value, with the art and music of Russia in the 19th century which is known to have lower pitch and darker values. Ultimately her results were inconclusive, but her research provides methods for extracting data from art and music, citing more journals on the subject

and continues the push to quantify synaesthesia.

Harmony in art is the visual effect of related elements combining in a satisfying manner, in music it is similarly defined as a combination of sounds pleasing to the ear [3]. Seeing as complements exist in notes and in colors, emphasizing harmony could be as simple as showing a pair of objects in complementary colors while complementary notes are played.

Texture poses more of a challenge. In art, texture is a visual representation of a tactile quality, Something could appear to be rough or smooth, whereas in music it is how the instruments are arranged, how the instruments and their individual qualities come together when layered dictates the texture of music [4]. There are three types of textures to music. Monophonic is when multiple instruments play the same melody, homophonic is when one instrument plays the main melody and the others play a supporting accompaniment.Lastly, Polyphonic is when multiple melodies are played simultaneously.

Further research should be directed into basic music theory, in a search for a deeper understanding of the structural elements.

III. METHODOLOGY

When starting the animation the first step was selecting music by genre, which gives us a starting point in terms of visualization. Selecting a genre, such as Latin or Classical opens up a number of themes to explore. This allows the animation to reference other cultural aspects of either periods of time or

geographical regions, such as trends in visual art or art which referenced regional history. Regardless of if a selected genre has a history or culture to draw on, the option to reference trends in album art will be acknowledged as well. A selection was made from freemusicarchive.org, *Someone Else's Memories* by Revolution Void. one which draws on Hip Hop, Electronic and Jazz roots. This song was selected for having a flexible creative commons license, but also for having genres of music with distinctive audio qualities and strong associated visual elements such as easily identifiable album covers, fashion, cultural associations and advertisements. The selected song's genres are often associated with an urban lifestyle and demographics. For this reason, the imagery of the animation depicts an urban scene with science fiction elements.

The primary program used in this project will be Adobe Animate. It is intuitive for those familiar with other programs in the creative cloud, such as photoshop which was also used to create assets to animate. These two programs are linked, allowing for files to be edited and updated quickly. Garageband had also been used in order to generate songs for early testing with these programs. The last program in the pipeline was after effects, here the animation was reformated so that a silent version of the animation played, then the viewer was presented with multiple options in music and finally an audible version of the animation was played as well, ultimately revealing the song to which the animation was set.

When played the animation features a single shot, in which selected elements will animate to the music, a cinemagraph of a sort. Each animated element has an associated instrument which becomes active in the composition, which means that the animation will have more moving elements over time.

The first animated element are raindrops which are set to the descending notes of the guitar with which *Someone Else's Memories* opens. The raindrops are timed to make contact with the ground as the notes are played, underscoring rhythm. The next element to animate was an electronic advertisement, a screen advising the viewer to 'Eat Bran'. As the song plays the sound of a record scratch, the sign glitches, depicting texture. Meanwhile, as these crossmodal elements play out, in the background a pair of street lights gently transition from pink to blue, which unifies the balance of color in the composition and continues throughout through the duration of the animation, acting independently of the instruments and balancing the audio elements as well, invoking the element of harmony. In order to make all these individual part of a larger whole and further harmonize the piece, a small narrative element was introduced in the form of a character who flees some unknown force. Running through space towards the viewer before finally sprinting off screen. He fades in and out of view in time with all the audible instruments, in an attempt to further link them.

For the testing to see the effectiveness of the visualizations, the animation has been broken down into two versions, one with

audio and one without. First the silent version is played, and the viewer is encouraged to make what observations they can. Then three songs are played,. *I need Love* by Planet Wardo is the first song, a pop rock song. *Someone Else's Memories* is next, then lastly *Pass Away* by Art of Escapism. These songs are all distinctive and belonging to their own genres with visual and cultural associations. The video gives viewers a moment to make their selection before finally playing the animation with sound, revealing the correct answer. In a test setting the viewer will then be asked to explain which aspect of the video and song they believed suited each other. If the participants are able to identify the song which the animation was set to without hearing the music while it is playing, then the test video and animation specifically are considered a success.

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