School Beats

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1 Introduction

Music complexities and their construction contexts have a lack of supporting literature within the visualization world. Data visualization is a correspondence of artistic interpretation within a particular subject matter. Graphical charts and graphs are used to display the information in an understandable and engaging format for all users to enjoy. Music, on the other hand, is instead an auditory representation. It is an expression of emotion and technique combined to produce sounds through instruments. As such, the combination of both visual and auditory representations is quite difficult to balance. However, the result is a well-executed combination that can bring a sense of astonishment to more than one of the senses.

For example, there are many different college fight songs: songs created for fans to cheer for their particular sports team. Each fight song usually has related elements such as word cliches (saying "Fight" or "Win") or the tempo of their specific song. However, there may be other influences such as the college's size or the number of seats in their stadium which could be compared as well. We believe that a data visualization used to represent the auditory songs along with a visual display can allow users to try and decipher any correlations while still being displayed in a balanced format. As such, our visualization will be the next step in providing auditory and visual representations not only in media but also in future visualizations as well.

2 One-sentence description

Using data gathered from college fight songs and their respective colleges and stadiums, we plan to develop a data visualization using d3 to view if there are any correlations between the details of the colleges and the complexity/redundancy of their associated songs.

3 Project Type

Comparison Analysis Study / Enjoyment

4 Audience

If we successfully balance a visual display with supplementing auditory attributes, our project will appeal to anyone interested in the accurate and cognizant representation of the data using sound to deepen the meaning of visual interaction. It will serve as an example for future visualizations using a relatively straightforward dataset.

We also intend to appeal to college sports fans, whether they be a student/alumni at an associated university, or any reason otherwise. Fight songs are a critical component of team spirit and university pride. Our analysis intends to foster interest in the fight songs of the selected university teams, and would potentially enhance the emotion between competing schools.

5 Approach

5.1 Details

On the visual side, since our dataset is based on college locations, we plan on implementing an interactive map of the United States that allows users to select available colleges to view the associated specifications, such as size or stadium seats, along with any song metadata using d3. The college specifications and the song metadata will be implemented in an embedded tooltip. On the audio side, we will use the Audio API provided with HTML to play relational songs according to the fight song's metadata. A relational song, in this context, is a song that is constructed based on another song's metadata. We will use a beat sequencer to construct each relational

song. There will be an initial drum beat that plays on the strong beat once every measure for four measures according to the beats per minute (BPM) of the associated fight song. Then, for every boolean metadata attribute that returns true, another four-measure instrument will be layered on top of the drum tempo. If no song is selected, then the drum tempo will play at a standard 100 BPM.

5.2 Evidence for Success

Our goal is to provide an ability to do a correlation analysis to any high-level researcher while still being used for entertainment purposes for any general user. It combines the use of a visual and audio representation of data that can be used independently of one another. As such, the data can provide not only visual information but audio enjoyment which changes based on the selected data.

In most aspects, audio visualizations are usually lines that represent the changing sound waves or express particular imagery during particular moments of the song. Our method instead constructs a song from the metadata of another to be used along with standard geographical data visualization. We cannot be certain that the visualization will be successful because of the nicheness of the topic. However, based on preliminary research on independent portions of both topics, it seems likely that it will be.

6 Best-case Impact Statement

In the best-case, users will be able to view a representation of data that combines the auditory and visual aspects into an agreeable format while still being able to view potential correlations in the selected dataset.

7 Major Milestones

M1. Merge, clean, and parse dataset.

M2. Create geospatial data visualization to represent college locations.

M3. Add tooltip information on a single selected data point about college specification and song metadata.

M4. Create an audio object interface or baked audio sequences (if not enough time) to play the selected relational song.

M5. Have a default relational song played when no data point is selected and the associated relational song when selected.

8 Obstacles

8.1 Major obstacles

- Depending on the amount of time available, there might not be enough to make a fully-fledged relational song maker based on some given metadata. As such, we can instead bake the final result and store a reference into the dataset. This provides a tradeoff with time, complexity, and dynamic ability.

- There may not be any correlations between the associated college specifications and the song metadata when being observed. However, the purpose of this project is to promote speculation of such connections and is more for enjoyment compared to full-fledged analysis. This would weaken the usefulness of the advertised visualization.

8.2 Minor obstacles

- The dataset is not fully complete as some college specifications are not present. This is not usually easily findable without diving deep into official source documents during school construction or a deep dive on their website. While not imperative, it provides more details and opportunities for comparisons between the specification and metadata.

9 Resources Needed

- Code to generate our visualization (will be done using d3.js).

- HTML Audio API and AudioBuffer Web API to allow us to use auditory elements in our project.

- College specifications skimmed from their website or official sources.

10 5 Related Publications

1. University branding with fight songs helps us discover the significance of our dataset. [4]

2. Investigation of audio data visualizations gives us a model to base our study on. [5]

3. Geographical visualization explains the significance of modeling with maps. [2, 3]

4. The meaning behind music and how it affects people helps us create a meaningful visualization. [1]

5. The end of the rainbow explains how visualizations can be used to help make sense of, or give meaning to, otherwise insignificant data. [6]

11 Define Success

The project will be a success if a user is able to view the associated tooltip information of each school while being able to listen to relational songs constructed from the original fight song's metadata.

References

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[2] W. Cartwright and C. Pettit. Geographical visualization: Past, present and future development. *Journal of Spatial Science*, 2010.

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[5] T. Ishibashi, Y. Nakao, and Y. Sugano. Investigating audio data visualization for interactive sound recognition. *Proceedings of the 25th International Conference on Intelligent User Interfaces*, 2020.

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