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Final Project Proposal

Name

If Sound Could Draw

Description Of The Project

Response to Question 1

My goal is to create a data visualization that illustrates a pattern by capturing the invisible properties of sound. Despite my appreciation for audio, it often feels like a confusing and abstract concept. For tactile or visual learners like myself, it may seem like an intimidating domain to grasp, explore, and experiment with. By exploiting auditory information to create designs, my aim is to create an amusing interface that attenuates some of the ambiguity that individuals like myself associate with sound. They can use their voice, instruments, natural noises, or any other audio as input to output a visual representation on their device's screen. The pattern is constructed based on changes in the detected characteristics (i.e. volume and frequency) of the registered sound. As variations in the audio occur (i.e. increased pitch), the user can observe changes in the design (i.e. stroke weight becomes more narrow) to give them information about which sound properties are affected.

Once they have completed their design, users will be encouraged to post it to the website, resulting in a small online community where people can share their experience with others. They will be able to add their name, location, and a short description of the sounds they used. They may also remain anonymous when posting their work. Additionally, they have the option of downloading their work, or erasing it completely. The purpose of this feature is to promote their participation in building this online network without forcing them to.

Response to Question 2

I wish to encourage users to be experimental with the interface. They get to control the input so they can try different audio sources like their own voice, sounds from their environment, animals, music, etc. They can also overlap sounds and alter them in certain ways to see how the pattern is affected. As they experiment with the audio, the visual depiction will respond so they can better understand the results of their actions. This project will, for some, offer a deeper understanding of certain audible properties that make up sounds. This will also give them the opportunity to reflect on the sounds that make up their environment. They may, for example, capture the sounds of wind and rain through the microphone to experience them through a different sense. Alternatively, they may rub two objects or materials together to see what kind of information results from this interaction. Overall, users can discover themselves when using their own voice or musical production, discover their environment by capturing the surrounding sounds, or learn more about their actions by initiating interactions between objects.

Response to Question 3

My project will help users gain a new awareness of the sounds they produce and are surrounded with. For users who find the concept of sound to be confusing or abstract-seeming, the visual depiction will help them better understand the information that can be gathered from audio. It may also challenge what they think they know about sound. Although they will not be able to directly edit the pattern, they are able to modify it by altering or changing the sound itself. Ultimately, they are in control of the design since it is being illustrated based on the input they give. However, they must learn how to manipulate the properties of the sound if they wish to have more control over the design. This may simultaneously feel empowering and disorderly to the user.

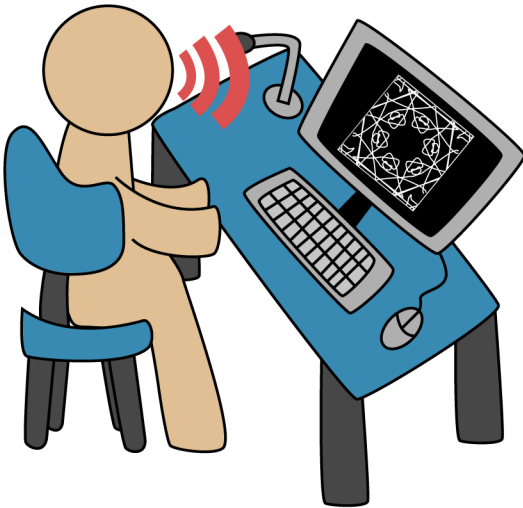
By giving them the ability to post their creations and view those made by others in a collective virtual space, they are encouraged to share their experience with others. The display of works on the website therefore becomes a space for collaboration. As they view the artworks and captions posted by other users, they gain information about each other and the type of sound used to create each design. Significantly, users are able to participate while maintaining anonymity. This gives them the opportunity to engage in the project without the obligation of sharing personal details.



1. The user opens website and decides whether they would like to activate their microphone or upload a sound file.



2. Since they selected the first option, they must produce sound. The visual appears based on the properties of their input.



3. As they make changes to the sound (i.e. increase the volume), they can observe changes in the design.



4. Once their design is complete, they may choose to publish it, download it, or delete it. In this example, they choose to publish it.



5. The user is asked to enter their name, location, and a description of their work. They may also remain anonymous.



6. They can browse the gallery to see other users' creations.

Similar Projects

Seeing Music by Jay Alan Zimmerman and Google

<https://creatability.withgoogle.com/seeing-music/>

Seeing Music is an inspiring Google experiment by Jay Alan Zimmerman that gives the user the ability to experience music visually. The user turns on their microphone or imports a sound file then selects between two modes: Basic mode and Piano mode. Basic mode is used for monophonic music and piano mode is for polyphonic music. Piano mode is built using a machine learning model designed by a team at Google. An on-screen keyboard is available for the user to visualize live piano performances. They are also presented with some settings to determine the type of visual representation they would like to see. These are based on sound textures and paths of melodies. There are nine settings to choose from such as Hilbert Scope, Spectrograph, and Waveform. When the user changes settings, the visual is erased and restarts in the new style. There are also a few sample sounds available so users can see examples without activating their microphone or importing any files. There are additional settings to toggle between colour modes (grayscale or RGB) and to activate grids and nodes. By letting individuals activate their microphones to input live information all while presenting them with modes and settings to customize their visual experience, there is a high level of interaction between the project and its users. According to the project description, it was built using Tone.js, WebRTC, Tensorflow.js, and Magenta.js.

Spectrogram by Jeramy Morrill and Boris Smus

<https://musiclab.chromeexperiments.com/Spectrogram/>

Spectrogram is a digital tool published in the Chrome Music Lab experiments by Jeramy Morrill and Boris Smus. The website lets users compare the spectrograms of different sounds, or activate their device's microphone to visualize their own input. Besides using their own audio, there are several other embedded options to choose from including flute, harp, whistling, trombone, drums, birds, modem, and wine glass noises. There is also a feature to click and drag the cursor across the screen to produce sounds. The result is an RGB spectrogram with a three-dimensional look. Morrill and Smus' tool seems to be an amusing experiment that invites users to explore and play with the sound options to experience different visual outcomes. It specifically measures variations in signal frequencies over time, so the user only gains an understanding of one sound property. Overall, it is straight-forward to use and does not include many features for users to customize their experience or gain a more in-depth understanding of the different components that make up sounds. It is, however, a useful tool to learn about audio frequency and the tendencies of certain noises and instruments to have more regular or varying frequencies.

Off the Staff by Nicholas Rougeux

<https://www.c82.net/offthestaff/>

Off the Staff is an experiment to visualize notes from music scores. The work was created by Nicholas Rougeux, who is an inspiring web designer and data artist. He creates arrangements of dots using the notes in the score, and they are distanced from the center of the design according to the pitch. The dots are sized based on the duration of each note and progressively appear in a circular pattern relative to the time at which they occur. They are colourized to represent different instruments.

Rougeux uses classical songs such as The Four Seasons by Antonio Vivaldi and Allegro con brio by Ludwig van Beethoven. By the end of each tune, posters are created with the resulting designs, which are available for purchase through his website. Rougeux also publishes videos so people can discover how each poster was created. Since the design varies based on changes in the score notes, users get to experience the music both audibly and visually. In other words, they gain a new understanding of the notes they are hearing as they encounter them through two senses instead of one. Additionally, there are links to the sheet music for users to consult. The process videos and resulting poster designs are fascinating and unlike any other work I have come across. On his portfolio website, Rougeux explains the method and technologies behind his work so users gain an insight into how his project came to life.

How My Project Will Be Different

The three projects previously discussed are similar to my project concept as they are all data visualizations of sound. I chose those examples specifically because they all approach a similar objective in distinguished ways and using different technologies. To my understanding, Seeing Music and Spectrogram are primarily tools for experimentation and exploration. There is no actual *product* from this experience. Off the Staff, on the other hand, is a collection of designs derived from experiments conducted by Rougeux. In this case, there are products but users are not given the opportunity to participate in their creation. My project will be different by giving individuals the ability to explore and experiment with the tool, and to create their own products as a result of this interaction. Unlike the three examples, I want to give users a space to share their designs and browse those made by others. This collective virtual space will ultimately encourage the sharing of information while simultaneously promoting collaboration.