Collabscape: A Collaborative Musical Net Art Installation

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ABSTRACT

Collabscape is a collaborative musical net art installation that enables users to create infinite soundscapes and ambient music together using a web browser. Users navigate to the website, enter their name and location, and are given a unique on-screen object to click and drag. The position of this object effects an audio sample that is assigned when the user joins the site. The user info, on-screen object, and the assigned audio sample are broadcast and updated in real time to all other users on the site using the NexusHub and Tone.js frameworks, and the final musical result is created through the number of users on the site and the position of their objects on screen.

1. ARTISTIC INTENT

The goal of the installation is to re-imagine the way in which people and communities “connect” to create music. Traditionally this is done in-person with a relatively small number of people who play an instrument. However, the potential for creating music through a network extends far beyond locality, and certain design choices can be made to broaden the scope of inclusion to non-musicians. The installation also hopes to empower musicians and non-musicians to partake in the kind of community music making that COVID-19 has sought to eliminate... only this time on an international scale. In essence, Collabscape allows anyone with an internet connection to create music and connect with other people from anywhere in the world.

2. RELATED WORK

This project combines the cooperative capabilities of peer-to-peer networks with quasi-generative musical processes. As such, several artworks were central to the conceptual and technical aims of Collabscape. These include Web Wall Whispers [2], Generative.fm [1], cooperative composition platforms such as Playsound.space [5] and Earsketch [4].

Figure 1: Home page of Collabscape

3. INTERACTIVE DESIGN

There are two main pages for Collabscape. The first page asks users to give their name and location before joining the soundscape (Figure 1). Once the user joins, their information is displayed alongside the other users who are also currently on the web site. However, a user may simply leave the text boxes blank or add in a pseudonym or false location if they wish to remain anonymous. The next page displays the user information, contains a window where users can chat to one another. An on-screen object is created with a randomized color and size that is unique to that particular user. This object is a circle that has been blurred using a css filter to make it look like a firefly. The chat can be used as a way to instruct users object movement during a performance, or to casually connect with other users on the site.

The user is also assigned a number that is used to reference an audio file inside a Tone.js Players object. They can click and drag their firefly around the screen to change audio parameters such as volume, pan position, reverb room size, and low pass filter cutoff frequency. The audio sample will continuously loop while the changes are updated. The X position of the firefly controls the pan position and reverb room size, while the Y position controls volume and the low pass filter cutoff frequency. The higher the firefly, the softer the audio sample is and the lower the frequency cutoff is. This is done to create the illusion of depth in the soundscape. The implemented effects are intentionally subtle. These restrictions hope to encourage users to make musical choices primarily by listening to others and placing their firefly in a location that contributes to the overall soundscape.

The visual interaction is also designed to be created collectively. The background image for Collabscape is intentionally barren, including nothing except for black and white.
photo of a few trees in front of a lake. Since each users firefly contains a randomized color, more users on the site will create more color, activity, and visual interest (Figure 2).

4. TECHNICAL DETAILS

The sound samples were gathered using the Freesound API in the Max MSP environment using the ac_ tonality filter with a value of “C Minor”. This returned many samples which were first vetted for relevance before being included. C minor was chosen to limit the number of returned samples and to insure that all chosen samples had some common feature. The samples were then arranged in Reaper, mixed down to mono, volume balanced to -16 LUFS, and then exported. The samples range from ambient synthesizer and drones to birds, water, and wind. Currently there are 158 audio samples that can be assigned to users. Given the limited number of audio samples, it is reasonable to assume that between 30-40 people can be on the website at a time before a sample is doubled in the soundscape.

Collabscape uses the NexusHub\(^2\) framework to transmit and receive user information utilizing peer-to-peer network control of audio events[3]. An initial message is broadcast when a user first inputs their name and location. This message contains the name, location, window width and height, and an ID, or randomly generated string of 10 numbers that is used to reference that particular user. On the receiving end, the name and location are displayed on-screen while the ID is hidden and stored in an array containing all other user ID’s. The ID is also turned into a string and set as the id for a newly created div which contains the on-screen firefly.

The next message sends the user ID along with mouse x/y positions when the firefly is clicked. NexusHub will check the array for the user ID and update the position of the firefly using the window width and height sent by that user initially from NexusHub to the width and height of the screen of the viewer. This allows the firefly position to be updated on all active user screens and responsive to multiple screen sizes in simultaneously. Collabscape can be viewed on both mobile devices and desktop computers using most browsers, however, it works best using Google Chrome.

5. FUTURE DIRECTIONS

In an attempt to make Collabscape as accessible and inviting as possible, and immediate improvement would be to include a much larger set of audio sample. Having as many as 500 would most likely achieve this goal. This would also make each successive visit to the site dramatically different for smaller groups, since it will be less likely to hear the same samples again.

The above improvement would warrant further updates, as having potentially hundreds of audio files playing simultaneously is probably not practical or desirable. One solution would be to scale the overall volume in the Tone.js Players based on the number of users, so the volume would decrease as more users join the site. Another would be to include longer samples containing more silence so that recurrent sound events are farther apart. A final solution would be to turn looping off for all players and having them play back only when the firefly is clicked.

6. PERFORMANCE

A performance using Collabscape is best realized outside of the traditional fixed dedicated time frame that is common in most concert settings. It should ideally feel like viewing an installation, with the site open for anyone to join at anytime.

7. CONCLUSIONS

Collabscape is a collaborative musical net art installation that enables users to create soundscapes and ambient music together using a web browser. The installation uses the NexusHub framework to send and receive user information and the Tone.js framework to play and manipulate audio files. The resulting soundscape is the effort of all the users combined.

8. REFERENCES


\(^2\)https://nexus-js.github.io/ui/