Sonic Sculpt

A web application that let's you share, combine, collaborate on and mix field recordings through granular synthesis

Project Proposal for CART 351 by Maxime Gordon

Description

Concept
As an electronic musician I often work alone and indoors which has only been exacerbated by the covid-19 pandemic. In my compositions I often use field recordings or found sound samples either that I have recorded or that I have found from the internet. Notably what I find missing from my process is a sense of play or discovery that can come from working with others and also a sense of grounded-ness or guiding principal of a sound palette. To address these issues I propose the web app and tool *Sonic Sculpt* that lets you share, combine, collaborate on and mix site-specific field recordings through granular synthesis.

Sonic Sculpt aims to examine:

(1) How to encourage collaboration and play between experimental electronic musicians
(2) How to increase a sense of connectedness with a persons environmental surroundings through sound

Users and the Space
In Sonic Sculpt users have the ability to view other peoples soundrooms/sonic sculptures on an explore page. Eventually I imagine the explore page to be organized using machine learning based on sound feature extraction but this may be outside the scope of this project due to my inexperience with machine learning and web applications. In the event that machine learning is too difficult to implement the organization of the explore page will be done through user created tags. These tags would describe the sounds of the audio files used to create the sculpture and would be either custom or prompted (ie. voice, water, airport, ambient, calm etc.).

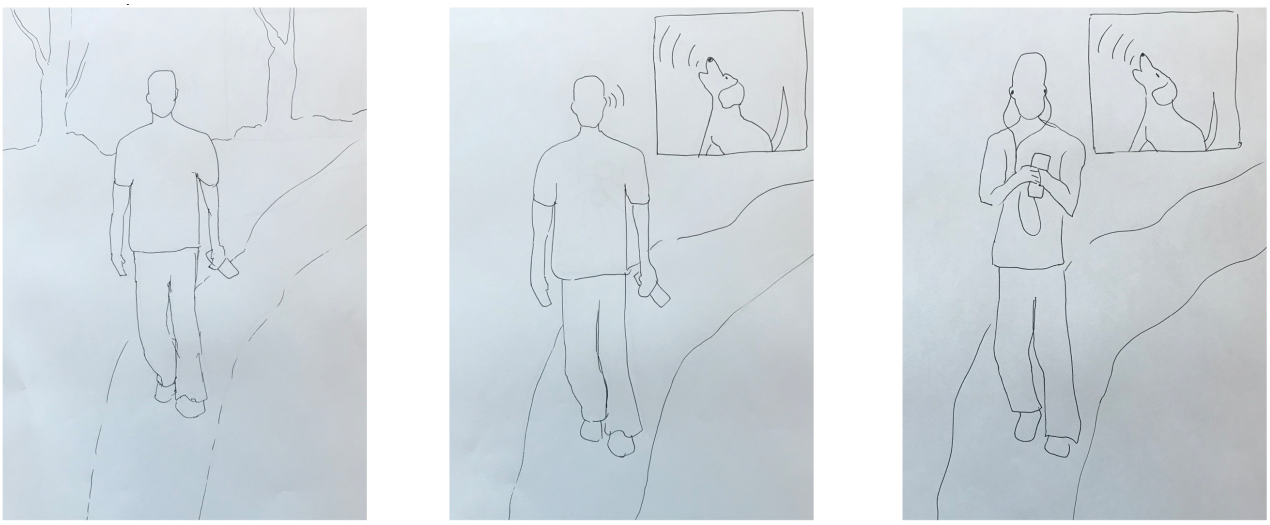
Users also have the ability to invite others into their soundroom with a room code opening up the possibility for collaboration. Through the ability to collaborate I hope that users can inspire each other and share experiences together through sound.

Empowerment and benefits
This app bridges the gap between electronic musicians by allowing for collaboration over a network as well as the exploration of other creations/soundrooms/sculptures by other users.

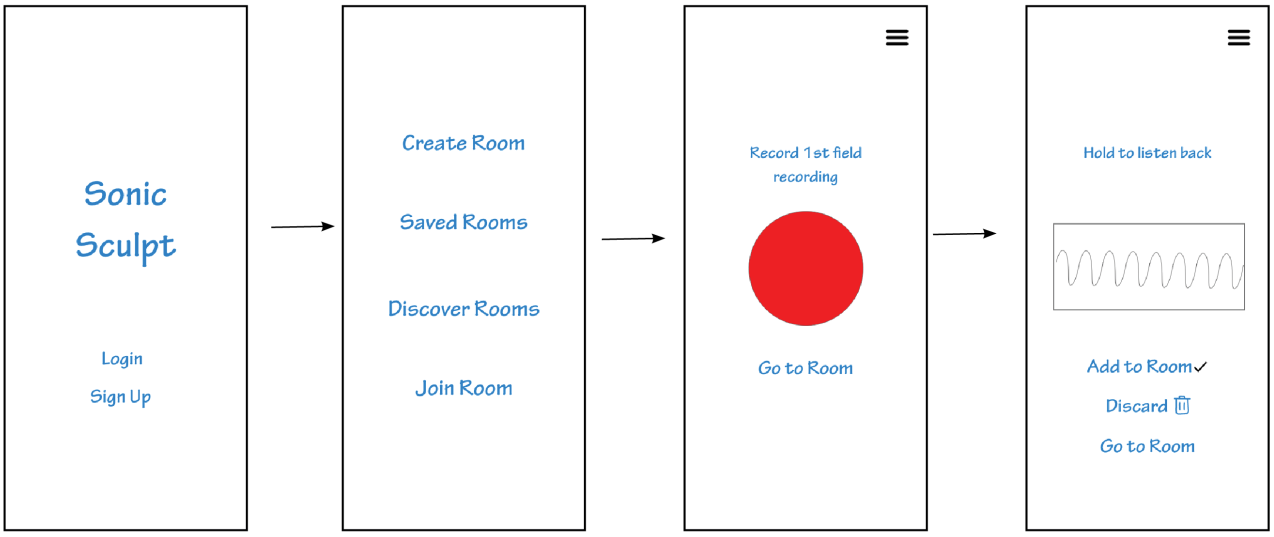
The app also promotes exploration of existing sounds in people's environment and encourages discovery of new and interesting sounds that may be typically overlooked by users in their everyday lives. A result of using sounds from a particular place to play a granular synth means that soundscape/sculpture created will be deeply connected to the place that it was recorded given it a sense of meaning and permanence sometimes lacking in electronic composition.

Storyboard

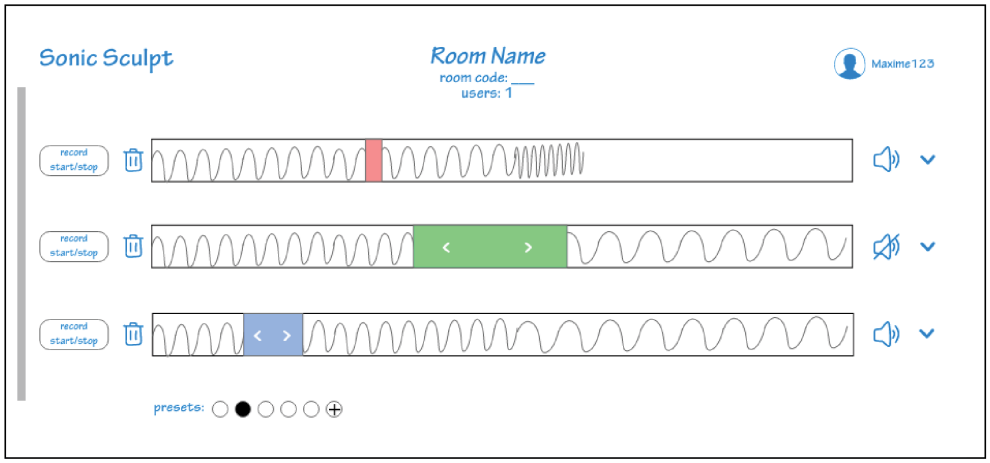
The user is outside on a walk enjoying nature. Suddenly they hear a dog barking and take out their phone to capture the sound using *Sonic Sculpt*.



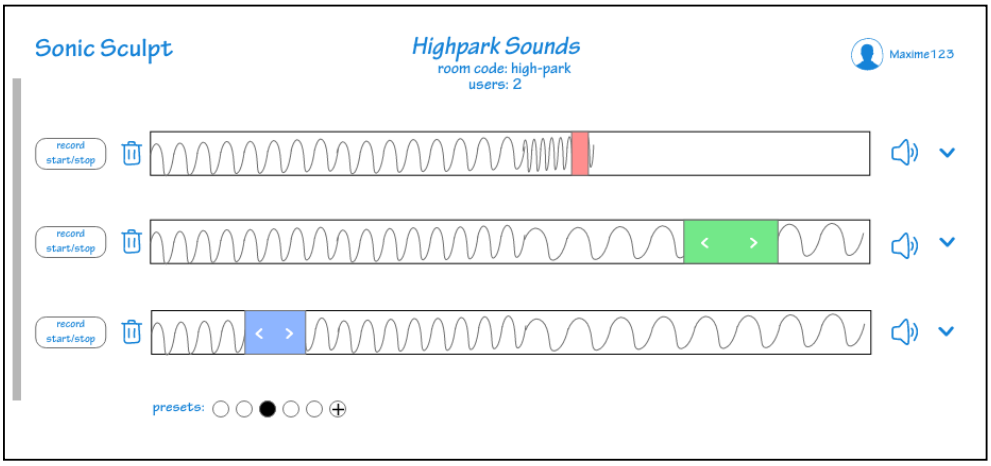
In the app they create a room and record this sound which is the first field recording of this new room. They hold the sample and listen back to the recording they just created and decide to add it to the room.



As they continue walking the user finds 2 more interesting sounds and they add them to the newly created room. They then open up the room page where they manipulate and sculpt the field recordings.



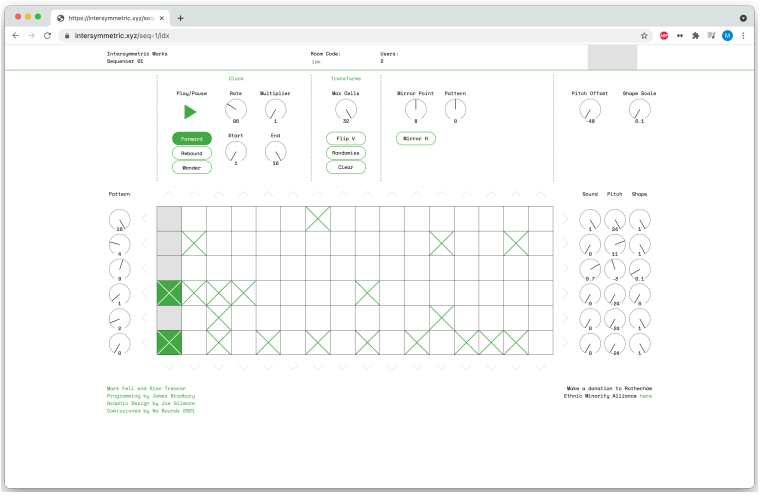
After a little time manipulating the samples alone they text their friend a room code and both of them play together in the room.



Technical notes:
- Number of users in a room can equal the number of channels of sound
- Max number of channels = 10 therefore max users per room is 10
- Each channel holds a different field recording, min number of channels = 1, max = 10
- Each channel is a different granular synth that is controlled by its own parameters
- Can save preset of a room -> can be recalled by push buttons
- Rooms are public and discoverable by any user but can only be collaborated in, in a given session by users sharing the same room code

Similar Projects

Intersymmetric Sequencer 1 (2021)
https://intersymmetric.xyz/



The Intersymmetric Sequencer 1 is an online multiplayer drum machine by Mark Fell and Rian Treanor. Fell and Treanor are both music producers who are interested in creating collaborative musical tools and are responding to what they see is lacking in musical communities. Treanor explains the lack of online musical tools in comparison to online gaming as he says, “Think about [online] gaming – shooting each other in real time, a million bullets a second. That is way more complex than what we’re doing! Why does that not exist in music?”[1]. Indeed, while there is a rich history of online gaming there is not a comparable community for online music making.

The Intersymmetric Sequencer 1 allows users to create a room where they can invite other users to join and play the sequencer together in real time. The synthesis is handled by Tone.js and there are a variety of parameters and controls that the users can modify. The clock synchronization of the app doesn’t allow for perfect syncing of the sequencer but rather, ‘all that is passed through the server is the state of the grid and the dials, as well as things like rooms and which one you belong to’[2]. This synth is extremely fun to play and the collaborative aspect is a large inspiration for *Sonic Sculpt.* The UI is very minimal and easy to understand which makes it accessible to beginners who maybe have never used a drum sequencer before. The synth’s sounds have been curated by Treanor and Fell which is fun as a fan of their music, however it could be even more interesting if you were able to code your own synth sounds to include in the sequencer. There is also no description about each synth sound which is an interesting design choice as it promotes exploration and play with each sound - you must engage with the device to learn what each sample will sound like.

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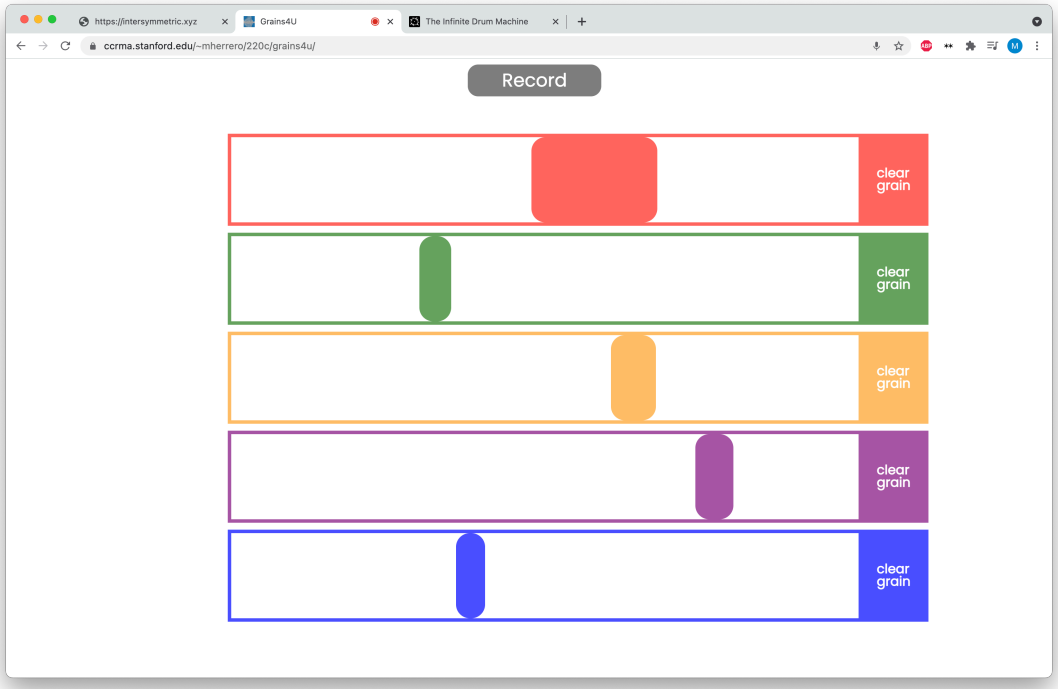
[1] https://www.theguardian.com/music/2021/mar/03/rian-treanor-the-producer-hacking-a-smarter-kinder-future-for-music.

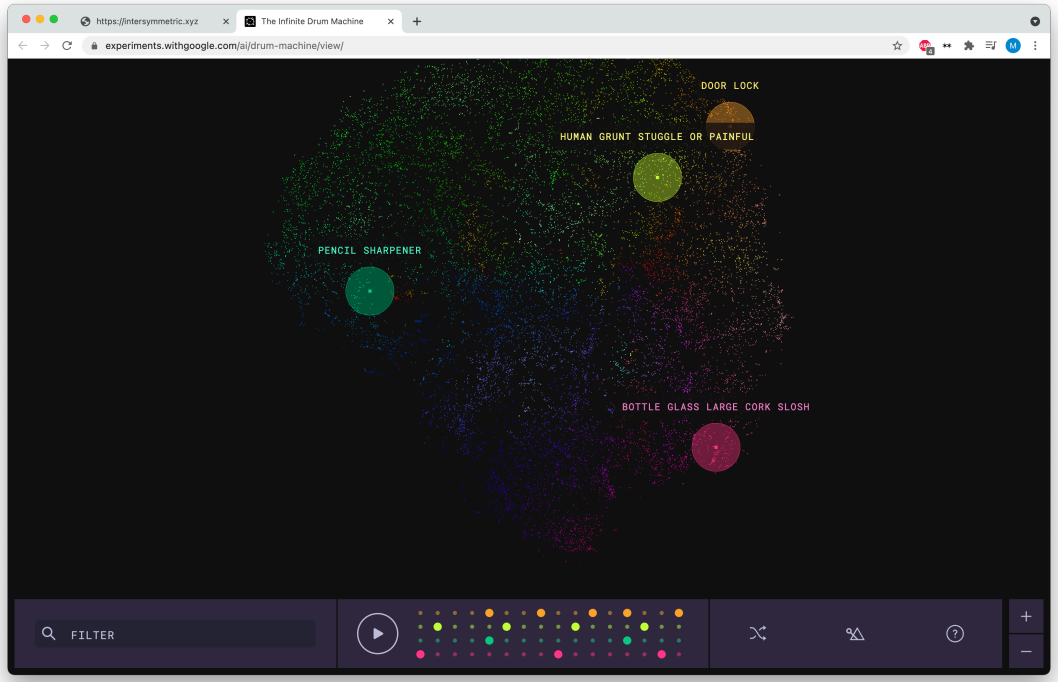
[2] https://llllllll.co/t/realtime-collaborative-music-making-in-the-browser/47619/9

Grains4u (2016)
https://cm-gitlab.stanford.edu/mherrero/grains4u



Grains4u is a granular synthesis web application by Matt Herrero built with HTML, CSS, Javascript, and the Web Audio API. The UI is very simple consisting of a record/stop button and 5 ‘grain boxes’ that allows the user to layer up to 5 granular synths each loaded with the same audio recording recorded by the user. Users move a resizable sliding box across the grain box to go to different parts of the sample and can alter the length of each grain by resizing this box. Recording a new sample removes the original audio and replaces it with the new audio. This project is simple and offers beginners a way to experiment with granular synthesis which I really like. With the limited options it is easy to sketch out interesting sounds and experiment with the single recorded audio file. Immediately it is clear however that to create more complex soundscapes it would be necessary to have more than one audio recording able to be manipulated in the grain boxes. Also it is quite unclear about what is actually happening under the hood. Having visual feedback such as a display of the waveform being manipulated as well as more clear feedback about the length and volume of the grains would be beneficial. Overall this project succeeds in creating a simple way of playing with one audio file and granular synths but could do better in visual feedback of sound manipulation.

The Infinite Drum Machine (2017)
https://experiments.withgoogle.com/ai/drum-machine/view/



The Infinite Drum Machine is a drum sequencer by Kyle McDonald, Manny Tan, and Yotam Mann. It uses a machine learning algorithm called t-SNE to classify sounds, putting sounds that sound alike closer together 2D cloud-like rendering and then lets the user explore and use these everyday sounds to create beats. Users explore ‘neighborhoods of similar sounds’ (quote) by clicking and dragging a circle over the cloud-like image. Each dot/circle in the cloud is a sound that has been classified by the algorithm. Each neighborhood is given a distinct color so it’s easy to see by color and by spatial positing which sounds will sound alike. If the user finds a sound they like they can put it into a drum machine at the bottom of the screen and compose a song using these everyday sounds. The bottom of the screen is where most of the drum machine interaction occurs. Users can control the tempo of the playback of the drum machine, click a randomizer button to randomly choose 4 sounds in the cloud choose when a sample will sound in the 16-step sequencer and choose 4 sounds they wish to use in the sequencer. The UI of this app is very simple and easy to understand however without reading about or watching the explanatory video it could be hard to figure out what is happening.

Comparison

With *Sonic Sculpt* I hope to create a tool for musicians to engage with the sound around them and collaborate with other musicians on to augment and sculpt these soundscapes. I've taken inspiration from each of the projects listed above weighing the pros and cons of each application. Intersymmetric Sequencer 1 successfully creates a collaborative tool but the user can't feel personally connected to the sounds as they have limited control over what they sound like and can't personalize their own synths. Grains4u is an excellent tool for playing with granular synthesis but doesn't invite in other collaborators. The Infinite Drum Machine is successful in its classification of everyday sounds but creating a drum machine out of these sounds feels gimmicky and not doing the sounds justice. Furthermore, none of these applications offers a way to save certain states through presets. With *Sonic Sculpt* I address all of these issues:

- *Sonic Sculpt* uses granular synthesis as it offers a way for people to include personal recordings they find meaningful to themselves. By allowing users to record sounds they find around them this encourages listening and engaged-ness to their sounding environment.
- *Sonic Sculpt* promotes collaboration - with field recording and composing electronic music people are often alone. Aloneness has been exacerbated due to the covid-19 pandemic and is something that should be addressed in music applications.
- *Sonic Sculpt* uses granular synthesis as its base instead of a drum sequencer because it can offer a more fluid and evolving sound result which is more true to the original recorded sounds.
- *Sonic Sculpt* allows the user to save presets and rooms of their sculptures which promotes sharing over longer periods of time and a way to reflect on past sound works