HeartSynth

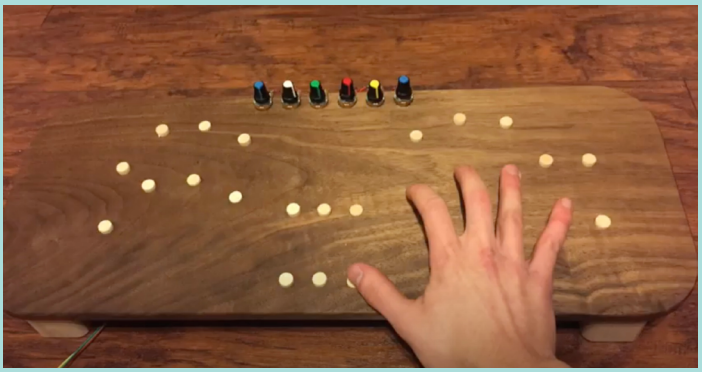
an interactive installation

overview

HeartSynth is a audio/visual synthesizer inspired by the need for accesibility in music. This piece uses biofeedback and a physical controller designed to fit the users hand naturally. Unlike many instruments, HeartSynth can be played effectively by anyone regardless of musical skill or experience.

The audio engine uses a subtractive synthesiszer and drum machine which were both built in Max/MSP. Additionally, this piece uses an arduino, a custom built keyboard, and a heart-rate monitor.

This piece was originally designed as a piece of my portfolio for admission to the Performing Arts Technology Program at The University of Michigan in 2017.



audio

At its base, HeartSynth is a polyphonic subtractive synthesiszer. Essentially, each dial controls the amount of square, triagnle, saw, and sin wave in the signal. The 5th dial controls the tone preset which changes the attack, decay, sustain , and release of the synthesizer. The final dial controls the lowcut frequency of an eq on the synthesizer.

In addition to the subtractive synthesizer, there is a drum machine which features a kick, snare, and high hat sounds. Each of these are genereated with [noise~] and [reson~] objects. These are then sequenced determined on the current amount of effort being exerted into the system. The tempo of the drum sequence is also modulated based on the players heartrate.

The dials are meant to be un-labeled. This allows a user to control the insturment wihtout having the biases of knowing what you are controlling. This allows for intresting exploration of the instrument.

interaction

Instead of using a traditional keyboard layout such as a piano keyboard, I chose to use a layout with buttons in the shape of two hands. The user lays their hands on the controller and pushes the buttons to trigger sound. There are also for knobs which correspond to synth parameters and subsequently change aspects of the visualization.

The secondary mode of input is a heartrate sensor which the user wears on their wrist. This data controls the drum machine/sequence pattern and also the general intensity of the synthesizer.

As the user exerts more effort into the system the visualization and audio expereince change. It is also possible to excite the system enough for it to draw upon the computers webcam as a tertiary form of input.

visuals

The animation uses a grid with varies width/height depending on the input from the user. The boxes are also influenced by data from the webcam. See the demo to better understand the visualization.

more info

demo - https://bit.ly/2WEfqOT

source code -https://github.com/sdsmit/heartsynth