Semester two: experiments with the system

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I started this semester thinking my main concern was how I was going to move sound around in space(s) and how I would shape my compositions in spatially interesting ways. To quote myself: “On one side I am looking to elaborate on the spatial characteristics within my compositions using spatialization and surround sound techniques. On the other side I am looking for apt ways to perform and release these ideas and to find space for them to evolve”. Whilst the search for a spatial identity using spatialization as a key parameter still is a part of the project, my process has sort of flipped. The experiments this semester has instead been focused on my process, my ways of writing electronic music and different techniques of generating sounding and visual material. I consider this is a natural flip due to the current pandemic situation (venues and rooms not really being accessible) and to a logical truth, there needs to be sound to be able to move sound around. My first few experiments led me towards thinking: If I want the spatial aspects to be embedded in my compositions in ways they have not been before, then I probably need to explore new ways of writing in general.

A generative approach

In the beginning of the semester I acquired a new module for my Eurorack modular synth, the Turing Machine by Music Thing Modular. In its essence it is a shift register, a binary sequencer that spits out random voltages in random patterns based on an incoming clock signal. It basically generates a continuous stream of patterns that can be shaped into loopable musical phrases in a variety of ways (as is often the case with modular synthesizers). The design of the module was inspired by the minimalist process music by composer such as Steve Reich and Terry Riley. [1] The module helped me begin to grasp the potential of randomness, chance and noise as compositional tools. It showed me that the outcome of randomly generated pattern does not necessarily have to sound random and noisy. It pushed me and the project in the direction of generative music, *i.e*., making music by designing a system that makes music.[2]

Such a system for making music could be comprised of two tape machines running the same loop on different speeds causing the loop to weave in and out of sync and form an interplaying composition as in the case of Steve Reich - It’s Gonna Rain. Or it could be seven tape loops playing different sustained notes that rarely overlap in the same way, as in the case of Brain Eno – Music for Airports (2/1). Brian Eno provides a contrasting explanation of his definition of generative music: “Classical music, like classical architecture, like many other classical forms, specifies an entity in advance and then builds it. Generative music doesn't do that, it specifies a set of rules and then lets them make the thing”. [3]

Tero Parviainen made a presentation for the 2017 Ableton Loop conference, an interactive website for explaining the basis of a generative approach. He explains that the tape loop pieces mentioned

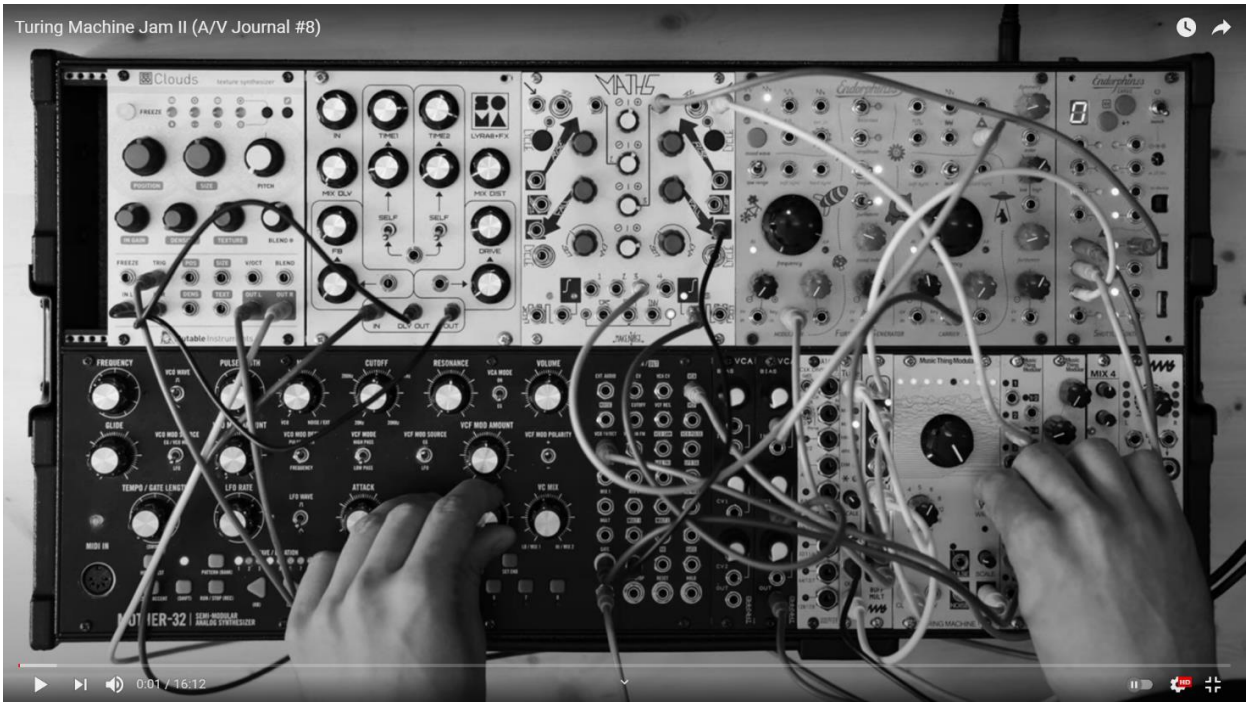
[1] Music Thing Modular. (https://musicthing.co.uk/pages/turing.html)
[2] Parviainen, Tero (2017). ”How Generative Music works”
[3] Eno, Brian (1996). ”Generative Music” (https://inmotionmagazine.com/eno1.html)

are examples of employing a generative method to compose new music, but the outcomes themselves do not have a generative nature, the results are the same every time. The album Reflection by Brian Eno on the other hand is both made using generative methods and is shared as a generative product, an app that generates a continuous stream of unique music. Parviainen points at the benefits of using these kinds of software systems in generative music making: "One of them is their capability to make lots of random choices. And randomness is an incredibly useful generative technique".[4]

Random patterns

My novel use of the randomness provided by the Turing Machine module looks a bit like this; I listen for fragments that resonate with me in the random patterns it spits out, I confine the pattern to a musical scale using a quantizer (most of the time), I loop, interact with and develop the looped phrase. When I feel a need for a greater development, I return to the stream of random patterns in search of a new fragment to interact with.

Random → Listen → Interact → Develop → Listen ← Back to random



Example 1: Turing Machine Jam II (Click here or the image)

In this example I am focusing on the side of my systems that generates pitches and rhythmical sequences, the basis, the starting point in my approach. The twisting of knobs to the right is me interacting with the looped pattern provided by the Turing Machine. I am pitching certain steps in the pattern up and down as a way of manually playing what the system has provided. I shape the timbre by hand, impose rhythms on top by using two delay effects and I transpose the pattern using

[4] Parviainen, T (2017).

another sequence. In other words, the system is under heavy influence (control) by me. The outcome is not random, nor is the product (the recorded video). I may not be doing generative music in every sense of the term but a performance with my system will never be the same twice and the patterns themselves cannot be saved in any other way than as a recording at the end of the chain. I see my use of generative methods as a way of being able to act more as a listener in the process of writing music by giving away some compositional control to the system. I can do real time sound design and be immersed in the process as it unfolds by letting the Turing Machine (in combination with other modules) choose notes and rhythms. It is very much composition as a process, and I do want the process to be heard.

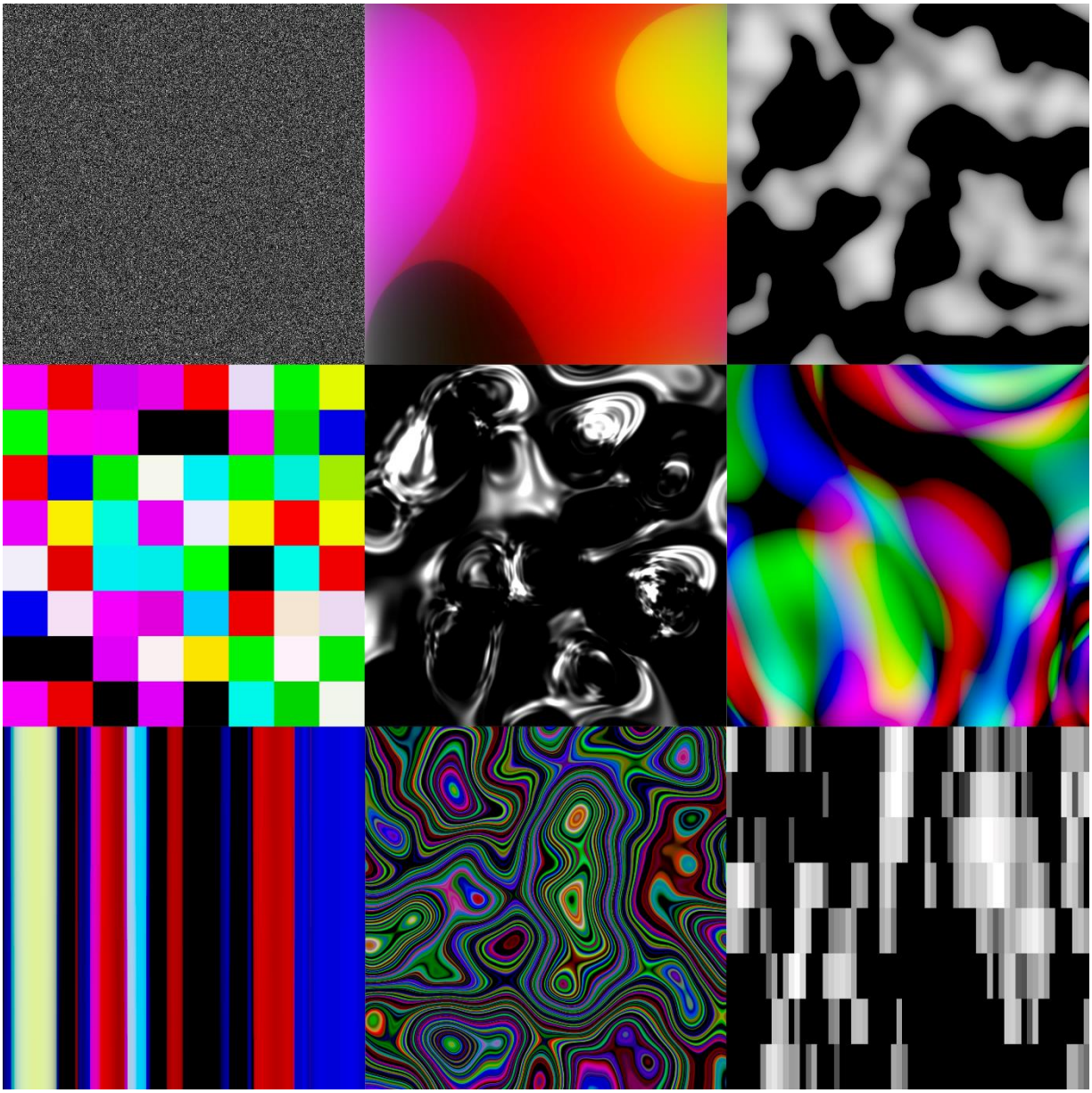
By using a module that was inspired by minimalism, I guess I am following in the same footsteps. I know I decided to incorporate the module because it suited my aesthetics. I know I enjoy clear patterns in art, visible frameworks and audible processes that gradually grow. I guess my system is a way for me to write evolving minimalistic pieces using generative techniques in real time. I certainly relate to the interest of Steve Reich: "What I'm interested in is a compositional process and a sounding music that are one and the same thing". [5]

Musical inspiration

From the same era as Reich, with some aesthetic similarities but working more exclusively with synthesizers an inspiration for this project since the start has been Laurie Spiegel. The spatial characteristics of the track Patchworks, the hard panned approach to the stereo field while still being based on rhythmically melodic patterns was what initially grabbed my attention. After spending more time around her body of work I am becoming equally intrigued by her way of using (and designing) systems to compose in general. Her writings on the manipulation of musical patterns on a macro level, from interpolation to phase offset and the notion of considering this level in music when designing a system is something I will return to.[6]

Qasim Naqvi is maybe a more present musical inspiration in this project. His 2019 album *Teenagers* and 2020 EP *Beta* is both great examples on how a Eurorack modular synth can be used to craft entire pieces in my opinion. The tracks *No Tounge* and *Roll Program* resembles a direction I want to steer my system in. Both pieces are based on clear repeating patterns, but with a bit more organic and fluid feeling than Spiegel. Rigid and precise, loose and organic. Two different but independently viable musical goals that I want to be able to move between going forward with the design of this system.

[5] Reich, Steve. "Music as a Gradual Process"
[6] Spiegel, Laurie (1981). "Manipulation of Musical Patterns"

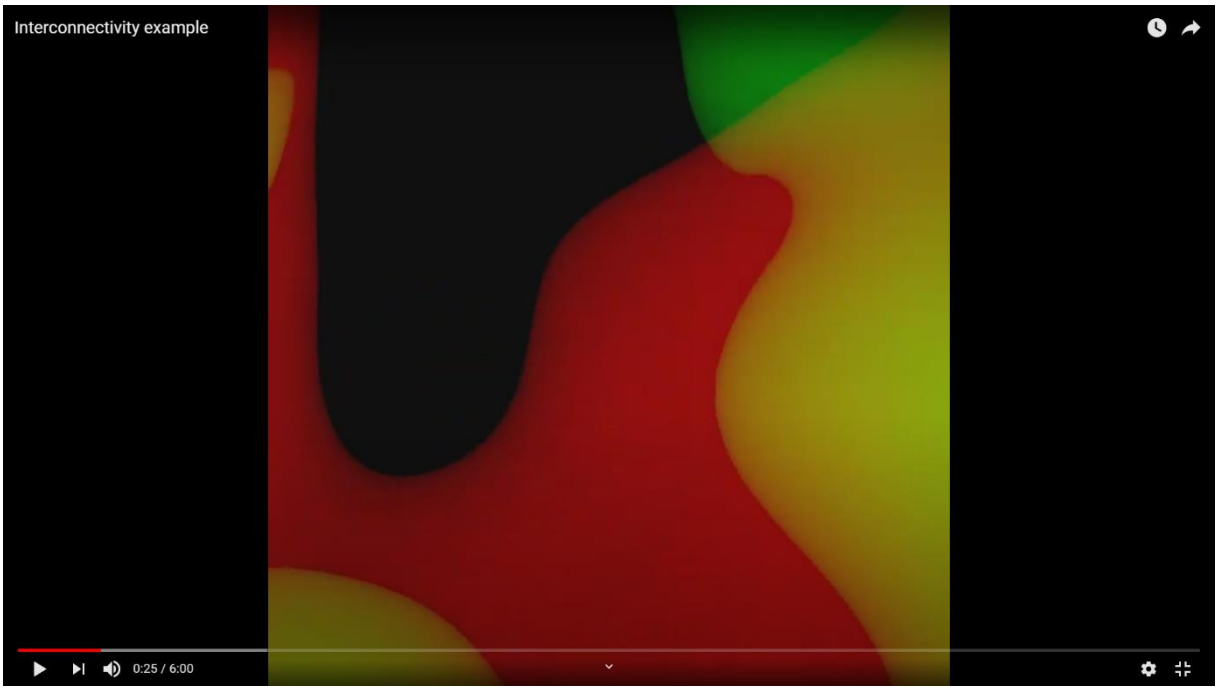


**This image will hopefully make more sense soon*

An audiovisual system

The nine squared images on the previous page are all patterns quickly generated from noise (random or pseudo-random noise) in the software Touchdesigner. This node-based tool for creating and manipulating visual content was something I wanted to learn how to use going into this project. The tutorial channels Paketa12 and Bileam Tschepe on YouTube has been very helpful in my experiments trying to figure out this software. One thing I quickly realized was how similar the workflow was to the modular synth workflow. Simplified, you patch different modules with different functions into each other to create a network that can generate something that excites you. In the beginning of this project, I posed the question: In what ways can my compositional process be reenforced by the making of visual content?

In the latter half of this semester I realized I was using noise to create visual patterns much in the same way I was using the Turing Machine to generate musical patterns. I began to view the two sides as a joined system, a generative audiovisual system. I had been experimenting with different ways of making the visuals be audio-reactive, having visual representations of the audio spectrum, making shapes change shape by analyzing the loudness of the audio and connecting it to different parameters and similar techniques. My supervisor Palle Dahlstedt then suggested I should try to figure out a way do the opposite connection as well, have the visuals inform the audio. As the system stands the sounding patterns are making movement happen in the visual realm by analyzation of the audio. I am currently working on ways of reading the motion in the picture and using those signals to control the timbre. The idea is that the two sides of the system will be in dialog with each other, move forward together with me in the middle as a moderator of the conversation. This interconnected feedback path is under construction (as all the system). I am experimenting with different ways of extracting the RGB curves of the video as control signals and sending them to the synth. Here is an example of that work in progress:



Example 2: Interconnectivity (click here or the image). In this example the red curves are controlling waveshaping of the oscillator, the green are connected to the frequency modulation.

I have not gotten as deep into the aesthetics of the visual side as in the musical, but I am getting closer to a version 1.0 of the system that I can perform with in front of an audience after spending this semester experimenting and building up my knowledge in Touchdesigner (you can follow this journey in my A/V Journal). I want the visuals and the music to move side by side, I want them to share the same breath but not be to obviously in sync. I want there to be room for interpretation, space for myself and for an audience to sort of ebb and flow within the audiovisual experience. I think the Russian duo 404.Zero manages this balance well. The way they craft dark and dense monochromatic textures in Black Sunday that still manages to be inviting is to me very inspiring.

Upcoming semesters

A quick summary of what I have been doing this semester: I have been harvesting patterns out of randomness for creating both visual and sounding art. I have been designing an interactive generative audiovisual system. I have been exploring new ways for me to write music.

The plan for my next two semesters is that I will continue to develop this system. I look forward to moving the short experiments I have been conducting in my basement studio and in digital spaces to actual rooms and to do actual performances. I will practice, develop the system further and write about the experience. I think Tero Parviainen puts it nicely: "Making generative music is all about the process of *designing* those systems". My ambition is to keep on designing, keep trusting the generative process that is this project. Part of that design work is doing deeper research on methods surrounding randomness in music, starting with John Cage's writings about indeterminacy and as mentioned earlier I will return to the writings by Laurie Spiegel.

As the flip of my initial plans for this process plays out I will move into doing experiments more closely related to the spatiality in my music. I have up until now mostly been focused on what will go into rooms (the system and what it generates). As I start to explore different rooms with this system I will look to develop the surround sound capabilities of it. A start of these experiments will be to put the spatialization of the patterns generated on the synth under visual control in ways similar to *Example 2* using Ambisonic panning techniques inside Touchdesigner. I also have a lot of ideas on how to deepen the interactive aspects, to give away some of the control to the audience. As stated, I will keep on designing.

This text and the whole audiovisual journal I have been keeping this semester is available on Research Catalog:
https://www.researchcatalogue.net/shared/679ab6244d4c605d4100e389fe777483