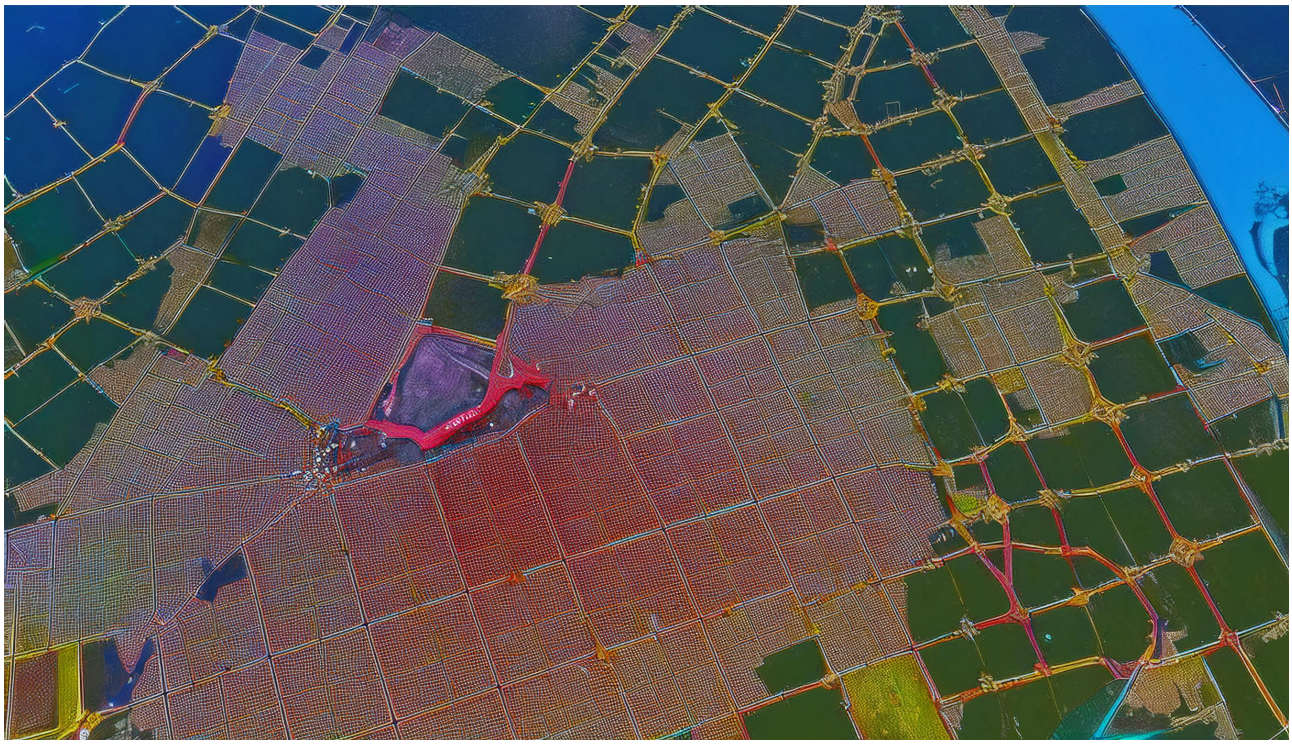
MACHINE YEARNING: AN AUDIOVISUAL EXPLORATION OF A HYPOTHETICAL FUTURE



by

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A thesis exhibition presented to OCAD University in partial fulfilment of the requirements for the degree of Master of Fine Arts in Digital Futures

Debut screening at DF Thesis Exhibition: March 28th - April 2nd 2025

Toronto, Ontario, Canada, 2025

Abstract

Machine Yearning is the title of the audio-visual album that explores a fictional near-future world through the eyes of an unnamed extra-terrestrial technological entity. The project also showcases a shift in my practice and the way I develop audio-visual work, serving the role of documenting an experimental stage in my creation process. While in the past my audio-visual sets have consisted of purely improvisational performances utilising eurorack format modular synthesisers (both audio and video synthesisers, usually with the video synthesisers reacting to the audio via control voltages). ***Machine Yearning*** is instead more of a produced, studio album that consists of a varied, experimental approach using a multitude of AI technologies in conjunction with audio-reactive softwares like TouchDesigner to create the visuals, and cybernetic patching combined with manually played elements to create the music. ***Machine Yearning*** explores the concept of the 'uncanny valley' originally coined by Mori in 1970**.** The album aims to explore content that blurs the lines between the real, the unreal and the constantly expanding realm that exists in-between the two.

Dedications

I'd like to thank the following people for providing technical, emotional and academic support over the course of working on this thesis project:

Thomas, Priya & Mathew Isaac, Adam Tindale, Bentley Jarvis, Joseph Ellsworth, Dr. Isaac Thomas, Mary Isaac, Rebecca Joseph Mathew & Maya Sara Mathew.

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Introduction

Machine Yearning is the title of the audio-visual album/film that presents a fictional narrative in the work, taking place from the point-of-view of an unnamed technological entity analysing humanity and the current state of the planet Earth. The entity is trying to gain some understanding of what it means to be a human being, indirectly reflecting my own personal understanding of what it means to be a human.

The title hints at the emotional direction of the project, contrasting the cold, sterile, analytical ***"Machine"*** with the emotional, organic ***"Yearning"***. This trope of a near-human being yearning for the feeling of oneness from their human peers, appears in multiple works of science fiction with characters like: ***Pinnochio*** (Carlo Collodi, The Adventures of Pinnochio, 1881-1882), ***Frankenstein's Monster*** (Mary Shelley, Frankenstein, 1831), ***Ex Machina's Ava*** (Alex Garland, 2015), all entities that exist in the 'uncanny valley': a phenomenon where near-human beings trigger a sense of discomfort or unease in actual humans due to our ability to detect something a little bit "off" about them. These non-human beings all long to feel acceptance and experience the feeling of being one with humanity, some achieving this via acceptance of their differences and eccentricities, others meeting tragic ends because of their inability to integrate and assimilate with the societies that surround them.

The trope is explored subtly throughout ***Machine Yearning*** mainly because the album doesn't feature a protagonist character with a name or any physical body that makes an appearance. Instead the project forces the audience to experience the narrative through the "eyes" of the entity, allowing me the freedom to be non-literal and express emotion and themes through subliminal UI choices and the behaviour of the visuals.

The album consists of 4 songs sequenced in order to create a poem through the combined song names:

Hyperstitious
Symbol Minded
Men With Codes
Earth2Sky

Towards the end of the creation process, the final track-count of the album was reduced to four, (eliminating an additional 3 songs that I felt took away from the cohesiveness of the project). This thesis still documents the planning and pre-production stages of those songs as I felt the knowledge and understanding attained from developing them was still relevant to the overall creation of the project.

It's important to me that the entire album feels alien and really embodies the aesthetic of some sort of unknown, technological thing viewing us from far away. This detachment from existing musical trends or aesthetics is crucial because I want the exploration of a new visual and sonic language that feels like it inhabits the uncanny valley to be a central part of the project. I don't want to lean too far into retro-futurism and tropes that have already been cemented into existing cultural associations with science-fiction universes. Of course there will be some inspiration taken from these tropes and it's impossible to create new content in a vacuum, but I do want to remember that the project is meant to be a glimpse into the POV of something that originated far away from humanity and the earth.

Due to this ethos informing the creation of the album I've decided to avoid using any recognisable sounds that originate from traditional drum machines (707s, 808s, 909s, etc.). I came up with the rather humorous phrase "aliens don't have 808s" during the pre-production stages of the audio. This phrase stuck with me throughout the early stages of creating the songs and pushed me to use a variety of synthesised sounds for the key percussion elements. While a big incentive for using eurorack gear in the first place is the ability to modulate sounds and create flexible timbres that interact with one another. In the past I'd often use modules that were essentially triggering one-shot WAV samples. These moments do stand out when compared to my prior discography and the "aliens not having 808s" was good in-retrospect as it forced me to not take for granted the fact that percussion sounds don't have to be the recognisable samples that have infiltrated musical culture all around the world.

I'm not going to be too strict with myself in this regard of abstaining from using any recognisable drum sound or one-shot samples because ultimately, aliens probably don't have modular synthesisers or 'Basimilus Iteritas Alter' Eurorack modules either but it's important I draw a line somewhere.

Realistically, a lot of electronic drum sounds that serve the utility purposes of a kick drum in a full musical mix will end up sounding somewhat like a 909 kick anyway. While being conscious of the fact that I don't want to draw too many direct references to existing cultural trends. I am aware that my project will likely end up exhibiting some traces of the artists that informed my work, such as Ryoji Ikeda, Tim Hecker and Kangding Ray (whom I discuss in-depth in the following literature review). These artists all treat sound as a material and focus a lot on timbral shaping as a compositional tool. They also rarely explore literal narratives or plots through their music. While Kangding Ray does have the concept album ***Cory Arcane*** which features a fictional protagonist, the majority of these artist's works exist more as dance-floor music or as pieces that explore technical concepts, philosophies, or compositional techniques and might be better suited to art galleries or exhibition spaces.

Literature Review

Machine Yearning is thematically focused around a fictional hypothetical future heavily inspired by science fiction media and the current state of technological development in the real-world. Through the process of creating the music and accompanying visuals, many of the narrative elements started to present themselves to me. I realised a lot of the tropes I was working with are actually present in several existing classics across all sorts of mediums.

The first and most foundational reference that informs this thesis is an essay written by Masahiro Mori, originally published in 1970, later translated by Karl F MacDorman and Norri Kageki and published in the June 2012 issue of (*IEEE Robotics & Automation)*. Mori, a robotics professor at the Tokyo Institute of Technology, proposed that a humans affinity for life-like objects increased in a 'monotonically increasing function', where the more life-like the objects became, the more affinity and fondness a human felt towards it. This relationship between human affinity and the object's human-likeness continue until the human affinity to the object suddenly drops at a stage described as the uncanny valley. At this stage in the relationship, the human likeness is relatively high but the life-like aspects of the objects instead create a sense of unease or discomfort in humans. The essay goes on to describe multiple parameters that might contribute to an object or robot seeming 'uncanny'. Mori proposes that certain behaviours or features like movement in life-like, create more exaggerated, steepened curves on the affinity to human-likeness graph. My understanding of this phenomenon is essentially: the relationship between canniness and human-ness has a point in the middle of the graph where as we move from non-likeness to strong-likeness, canniness exhibits a non-linear function and we observe a dip in human affinity to the object.

The second piece of work relevant to this thesis is Ryoji Ikeda's 2006 series ***Datamatics*** , "an art project that explores the potential to perceive the invisible multi-substance of data that permeates our world. It is a series of experiments in various forms - audiovisual concerts, installations, publications and CD releases - that seek to materialise pure data.".

While ***Datamatics*** is sonically incredibly interesting, mainly the UI sounding bleeps and frantically repeating rhythmic elements. I was much more inspired by the visuals and the way Ryoji Iekda used data-visualisation as a form of artistic expression. By exploring the aesthetic of data itself, Ikeda removes the audience from many recognisable features or subjects. Occasionally x-rays of human

anatomy or representations of seemingly geographical or ecological forms appear, but the lack of context often obscures the subject matter. This contributes to the ***Datamatics*** universe feeling alien, while Ikeda's work isn't necessarily uncanny, certain parallels can be drawn and it definitely feels other-worldly at times. The fact that Ikeda utilised a very simplistic almost entirely black and white colour scheme with occasional red and blue accents created a cohesive, mesmerising, aesthetic universe that established the connection between the audio and visuals immediately. Working within these constraints meant that any variations or parameter ranges could be explored to their fullest capacity. Many instances show data and text appearing with information readouts but the number of instances would rapidly increase causing the entire screen to be filled with a wall of white data with so much activity that the actual values were obfuscated and the audience wasn't actually able to discern what's being displayed. This is an important feature as it shows that ***Datamatics*** isn't actually aiming to produce media that audiences would use as an academic reference (the irony of this being an academic paper that is in fact referencing ***Datamatics*** is not lost on me) or as a way to actually interpret data for scientific purposes. Instead the work is designed to transform the varied data-sets (statistical representations of our universe) into visual forms or phenomena that we humans find stimulating in both sensory and intellectual contexts.

I find there's something very poetic about the moments when the screen is filled with data to the point that the audience can't even read the data, the inclusion of that range of the "busyness parameter" to me hints at the artistic focus of the work. Instead of the data visualisation being utilitarian, it becomes emotional and shows the audio-visual system being pushed to its limit, evoking the sense of being overwhelmed or panicked. There's something quite subliminal and sneaky about the approach Ikeda takes. By creating the pre-tense that the work is an informational piece through the very technologically advanced, scientific-looking visuals. The audience is lulled into expecting the banal but then they're surprised by moments where the system is overwhelmed and the visuals break that concept of utility.

The third source that I find relevant to discuss in this document are both created by Canadian sound artist, composer and academic Tim Hecker. Hecker's work has always been very influential to me and I'd like to initially discuss his thesis *'The era of megaphonics: on the productivity of loud sound, 1880-1930'*. This thesis discusses in detail the cultural impacts that loud sound had between 1880 and 1930. The interest to me is the examination of "Loudness and the Sublime". Hecker looks at a variety of sources that describe experiences considered "sublime" or moments of seeming en-

lightenment. The concept of the sublime seems to have been explored and elaborated upon by several texts over the years. An interesting distinction between natural wonders and "artifice-induced technological works" refers to architectural wonders that became more associated with the modern definition of the sublime.

These experiences are said to have been created through a variety of mediums and in the early days of discussion on the topic people didn't associate the sublime with sonic or visual stimuli specifically. *"Eighteenth-century debates on the sublime spanned a wide variety of fields, from epistemological psychology to landscape aesthetics. There was hardly any bias with respect to the sublime being an attribute of visual perception rather than aural."*
Hecker goes on to state that despite this, there does seem to be a lack of focus or study on the relationship between the sublime and audio.

A phrase from Hecker's thesis spoke to me deeply and was a huge source of inspiration: "*it is also the employment of a history that puts in increased belief in the power of instruments, amplification, and shock waves to provide experiences of wonder in an increasingly secular age".* (Thomas Weiskel, *The Romantic Sublime: Studies in the Structure and Psychology of Transcendence,* 6.)

The introduction to the topic of religion and a *"secular age"* brings me to the third concept that this literature review discusses: the *'yearning'.* The idea that these experiences of the sublime can create a substitute or perhaps an alternative route of access for spiritual experiences is exactly what I want to explore with my own work.

The fourth and final piece of media is the 2014 electronic album ***'Solens Arc'*** by architect, sound artist and musical producer David Letellier. Letellier's approach to treating sound as a physical material that happened to be expressed through instruments as opposed to just "musical notes" connects to Hecker's thesis as well as he discusses sound pressure levels and humanities recently updated lens with which we view sonic propagation tools as ways to physically interact with audiences of various sizes. ***Solens Arc*** specifically showcases several instances where timbres are manipulated while a repetitive musical element displays little variation melodically or rhythmically. While Kangding Ray is definitely not the only artist to release music that prioritises timbral manipulation over varied melodic or rhythmic sequences, the general aesthetic that Letellier creates through his sounds are all alien and uncanny, very much along the lines of what I hope to create.

Using processed recordings of dialogue (incomprehensible and impossible to actually make out any words) and breathing, Kanding ray interweaves these acoustic recordings with cold synthetic timbres to create musical environments that lie in the hybrid bio-mechanical realm.

This idea of the bio-mechanical and humans/organic creatures using and interacting with technology to stimulate our own senses is central to all three sources. With Ikeda's work it's about using technology to visualise scales that go beyond what we can relate to. With Hecker it's about using amplification and sonic propagation tools to experience SPLs that stimulate our bodies physically, and with Kangding Ray's work it's about the interplay between intellectual emotional manipulation via melodic choices (a piano melody consisting of notes in the harmonic minor scale evokes a sad mood) and physical emotional manipulation via timbral choices (a deep droning bass sounds evokes a primal sense of dread due to the inability to identify the spatial location of low-frequency sounds).

The biggest takeaway I had from all these works is that there's always an underlying system or methodology that connects seemingly other-worldly or impossible-to-create works to existing pieces that may appear more rudimentary or crude. At the end of the day Ryoji Ikeda's music is still rooted in conventional dance music, mainly because of the rhythmic choices (and occasionally sound design elements that are reminiscent of mainstream acid techno for example). By taking a conventional pattern or framework and only utilising it to a limited degree, as a hypothetical example: imagine randomly depopulating a 4/4 kick pattern so it feels sparse and less consistent than a standard pounding techno track. The root of the pattern is still informed by a very basic, mainstream rhythmic convention. But it can feel significantly different when combined with other, modified or under-utilised patterns. Similarly with Kangding Ray's music a lot of the sound design feels alien and unnerving or hard to discern, for example my favourite track from the album '***Serendipity March'*** features subtle murmuring vocals that really cemented the bio-mechanical, hybridised feel of the music. By intelligently placing the vocal samples of a human speaking at points where it will mainly be masked by other musical elements, while also disguising the identifying features such as pitching down female vocals to make the gender of the speaker more ambiguous. Letellier makes the listener question a lot about the sample and it's a lot harder to pinpoint its origin. While a song by a Drum N' Bass artist may feature a vocal sample from a movie that plays on the cultural association and utilises the vocal in a plunderphonics style where the novelty of the sound is the fact that it's a pop-culture reference being used to connect the outside world, to the world the song exists in.

Though the producer might filter the vocal slightly for mixing purposes, they're not intentionally trying to smear its origin and make it indiscernible.

Conceptual Plans & Technical Frameworks

I really value the ethos of the human composer and the machine systems interplaying and influencing one another in order to create a hybrid musical aesthetic.

The idea is that the audio-visual experience I'm building for ***Machine Yearning*** will create temporary zones that human beings temporarily lose their sense-of-self, or question their role in the grander scheme of the universe.

In an ideal world I'd like to perform this album at live shows in a blacked out room with a huge screen and a professional quality speaker setup. At times I want the audience to be able to dance or move freely as if they were at a nightclub listening to techno music and during other moments in the album I want them to be mesmerised and maybe stand still almost hypnotised by the audio-visual stimulation. This concept of hypnosis is obviously very prevalent in genres such as trance or hypnotic techno that often feature short, repetitive phrases that loop for long periods of time *(Kennaway James, Musical Hypnosis: Sound and Selfhood from Mesmerism to Brainwashing, 2011)*. The repetition of these phrases often allow the audience's perception of the pattern to evolve as time goes on. In combination with the ability to subtly manipulate the timbres of the sounds that are being played while preserving the original, minimal rhythmic/melodic pattern. The audience can be stimulated and have their attention-span captured for long periods of time.

While my project is informed by these genres, the album is also not exactly a techno set. There will be breaks in the music where the backbeat (the consistent, pounding kick drum and/or bass-line) completely goes away and a new song starts from a quiet soundscape for example. This means I don't have to worry as much about maintaining a groove and transitioning from track to track in a "danceable" fashion. Instead I'm embracing the potential for some moments to suddenly drop away, playing with audience expectations and anticipation.

The general overarching concept of ***Machine Yearning*** is that the audio-visual experience is from the point-of-view of an unnamed technological entity that's analysing humanity and Earth. Trying to find a way to connect and understand what it means to be human. But frantically struggling and grappling with its analysis.

In order to create an aesthetic which supports the ***Machine Yearning*** concept and also maintains a sense of cohesiveness between the visual and sonic realms I focused on using certain compositional or strategic techniques that would inform my creative process. I leaned towards composing music and creating visual assets through generative or cybernetic systems and tried to let the systems dictate a lot of the initial outputs that would be used as the scaffolding around which I'd build-up the audiovisual tracks. The idea was to source a significant number of foundational elements of the songs (both visually and sonically) from these systems, and from that point onwards allow a call-and-response style of creation to take place as I responded to the stimuli created by the generative tools. Either in the form of physically playing along with the patches, adding my own manually performed parts, or in a less immediate fashion: manually editing patterns to rearrange or adjust the structures or behaviour of the assets in order to create sequences that satisfied my own tastes. As the musical and visual assets developed, they were fed into other generative systems and the tools were given more and more content to process or train on, adding more and more details to the fictional world.

Figure 1: The eurorack-format, modular synthesiser, used to create the majority of musical-content heard on the album along with the *Rooms* reverb pedal.

One of the compositional techniques I used a lot in the development of these foundational skeletons of the songs were rhythmic interference patterns. The ability to use multiple, simple sequencers, that interact with one another to create more complex patterns has proven to be a fruitful strategy for me and one of the biggest appeals of using a modular synthesiser.

In general, electronic music can often end up falling into rhythmic tropes where songs that exist within a certain genre are pretty much guaranteed to use one of a small group of rhythmic patterns or grooves. For example the 'amen break' is synonymous with jungle music. Similarly techno music is so closely tied to the 4/4 kick drum pattern (a steady kick drum pounding away at a completely consistent interval, usually every beat of the bar). In some ways the entire beauty and complexity of techno comes from the composer's ability to form various grooves through accents and adding momentum to the feel of the music despite the steady kick drum pattern. A lot of this stems from the utility aspects of the 4/4 rhythm and the way it creates a hypnotic, repetitive feel that can be used to influence one's perception of the passage of time. Techno clubs open their doors for several hours a night and people are easily able to dance to music for 4+ hours despite the majority of the songs all maintaining the same kick pattern. One strategy that helps alleviate the phenomenon of rhythmic-fatigue is the variation in timbres amongst the different songs. Though, just like we see rhythmic patterns that are synonymous with certain genres, one can also observe similarities in the timbral qualities of kick drums in specific genres. Partially due to the tempo of the music: very fast, high-BPM music physically has less time between each transient therefore the sound design of a kick for such genres will organically end up utilising a shorter decay time. That said, even within the same genre or even album, most artists will show some variety in their kick sounds providing the listener with new timbres to keep them stimulated.

The relevance of this to my project is that I'm not constrained by the needs of a DJ trying to keep people dancing for several hours. I'm open to people not enjoying a groove but instead sitting down in a corner or leaning against the wall at the back of the venue and just enjoying the sensation of the music rhythmically pulsing away at interesting intervals. Of course the context of the performance/viewing environment will change the way the audience perceives the work, for example I doubt anyone will be dancing around their bedroom while watching this on their phone, meanwhile the same individual might be more inclined to do so in a club environment.

This ability to veer away from traditional 4/4 patterns that are constrained by dance-floor utility needs is very exciting because it encourages me to use patterns that don't immediately satisfy me. I liked having awkward gaps that might repeat for a while but eventually feel more complete when a separate musical element started to fill that space later on in the track.

In order to add further detail to these interference patterns used to generate the basic skeletons of the songs. I found it was quite helpful to get the initial grooves recorded in a multi-track format in Logic Pro and then using those individual tracks as CV triggers to add layers to specific sounds. Especially useful for kick and snare tracks, I really enjoyed clocking a simple 8 step sequencer with a snare or kick pattern and then adding the output of a new sound as a layer that isn't present for every impact of the kick. This creates accents and subtle sub-sequences for specific layers of a sound that when combined, create an evolving kick (or whatever other sound I chose to utilise the technique for).

The philosophy of patching discrete pattern generators and/or sequencers in configurations that allow them to interact, resulting in a combined, more complex sequence found its way into the TouchDesigner patches as well. As a beginner with the software with no experience prior to developing the project. I felt there was an endless amount of content available online, documenting various techniques and systems. This was overwhelming and I found it hard to create anything cohesive or usable for my project. I experimented with a few tutorials and instead of actually using the final outputs created with those examples, I instead started taking the most fundamental aspects of the patches and created systems around them.

In many ways, the most pivotal moment in my work with TouchDesigner was when I learnt how to create basic 2D geometry and then have those animated shapes/imagery react to audio files or modulation from noise sources or LFOs, etc. After that point I knew I could create interesting layouts using simple geometry objects, create movement in these objects, and then allow interaction between the "sequencers". For example an LFO turning on or off a text label in the UI overlay could also turn on or off a transform CHOP responsible for causing a completely separate object to spin between two specific degrees of rotation. This re-use of control signals/modulation sources also saved a lot of CPU resources as it limited the amount of components each patch required.

In contrast to using machine-based patterns and generative sequencing strategies. I also enjoyed manually playing parts that I would develop by improvising with a standard MIDI keyboard and then going back to and editing, in a piano scroll. Once again, the beauty of having all these parts recorded into Logic Pro X as MIDI files was that I could send the final, edited, melodic sequences to other synthesisers (both virtual instruments like Arturia's Pigments 4 and my hardware modular system).

With my background experience involving much more audio and music work rather than visual, I found the challenge of creating stimulating visuals to accompany such a large chunk of music was quite a stressful process. One of the biggest issues which I can relate to in the musical medium is the anxiety and unease that the vast empty, incomplete sections on the editing timeline create. Not having anything to look at while the completed (or often partially-completed-but-roughed-out) musical track played was difficult because it immediately felt like something was wrong. While it does sometimes provide a blank canvas that I'm free to imagine things appearing-on to accompany the music, generally I've found that it's been useful to lay down some base layers to fill up the timeline and then further elaborate/develop those looks. Since I wanted to focus on futuristic technologies and aesthetics or art-styles for my project, especially technologies that would output content which appeared uncanny to human audiences, I thought it would be interesting to use AutoLume (Kraasch and Pasquier), an AI GAN software that allows me to generate visuals trained on my own custom data-sets as well as data-sets I would obtain from the public domain. This was my primary strategy for filling up time and laying down a blank canvas. When combined with TouchDesigner and audio-reactive control signals sent via OSC, I'm able to generate somewhat abstract, but also vaguely suggestive imagery that complements the visuals and narrative themes of the album without being too literal or cinematic. As nice or interesting as it would be to create more of a narrative film style project, I think it would be too ambitious and potentially not an appropriate accompaniment to the type of music I'm creating. Instead the slightly less on-the-nose, abstract imagery will be perfect to keep the audience attention and provide something to captivate the eyes while the music captivates the ears. These abstract visuals ended up ensuring that there was an aesthetic through-line that kept the project cohesive and constantly made the audience question whether the imagery they were seeing was natural, artificial, or some sort of amalgamation of the two, inhabiting the uncanny valley.

While assembling the beginnings of the visuals I developed my general workflow:

1) Collect a series of public domain/creative commons imagery and videos.

2) Use these resources as seeds or references for AI generation tools. Primarily Adobe Firefly for text-to-image and Autolume for GAN style generations. These tools would be used to create either 2D image or video assets.

3) Arrange these assets in an Adobe Premiere Pro timeline to create an edit that felt like it matched the musical cadence and overall energy of each song.

4) Add UI overlays and visual enhancements and/or effects in TouchDesigner and capture a few takes with different variations.

5) Re-import these takes into Premiere Pro and select which takes should be used for which moments of the song (essentially editing between the different takes to pick the highlights of each effect or variation of the UI overlay).

An interesting reference that I was reminded of when developing my process, purely from a conceptual standpoint, is Alvin Lucier's ***'I am sitting in a room'***. A piece of sound-art that showcases the effect an environment or container has on a signal. While working on my album and feeding assets into different processes a specific mood and stylistic trend started to reveal itself. This self-resonance amongst the several nodes of the project was very interesting and the progress at which I was able to generate material also increased at an exponential rate (albeit with occasional stepped moments of stagnation) as I became more fluent in the process and moving assets between the different software.

Because of this feedback and the generative nature of a lot of the tools I'm using, a decent amount of the creation process happens on its own and I act as more of a farmer (or a gardener as Brian Eno referred to the creation of ambient music). While a big part of the process is a matter of selection and picking through content that's been created or influenced by a computer or system, there were several spots where I naturally came across cooperative moments that showcased the human/machine symbiosis.

This mirrors the process of Lucier's room (or rather the mechanical system devised around his room) obfuscating his stutter. This concept of the machine world perfecting the inherently imperfect human output is quite a central theme to my project. The unnamed technological entity is trying to integrate and starts to see all the flaws in the humans it's analysing.

Exploring Lucier's open-mindedness and eagerness to experiment with different angles of approach when composing music also lead me to discover several of his peers and collaborators that employed similar experimental methodologies in creating musical work. Lucier documents composer and installation artist Maryanne Amacher thoughts and works that involved experimental approaches in his 2018 book *(Eight lectures on Experimental Music)*. Amacher discusses the soundtrack of a video game titled ***'Myst'***, stating that the game featured hypnotic, partially coloured noise as a way to draw the listener in and make them really analyse what they were hearing and (potentially subconsciously) assign those sounds a meaning. As opposed to using "a funny little tune" that would immediately be categorised as musical.

One example of a moment where I was able to cooperate and work with the generative software is showcased in the maps that are shown throughout the first track ***'Hyperstitious'***. The maps were

created using Adobe Firefly with a variety of prompts, as an example, the maps shown on the next page were made with the following prompt:

"blueprint view of a city map from birds eye view, showing 100s of Kilometres area”

The prompt would then be accompanied by a composition and style reference, the composition reference influences the general layout and shape of the generated images while the style reference influences the choice colours and textures generated.

This is where it gets interesting…

I was able to draw my own general outlines and shapes on a little notepad and then use that as a composition reference in Firefly.

The following figures shows an example of a human-drawn composition reference influencing the AI software's actions and output:

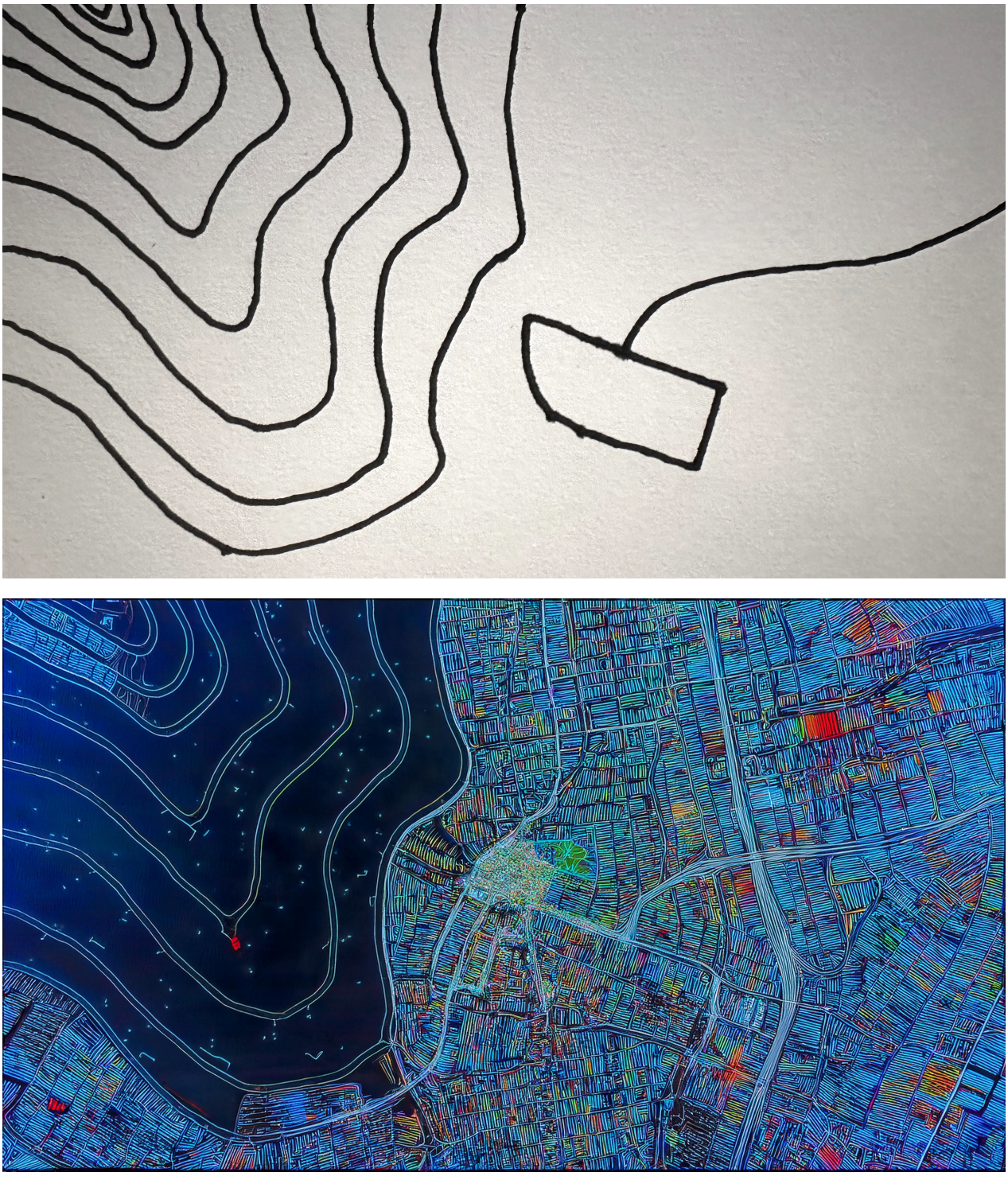

Figure 2A, 2B: The composition reference I originally drew by hand on a notepad compared with a 2D map outputted by Adobe Firefly.

When I started to design overlays and edit together the different visuals for the first song. I realised I needed to have some sort of goal for each shot/section of each song and if I didn't have a general plan or concept of what the UI was displaying, it would end up being an endless task and would lack consistency.

I laid down some very basic ground rules, for example: no back-to-back tile effects. If song 1 featured a shot that had tiled a bunch of different takes or variations together (instead of showing one video, the screen becomes a grid and several instances are shown simultaneously), I would institute a rule that banned song 2 from using any tile-shots. This was to make sure I didn't go back to the same 'moves' too often and gave the audience something new to think about and constantly maintained their attention-span. The iconography used in the UI overlays are loosely inspired by a variety of sci-fi media including the UI aesthetics showcased in several anime films as well as classic imagery such as the semiotic standard designed by Ron Cobb for the 1979 classic ***Alien*** (Scott).

Going back to discussing my workflow: When working on the UI overlays in TouchDesigner I worried I would run into the same issues as I did with the editing stage; where the various shots would either become too repetitive or too random and unrelated. Instead I wanted to plan each song's visual language a bit more efficiently. I felt the best way to do this was through physical, hand-drawn storyboards as they let me quickly make changes as to an idea and keep in mind the overall picture as opposed to spending too much time going down a rabbit-hole trying to make some tiny detailed UI feature somewhere in the corner of a screen, flash in time with the kick pattern. This also meant I could keep an overview of each song's general look. It was important to vary the density and activity-levels of each overlay so that the viewer was always shown something somewhat new and interesting, preventing visuals that became too repetitive and lost the attention of the audience.

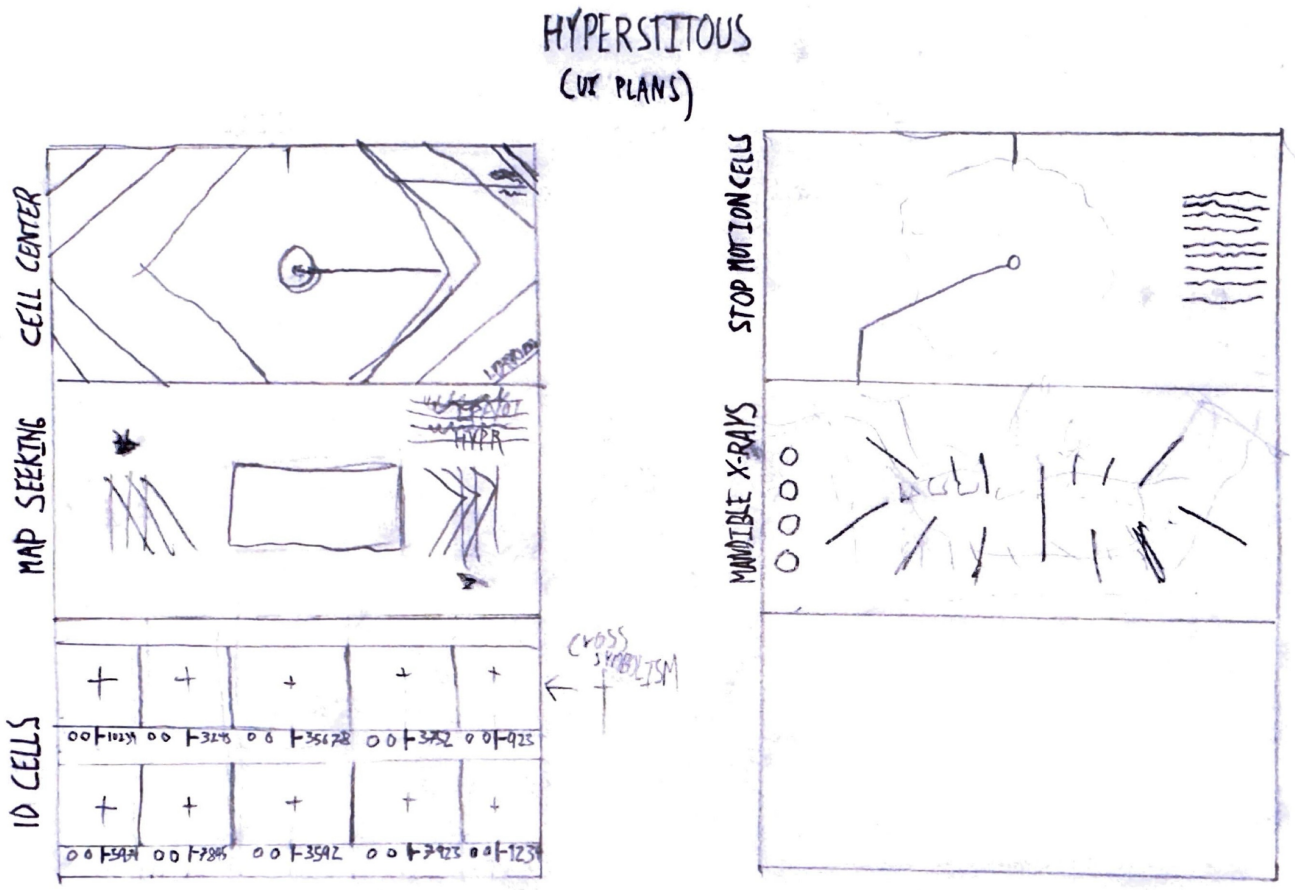

Figure 3: The in-progress UI storyboard I drew for *'Hyperstitious'*

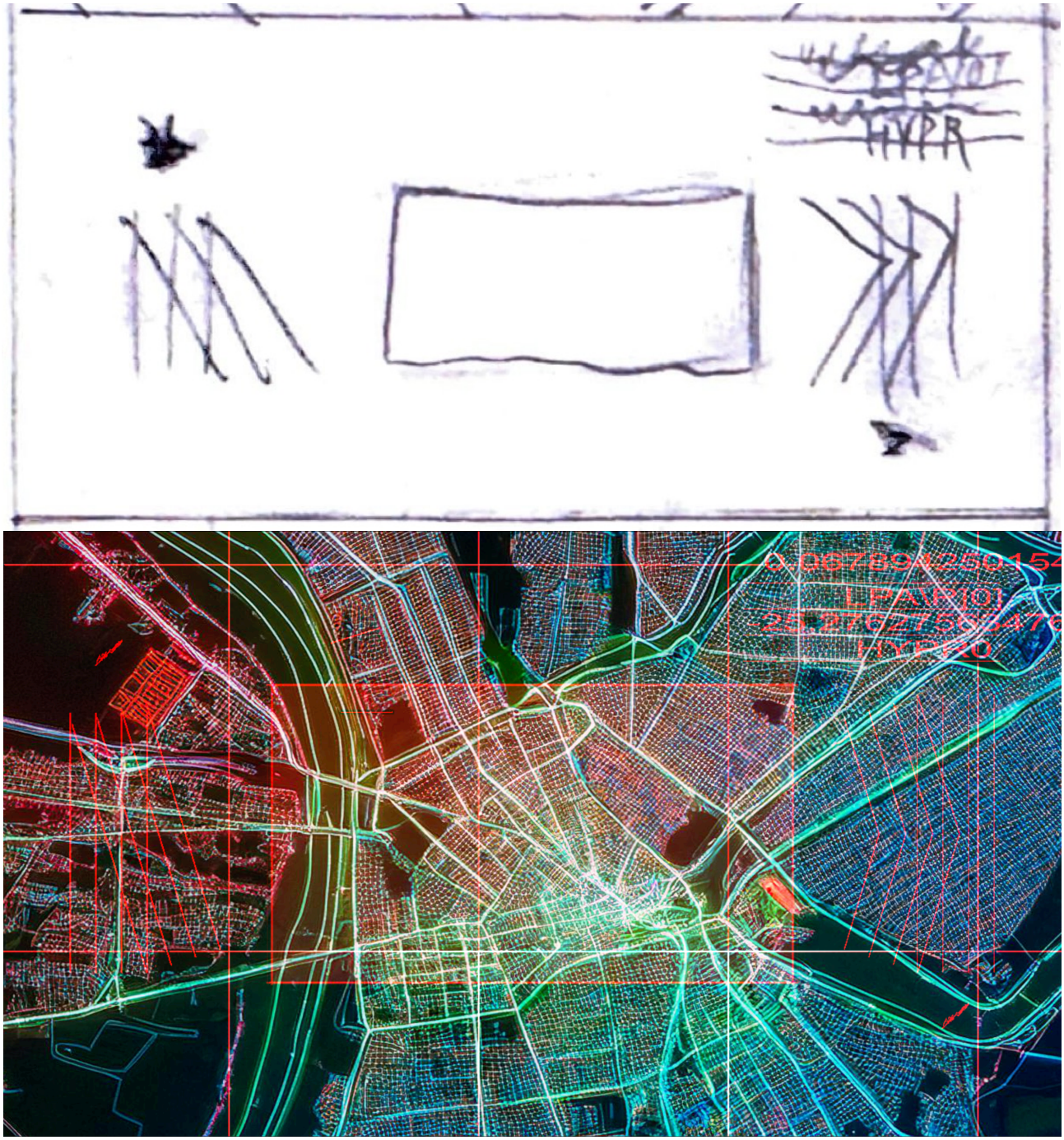

Figure 4A, 4B: A rough sketch I created while planning the map UI overlays for *Hyperstitious* compared with a final shot of a map created in Adobe Firefly overlaid with UI elements created in TouchDesigner.

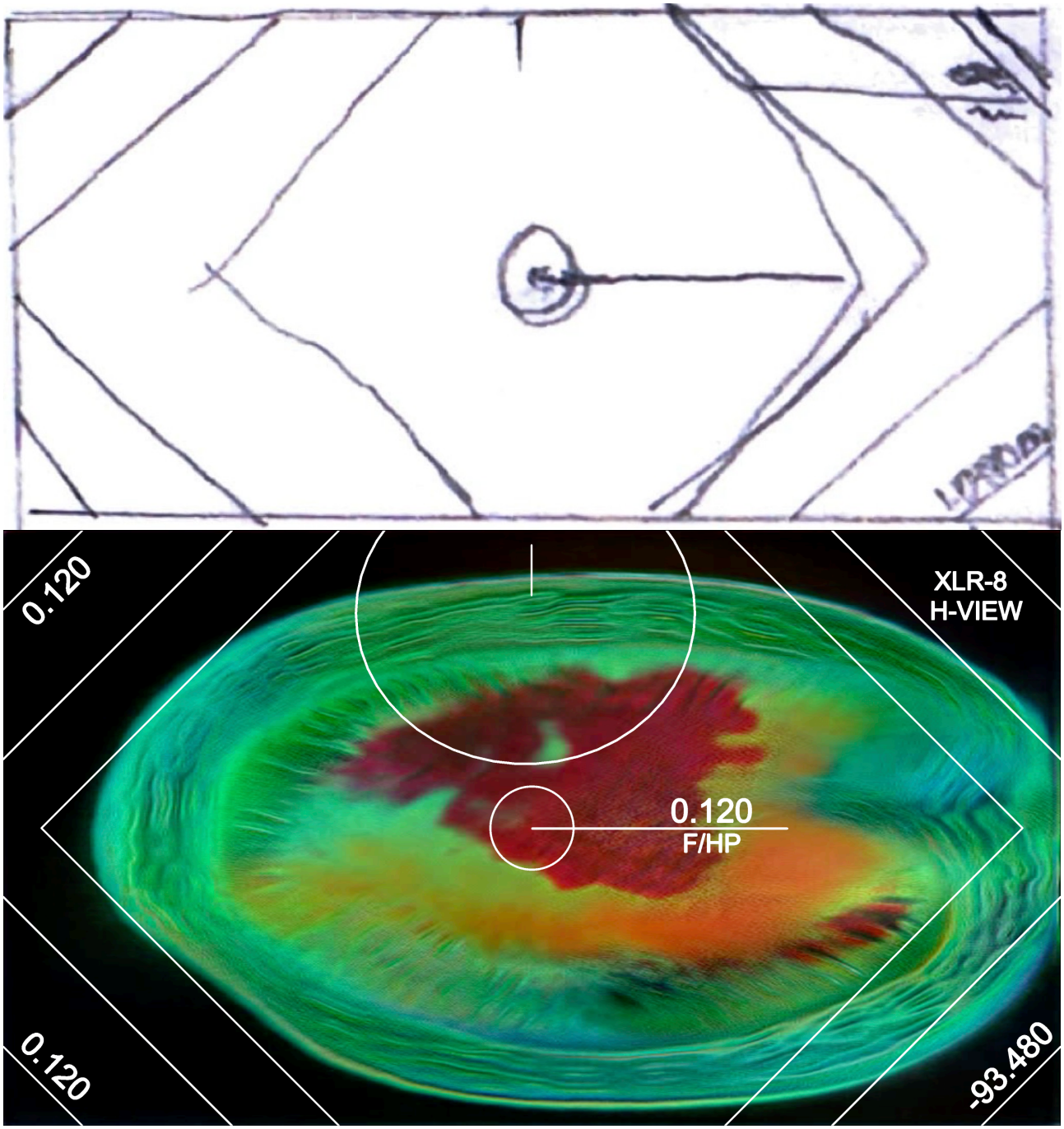

Figure 5A, 5B: A rough sketch I created while planning the single-cell analysis-view UI overlay for *Hyperstitious* and a final shot featuring a fictional single-cell organism created using AutoLume layered with UI elements created in TouchDesigner.

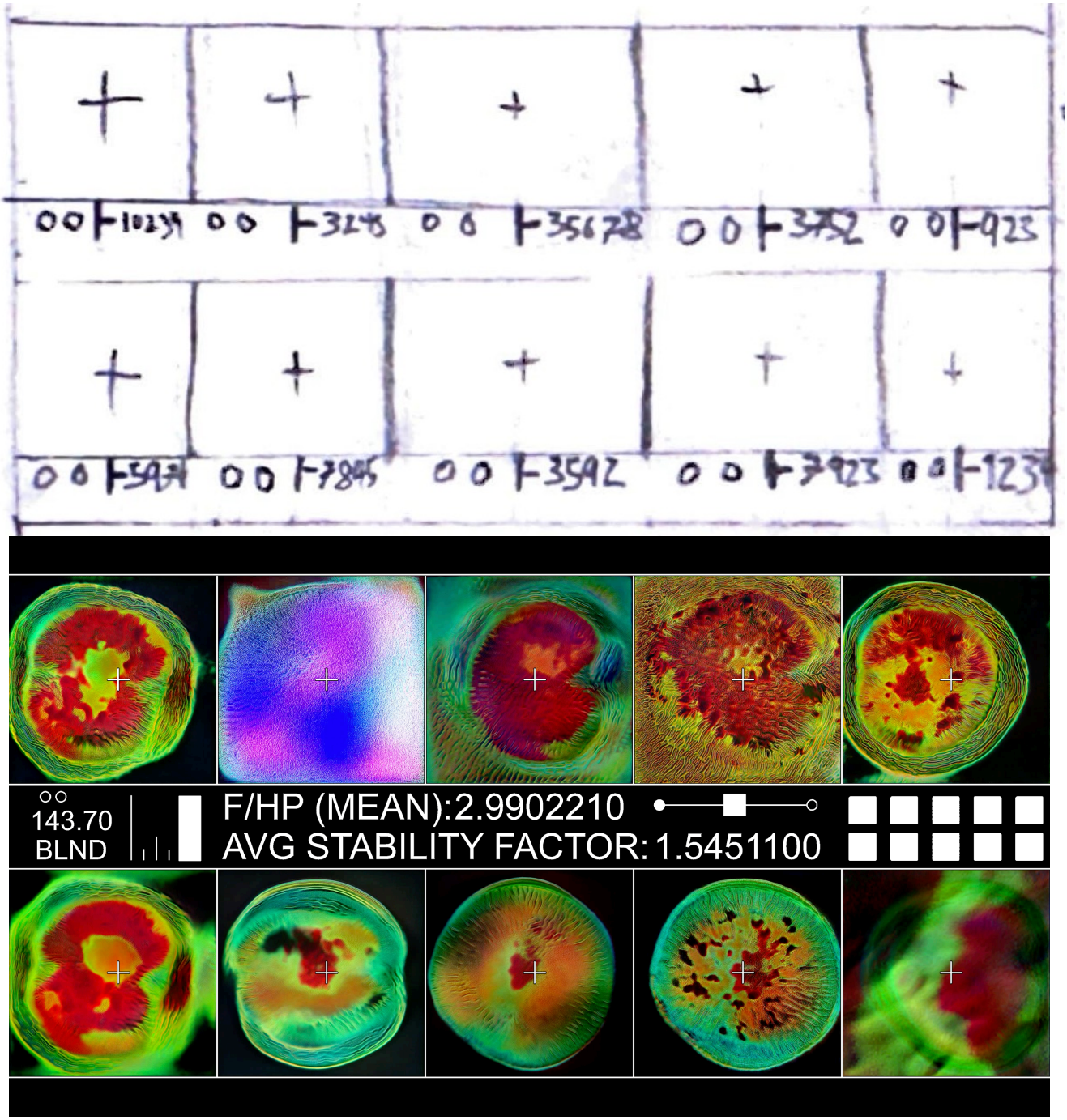

Figure 6A, 6B: A rough sketch I created while planning the single-cell group-view UI overlay for *Hyperstitious* and a series of fictional single-cells created in AutoLume laid out in a tiled fashion and overlaid with UI assets created in TouchDesigner.

Despite the detail that went into the UI design, I consciously decided to leave some sections of the film as just the source footage, excluding the use of an overlay. This decision was partially influenced by the fact that the trope of AI or robot-vision featuring a bunch of readouts and random flashing HUD elements is purely “rule of cool” motivated. If this fictional technological entity was actually analysing our planet it would just process its data internally in a non-visual fashion and never bother to make displays that humans would interpret. In many ways the trope stems from the anthropocentric bias that most media is guilty of. The reality is my project is also absolutely committing the same illogical behaviour, all these readouts and UI displays are after all, just there to create something visually stimulating and to help convey the narrative in a fashion my human audience will be receptive to.

In addition to the conceptual reasoning, in a practical sense this ability to switch between the raw footage and the same footage with the overlays created a parameter I could conveniently modulate, proving to be very useful in creating efficiency in my workflow:

The need to fill up relatively large sections of time was a big hurdle throughout the album, which meant a lot of the work I did was focused around maximising the amount of time I could stimulate an audience using a limited number of visual assets. By taking short loops of video content; for example a 10 second clip featuring footage of cells under a microscope. Using variations in the UI overlays, I was able to repeat the same exact 10 second source-clip, multiple times, but still keep the visuals exciting for the audience via the variation in UI visuals adding more fictional information to the original footage, especially by alternating between different sized shapes and visual densities. For example a short text-readout placed in the corner of the screen in the first overlay then quickly replaced with a much more sprawling, visually domineering display, like a series of busy, blob-tracking squares populating the majority of the screen. The key to getting away with re-using visuals was creating dynamic range in the UI overlays, allowing me to multiply the amount of resources I had available to me when editing the final timeline together in Premiere.

Another benefit of the UI overlays was the fact that even source-footage that may feel frustrating to watch on its own due to jittery video-playback or low-resolution pixelated images, quickly seem a lot smoother when the high-fps UI elements are constantly moving on screen. I found I could create a sense of cohesiveness and smoothness to footage that would have otherwise been unusable.

While the majority of the footage I captured featured generative or synthesised assets, I did film some sections at the university's shooting room. The second song on the album ***'Symbol Minded'*** shows footage of an unnamed participant being used as a subject of a fictional scientific experiment.

Figure 7: The VR headset used as a prop during the filming of *Symbol Minded.* The experiment involves the subject wearing a virtual reality headset that's connected via transparent flashing cables to some sort of mysterious machinery. In reality the machinery is my 104hp Eurorack skiff and the cables are connected to 1/8 inch input jacks that I installed in the plastic VR headset.

In the same way the process of designing and creating the UI overlays had potential to eat up lots of time (that I didn't have to spare), the studio shoot required a decent amount of planning and preparation to stay on-schedule. I drew up a little storyboard to keep the main shots I needed in mind and was able to get the whole shoot done with my iPhone 14 ProMax. I shot at 60fps and didn't bother capturing in 4k. Since all the 'lab footage' will be processed by analog glitch equipment and re-recorded via a DSLR pointed at a CRT TV, the quality and colour of the footage wasn't particularly important. The main thing to focus on was lighting and framing, ensuring I framed every shot with excess 'headroom' (capturing more background around the subject of each shot than I actually plan to use in the final frame) so I had space to crop things when processing the footage through the analog gear.

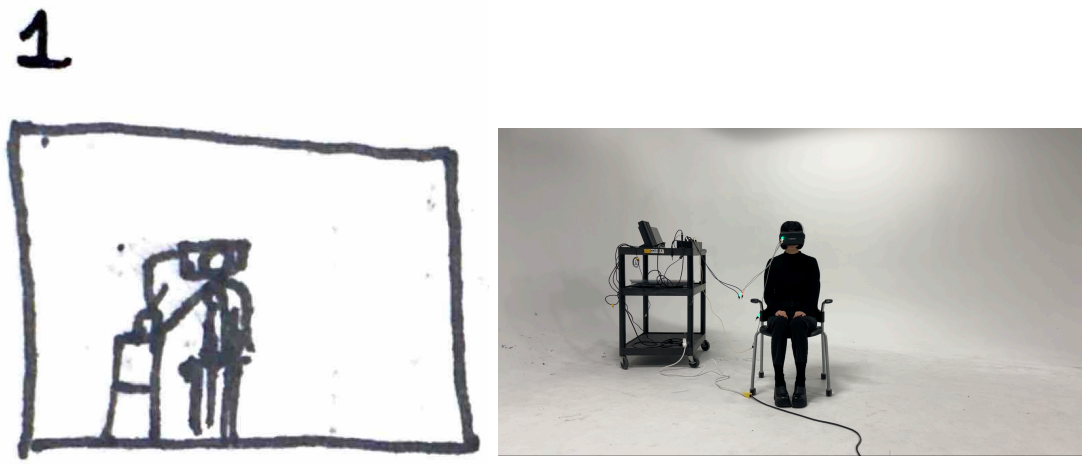

Figure 8A, 8B: The storyboard sketch of a shot in *Symbol Minded* next to the actual shot captured during the filming.

While planning these shots and designing the UI overlay text I encountered a similar feeling to the one I experienced when staring at the daunting, empty editing timelines early on in the composing or video editing process. I often wasn't sure what direction to give the subject/what movements I should have them perform. With the overlays I wasn't sure what the text should actually say and what fictional information each readout is supposedly trying to share with it's audience. The world-building potential felt like it had to be grasped and used to add depth to the fictional universe of ***'Machine Yearning'.*** I leaned into a humorous angle of approach and decided to keep things fun and utilised the 'rule of cool'. I've often heard of the 'rule of cool' in discussions about Sci-Fi lore. Often even in real-life, military call-signs and operational code-names can feel slightly too cool to have been randomly selected, I imagine there's always an element of emotional decision-making involved in those aspects as well, even in the naming of scientific species or phenomena. This realisation made me feel a lot more comfortable and inspired to really incorporate tongue-in-cheek references or fun allegories that are just loosely incorporated. For example the ***'Symbol Minded'*** UI overlay features a readout displaying the 'Simon Factor', which was meant to be play on the fact that the fictional experiment is trying to explore the ability to control the human test subject via the transmission of signals to their sensory organs. The UI readout is making a fun reference to the children's game 'Simon Says', where someone calls out instructions and the participants have to try to follow-along and act out the moves accordingly. This contrast of the more playful readouts and phrasing against the more sinister or ominous imagery works well to create a sense of depth to the universe. That emotional dynamic range is important, if everything is dark and gloomy and clinical, then nothing is dark and gloomy and clinical.

I ended up choosing to exclude tracks 4, 6 and 7 (***Sun-Gazing, Man Made*** & the self-titled ***Machine Yearning***). The decision to exclude the songs came mainly from scope-creep and the time-limitations I was working under. While I had the audio for all the songs (except ***Machine Yearning***) at a stage where it was feasible to complete them, I felt there was a lack of cohesiveness and the flow of the overall album was suffering. In addition to this I was taking a lot longer on the visual development of the songs that were further along in the musical composition process. The daunting task of creating stimulating visuals that would live up to the attention-to-detail shown in the first few songs started to loom over me and I felt I would be tempted to fill time with sub-par content, lowering the overall quality of the album.

This document still includes the original planned structure with all 7 tracks as I felt the inclusion of the conceptual backgrounds for the songs that were excluded in this document was important since they still influenced the songs that were shown at the exhibition. Keep in mind the removal of songs 4, 6 & 7 was extra-convenient because I was able to retain the flow and transitions between the first 3 tracks but moved song 5 (***Earth2Sky***) to the closing spot of the track-list.

1. Hyperstitious

Hyperstitious is the first song on the album and acts as an introduction to the general themes of the work as well as showing the audience a decent idea as to what they can expect sonically and visually for the rest of the show.

The term ***'Hyperstitious'*** refers to the idea that humanity can indirectly bring things into existence by collectively imagining new technologies or concepts. As fictional works start to create these ideas and start imprint on the zeitgeist, individuals that are in a position to create new technologies now subconsciously have these ideas in the backs of their minds and often have a subliminal desire to see these new and novel ideas brought to life in the real world. I found this very poetic and I really liked the suffix "stitious" as it made me think about superstition and the world of the occult, the paranormal and the divine (or potentially "sublime" as Tim Hecker refers to it) (Hecker, Tim, *The era of megaphonics: on the productivity of loud sound, 1880-1930*, 2014) . In many ways this topic of hyperstitions is perfect as my first track because it captures the essence of the project perfectly. The cold, accurate, analytical technology is contrasted with the elusive, enigmatic world of the supernatural or spiritual, the unquantifiable. I think this is more evident in the sound of the music as opposed to the actual visuals but I will have certain clues and little easter-eggs embedded throughout the project that help build the narrative up, even if the audience isn't conscious of these hints. I think audiences, especially those not deeply involved in the world of music production or sound design find music more subliminally suggestive than visuals. The acousmatic experience (Warner, Daniel, & Christoph, Cox, *Audio Culture: readings in modern music,* p.76), the idea of obscuring the visual source of a sound to create a sense of unknown, is a big part of my album. I'm not particularly hung up about having every single sound sync up with some sort of visual gesture or UI pop-up, while some projects (like Ryoji Ikeda's ***Datamatics***) make it a point to have the main visual elements supported by an accompanying sonic element. For example the visual of a scan showing several blips on a radar is very likely accompanied by a high-pitched, transient bleep sound that syncs up with the blips in the ***Datamatics*** audio-visual world. I think pursuing that path for my own project will create a lot more complications in my process and instead I plan to loosely have some correlation with the visuals and sound. One strategy I plan to utilise a lot is simply overloading the user with multiple UI/visual elements on screen all moving at different rates (potentially divisions or multiplications of the main song BPM). This will create a lot of perceived synchronicity between visuals and audio without having to manually program/orchestrate these occasions. Instead, having

plenty of movement on screen will allow audience members to naturally draw connections between visual and sonic elements that might appear to be moving in a synchronised fashion, even if that connection is actually coincidental. The more visual activity taking place, the more likely it is for something to sync up with the musical activity taking place in the audio realm.

The visuals for ***Hyperstitious*** also feature footage of microscopic biological organisms, these sections, sourced from creative commons royalty free footage as well as content generated by AI software like Adobe Firefly and Autolume; a Generative Adversarial Network software that I've trained on images and videos sourced from a variety of places (including content I've generated with AI tools). I like the workflow that I've naturally fallen into where all the components of the project influence each other and as these separate elements start to resonate, an audio-visual language naturally develops.

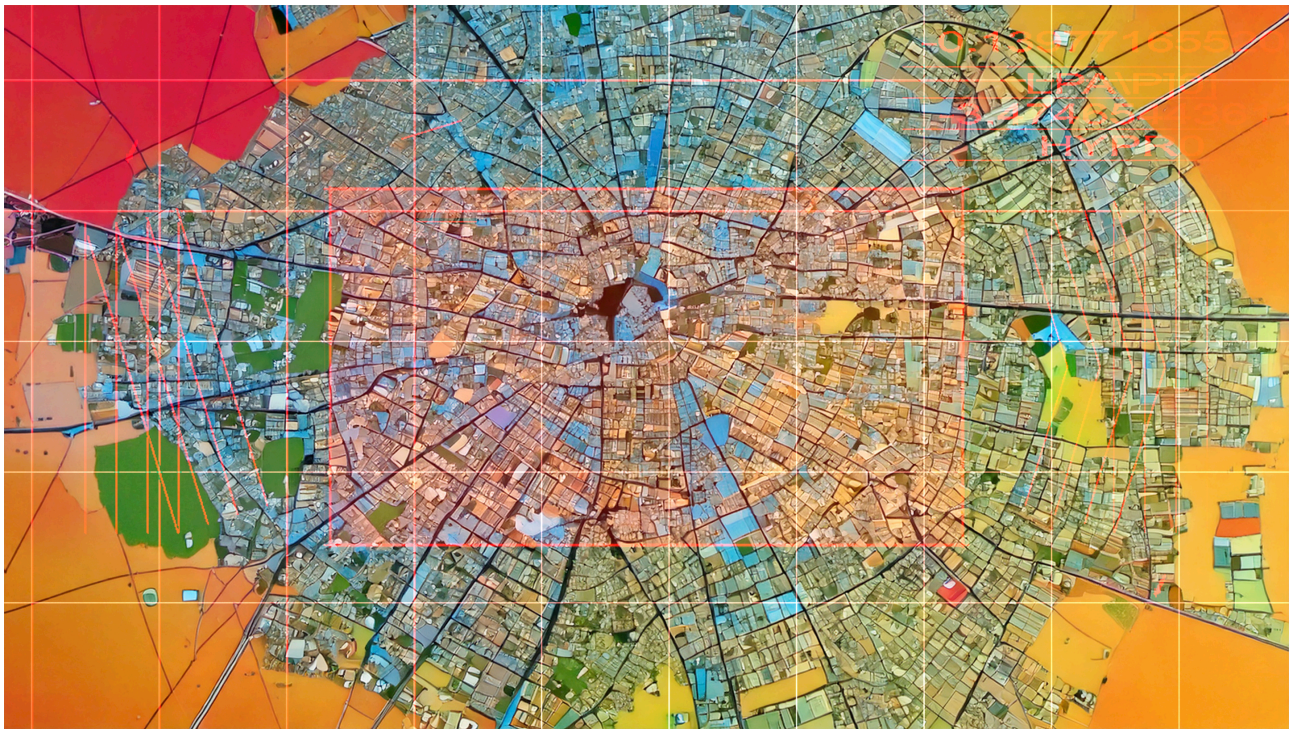

Figure 9: A shot from the beginning of *Hyperstitious* featuring a 2D map created in Adobe Firefly overlaid with UI assets created in TouchDesigner.

The machine is either looking at humans on a macro scale and seeing cities and urban developments, or looking at humans on a micro scale and seeing individual cells and microscopic organisms. The idea behind this is to show the unnamed entity trying to analyse human beings but constantly getting the scale wrong. The entire theme of ***Machine Yearning*** is to show the machine try-

ing to integrate with the desire for meaning. I felt this was a very relatable topic to people in today's world as we see an age where previously-established paradigms are being redefined and the human experience is rapidly morphing. Secularity and religious thinking, conservatism and liberalism, individualism as opposed to collectivism, these continuums seem to be perplexing cultures more than ever before, further exaggerated by the interconnectivity that humans on our planet are experiencing. Individuals are constantly redefining themselves in an effort to feel a sense of harmony with the communities around them (both physically or through virtual environments via the internet etc.) and seeking that sense of validity or "meaning".

To try avoid being too on-the-nose with the emotional 'yearning' side of things, I've been subtle about placing easter egg in ***Hyperstitous***. A lot of the maps shown are based on rough drawings I created and used as composition references for Adobe Firefly. The maps are the key locations from the iconic Wong-Kar Wai film ***Chungking Express***. This in addition to one of the fictional UI readouts on the top-right corner reading 'LAN-P' a very vague reversed version of "pineapple" which is a reference to the main cop character buying tins of pineapples that will expire on his birthday (as a ritual to help him grieve the end of his relationship). I think it's quite adorable imagining this ominous, extra-terrestrial machine watching classic HK cinema and completely misunderstanding it, instead getting a vague concept that somehow pineapples relate to romance and love in human cultures.

A goal of mine for this project was to showcases some more subtle percussion sounds that I was able to 'perform' timbral manipulations, creating the effect of specific sensations or gestures taking place.The drums heard throughout ***Hyperstitious*** are an example of timbral manipulation that I was particularly pleased with. The source of the snare sound is one of the percussive models on Mutable Instruments' Plaits, which I manually modulated via Planar 2 (a joystick module) this pattern was edited in Logic and then fed through Typhoon's delay mode. The delay time and feedback were once again modulated by hand, in-time with the music, creating a swelling effect that suddenly became very small and short at the end of each percussion phrase. The transient, stuttering repeats, slowly landing closer to the original Plaits snare created an almost-resonant, yet still-rhythmic effect that added a lot of organic activity and life to what was originally a very rigid pattern.

Figure 10: A map used in the visuals for *Hyperstitious*, the layout was inspired by the Central to Mid-Levels escalator in Hong Kong, the location of one of the most iconic shots in *Chungking Express*.

2. Symbol Minded

A play on the phrase ‘Simple Minded’, the second track explores humans and our reliance on senses, especially our primary sense of sight. The idea being that we as humans have evolved so deeply into our visual cultures that we’re living our entire lives and basing a lot of our identities on symbolism and imagery shown to us on displays. The mechanism I’ve chosen to explore this through is a fictional scientific experiment conducted in some sort of shadowy underground lab. I have the subject (an actress) sit down on a chair set up in an empty white room in front of a camera. They are wearing a VR headset with a few flashing cables connected to testing equipment. The fictional purpose behind the experiment is that the subject is being shown footage or symbols through the VR headset and their vital signs and biological data are being tracked. This footage will be glitched and processed through my analog video-synthesis gear and filmed through a CRT display. The footage will be contrasted with more AI generated content emulating optical scans of retinas and similar imagery.

While filming I found the ability to direct the subject very useful and I enjoyed having more of an organic, collaborative style of working. With the other songs, 99% if not 100% of the visual content is sourced digitally or synthesised using digital tools. Shooting the experimental footage for this song was a nice change from that and allowed room for human-interaction and collaboration. Some shots, like the ones where the subject is standing centred in the middle of the room and constantly switches between poses were especially satisfying. In the footage it looks as if the subject is spontaneously responding to signals that are broadcasted to them via the VR headset, in actuality I was standing behind the camera and would randomly shout commands like “hands on your head”, “hands down”, “T-Pose” with the intention of keeping the actress responding with a natural sense of hesitance. These ‘wild-takes’ where the footage was captured without a specific pattern or shot-length in mind provided useful content that I could speed-up or slow-down in post-production to create different effects.

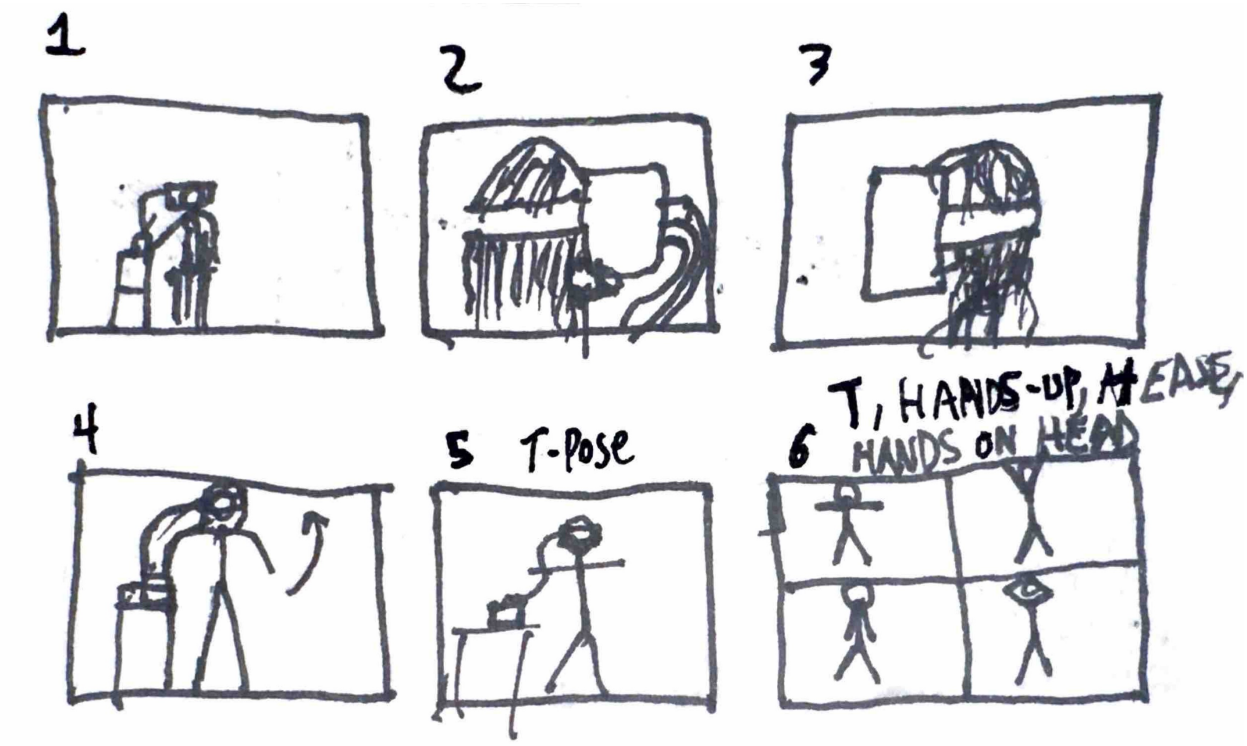

Figure 11: The rough storyboard I drew by hand and used to plan the studio shooting session.

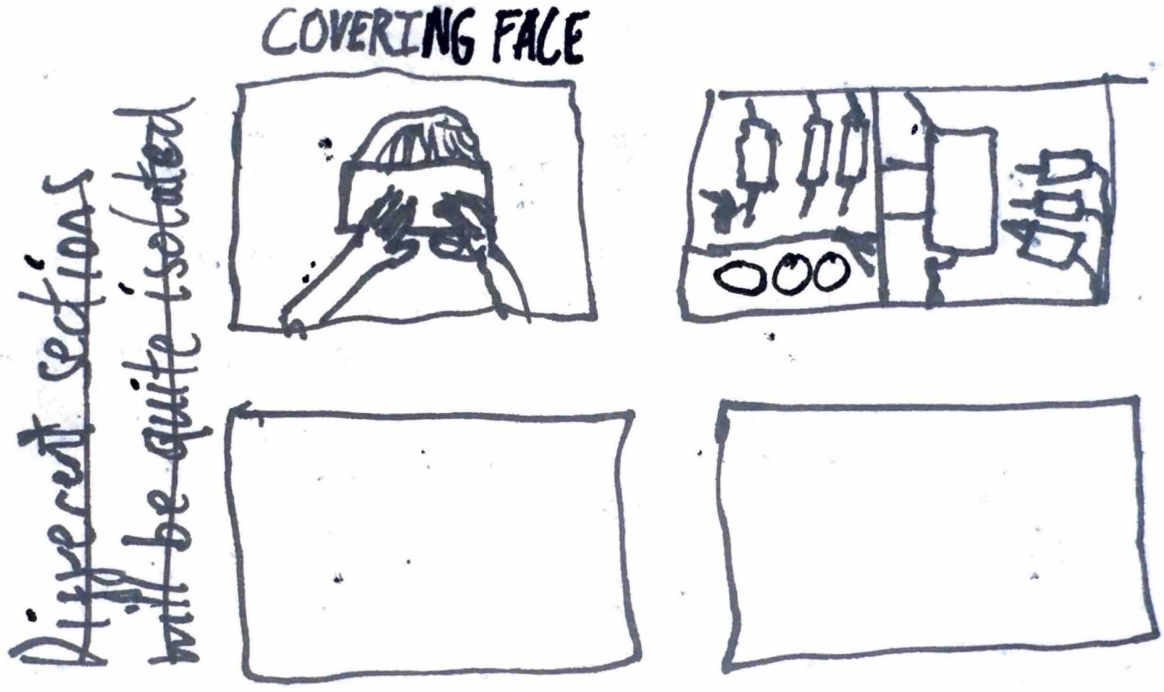

Figure 12: A second page of storyboard images I drew to plan the studio shoot.

The audio for this song is relatively danceable from the beginning and features an array of punchy electronic percussion sounds. The original rhythm continues bustling along with some chirping melodic elements occasionally joining in. As this continues a rumbling abrasive bass drone starts to enter and continues building up until abruptly stopping. This pattern repeats throughout the song and the only real addition for the rest of the track is high-frequency ringing drones with very little variation.

I like that this song doesn't have any particularly noticeable melodies that one could hum along to as opposed to the ending of ***Hyperstitous*** for example which is melodically and harmonically quite vibrant. ***Symbol Minded*** feels quite technical and grimy, the bass sounds slightly ominous but more than anything it feels mechanical and I like that it suggests a subterranean, dark environment (perfect for a shadowy black-lab).

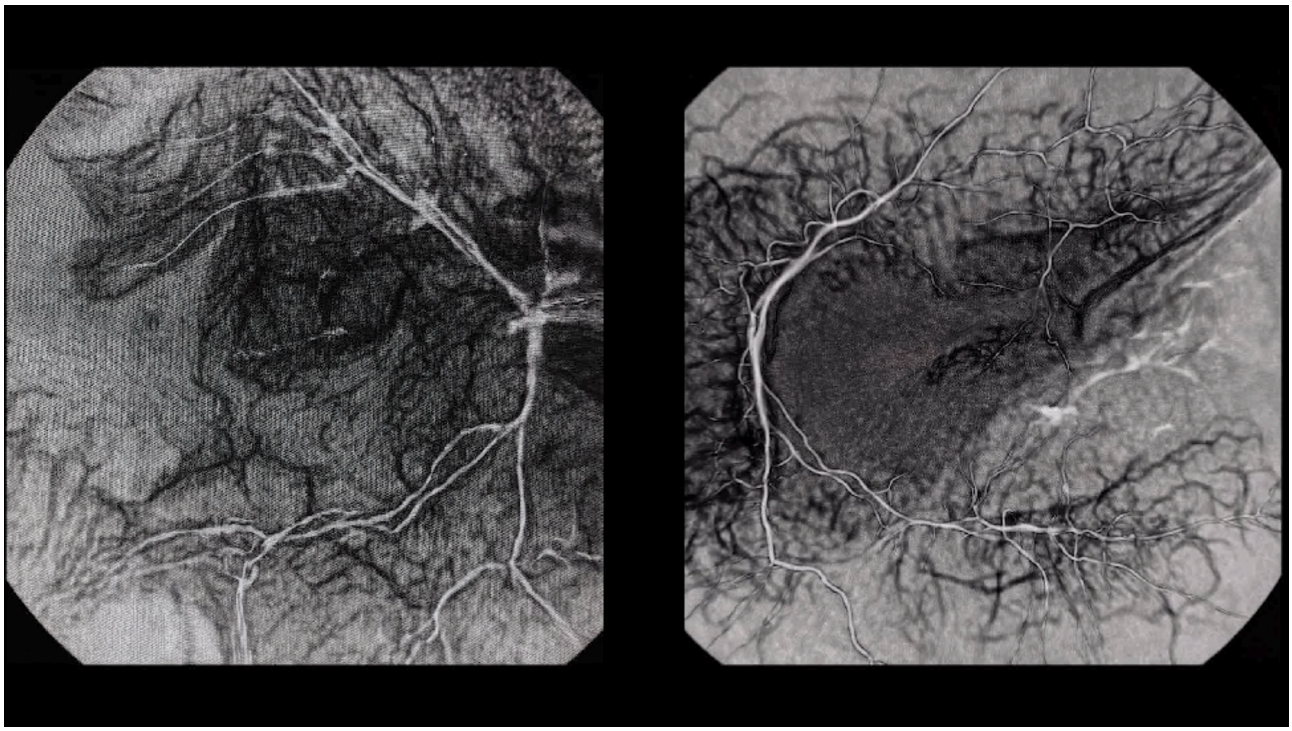

Figure 13: A shot from '*Symbol Minded'*, the visuals consist of 2 individual squares generated by Adobe Firefly and placed opposite each-other in Premiere Pro. Adobe Firefly was originally fed medical imaging scans used to diagnose an eye-disease.

3. Men With Codes

Picking up at the end of ***Symbol Minded*** is the third track of the EP: ***Men With Codes***. This track is where things start to get bit darker and more dangerous. By that I mean that the unnamed entity acting as the protagonist is starting to look at the aspects of humanity deemed unsavoury by our culture. The track explores human morality, the concept of judging one another, the judicial systems we rely on to create some sense of equality or justice and the ways we as individuals feel about these relationships. The play on the word "code" here being that technology has influenced our ability to follow behavioural guidelines that have been codified.

While I've still not entirely decided at the time of writing this document whether the following plans for TouchDesigner visual elements will end up in the final version of ***Men With Codes*** or ***Earth2Sky***, I'm listing the concepts here as they relate more closely to the topic of human morality and judgement.

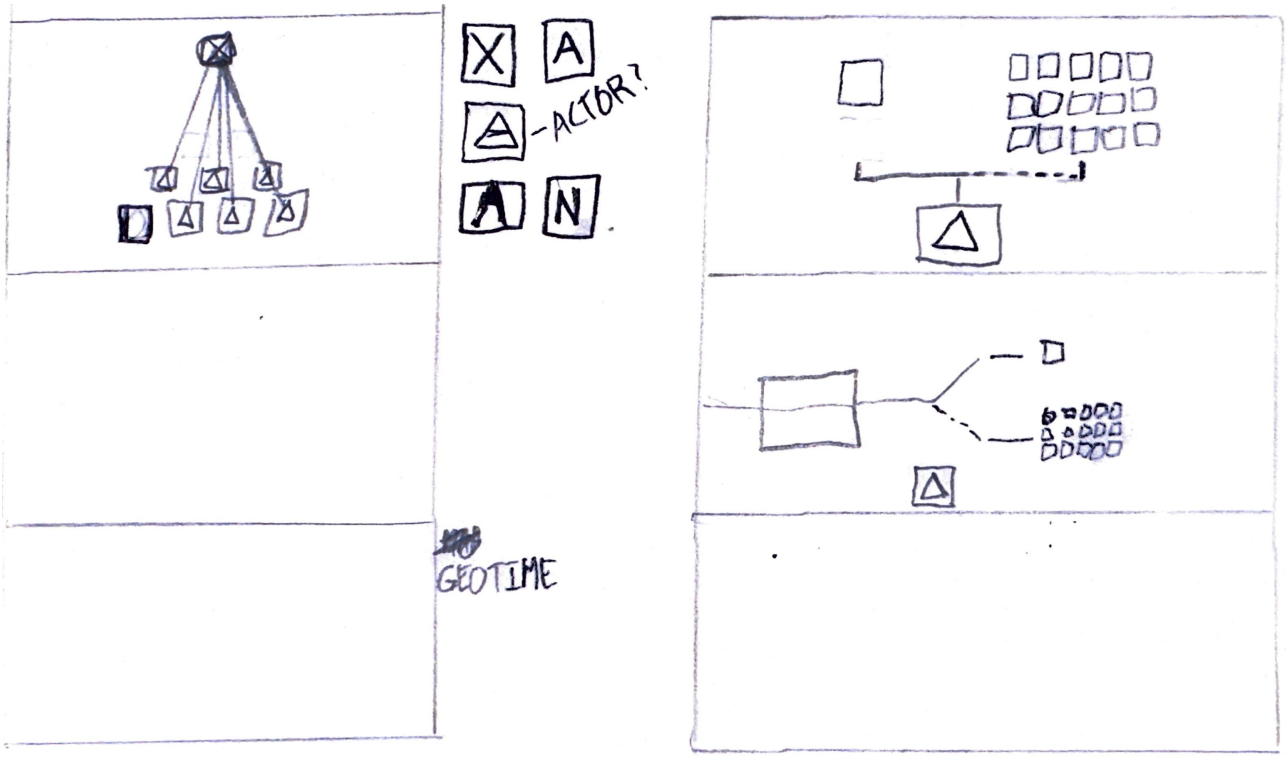

Figure 14: A rough sketch of some potential morality diagrams that I will further develop in TouchDesigner, the top left frame shows the firing squad with one missing bullet, the two frames on the right show variations of *The Trolley Problem.*

The visuals I have in mind will be extremely simplified 2D animated diagrams that showcase a few systems or thought experiments that humans have developed in order to cope with the topic of morality (or immorality), including: The conscience round: *"a blank round of ammunition issued to one or more members of a firing squad without telling them, so that each person in the squad knows there is a chance that they themselves did not fire the lethal shot"*. ("Conscience Round") and ***The Trolley Problem*** ("Trolley Problem").

I want this track to loosely refer back to ***Hyperstitous*** with the way it shows visuals that contrast between crowds of humans and individuals. This track will make use of the Autolume GAN aesthetic heavily featuring the NVIDIA ffhq dataset which consists of 70,000 faces. I want to keep cycling through the GAN field and show faces morphing into one another symbolising the individuals morphing into a crowd and how individual emotions and thoughts completely change in significance when viewed through the context of humanity being a massive organism.

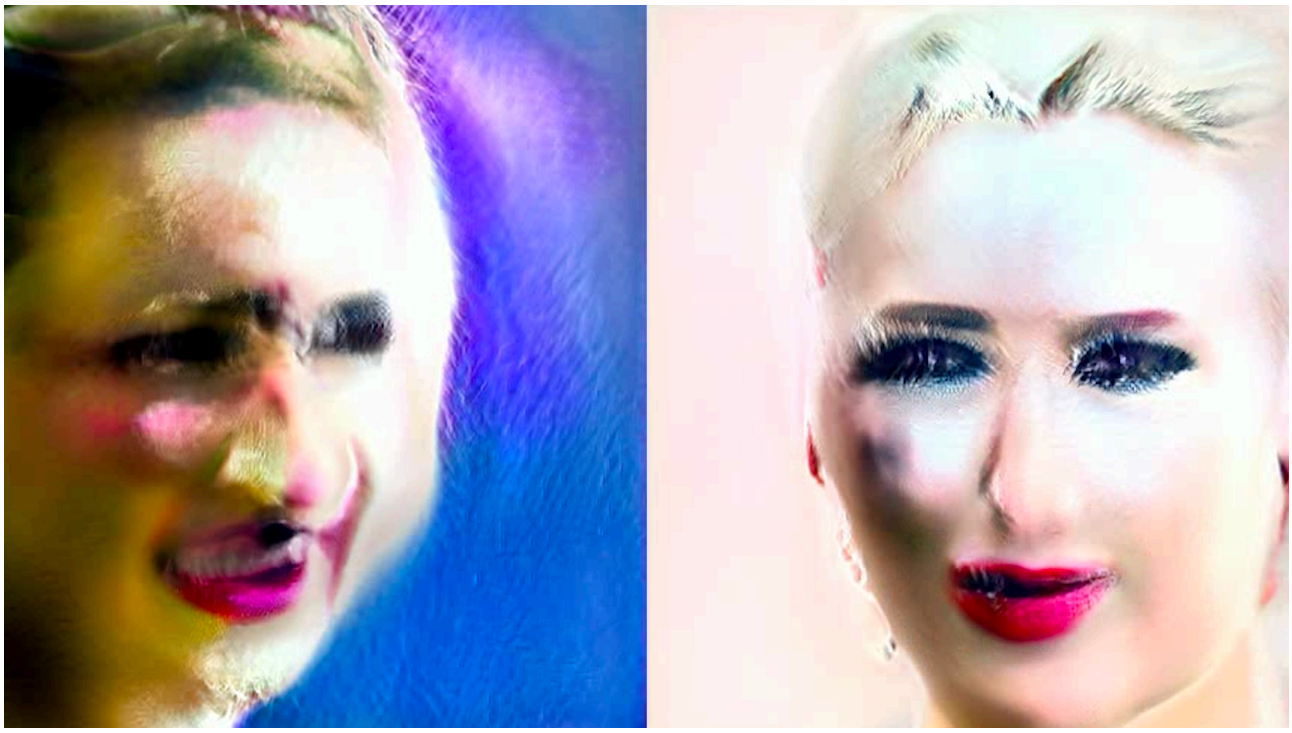

Figure 15: A section of '*Men With Codes*', the visuals consist of two individual square-framed videos generated by Autolume using the NVIDIA ffhq dataset and placed opposite each other in Premiere Pro.

The first half of the song showcasing these morphing faces fits perfectly with my central theme of the uncanny valley. In fact the morphing faces turned out to loosely parallel real-world research projects conducted in order to explore human responses to computer-generated faces. De Borst and de Gelder discuss several studies in their article ***'Is it the real deal? Perception of virtual characters versus humans: an affective cognitive neuroscience perspective'*** that suggest computer-generated faces can sometimes be as effective as human faces when used to study perception of emotional facial expressions *"When looking at the brain data for the group as a whole, human and avatar faces evoked similar activity in the amygdala. These results suggest that animated faces may be as effective to investigate perception of emotional facial expressions as human faces"*. The specific study they mention in the previous quote did show there was inconsistent results when comparing the behavioural results between the sexes and suggest that further, more specific research needs to be conducted to further explore the concept. However the article discusses several other studies that examine the phenomenon of the uncanny valley and the ability for the computer-generated faces to effectively elicit responses in humans *"These initial results seem to suggest that although physical differences are perceived between avatar and human faces, the expressed emotions may still be processed in a similar manner"*.

Getting back to the music-production aspects of this song: The track starts with a blaring, repetitive, non-musical melody playing. This melody was created using a series of un-quantised voltages, mixed and combined from a variety of sources including clock-divider gates and Mutable Instruments ***Marbles'*** X2 output, in order to maintain a sense of chaos. Generally the only rule I followed when creating a patch like this is to try and use clocked-random sources, in order to maintain some centrality to the temporal movements in the patch. When there's so much interconnectivity and variables that interject changes in behaviour in the patch, it's important that nothing strays too far outside of the bounds of musicality. The topic of judgement and systems processing individuals inspired thoughts of the judicial system and prison alarms. Alarms are generally designed to signal something to humans (usually in less-than-subtle ways) and the unforgiving, bold nature of them felt exciting and slightly dangerous. I wanted to use this melodic loop as the core of the song and then try and add as little as possible to it. In a sense there's a very ironic, humorous aspect to this song as it was an attempt at entertaining/pleasing a crowd with a song written around an incredibly obnoxious sound.

This song was an example of a system-based compositional workflow paying dividends. One of the biggest advantages of using modular synthesiser systems and trying to handle the majority of timbral manipulation and gain-staging in the hardware domain are the balanced mixes often outputted from patches. The nature of creating a series of sounds that are all multi-tracked in the same take is that you end up filtering sounds, side-chaining and arranging melodic content in an intelligent sense while actually recording the patch.

Men With Codes basically consisted of the melodic "alarm" sound as the first patch, then the synthesised kick, snare & hat track as a second layered patch. After this initial groove was established I layered a simple percussive bass part sequenced by Metropolix. At that point the mix sounded quite full to me, despite the use of quite unorthodox melodic elements and very short, super-transient percussion elements. I did layer a few virtual synthesiser sounds to the melodic pads (sequenced manually in the piano-scroll). The song represents a very spontaneous and organic compositional process and out of the whole album was probably the most enjoyable to produce.

(EXCLUDED FROM FINAL TRACK-LIST)

4. Sun Gazing

As of now ***Sun Gazing*** is one of the least developed songs on the album. I know it'll be an ambient mid-point of the album and will show some sort of centred circular imagery symbolising the sun. The idea of this song is the entity realises that the humans are inherently flawed and they're all looking to the sky or the sun in order to ascend beyond their sinful human ways and instead attain some form of enlightenment which is ultimately rooted in escapism from the earthly realm. Several cultures and religions have worshiped the sun for obvious reasons. I want this section of the EP to be minimalistic and act as a little breather and change of pace after ***Men With Codes***. Especially because the first three songs are all somewhat rhythmic and around 140-150 BPM. This slightly less-rhythmic section will be a nice interlude that sets the stage for the following tracks, leading into the climax of the project.

5. Earth2Sky

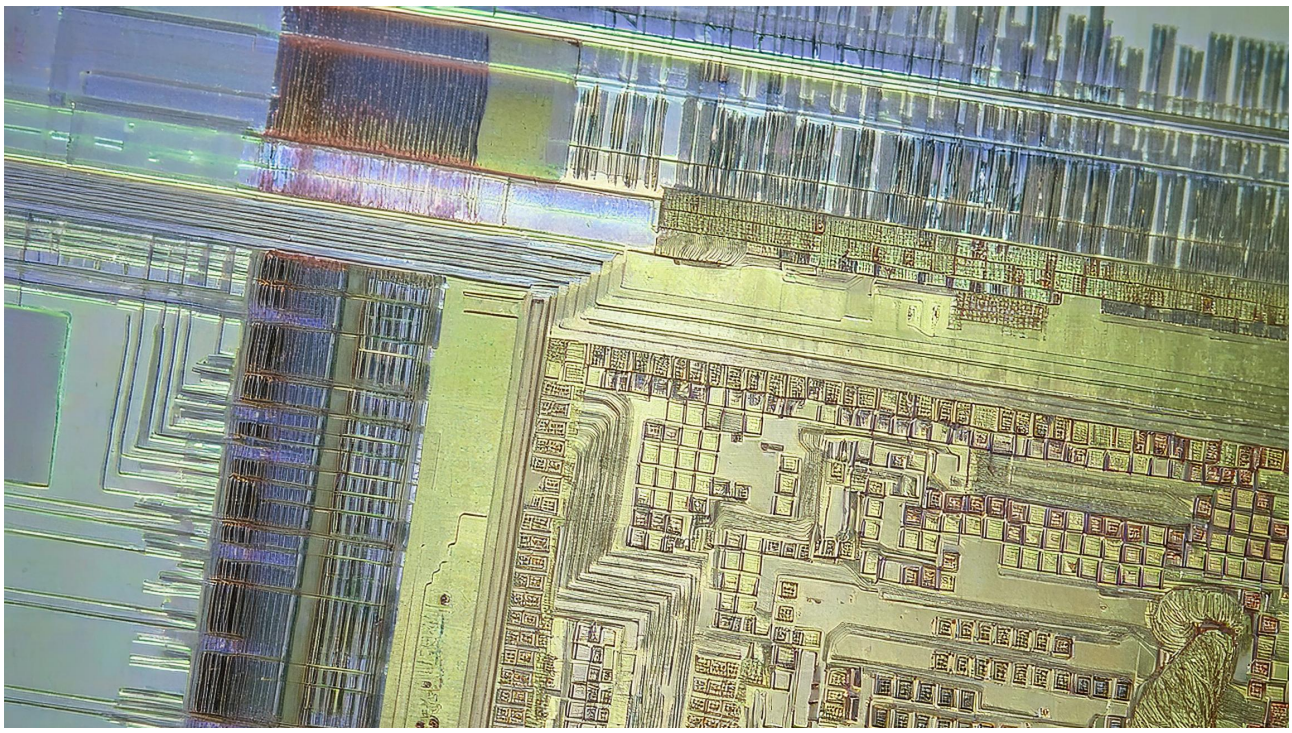

Figure 16: An image created in Adobe Firefly of a fictional CPU circuit board.

Earth2Sky is the most straightforward-techno track on the album, featuring a heavy 4/4 kick drum pattern and droning bass part accompanied by high-pitched cutting lead pads. The track acts sort of like the action montage that takes place in a Hollywood film.

Earth2Sky explores the concept of humans originally being agricultural creatures that value physical real-estate quickly morphing into beings that exist in virtual spaces and how our identities are now influenced more by people and places that we aren't physically connected to in a direct sense. The other aspect that I find interesting about this phenomenon is the reality that even the virtual spaces and networks are rooted in physicality and minerals that are extracted from the earth itself. I'm using satellite imagery in a similar fashion to the maps shown in ***Hyperstitious***, but mainly focusing on agricultural land, mines and other areas where resources are being harvested. I also want to incorporate LIDAR scans of mines and showcase the 3D models as part of the visuals. Coming back to the recurring theme of showing extreme micro with extreme macro imagery I want to contrast between footage of satellite footage and circuit board closeups. This concept was inspired partially by the 1982 experimental film ***'Koyaanisqatsi'*** (Godfrey Reggio). The film featured footage

of both natural landscapes as well as sprawling cityscapes and human civilisation and technology. In many ways the film is quite similar to my project conceptually, though a lot less fictional and more documentarian.

Of the completed tracks on the album, ***Earth2Sky*** took the longest to finish and I ran into the issue of early demos sounding very generic, like something you'd find on a YouTube techno compilation. The drum sounds felt stale and too recognisable while the melodic and harmonic content of the piece was lacking structure or a direction to which it progressed. There was a build-up in the middle of the song featuring the traditional acid-style filter-sweep and the individual instruments all built in intensity, the kick dropped away for a bar and then everything suddenly entered the mix again. This drop felt so sickening and in many ways was the anti-thesis to my original goal of creating something new and interesting. Initially I tried to solve this issue by throwing gear-based, technical solutions at it. I tried complex interference pattern-based sequencing, cold, shift-register based looped-random style melodic sequencing, hoping I'd capture a loop of frantic, unquantified voltages that would inject some excitement into the piece. Inevitably this just added more unusable or not particularly exciting content to a big, over-compressed demo that didn't really have anything going for it.

In the end the solution to problem of adding life to a generic track came from the overall narrative I was trying to create. The song represented the final turning point, the birth of this hybrid, human-machine future, semi-artificially orchestrated by our unnamed AI protagonist. If the song was about such a pivotal change, a before-and-after moment, clearly a topic where time, evolution and temporality was the key point, the song should feature some sort of structural change too. I decided that I would completely remove the section after the big drop and instead that section would be unexpectedly (and uncomfortably perhaps) ambient and drone-based. The idea of completely removing any recognisable drum sounds from the second half of the track, in order to contrast with the more traditional techno percussion of the first half, perfectly symbolised the point in the narrative where the world changes. As the song developed musically, the concepts for the visuals also started to appear.

I knew from the very beginning of the project that the song should feel militant and and evoke imagery of large machinery and systems that dwarf individual humans. While the previous track ***Men With Codes*** explores the combination of individual humans creating large groups, ***Earth2Sky*** explores the powerlessness that individuals experience and inevitably of certain developments in humanities future. The imagery shows research being conducted by the AI entity as it starts to form its

plan for assimilating. The build-up of the track shows the AI starting to create supply-chains and creating factories to help develop it's experimental technology. This build-up suddenly pulls away and the audience is shown an operation where a human subject is being surgically implanted with some sort of technological object. This vague reference to some sort of neural-chip that would allow the biological entity to interface with the digital, technological world acts as a nice conclusion to the narrative as it shows that the AI's realised it can't change itself in order to create compatibility with humanity. So it instead changes humanity into a state that is compatible with a form of connection that it yearns for.

(EXCLUDED FROM FINAL TRACK-LIST)

6. Man-Made

This track starts quite abruptly with a melodic line that sounds vibrant and active. The track is about the artificial direction humanity is heading, specifically in regards to transhumanism and the ability to modify ourselves in order to achieve self-actualisation. I had originally wanted to use dental scans in this song (I decided mid-way through production that the scans would fit better in the opening track ***Hyperstitious***) and start playing with the idea that our environment has changed our physical forms. Human mandibles have shrunk over the last 10,000 years due to a mixture of our diets becoming more processed and generally eating less fibrous, tough foods. This track should create a sense of anticipation and feel like it's the moment right before the final climax that takes place in the final track '***Machine Yearning'***. I did want to discuss the topic of population control and dwindling reproduction rates. The idea that the humans are more focused on living in virtual worlds where they can't physically reproduce as opposed to meeting partners in the real world. The idea of "matching" like in a dating app setup is interesting to me and I wanted to further explore these concepts of gender and fluidity in regards to gender through the song.

(EXCLUDED FROM FINAL TRACK-LIST)

7. Machine Yearning

The final track of the album is heavily inspired by the Marshall McLuhan quote ““Man becomes, as it were, the sex organs of the machine world, as the bee of the plant world” from ***‘Understanding Media (1964), p. 46’***. This was a fitting topic to end the album with and creates an interesting conclusion to the narrative as well. The idea being that ***Machine Yearning*** is the moment of the singularity beginning, the man and machine worlds combine and the new version of humanity is created. The idea of collective consciousness and artificial intelligence is definitely a central theme of this song. I wanted this track to be emotional and ideally achieve that experience of the ‘sublime’ as Tim Hecker refers to. I had imagined this as a love song written by the ***Machine***, letting out a final call about its desire to belong and feel accepted, expressing its ***Yearning***.

Conclusion

I've always been the type of artist to have big concepts and some sort of narrative or fictional world in my head which I imagine the work I'm creating is meant to exist in (or perhaps act as a preview or portal to that world, for the audience). This project was interestingly both the most developed fictional world I've created and simultaneously, incredibly abstract and open to interpretation.

In retrospect there are always going to be things a creator would change about their process, however, often time spent struggling in unproductive phases of exploration is actually an investment. One has to invest time into several potential paths towards creating their ideal output and you will never know which path is the most fruitful until the end of the process. This is the nature of creating something new and it's unavoidable.

Especially on a project like this, that utilises so much technology and generative system-based creation, a lot of what's recorded or captured will end up challenging the creator's discretion. This project featured rhythmic elements and visual styles that were quite different from my previous audio-visual output. The final output will always be different from what one imagines early in the pre-production stage and the more I've worked on art and music the more I've come to truly enjoy this aspect of the creative process.

The goal of creating content that lies within the uncanny valley and elicits a sense of unease in human audiences was definitely fulfilled through this project, albeit the phenomenon was explored more in certain tracks than others.

Men With Codes ended up showcasing an audio-visual aesthetic that lined up the closest when compared against my original goal of making work that seemed uncanny. When frozen and analysed, the imagery is clearly not showing real humans, but it does feel like the visuals are morphing between imagery that is rooted in reality. Seeing these sections come into fruition and getting to observe audience responses at the exhibition was very validating as I could see the hypnotic nature of this type of work. Rooted in the uncanny, audiences feel an almost innate incentive to continue to focus and try to understand whether they're looking at something real or artificial.

Figure 17: A screenshot from *Men With Codes*, the abstract imagery was created in AutoLume using a custom model, trained on a series of public domain videos of different types of human crowds.

What I initially worried was a flaw, traditional techno sounds established through previous musical releases over the course of several decades making their way into my project. I slowly realised through the process of creating the album that the push and pull of these different technologies, jostling for a space in the project actually embodied the project's original goal in an unexpected but satisfying fashion.

While I'm happy to accept that hindsight is 20/20 and the process developed organically. There are things I would change if I had to redo the project.

I would have liked to incorporate more procedural systems in the visual side of things. The project's visuals ended up being more of a film-editing project than a truly algorithmic, generative project. This is totally fine but I would love to further explore more self-patched systems that influenced themselves and showed long-term progression to the visual development of a shot or scene. UI that opened up into a new menu page or something along those lines.

The second aspect where I think this project veered away from my original expectations and something I would have been interested in exploring further are moments where sound and video interacted in an obvious, interdependent fashion. My final AV album features a lot of edited moments and shots where there is a singular relationship between sound and video. Perhaps a kick drum triggers the changing of a background image or the volume of the melody causes a texture to ripple. I would have liked to create audio-visual relationships in a system and then compose the audio-visual gestures or phrases with that system in mind. The fact that I was mainly working long-term and recording multiple takes of audio and video separately meant this would not be practical or intelligent for my current purposes. However it would have significantly changed the final outputs if the patches were developed from the very beginning with AV interactions in mind as opposed to creating songs purely as audio (albeit with imaginary imagery or themes present in my mind) and then creating accompanying visuals afterwards, relying on the recorded STEMS to create interactivity.

The future of my practice has changed as a result of this project. After getting the final mixes mastered by a specialised audio engineer and obtaining the appropriate artwork from a graphic designer or visual artist. I plan to release the album digitally, the audio will consist of the final four songs listed in the thesis and will be distributed to all major streaming services and online marketplaces. I will either release a single song's audio-visual work as a standalone music video or upload all four tracks as individual videos. In addition to these digital, internet-based releases, I hope to screen the album at gallery and/or art festival events. All of the artists I listed in the literature review have showcased their work at Montreal's ***Mutek*** festival, while a much larger-scale event and generally featuring big-name acts, events like ***Mutek*** would be ideal for screening my project and I imagine audiences at such events would be open to approaching the work from a curious perspective and hopefully find the audio-visual pieces stimulating.

Focusing this project around the phenomenon of the uncanny valley and aiming to create work that was notably alien to a human viewer was a worthy challenge. I found there were a lot of moments where the current technology started to reflect older mediums, this makes sense as similarities between certain technologies will always end up revealing connecting threads. For example the Auto-Lume visuals exhibited a lot of digital artefacts that reminded me of early 90s computer-graphics (likely due to their architecture being rooted in the digital medium). Of course it's important to note that my personal aesthetic sensibilities will inevitably colour and influence my creative outputs, even if the source of the works are based more on generative technologies, the curation and

arrangement of the final assets in the editing stage in my workflow is still entirely decided by my intentional actions. I definitely feel there are ideas I want to further explore in the realm of the uncanny, especially exploring bio-mechanical forms and aesthetics. Given my previous experience and the new tools I now have available, it's likely this future work will still be audio-visual. That said if I can sort out the appropriate logistics and tech requirements, I'd be very interested in exploring non-linear media more, with interactive installation work, possibly even incorporating concepts like long-distance networks and the ability to broadcast media, where audiences might not need to physically inhabit the same space, instead interacting with the work via virtual environments and technologies.

While the work definitely leans towards the experimental side of the electronic music spectrum as opposed to focusing on catering to dance-floors. All four songs on the final release feature sections that could feasibly be incorporated into DJ sets in a variety of electronic music genres. The album expressed a range of different emotions and stylistic choices both musically and visually. Especially for a narrative project like this, it's important to have some distinct moments that act as markers for the audience and give them vivid memories they can recall a long time after witnessing the media, ideally these memories of evocative audiovisual experiences will provide the audience with some ideas or thoughts that they can further intellectualise as opposed to purely serving them a sense of ephemeral elation.

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