



benjamin bacon

selected portfolio

benjamin bacon

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Benjamin Bacon is an interdisciplinary artist, designer, and musician. His practice and research sit at the intersections of computational design, networked systems, machine art, digital fabrication, and sound. His body of work has been exhibited in various venues worldwide, including North America, Europe, East Asia, and the Middle East.

Bacon's practice centers around explorations into computation, its qualities and characteristics as a creative medium, and its changing relationship with society and industry perception. His creations have taken the form of mechanical sculptures, machine

learning neural networks, networked systems, experimental interfaces, body-hacking, and sound. His methodology as an artist is fundamentally rooted in the design research process. It is experimental in its essence, often reliant on direct interaction with materials. His conceptual approach is at times playful, at times critical, at times commentary, and at times speculative.

Bacon's work has been profiled by print magazines such as Design 360, IDEAT Magazine, and Modern Weekly, as well as online magazines and platforms such as the New York Times, Rizhome, Creators Project (China), LEAP, The Art Newspaper, Neural Magazine, and CLOT Magazine. Music and sound have maintained a strong presence in his practice. His music has been collected and released on compilation albums such as Thanks for Stopping By (Guangzhou Underground Records) under the stage name Artifact Unknown, Taxeee Tapes Vol. 3 (87Fei87 Records), Face the Beat Session 4 (Sideline Music), and Re-Charge Music Compilation Volume I (Mao Re-Charge) under the stage name SoundSpade. His work in technology, sound and music has led to interviews with RADII China and the German National Radio and an invited talk at TEDxNingbo.

Benjamin Bacon is currently an Associate Professor of Media and Art at Duke Kunshan University and co-director of the Design, Technology, and Radical Media Lab. He is also a lifetime fellow at V2_Lab for the Unstable Media since 2019 and the co-chair of the XRResearch Cluster at V2_ with Boris Debackere.



Renderings of Probe II, Subaudition, Machine I (left)

probe II

electronics, ML, custom software, stainless steel
2021

installation video (3min): <https://vimeo.com/690180690>

Probe II, Subaudition is the second work in the Probe Series by Benjamin Bacon. The Probe Series evolved from an interest in how machine logic could live in physical space, and an interest to explore machine perception and sentience through experimental design of machine learning driven mechanical installations. Set in the conceptual framework of a post-planetary space exploration design fiction narrative, the series frames machine perception as “alien” and speculates on a future where conscious machines can bear the trials of space travel to investigate “hostile” human-occupied environments in search of new habitats. The Probe Series follows this train of thought, where each installment of the more extensive series investigates one aspect of sensory perception and data collection and analysis.

“Subaudition: The act of understanding or supplying something not expressed, a reading between the lines.” - Merriam Webster

PROBE II: Subaudition is a binary set of machines that apply machine learning methods of speech to text recognition in

exploring the concept of subaudition through the translation, degradation, and misinterpretation of meaning in spoken language to binary information, transmitted between the two machines and expressed as kinetic movement and signaling outputs of each of the machines respectively.

Machine I: Recognition. Decoding. Transmission.

The microphone on Machine I captures the human voice, environmental sounds, and directional position of the participants when motion in the environment is detected. It transcodes and packages up this information to transmit to Machine II for further interpretation.

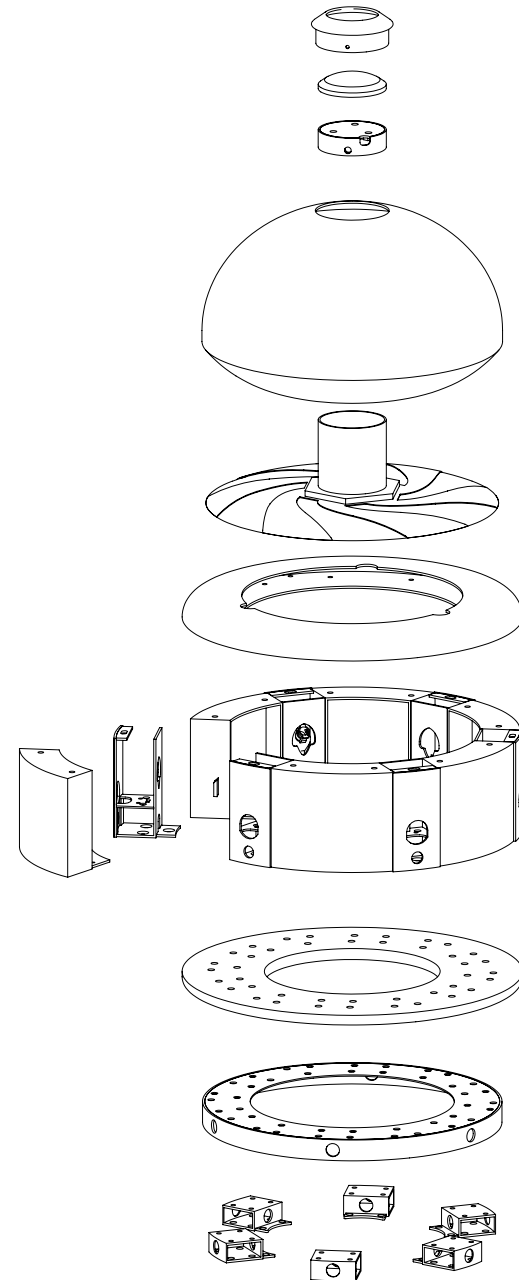
Machine II: Receiver. Pattern Emitter.

Machine II collects and re-interprets the transmitted information and transforms it into non-verbal light projections into the space through a mirrored zoetrope projection mechanism.

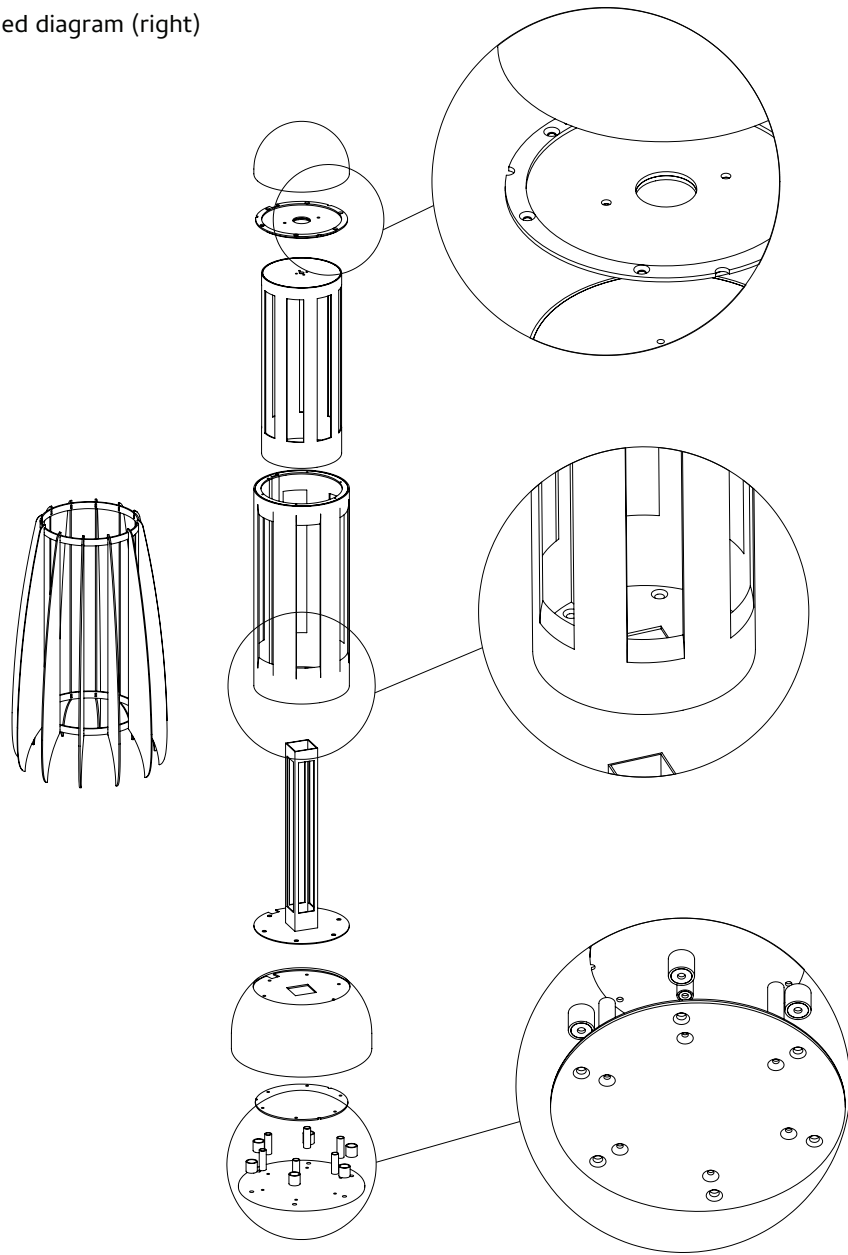
The two machines together mimic the human ear and language processing system in the brain, where audio signals are picked up and translated into an internal language to the human body. Environmental sounds, mistranslation, glitches in the ML model due to data training limitations all contribute to the formation of a machine-centered interpretation of human language and oral communication. The work poses the questions: can machine learning models act as complex archives and artifacts of human behavior? Can machines “learn” human culture? Are they unreliable witnesses?



Probe II, Subaudition, Machine I
physical machine (left)
exploded diagram (right)



Probe II, Subaudition, Machine II
physical machine (left)
exploded diagram (right)





Probe II, Subaudition, Machine I, Machine II
Exhibition image from Under the Viral Shadow
Art Laboratory Berlin



Probe II, Subaudition, Machine I, Machine II
Exhibition image from Under the Viral Shadow
Art Laboratory Berlin



Horologic Solum
STArts Festival Shenzhen, exhibition image. (left)

horologic solum

electronics, tape machines, magnetic tape, wood, stainless steel
2020-2021

collaborators: Vivian Xu

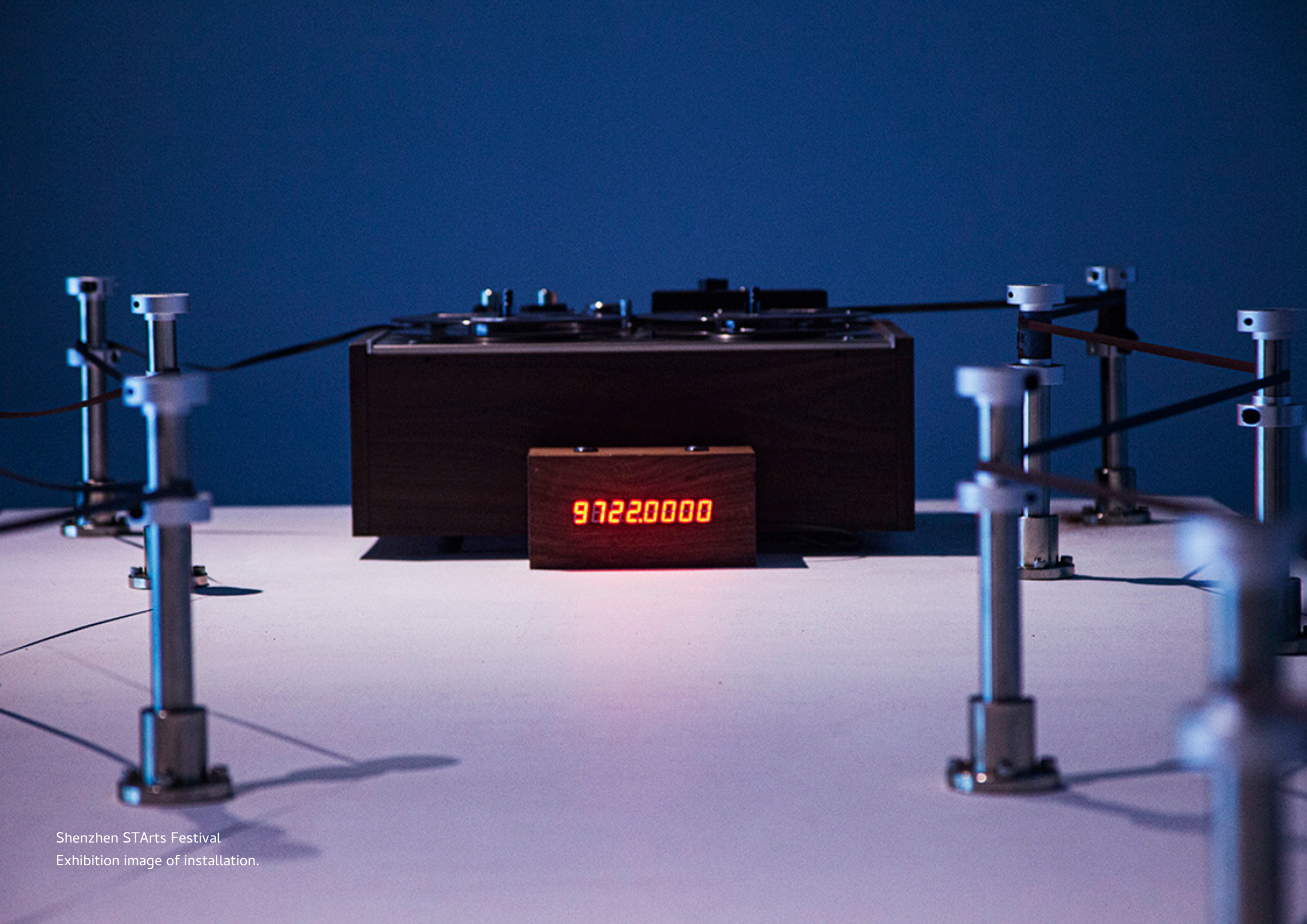
installation video: <https://vimeo.com/692501780>

Horologic Solum is a case study and exploration into media memory, its configurative logic, materiality, cultural functionality, and the information that gets stored on it, distorted, decayed, and reinterpreted. The piece interrogates archival media modes, communication technologies and how they fail to transform and translate across expansive stretches of space and time. Using the NASA Golden Record as an artifact of human civilization, the contents of the records are run through a “system of decay”, as meaning and memory dissolve. The installation consists of two tables each with a tape machine, a timer clock, and a cassette tape running system. The installation works with 5 layers of time (see website for which 5 layers) and reality in creating connections between the past, the present, and the future. As the tapes cycle through the installation, their materiality is eaten away, the process sonified as the content is destroyed. The clock keeps a steady count of the time elapsed until the media dies.

This work was funded by the STArts Festival (Shenzhen).



Shenzhen STArts Festival
Render of exhibition design



Shenzhen STArts Festival
Exhibition image of installation.



Shenzhen STArts Festival
Exhibition image of installation.



Neural Dreams / Human Machines (2022)
vinyl print on layered acrylic (left)

neural dreams

ML, acrylic, video
2014-2018, 2022

Neural Dreams / Human Machines is a series of works that the artist began in 2014 that experiments with the Google Deep Dream neural network as a tool and approach for generating computationally processed imagery. Utilizing public domain video footage, television advertisements and scraped video footage from the internet, this series explores how machines translate and interpret human mass media and visual culture. This process utilizes a method of frame-by-frame image processing with assistance of open-source ML tools. Found visual content is processed through multiple generations and layers of inception and pieced together manually with an emphasis on exhibiting the image morphology process. This work experiments with early day machine learning tools and neural networks in a figurative and material way, where custom programming was necessary and long processing durations spanned days and weeks.

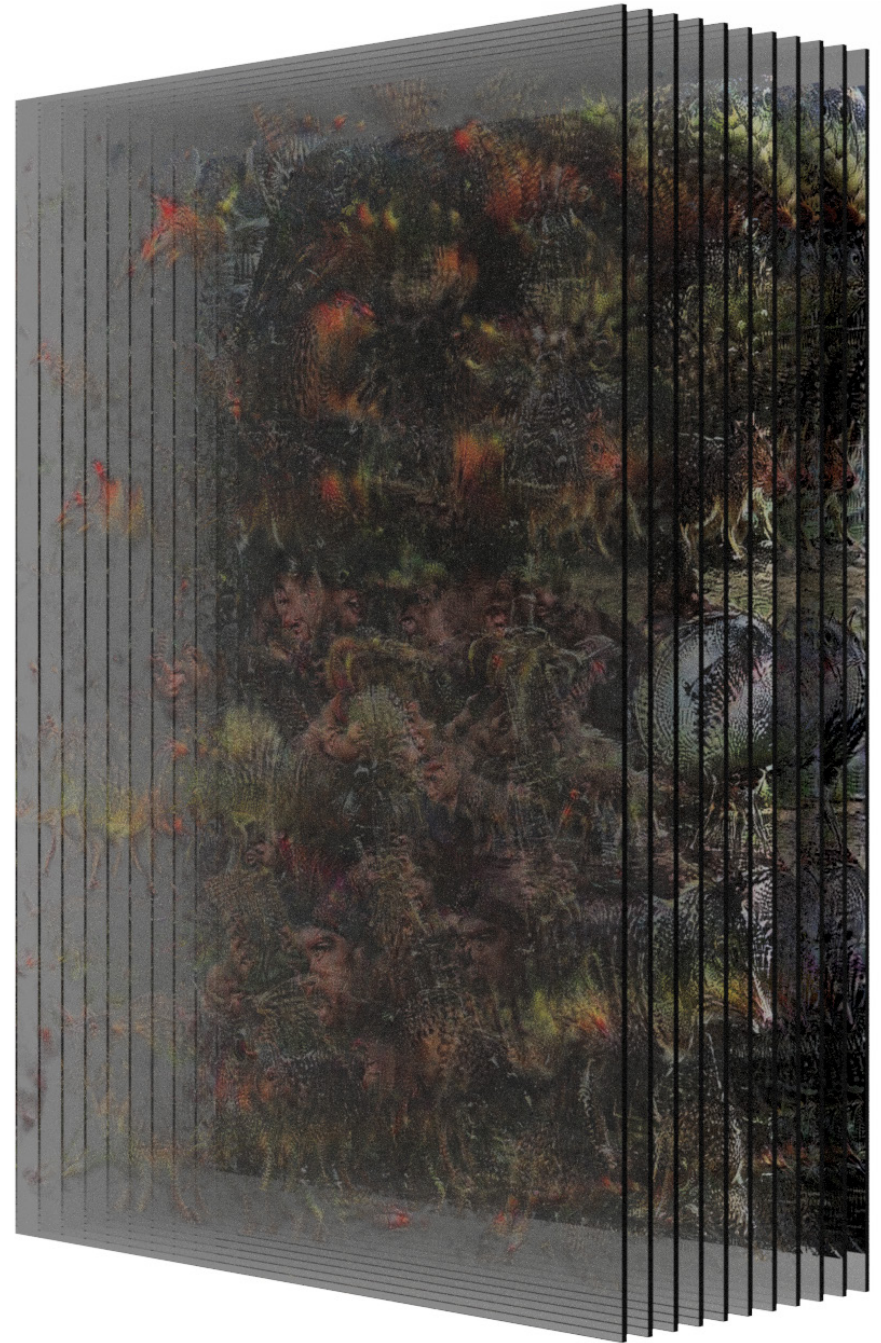
A 2022 reiteration of the works further experiments with different methods of bringing deep dream images into physical materials and space in a 3-dimensional way.

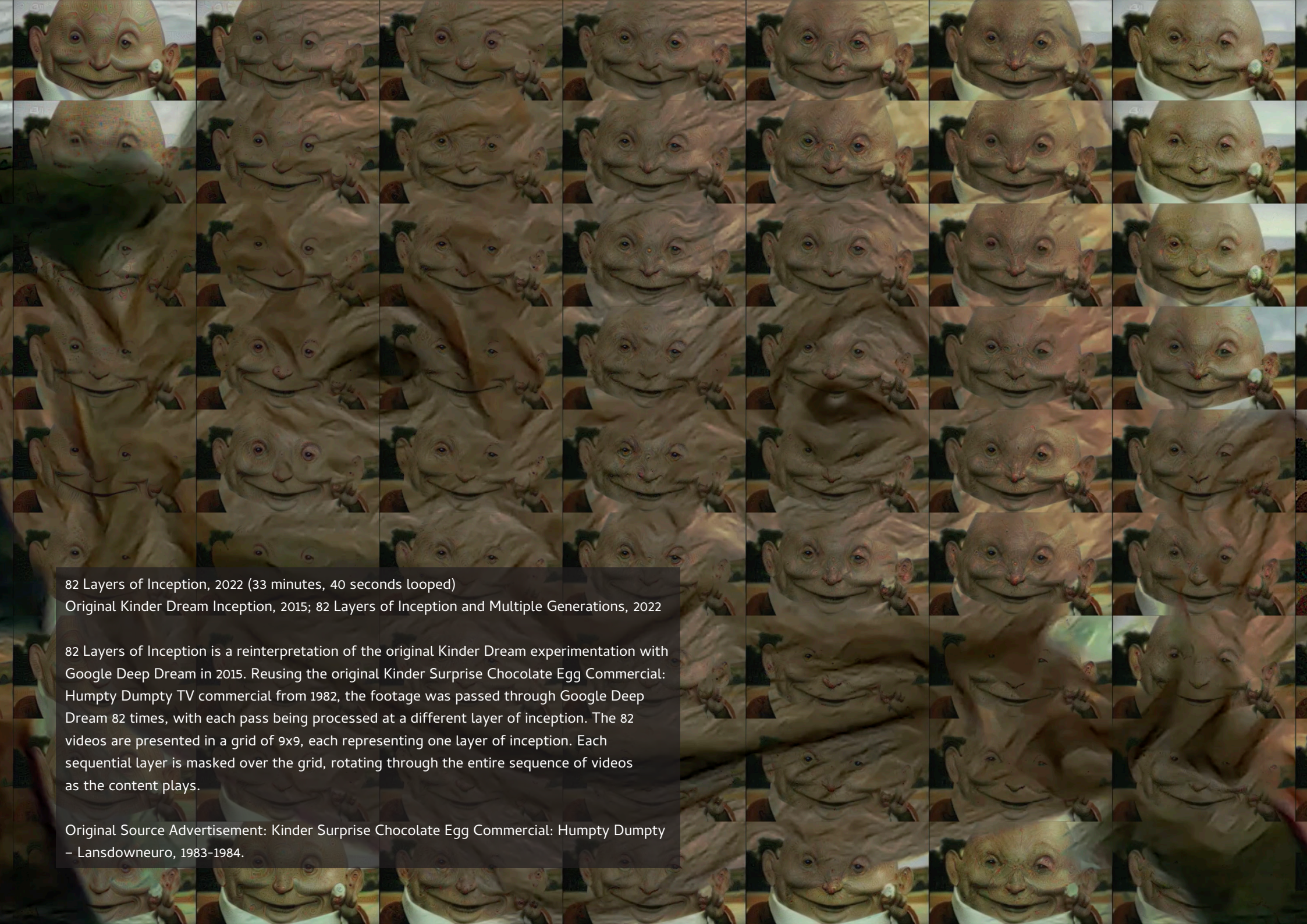
Neural Dreams / Human Machines
Vinyl print on layered acrylic, close up.





Neural Dreams / Human Machines
Layered acrylic design.



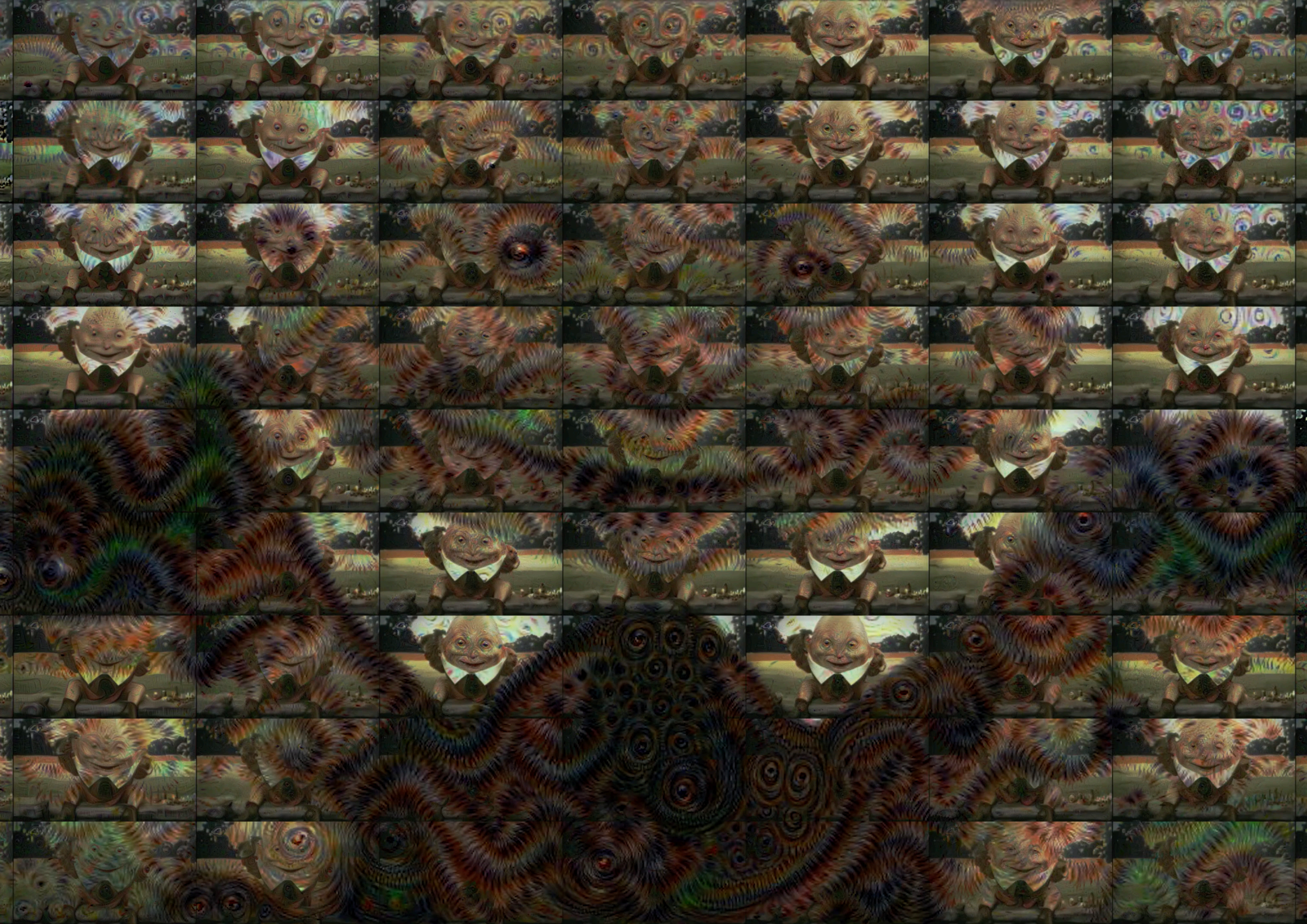


82 Layers of Inception, 2022 (33 minutes, 40 seconds looped)

Original Kinder Dream Inception, 2015; 82 Layers of Inception and Multiple Generations, 2022

82 Layers of Inception is a reinterpretation of the original Kinder Dream experimentation with Google Deep Dream in 2015. Reusing the original Kinder Surprise Chocolate Egg Commercial: Humpty Dumpty TV commercial from 1982, the footage was passed through Google Deep Dream 82 times, with each pass being processed at a different layer of inception. The 82 videos are presented in a grid of 9x9, each representing one layer of inception. Each sequential layer is masked over the grid, rotating through the entire sequence of videos as the content plays.

Original Source Advertisement: Kinder Surprise Chocolate Egg Commercial: Humpty Dumpty – Lansdowneuro, 1983-1984.





Probe I, Averso specillo di ducendum
rotation machine head with dual camera system (left)

probe I

electronics, ML, custom software, stainless steel
2019

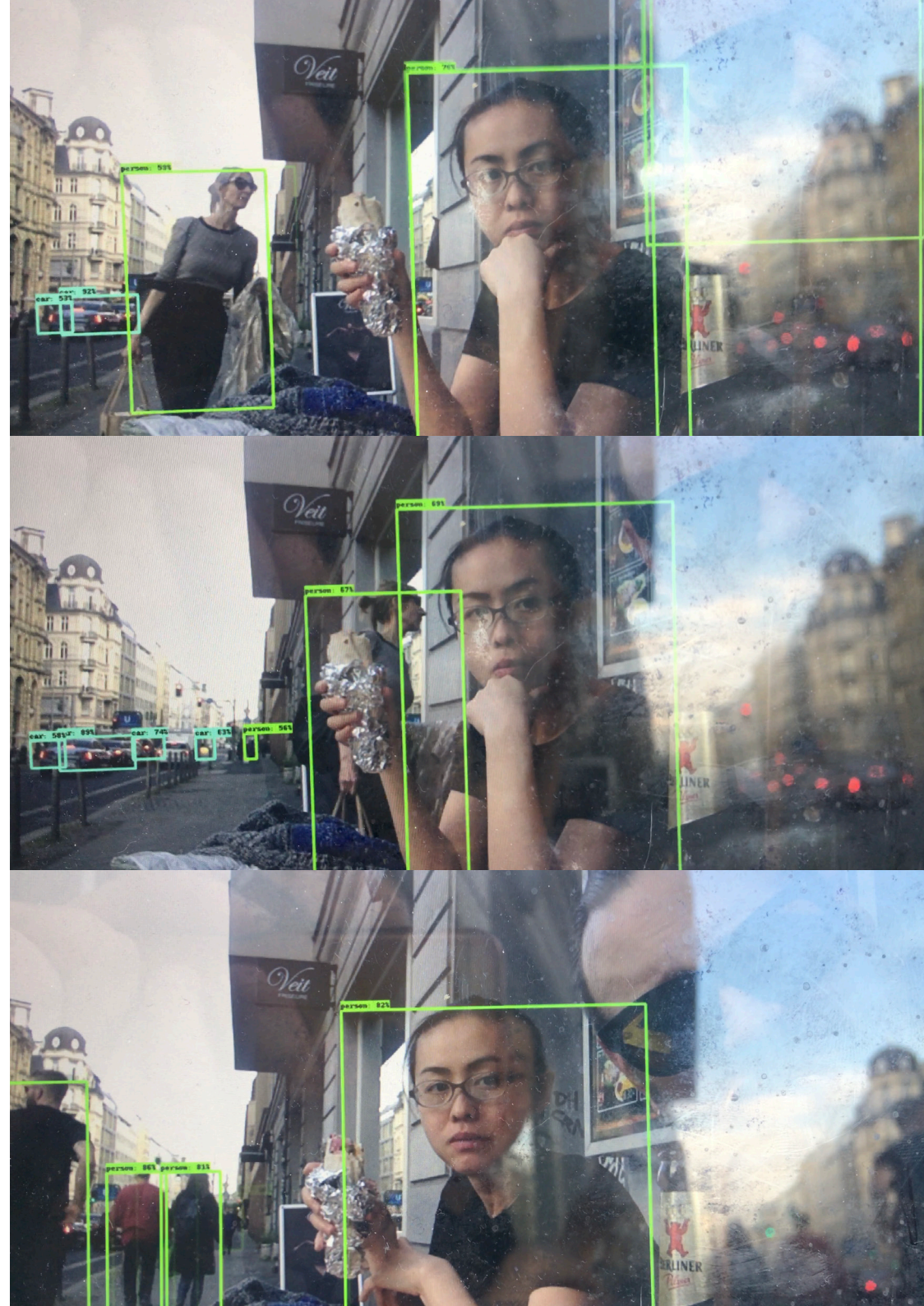
Probe I, Averso specillo di ducendum is the first work in the Probe Series by Benjamin Bacon. The Probe Series evolved from an interest in how machine logic could live in physical space, and an interest to explore machine perception and sentience through experimental design of machine learning driven mechanical installations. Set in the conceptual framework of a post-planetary space exploration design fiction narrative, the series frames machine perception as “alien” and speculates on a future where conscious machines can bear the trials of space travel to investigate “hostile” human-occupied environments in search of new habitats. The Probe Series follows this train of thought, where each installment of the more extensive series investigates one aspect of sensory perception and data collection and analysis.

Probe I is an ML-driven machine that presents a version of the artist’s imagination of post-planetary machine life. Inspired by the Panspermia hypotheses (the theory that life on the earth originated from microorganisms or chemical precursors of life

present in outer space that are able to initiate life on reaching a suitable environment), the installation speculates on a future where conscious machines can bare the trials of space travel to investigate hostile environments of terrestrial planets. The piece takes on the perspective of alien machine life forms as it observes, document, and analyze the strange phenomenon of life on earth through computer vision and machine learning analysis. The installation tracks human and object data in the immediate space around it, including presence and movement, and feeds this data back to a machine learning model developed by the artist that analysis and tries to make sense of the data.

This work was commissioned and collected by UNArt Center in Shanghai, China in 2019.

Computer vision and ML object recognition. Testing ML model on the streets of Berlin. (right)



Probe I, Averso specillo di ducendum
Render of installation to proportion.





Probe I, Averso specillo di ducendum
Exhibition image at UNArt Center.



Blossoms: The Many Colors of B6's Music concert poster
The installation was presented during the second half of the concert.

bioharmonic quartet

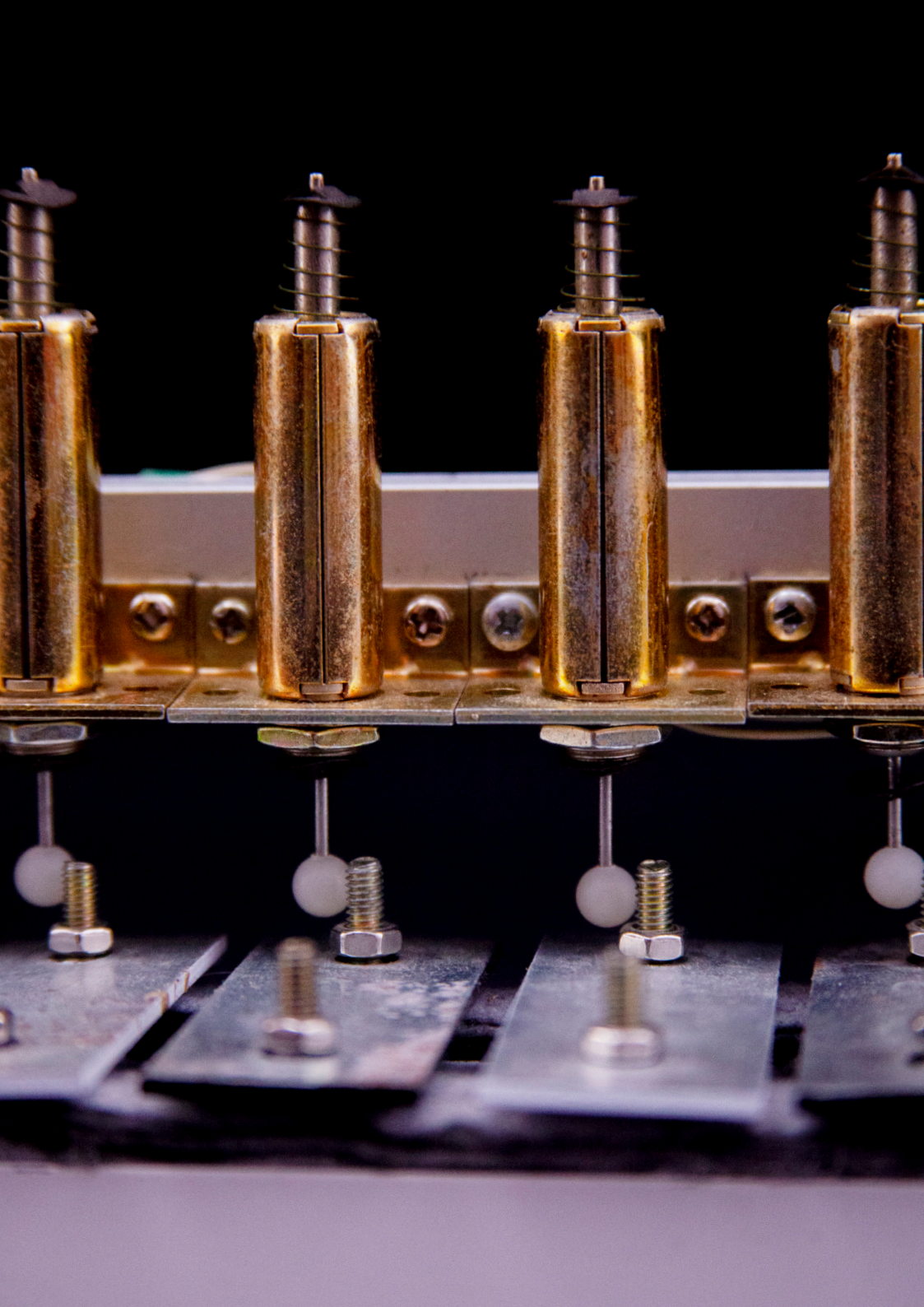
wearable electronics, ML, custom software
2018

collaborators: Vivian Xu, B6 (Lou Nanli)
performers: Wang Wenwei, the Shanghai Philharmonic string quartet, piano

The Bio-harmonic Quartet is a hybrid performance system that links together several musicians and artists via a biofeedback network. This network acts as a musical interface and uses the collective data of participants' bodily activities to generate music and soundscapes in collaboration with ML models. The work is an exploration into human-machine relationships within the context of music creation. The piece began as an exploration into BCI and ML technologies and how they might disrupt and evolve music creation, production, and performance. It moves beyond the artist's earlier exploration of machine networks and human-machine interaction models to create a more complex human-machine system that works in harmony towards creative expression. The piece consists of machine learning models and basic wearable sensory systems that capture muscle movement, pulse, and BCI data. Further research with multi-nodal open source BCI sensors is ongoing to further develop this work.

Dogma Lab artists and B6 in the performance space.
Benjamin Bacon (left), B6 (middle), Vivian Xu (right)





Little Sound Machines
Machine No. 7 close up (left)

little sound machines

electronics, ML, custom software, glass, brass, wood, felt
2018

Little Sound Machines is a sound installation consisting of a series of both mechanical and digital machines that are connected to a machine learning network. Three ML models form the central brain of the network. Through learning from and influencing each other, the models construct the musical phrases that are then played out through a series of sound-generating machines constructed from found objects, up-cycled components, and spare parts.

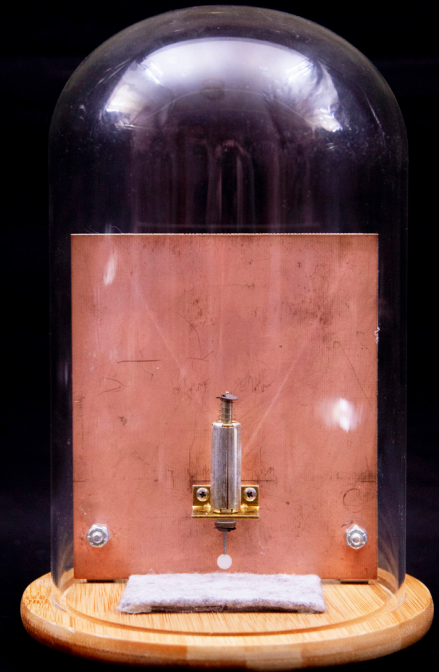
The piece positions the musician and artist in collaboration with the machine. Through experimentation, the artist explores new musical interfaces that erases the composer from the equation in favor of a purely machine-made performance. This performance evolves throughout time, allowing the machine autonomy to self-learn and self-express.



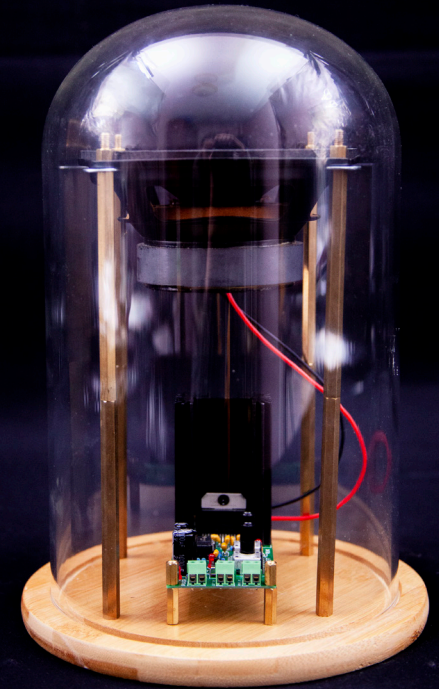
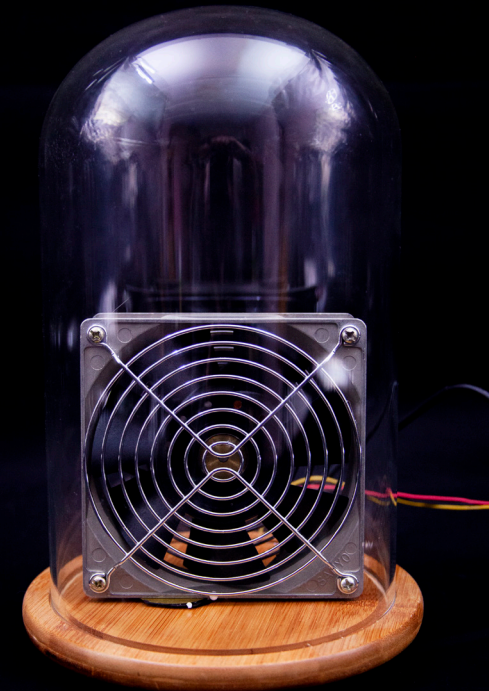
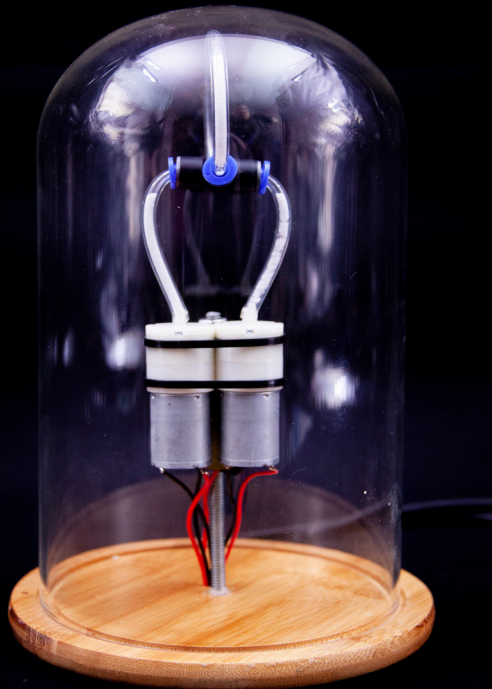
Machine No. 1 (top)
Machine No. 4 (bottom)



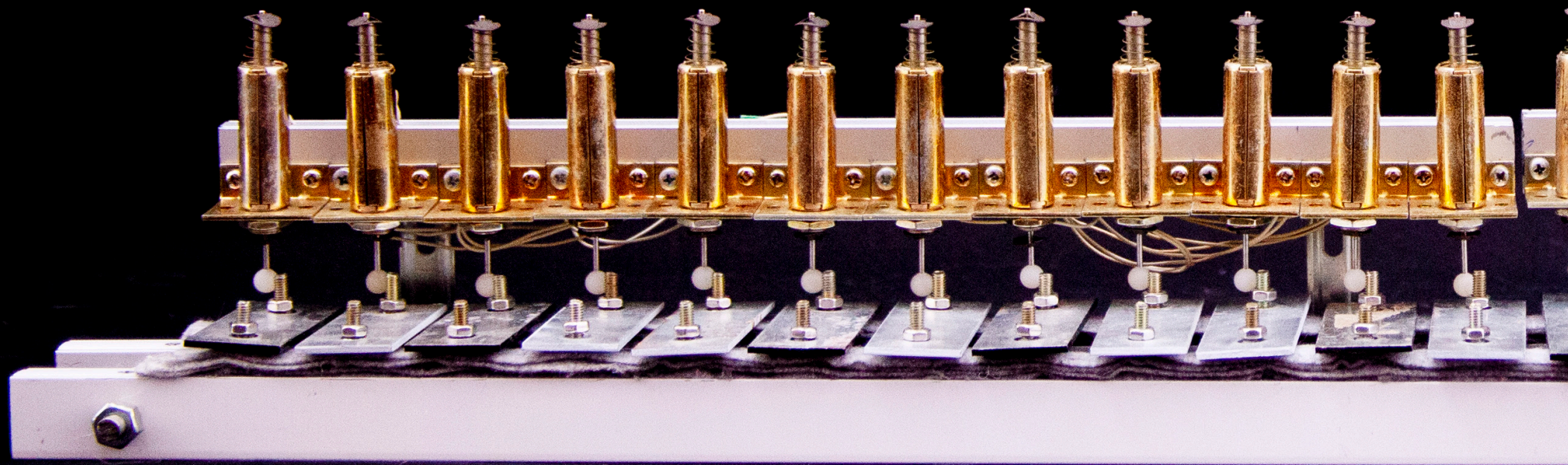
Machine No. 2 (top)
Machine No. 5 (bottom)

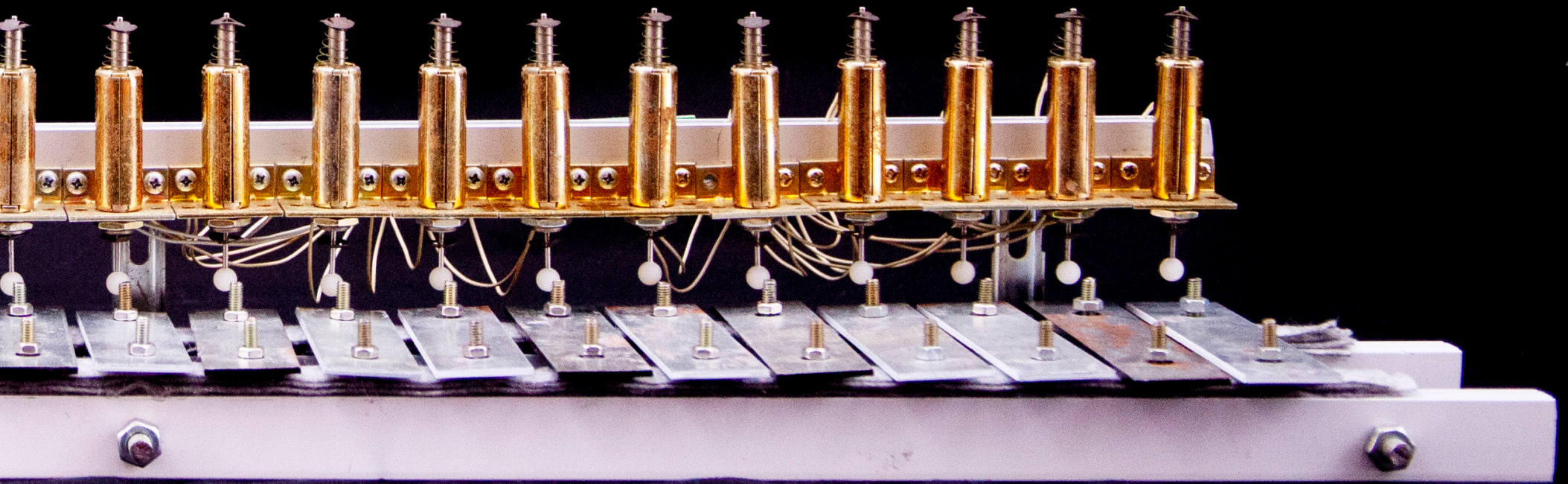


Machine No. 3 (top)
Machine No. 6 (bottom)



Little Sound Machines
Machine No. 7







Magnetic Body Instrument

Performance at the “++” Audio Visual Interaction International Forum

magnetic body instrument



electronics, magnetics, body modification

2016

collaborators (in performance): LoN

bodyhacking documentary (contains bloody scenes)(11min 32sec):

<https://vimeo.com/290548147>

performance video(20min 8sec): <https://vimeo.com/290549353>



The Magnetic Body Instrument looks at the human body as an interface and experiments with ways of hacking the body for the purpose of musical expression and performance. By embedding magnets into his fingers and working his hands in combination with custom designed electromagnetic instruments, the artist/musician creates a human-machine ecosystem that allows him to sense and feel his instruments during performance, where musician and instrument become one.

BODY HACKING

In preparation of the performance, the artist researched basic methods of body hacking and modification, including:

- different types of anesthesia and their affects
- what is available and safe for nonmedical professionals

Magnetic Body Instrument

Testing finger magnetism, images from documentary.

Short clip: <https://vimeo.com/290549151>

- quantities of anesthesia and it's correlation with duration
- types of magnets that may be safe to embed into the human body
- best tools and protocols for injection

The final procedure utilized lidocaine and gold plated 1mm thick miniature circular magnets. Medical grade magnets (titanium coated 52N magnets) at the time were unavailable.

The documentary documents the embedding of magnets into three fingers, performed by the artist himself. After a period of two weeks, the artist was able to feel sensations of magnetic pulls within his fingertips triggered by magnetic fields from high voltage power cables in walls or metal objects. Unfortunately, due to a lack of access to medical grade magnets, the implants were ultimately rejected by the artist's body after two months.

INSTRUMENT DESIGN

The Dogma Dual Axis Mono Synthesizer (DDAMS-1) was designed and created as part of The Magnetic Body Instrument and is controlled by interacting with the implanted magnets by way of cutting through electromagnetic fields around the instrument. The DDAMS-1 is an open-source Arduino-based two voice granular mono-synth with a customized dual-axis accelerometer human musical interface, midi in, line level out and programmable controller. The controller is designed to also accommodate for traditional instrumental use.





Mingle (2014 iteration)

Image from Hyperseeing exhibition, CAFA Museum, Beijing.

mingle

electronics, custom software

2007, 2014

At Mingle's core, the installation is a voyeuristic sound piece that interacts with audio messages left by audiences in local or remote locations and uses their conversations as fodder for sound experimentation.

First conceived and created in 2007, Mingle utilizes a networked sound interface for audiences across different time zones and spatial configurations to listen into and participate in the deconstructing and constructing of sound poem made up of messages left by gallery visitors. The artist created multiple portable red phones with customized hardware that allows users to record sound or messages as well as play back audio recordings through wireless connection. This flexibility enables the installation to intervene in public spaces outside of the gallery and museum. As more audio clips are collected, the sound poem loops and transforms based on crowd sourced content. The first iteration of this work was installed in different time zones in the USA, Asia, and Europe.



Mingle (2014 iteration)
Image from Hyperseeing exhibition
Central Academy of Fina Art Museum.

In 2014, the artist expanded on the work by investigating and experimenting with concepts of private and public access to information and questions who is allowed access data.





Electromagnetic Solenoid Orchestra (ESO)

Close up image of solenoid actuators within in octave module.

eso

electronics, custom software, stainless steel

2011

The Electromechanical Solenoid Orchestra (ESO) is a decentralized mechanical sound and music network driven by real time data pulled from the environment. The design of the ESO system stems from the concept of creating complex machine systems from simple mechanisms or components such as electromechanical actuators. When installed in a spatial matrix formation, the viewer can experience the installation from within it, where the soundscape transforms as audiences shift position and move spatially through the installation space.

A total of 24 stainless steel cage were designed and built for the ESO, each cage a deconstructed xylophone with one octave controlled and activated through solenoid tapping. These custom-made and non-traditional instruments can be driven by data to generate complex musical soundscapes that go beyond the capabilities of human muscle movement. The first iteration of this work pulled environmental data collected by the Citizen Sensor kit developed Joseph Savaadra from multiple cities in Asia, Europe, and the United States



Electromagnetic Solenoid Orchestra (ESO)

Exhibition image at the Translife exhibition, National Art Museum of China (2011)



Soundspade

Top view of instrument interface (left)

soundspade

electronics, custom software, acrylic

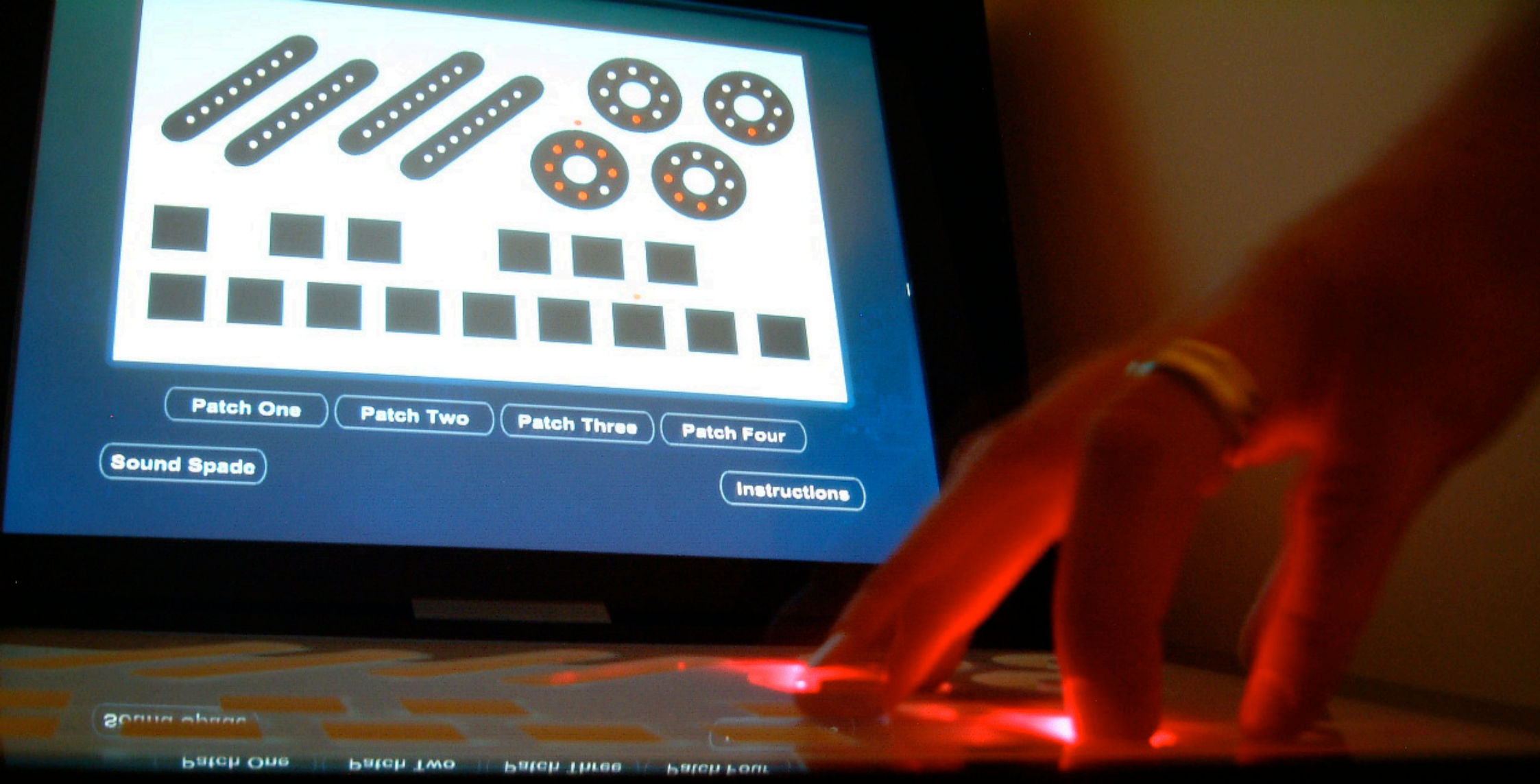
2006

Hiding in New York video (1min 55sec) <https://vimeo.com/67693535>

Soundtrack created by Benjamin Bacon with Soundspade

Soundspade is a crowd-sourcing digital music performance interface that generates experimental electronic soundscapes. It is an exploration that reimagines the relationship between musician and audience through interface design and peer-to-peer networks. The piece is a software and hardware tool that enables musicians to search, upload, play and compose, using a network repository of sound samples. The sound files can be contributed to the repository from the audience through local sharing via iTunes. The software analyzes the sound files for different musical qualities when they are uploaded. The musician can then search the repository based on musical qualities, and selected samples can then be downloaded. The Soundspade software downloads songs from shared iTunes playlists, and then analyzes, slices, and ingests them into the repository for use in the hardware.

Music created by the artist using Soundspade was used in artist Liu Bolin's video installation Hiding in New York.



Soundspade
Software interface with touch pad control system.



Soundspade
Full instrument view.

The Soundspade hardware is an embedded Linux music workstation designed to be portable and easy for musicians to use. It incorporates touch sensitive technology for its key controls. The main premise behind the music workstation is to provide an integration of an audio and MIDI enabled computer and MIDI controller. The hardware supports Open-Source MIDI and audio software making it a versatile workstation for any musician. With the addition of the Soundspade client software, the musician can upload, search, and download samples from the Soundspade repository.