METACREATION LAB FOR CREATIVE AI

ARTWORK + PERFORMANCES + SYSTEMS

METACREATION LAB FOR CREATIVE AI

As a contemporary approach to generative art, Metacreation involves using tools and techniques from artificial intelligence, artificial life, and machine learning to develop software that partially or completely automates creative tasks. Through collaboration between scientists, experts in AI, cognitive sciences, designers and artists, the Metacreation Lab for Creative AI is at the forefront of the development of generative systems, be they embedded in interactive experiences or integrated into current creative software.

Scientific research in the Metacreation Lab explores how various creative tasks and workflows can be automated and enriched with generative AI and co-creative interfaces. These tasks include music composition, sound design, video editing, visual effect generation, 3D animation, choreography, and video game design.

Besides scientific research, the team designs interactive and generative artwork that builds upon the algorithms and research developed in the Lab and challenges the social and cultural discourse on AI and automation.

This portfolio features selected systems, performances, and installations created by the Lab members and their collaborators in recent years.

AUTOLUME

Autolume: Neural Video Synthesizer

Using our in-house deep neural visual models for generating real-time video, Autolume breathes live motion into visuals. Our AI-based VJing program can be controlled manually or can react to an audio feed, or any OSC controls thus becoming a powerful real-time AI visual synthesiser.

Given the rarification of live performances during covid, the visualization system has been used to create two audiovisual installations so far: Autolume Acedia and Autolume Mzton. A series of NFTs and collaborations with visual artists are to be released shortly.

INSTALLATIONS

Dystopia Sound Art Festival
March 2021, Istanbul, Turkey

Light Up! Kelowna - ARTSCO
February-March 2022, Kelowna, Canada

Provocation Ideas Festival
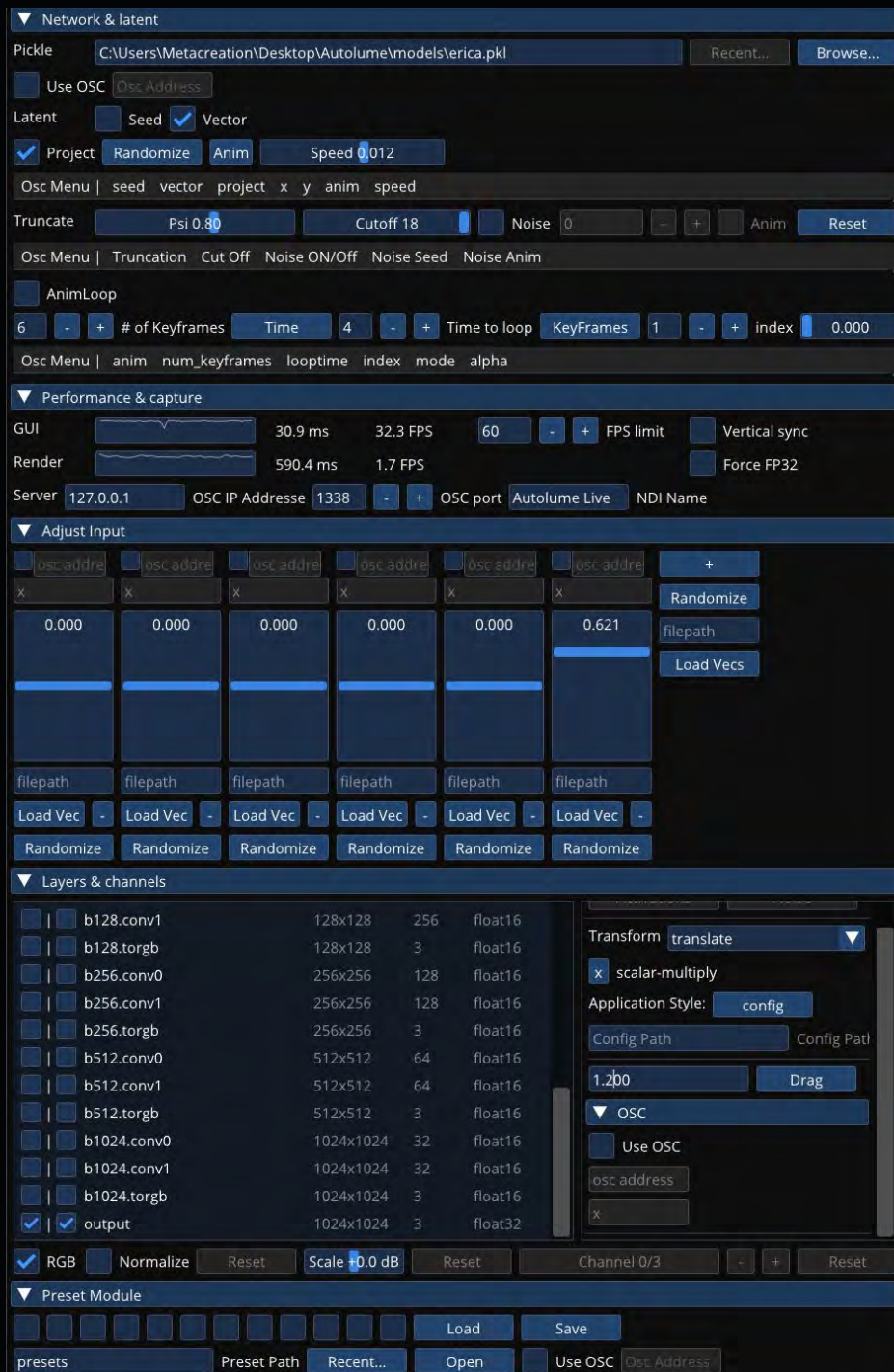June 2023, Toronto, Canada

CREDITS

Philippe Pasquier – Artistic direction & sound design
Jonas Kraasch – Artistic direction & programming

IMAGE CREDITS
This page & cover: Philippe Pasquier.
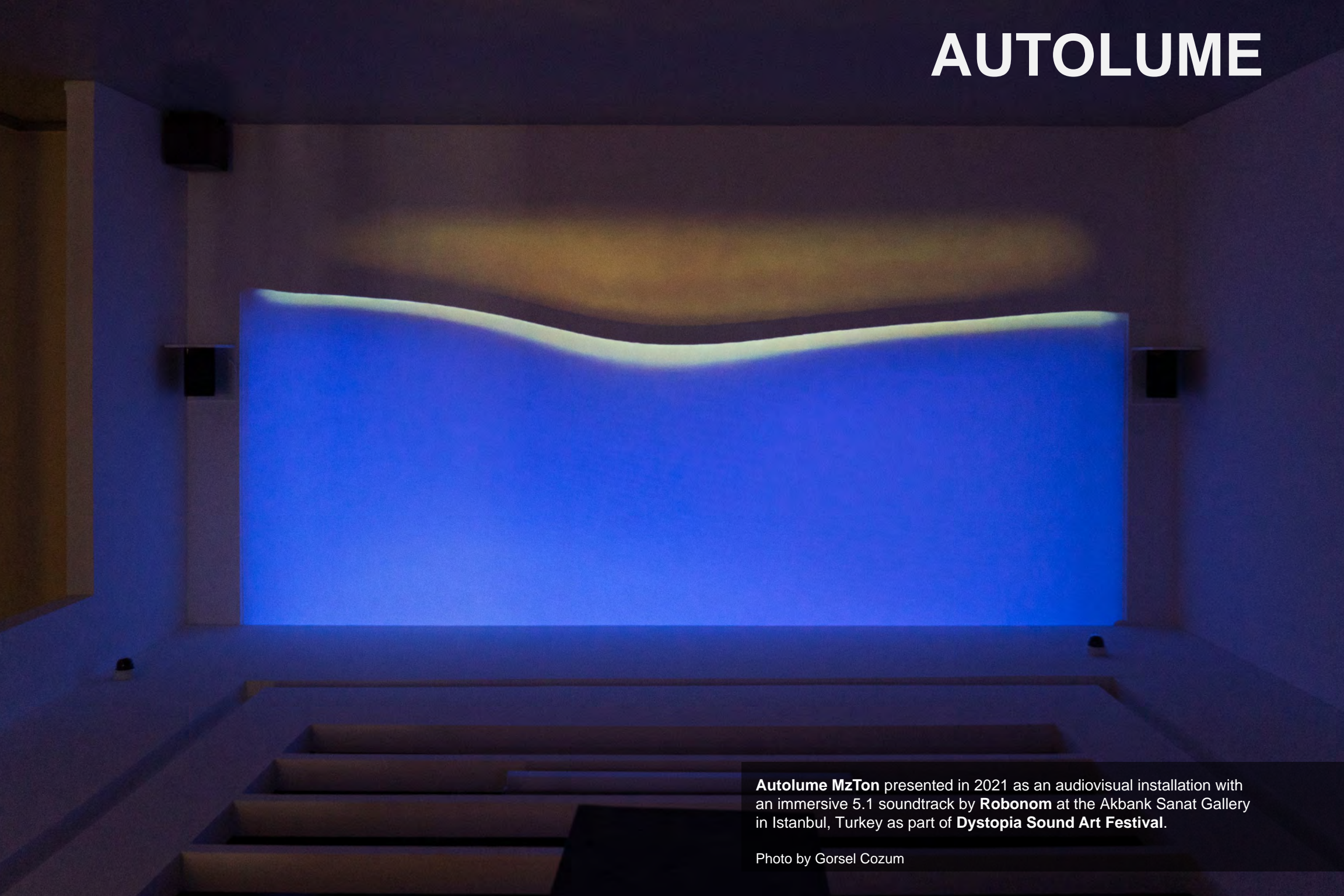Images produced by Autolume Live with model of artwork by Erica Lapadat-Janzen

AUTOLUME

Autolume v2 is a powerful no-coding live visual synthesizer allowing users to train disentangled and compressed **StyleGan-2-ada** models from small ethically acquired datasets. Here, the system is playing a model of artworks by new media artist Erica Lapadat-Janzen.

Autolume MzTon presented in 2021 as an audiovisual installation with an immersive 5.1 soundtrack by **Robonom** at the Akbank Sanat Gallery in Istanbul, Turkey as part of **Dystopia Sound Art Festival**.

Photo by Gorsel Cozum

LONGING + FORGETTING

Longing + Forgetting presents the idea of generative choreographies amongst multiple video agents, or 'digital performers'. Using a simple movement 'alphabet' that borrows from Laban concepts such as effort, weight, and space, the 12 physical performers were filmed traversing a climbing wall. This resulted in thousands of video clips which were then analysed and tagged according to basic movement properties. As such, each video agent is comprised of many fragments of movement, which are stitched together with rules that govern their goals and actions.

CREDITS

Philippe Pasquier – Artistic direction & sound design
Thecla Schiphorst – Artistic direction & choreography
Matthew Gingold – Artistic direction, coding, editing & animation
Greg Snider – Set design
Kristin Carlson – Associate producer
Ben Rogalsky – Lighting design
Josh Burns – Editing & animation

Performers: Shannon Cuykendall, Matt Duncan, Sarah Fdili Alaouim, Meghan Goodman, Marcus Marshall, Joshua Ongcol, Priya Rajaratnam, Bladimir Santos Laffita, Nathalie Sanz, Cara Siu, Yawen Wang, & Martin Wong

Image by Matthew Gingold

EXHIBITIONS

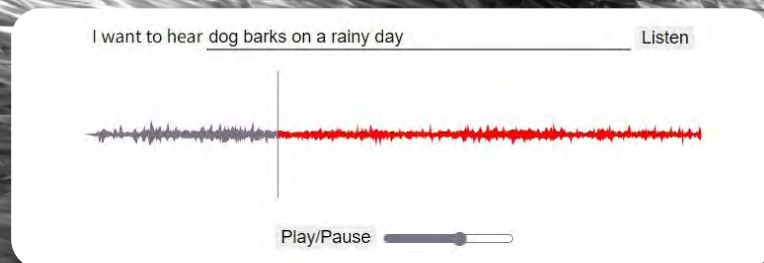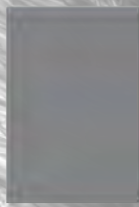**Surrey Urban Screen.** Surrey Art Gallery
January-May 2014, Surrey, Canada

Beyond Festival, ZKM
September 2016, Karlsruhe, Germany

Art.CHI
May 2017, Denver, USA

FRAME: A Biennial of Dance
March 2023, Melbourne, Australia

AUDIO METAPHOR

I want to hear dog barks on a rainy day — Listen

Play/Pause

The text analysis identifies key semantic indicators used to search for related sounds either locally or online. The algorithm, SLiCE, attempts to optimize search results to maximize the combination of keywords in a result. Sounds returned from the search are cut up based on a perceptual model of background and foreground sound. Each classified segment is then run through a predictive model applying mood-based labels to the sound from a two-dimensional affect space.
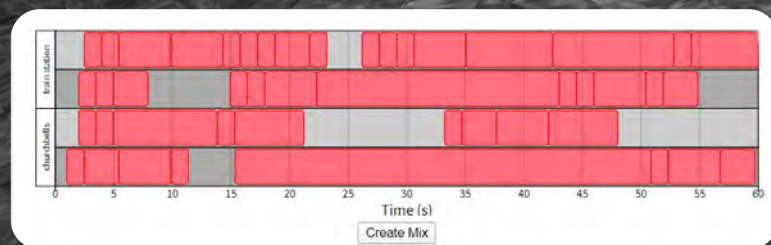
A mixing engine takes labelled sound segments, selecting, arranging, and mixing them into a soundscape. The engine creates separate tracks for semantic groups returned from the search and the mixing engine inserts corresponding sounds onto these, based on the overall mood at a particular time. The volume envelope of the mix is calculated by the control system. The generative results of Audio Metaphor reveal the human-like creative processes of the system and are used for assisting sound designers in-game sound, sound for animation, and computational arts.

▶ Scan the QR code on this page to try the latest web version of Audio Metaphor yourself

Audio Metaphor Soundscape Generation Research

Audio Metaphor is a soundscape generation engine tailored for computer-assisted sound design. When presented as an artwork, it presents itself as a search engine in which the audience is invited to enter an expression or a sentence that will serve as a request to the automatic soundscape generation system. Enter a query like "The waterfalls inundate the city" or "The marshmallows explode in the campfire" and it will start playing a soundscape corresponding to it! Using state-of-the-art algorithms for sound retrieval, segmentation, background and foreground classification, automatic mixing and automatic soundscape affect recognition, Audio Metaphor is a powerful system that generates rich and believable soundscapes at an interactive rate. This interactive audio installation is questioning the ubiquity of information, be it real or fake, actual or synthetic.

PERFORMANCES AND INSTALLATIONS

Sight+Sound Online Festival - Eastern Bloc
July 2021, Montreal, Canada

Alternator Centre for Contemporary Art
April 2016, Kelowna, Canada

ISEA 2015, Vancouver Art Gallery,
August 2015, Vancouver, Canada

CREDITS

Philippe Pasquier – Artistic direction & sound design
Miles Thorogood – Artistic direction & programming
Jianyu Fan – Programming & development
Renaud Bougueng-Tchemeube – Programming
Joshua Kranabetter – Programming

IMAGE CREDITS
Background by Remy Siu (REVIVE, 2018)

CALLiOPE

Session
ISMIR-2022   New Session

Ch. 10
Instrument
standard kit

☐ Mute Solo Select All

Density   Min Polyphony   Max Polyphony
0.00   1   4

Ch. 3
Instrument
electric bass (finger)

☐ Mute Solo Select All

Density Min Polyphony Max Polyphony Min Note Length Max Note Length
0.00   1   4   1   4

Ch. 2
Instrument
electric piano 2

☐ Mute Solo Select All

Density Min Polyphony Max Polyphony Min Note Length Max Note Length
0.00   1   4   1   4

Ch. 1
Instrument
lead 8 (bass + lead)

☐ Mute Solo Select All

Density Min Polyphony Max Polyphony Min Note Length Max Note Length
0.00   1   4   1   4

Temperature

Soundfont
None   sgm-plus

CALLIOPE: A Co-Creative Interface for Multi-Track Music Generation

Calliope is a free-to-use computer-assisted interactive composition environment using our state-of-the-art Multi-track Music Machine (MMM) model for symbolic music.

Users can take advantage of the incredible compositional power of MMM to generate and re-generate music using a seed MIDI file via a practical easy-to-use graphical user interface. The system can interface with your favourite DAW (Digital Audio Workstation) such as Ableton Live or Logic with MIDI streaming functionality.

2.1 Add more midi file(s) to the session

2 Create a user session for the file(s) → **3** Select a midi file ← **9** Generated midi files

4 Select bars to generate   **8** Click [Generate]

5 Set track-specific controls

1 Upload a midi file   **6** Set global controls → **7** Set batch size

Computer-Assisted Composition

Calliope is used to generate new MIDI content from existing MIDI files or to generate from scratch. This is achieved by selecting bars to be re-generated and a destination instrument which will play the generated content (e.g. trumpet, drums, violin or piano). This influences the model generation because composing for a drums section is a different task than composing for as string section. Calliope is aimed at both amateur and professional composers/users. It is an outlet for exploring new creatively generated ideas for your next music project. It is also useful for experiencing alternative workflows to traditional music composition and production, and for explore AI possibilities in digital music composition.
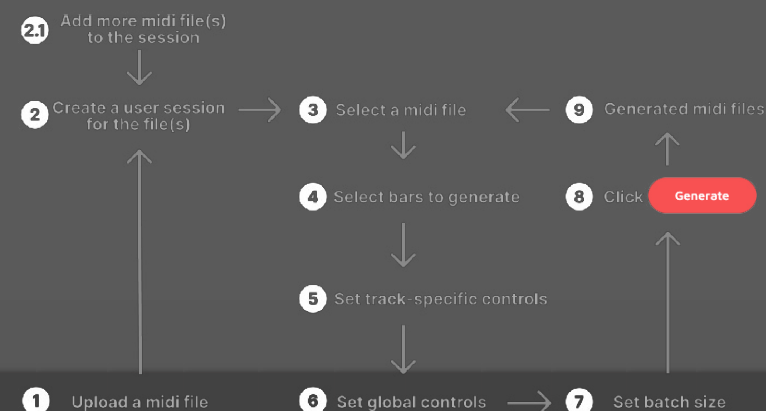
▶ Scan the QR code to the right to access the latest version of Calliope

CREDITS

Renaud Bougueng – Research & programming
Jeff Ens – Dataset & model development
Philippe Pasquier – Supervision & design
Vishesh Mittal – MIDI Visualizataion

MONOBOR

Thumping Machine Music

This series of energetic acid-house tracks are released under the monobor alias of Philippe Pasquier. The composition was carried out with a generative algorithm based on MMM (Multi-track Music Machine), a machine-learning tool for composition with MIDI information in development at the Metacreation Lab. The computer-assisted composition algorithm was deployed in collaboration with Stockholm-based electronic music instrument manufacturer, Teenage Engineering, and the music exclusively uses Teenage Engineering machines.
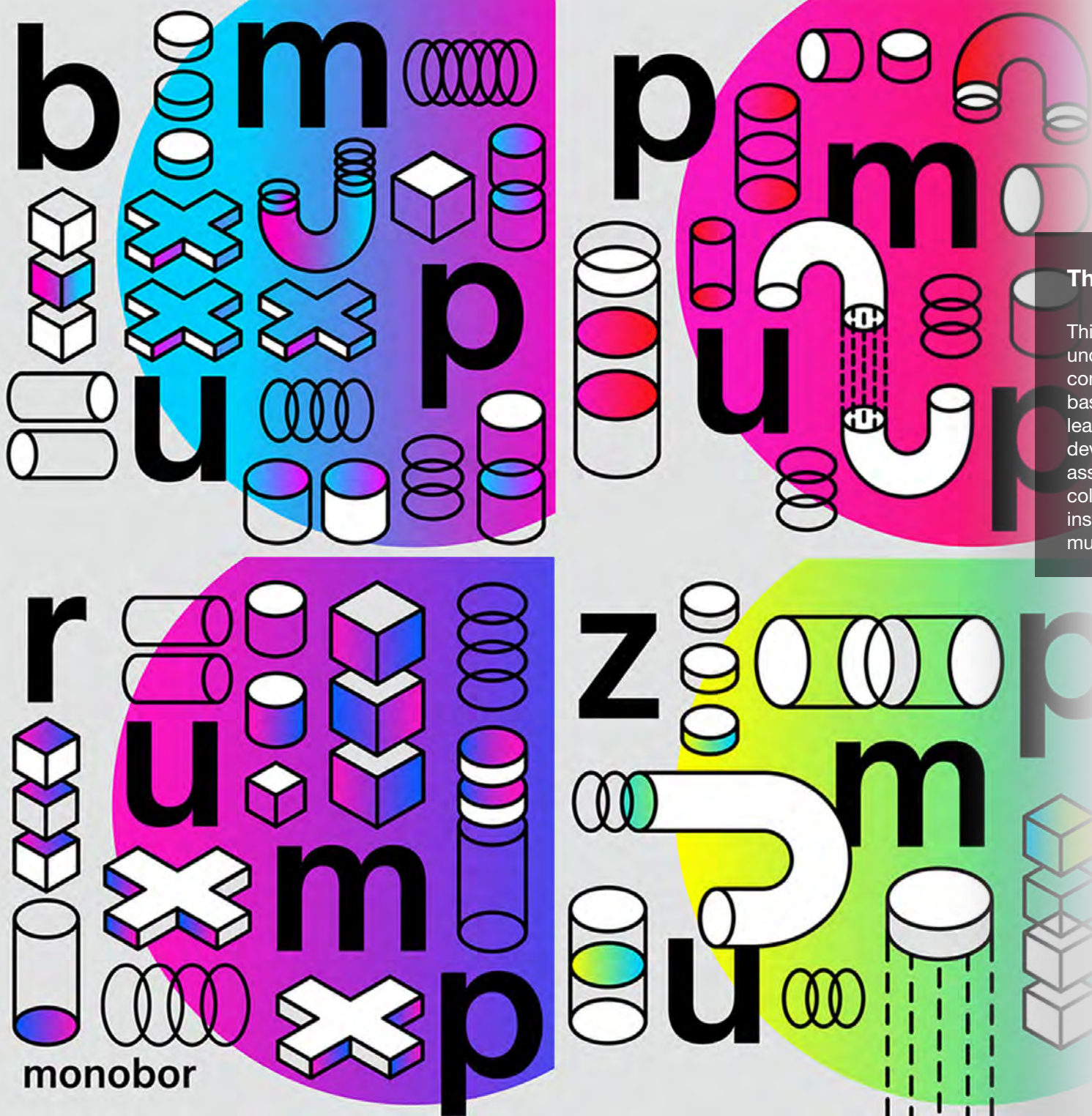
Stream monobor on various streaming platforms:

- Spotify
- Apple Music
- Youtube
- Deezer
- iTunes
- Soundcioud

CREDITS

Philippe Pasquier – AI development, music generation, interpretation & production
Jada Stevens – Album artwork
Kris Voveris – Mastering

REVIVE

REVIVE is the live interaction between the musical AI **MASOM**; electronic musicians Kıvanç Tatar, and Philippe Pasquier; with accompanying visuals generated by Remy Siu. MASOM (which stands for Musical Agent based on Self-Organizing Maps) is a musical AI that has learned electroacoustic and electronic music by listening to a vast quantity of it. For each musician, a corresponding visual agent puts its sound and musical decisions into images, thus revealing the musical gestures that are so often lost in electronic music performances.

PERFORMANCES

CHI2018, SAT (Society for Art and Technology)
April 2018, Montreal, Canada

Mutek, SAT (Society for Art and Technology)
August 2018, Montreal, Canada

ICST (Institute for Computer music and Sound Technology)
ZhDK, December 2018, Zurich, Switzerland

Living Things Festival, Okanagan Art Gallery
February 2019, Kelowna, Canada

NYCEMF 2019 Electroacoustic Music Festival
June 2019, New York City, USA

Boca Del Lupo at Performance Works Theatre
December 2019, Vancouver, Canada

CREDITS

MASOM – AI performer
Kıvanç Tatar – Performer & audio developer
Philippe Pasquier – Performer & system designer
Remy Siu – Collaborator & video developer

IMAGE CREDITS
Left: SAT, Montreal; Right: Mirjana Prpa

iOTA

iOTA is an audiovisual performance that integrates the visuals and motion of Ouchh with a soundtrack generated by a musical AI called **MASOM**. The agent uses machine learning and was trained using the music of Turkish composer and Audiofil director Mehmet Ünal. The agent receives events from the visual mapping program so as to maintain synchronisation.

PERFORMANCE

Ars Electronica, Deep Space 8k
September 2017, Linz, Austria

CREDITS

Ouchhh – Visual programming
Audiofil – Music composition
Kıvanç Tatar & Philippe Pasquier – AI design & programming

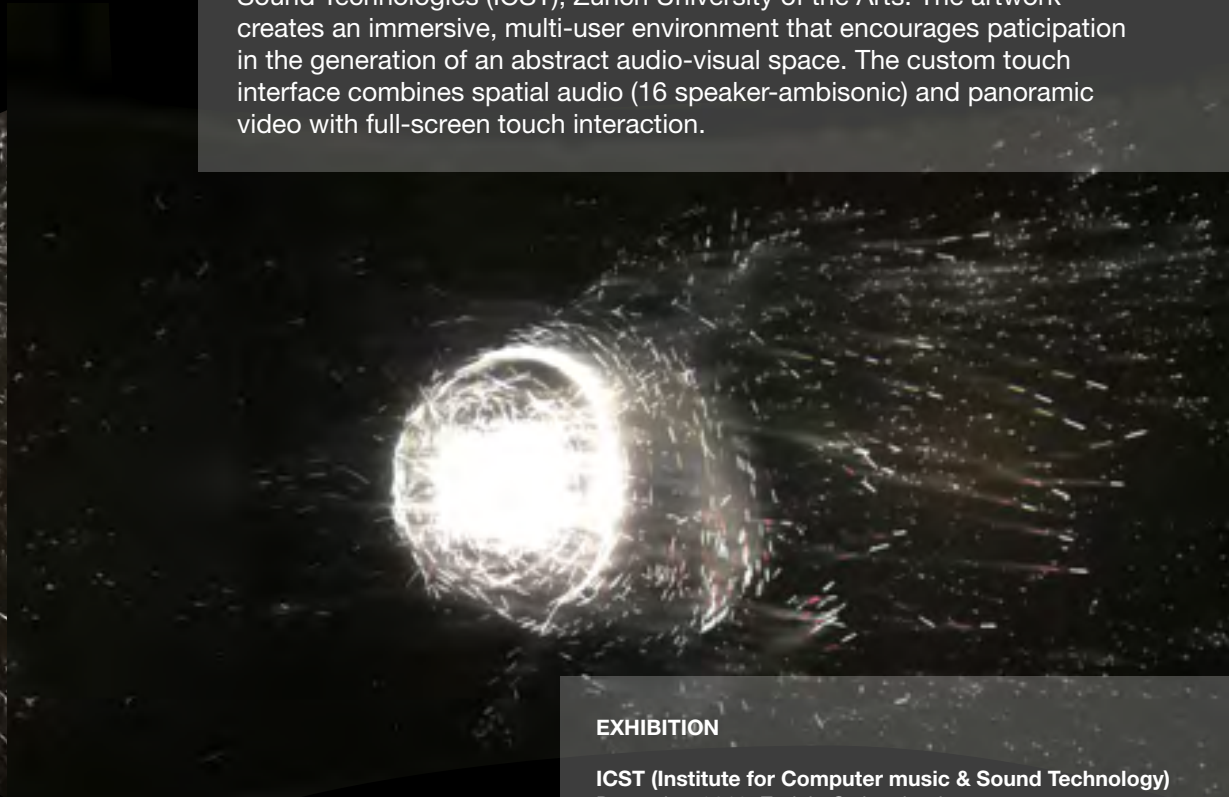**IMAGE CREDITS**
This Page: Ouchhh
Next Page: Philippe Pasquier

ZETA

Named after the sixth star in a constellation, **Zeta** is a touch-based interactive audio-visual installation artwork made for the custom 3D touch interface at the Immersive Lab of the Institute for Computer Music and Sound Technologies (ICST), Zurich University of the Arts. The artwork creates an immersive, multi-user environment that encourages paticipation in the generation of an abstract audio-visual space. The custom touch interface combines spatial audio (16 speaker-ambisonic) and panoramic video with full-screen touch interaction.

EXHIBITION

ICST (Institute for Computer music & Sound Technology)
December 2018, Zurich, Switzerland

CREDITS

Kıvanç Tatar – Developer Audio & Visual Programming
Philippe Pasquier – Audio Curation & AI Training

IMAGE CREDITS
Philippe Pasquier

THETA

Theta is a facade projection piece that integrates the visuals and motion of Ouchh, with a soundtrack generated by a musical AI called **MASOM**. MASOM stands for a Musical Agent based on a Self-Organized Map The agent uses machine learning and is trained using the music of Turkish composer and Audiofil director Mehmet Ünal. The agent receives events from the visual mapping program, maintaining perfect synchronization.

PERFORMANCES

IMAPP 2017
September 2017, Bucharest, Romania

ARTECHOUSE
March 2018, Washington DC, USA

Circle of Light Festival
October 2017, Bolchoi Theatre, Moscow, Russia

CREDITS

Ouchhh – Visuals
Audiofil – Music composition
Kıvanç Tatar & Philippe Pasquier – AI design & programming

IMAGE CREDITS
Imapp (Stills From Video)

RESPIRE

Respire brings together a virtual environment (via head-mounted display (HTC Vive), embodied interaction (via a respiration sensor), and an intelligent musical agent to listen to breathing patterns and generate the sound with affective properties. Built upon mindfulness principles, breathing is utilized as an object of the user's attention through impermanence of virtual landscapes and audio environment. The changes in Respire are generated directly from changes in breathing patterns, as the user becomes aware of their breath and the agency they have in the environment.

EXHIBITIONS

Pulse Breath Water, OneArt Space
March 2016, New York, USA

P.O.E.M.A, OiFuturo,
July-August 2016, Rio de Janeiro, Brazil

Pulse Breath Water, **MUTEK VR Salon**
November 2016, Montreal, Canada

Art.CHI
April 2018, Montreal, Canada

Digital Carnival
September 2018, Richmond, Canada

CREDITS

Mirjana Prpa – Art direction, VR design
Kıvanç Tatar – Art direction, audio & AI design
Philippe Pasquier – System design

IMAGE CREDITS
This page: Mirjana Prpa
Next page: Sheng Ho

RESPIRE

PrayStation

This piece begins with an initially empty digital canvas, a prayer dial, and an electroencephalogram (EEG) headset. The user is invited to wear a headset and select from one of the eight most predominant religions: Christianity, Islam, Agnostic, Atheism, Hinduism, Chinese Folk and Confucianism, Buddhism, and Animism.

The user is then invited to pray, meditate or focus, while the system analyzes the user's brainwaves for activity. As the user reaches the appropriate mental state, virtual agents, a few pixels in size, appear on the canvas and start painting an iconic image representative of the chosen belief system. The more focused the user is, the faster the agents work, the more relaxed the user is, the larger the agents are thus impacting the canvas more.

EXHIBITIONS

Audain Gallery, Goldcorp Centre for the Arts
June 2014, Vancouver, Canada

ISEA2016, Museo Arte de Caldas
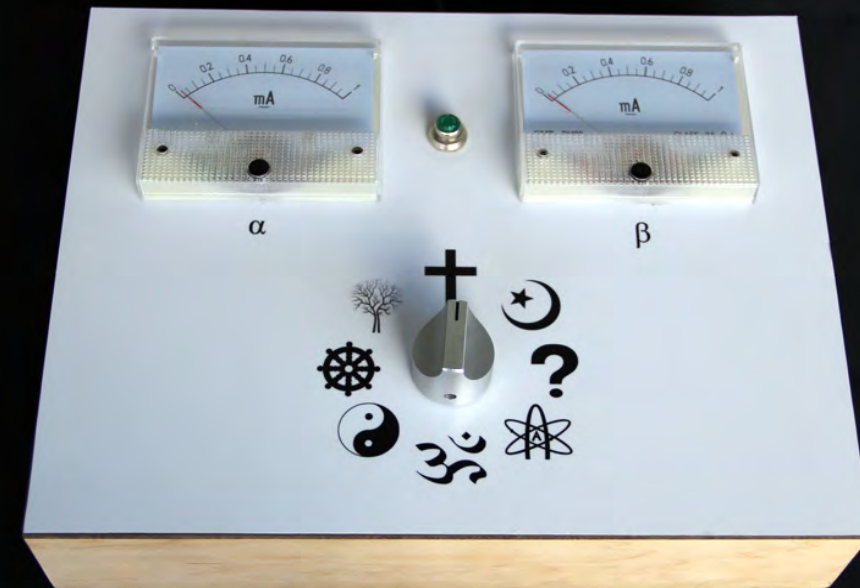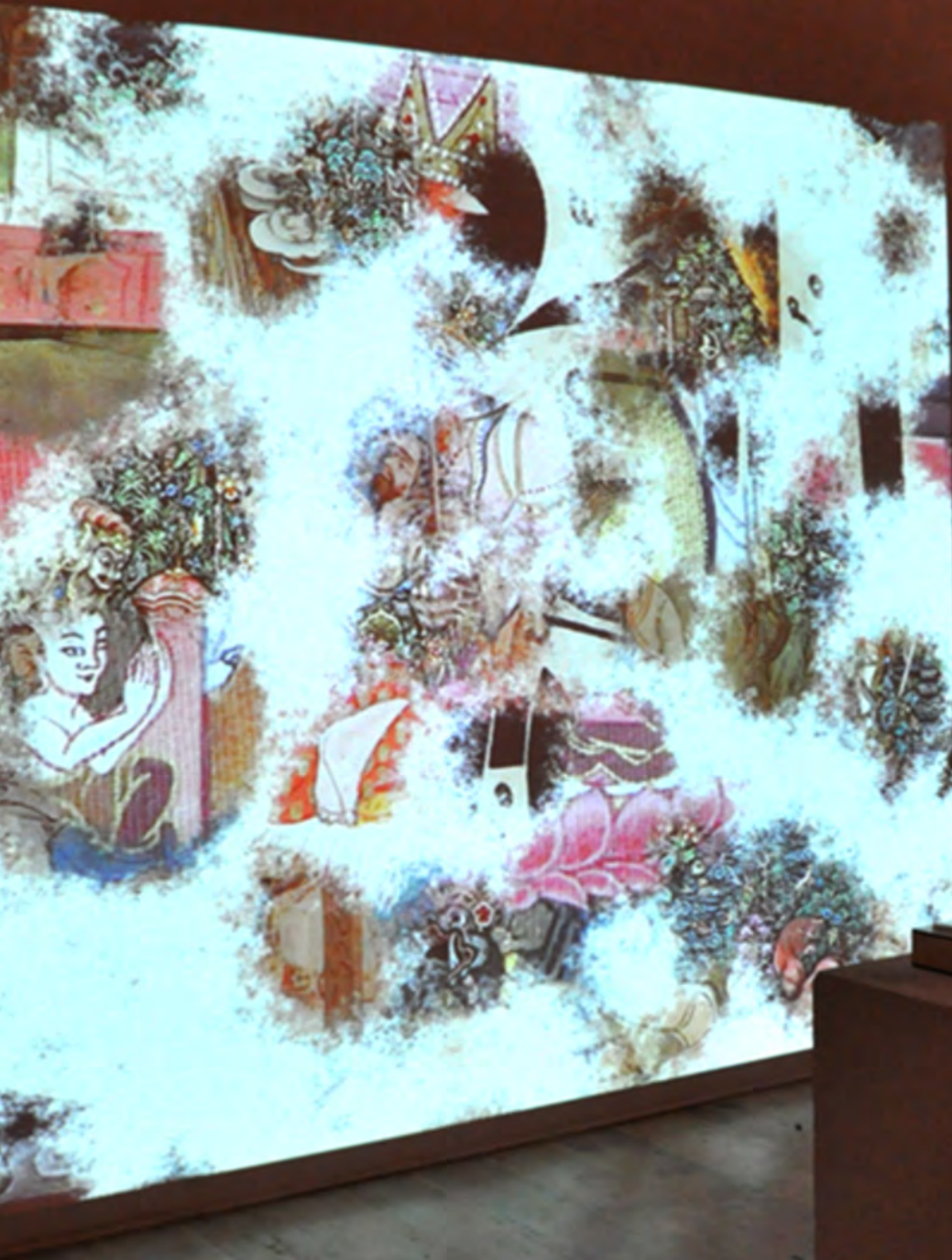June 2016, Caldas, Colombia

CREDITS

Justin Love – System design, electronics, & visual programming
Philippe Pasquier – System design & audiovisual programming

IMAGE CREDITS
This & next page: Justin Love & Philippe Pasquier

PrayStation