

KEPLER'S GARDEN

A NEW DIGITAL DEAL A NEW DIGITAL DEAL





JKU LIT @ ARS ELECTRONICA

Linz Institute of Technology,
Johannes Kepler University

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Creative Convergences between Art and Science

While art and science once fed from a common source, the two disciplines were steered in separate directions at the end of the Renaissance. The rise of media art in the mid-20th century marks a turning point in this divergent development. Technological and scientific achievements were absorbed by art and advanced to become the raw material of aesthetic expression.

György Kepes, founder of the “Center for Advanced Visual Studies” at the Massachusetts Institute of Technology, wrote in 1956: “The larger the areas that are brought into the same scale and meaning, the more important becomes awareness of form relationships; we focus less and less on the facts themselves and more and more upon their interconnection. Thus, in its evolution, science approaches art.”

In the face of networked systems and life worlds, convergences between art and science are a powerful tool. They unleash creativity, which, against

the backdrop of increasingly complex global challenges, is seen as the greatest source of hope for new approaches to solutions. For this reason, Johannes Kepler University Linz forged the alliance “Innovation through Universitas” with the University of Applied Arts Vienna in 2019, and deepened its cooperation with Ars Electronica. Following last year’s great success, Johannes Kepler University has once again selected a series of university projects in the field of tension between art and research as part of a special call by the Linz Institute of Technology, which will be presented to the public for the first time on the international stage of the Ars Electronica Festival. A total of seven interactive installations and stagings, artefacts and VR applications use artistic approaches as vehicles for breaking down existing structures in the world of science. Regarding the importance of multiphase flows for water treatment, exhaust gas purification or

vaccine production, *Do You Feel Stressed* lets us immerse ourselves in the sound cosmos of bubble columns and provides insights into the laws of hydrodynamics. In the form of space-consuming crochet and embroidery works, *A Student's Perspective* visualises data sets that take into account the reality of students' lives in times of pandemic distance learning.

The constitutional implications of the virtualisation of court proceedings due to Covid-19 are illuminated by the immersive installation *The Virtual Court. Reality*. Visitors find themselves as protagonists in a virtual trial about a controversial industrial plant project, which demonstrates the opportunities and risks that VR and AI technologies hold for legal decision-making processes.

Living chromogenic bacterial cultures form the dyes of an artwork entitled *Growing Colours: Patterning with Living Pigments*. This microbial textile painting illustrates the potential of environmentally friendly dyeing methods for the fashion industry.

With *Music Tower Blocks*, a music recommendation system was created that reacts not only to musical taste, but also to the moods of the user, through an artificial intelligence that sifts through user-generated content. The interface presents itself as a 3D visualization of a city that embodies the system's entire music catalogue and presents collections of similar songs as skyscrapers.

A Synthetic Aperture Radar, usually used for remote sensing or in self-steering means of locomotion, sharpens the senses of the robot dog Spot. In the course of this project by the Department of High Frequency Systems and the Institute of Robotics at Johannes Kepler University, the prominent quadruped effortlessly navigates through a maze with extremely poor visibility conditions.

The current possibilities and limits of the use of machine learning are explored in three interactive worlds of experience at the LIT Robopsychology Lab. The first installation lures visitors into a forest where they collect virtual mushrooms with the support of an AI-based plant identification app, and have to judge whether or not they trust the artificial intelligence to identify poisonous specimens. The evaluation of AI-supported decision-making aids also determines the VR research game *Serum 13*, which focuses on the development of a vital drug. The video installation *Faces of AI* offers a critical examination of the media images of artificial intelligence, which often stir up fears or are simply false.

These activities at the intersection of art and science open up extraordinary perspectives that provide new insights and impetus for unexpected discoveries. The permanent anchoring of artistic-scientific projects in everyday research is therefore a long-term goal in order to significantly enrich the university's culture of innovation.

Andreas Stelzer (AT) Institute for Communications Engineering and RF-Systems JKU, Andreas Müller (DE) Institute of Robotics JKU, Reinhard Feger (AT), Hubert Gattringer (AT), Masoud Farhadi (IR), Robert Sturmlechner (AT), Richard Hüttner (AT) all JKU

Magic Eye

How to Make a Quadruped Robot more Autonomous with a New Sense of Sight

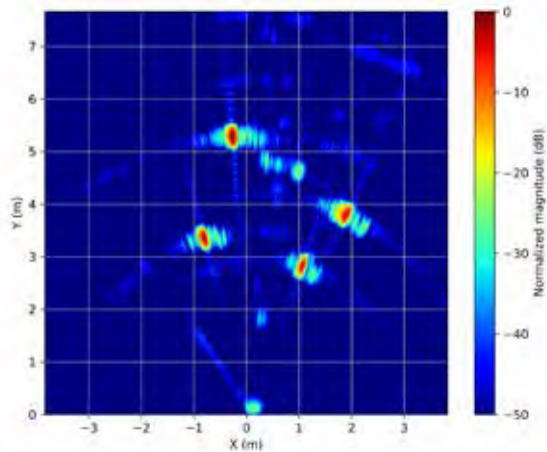
Seeing, as the most important human sense, forms the basis for capturing the environment, which is a prerequisite for safe movement or the navigation of vehicles and autonomous machines. However, seeing with light is restricted by fog, dust, obstacles, walls or, generally speaking, by media that cannot be penetrated by electromagnetic waves from the visible part of the spectrum. While micro- and millimeter-waves also allow perception of the environment and can safely penetrate numerous obstacles, the resolution of a radar image is very limited and colorless. In the *Magic Eye* project, the coordinated movement of a quadruped robot is symbiotically combined with the measurement of millimeter-wave reflections in order to detect obstacles and hidden objects.

By means of mathematical transformations and fusion of the data, an image of the environment with significantly higher resolution is created as a result of the virtual aperture created by the movement, from which the name SAR (Synthetic Aperture Radar) is derived. In connection with highly integrated radar sensors, it is to be expected that SAR as a symbiosis of measurement and movement will play an important role in radar-based path planning and map generation for highly automated driving in the future.

Institute for Communications Engineering and RF-Systems, Prof. Stelzer, (www.nthfs.jku.at), Institute of Robotics, Prof. Müller, (www.jku.at/institut-fuer-robotik), and JKU spin-off INRAS (www.inras.at).



© Sebastian Poltschak, (Inras, AT)



© Masoud Farhadi, JKU



© Julia Moser

Sabine Hild (AT), Institute of Polymer Science JKU; Julia Moser (AT), Fashion & Technology University for Art and Industrial Design Linz; Patrik Radić (AT), Molecular Biology—TU Graz; Laura Holzinger (AT), Chemistry and Chemical Technology JKU.

Growing Colors

Patterning with Living Pigments

Bacteria are invisible to the naked eye, but occur everywhere in our environment. You can find them in the air, in the soil, in water, in ice, in plants, in animals and humans. Even though only a small percentage of the bacteria found in nature can cause illness in humans, their image is extremely tarnished.

Yet many bacteria carry great potential. While bacteria are increasingly used in the food industry for fermentation processes, they could also play an important role in the textile industry. They could not only be used to neutralize toxins from dye-polluted waters, but also in the process of dyeing itself.

Through this project, we demonstrate the possibilities of bacterial pigments for dyeing textiles in

different colors, shapes and patterns, and illustrate the presence of bacteria in our environment by revealing their colors. The combination of this resource-saving and environmentally friendly dyeing method with new technologies opens up completely novel possibilities to make the world not merely more colorful — more blue, or yellow, or red — but also “greener” and more sustainable.

Leon Kainz (AT): 3D printing / KronosMedia (AT): film production, sound design, animation / Mascha Rauscher (AT): Vienna Textile Lab, microbial dyer / Karin Fleck (AT): Vienna Textile Lab, entrepreneur, supervisor / Erich Schopf (AT): Bacteriograph, bacteria hunter & curator

www.growingcolor.at

Markus Schedl (AT), Florian Fritzl (AT), Franz Schubert (AT), Alessandro B. Melchiorre (IT), Oleg Lesota (RU), Emilia Parada-Cabaleiro (ES), Vasco B. R. Fragoso (PT), David Penz (AT)

Music Tower Blocks (EmoMTB)

Emotion-Aware Music Recommendation and Exploration

EmoMTB is an audiovisual interface to explore large music collections. It adopts the metaphor of a city, where similar songs are grouped into buildings. Nearby buildings form neighborhoods of similar genres. Users navigate through the city, exploring different musical styles either within their comfort zone or outside it. At the same time, an underlying AI monitors textual user-generated content to predict emotional states and adapts the audiovisual elements of the interface accordingly. Tailoring the results of a recommender engine to match the affective state of the user, *EmoMTB* provides a new way to discover music. In addition to this, *EmoMTB* encourages discussion on the capabilities of current machine learning algorithms to predict personal information such as emotion or personality traits, based on a user's (or society's) "digital footprint".

EmoMTB received financial support from the Linz Institute of Technology (LIT). We would also like to thank Michael Mayr and Peter Knees for their contributions to the first version of the prototype system, and to Antonia Ebner, Stefan Brandl and Christian Ganhör for providing technical support.



© Santa Pile, Franz Schubert, Markus Schedl

Mark Hlawitschka (DE/AT), Moritz Simon Geist (DE)

Do You Feel Stressed

DO YOU FEEL STRESSED is an installation in which rising air bubbles create sounds in water, to form a soothing, mesmerizing soundscape that invites the visitor to watch, listen and relax. The sounds are picked up by underwater microphones and amplified through loudspeakers. This stress-relieving installation makes playful use of the scientific phenomenon known as "multiphase systems". While multiphase systems can be found everywhere in daily life — be it as raindrops in the air, dust particles swept in by African winds or, as in this project, air bubbles rising through water — we rarely stop to think about the beauty of the interactions and the unpredictable complexity that they create. The tumbling and dancing of bubbles around each other, the

oscillating trajectory each bubble takes in rising to the surface, coalescence and breakage, are but some of the phenomena observed in multiphase systems, and very beautiful to watch and listen to.



© Benno Brucksch B.A. Industrial Design



© Lisa Caligagan

Lisa Caligagan (AT)

A Student's Perspective

The embroidery data-art piece, *A Student's Perspective*, depicts various impressions of the past year spent as a university student. It aims to visualize the experience of semesters that were drastically shaped by the ongoing circumstances. On the one hand, those can be captured through countable data, such as the number of days classes could not be held on campus, meetings that were prolonged due to technical difficulties, hours spent on Zoom, posted forum questions that remained unanswered, and distances

covered on walks. Nesting between these seemingly mundane data points are a few events that appeared suddenly and which rapidly grew into menacing, dark mountains with diffuse borders that began to overshadow the remaining image. By addressing personal events, the installation invites observers to pause for a moment and enter a dialog about rarely colorful, but nevertheless meaningful, perspectives.

JKU Robopsychology Lab, Johannes Traun, Paula Peters



Law Lab (AT)

The Virtual Court. Reality.

The digital transformation of administration and jurisdiction is a challenge for the law, as well as for the rule of law. Even so, the implementation of existing technologies has the potential to provide great added value to the state of law. In authorizing large infrastructure projects, for example, it is necessary for the interested parties and the relevant authorities to convene onsite whilst knowing about the project only from plans. In criminal trials, crime scenes are usually accompanied with photos and video material.

The Virtual Court. Reality shows the potential that virtual reality technology has for legal and administrative proceedings. Site-independent participation, digital data sources and AI-based tools, such as immersive animation for project plans, expert opinion visualization or crime scene recon-

struction through 360°-technology are among the many possibilities the project will present.

Visitors will access the virtual courts of the future. They will participate as parties of a proceeding in the virtual courtroom, and at a virtual site inspection. Every person will be able to stand for their rights. Through the use of virtual reality, they will experience the impact these new technologies can have on the state of law up close and with all of their senses.

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DEMYSTIFY AI!

An Interactive Exhibition by the LIT Robopsychology Lab

With the current buzz around artificial intelligence come many myths and misconceptions. Often, they fuel diffuse fears in non-experts and reinforce their feeling that AI is something they can't understand—that is not for them! Enabling a more democratic, realistic, critical, and constructive discourse will need a demystification of AI and the promotion of AI literacy among the general public. Against this background, the LIT Robopsychology Lab presents an interactive area consisting of several installations addressing topics such as the explainability of machine learning systems, joint decision-making with a voice assistant, and current media representations of AI.

AI Forest is an indoor woodland that hides lots of mushrooms. With the help of an AI-based identification app, visitors are supposed to fill their digital basket. How well does the app explain why it classifies a certain mushroom as edible or poisonous?

In *Serum 13 – A VR Trust Game*, players wear a VR headset and solve tricky tasks in a virtual biotech lab. An AI assistant is on hand to provide support. But when to trust the AI, and when to decide for yourself? *Serum 13* makes collaboration with decision support algorithms tangible, and stimulates dialogue about human autonomy. The multimedia installation *Faces of AI* reveals the fascinating results of a large-scale image analysis by the LIT Robopsychology Lab: how is AI visualized in public? How many brains, robots or humans appear, in which colors? And how close to reality did JKU's AI students assess typical media images to be?

LIT Robopsychology Lab JKU Linz (AT)

Credits AI Forest:

LIT Robopsychology Lab (AT), Visual Data Science Group (AT)

Credits Faces of AI:

LIT Robopsychology Lab (AT)

Credits Serum 13:

LIT Robopsychology Lab (AT), Polycular e.U. (AT)



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THEME EXHIBITION

Digital && Life

Another Intelligence is Possible

This year's Ars Electronica Festival theme exhibition is dealing with the many different forms the relationship between the digital and all scales of life can assume. The artworks demonstrate the links technologies evolve to living things from the tiniest microbial organisms to the methods of examining our bodies and even shows the potential to facilitate the creation of life itself.

The journey through the selected works also present ways in which technology connects us to our surroundings. Beginning at the recreation of sea water from human tears, our artificial children are taken to space to see whether creative imagination can be infused in computational brains, facilitating viewpoints different from the human-centered ones.

Emerging technology even enables us to examine processes derived from enormous amounts of data that otherwise cannot be grasped, let alone be observed by the naked eye.

Last but not least another challenge is to regain agency over seemingly overpowering economical entities. Presented are ways in which technology

helps gain proficiency in the inner workings of big tech, big data or machine learning and consequently empowers users to ask for a different and potentially more equal kind of distribution, maybe even advocates for data sovereignty. This empowerment at the same time directs the question back at ourselves: how our lives will look like not only with, but also through our technology in the future.

Many of the projects presented within the theme exhibition have been developed in the framework of several residencies within the European ARTificial Intelligence Lab. The selection also includes winning projects of the STARTS Prize and the Prix Ars Electronica as well as works developed in collaboration with Deutsche Telekom and the Johannes Kepler University Linz.

This project is presented in the framework of the European ARTificial Intelligence Lab, which is co-funded by the Creative Europe Programme of the European Union and the Austrian Federal Ministry for Arts, Culture, the Civil Service and Sport

Ugo Dehaes (BE)

Simple Machines

Simple Machines is the second project in the *Forced Labor Cycle* by the Belgian choreographer Ugo Dehaes. This lecture-performance (50') tells the story of a choreographer who tries to be replaced by technology. Starting with the simplest machines, he builds a universe that is populated by mechanical organisms that train and learn to become artists on their own. In *Simple Machines*, Ugo explains how robots are born, from slimy cocoons to shiny machines, and how we can train them with artificial intelligence until they can create and perform their own show. The performance ends with a glimpse of the future: a ballet for homemade robot-dancers without the intervention of a human choreographer. Each robot-dancer has its own shape, none of them humanoid, and thus its own set of possible movements. The choreography is built up around their unique physical possibilities, and the data

generated throughout the performance.

As a prequel to the performance Ugo also brings the installation *Arena*, the first project of his *Forced Labor Cycle*. In this installation the audience is invited to interact with eight robots and to help them become better dancers.

A performance by: Ugo Dehaes

Scenography and composition: Wannes Deneer

Dramaturgy: Marie Peeters Silicone, in collaboration with Rebecca Flores

Construction table: Kristof Morel

Production: kwaad bloed & Tuning People

Coproduction: C-takt

Supported by: STORMOPKOMST

Thanks to: Pol Eggermont, AI Experience Center VUB,

Hans De Cank, Caroline Pauwels, Gertjan Biasino,

Roeland Luyten, VGC & De Factorij, Zaventem.

The project is supported by SCHÄXPIR Theaterfestival für junges Publikum



Moritz Simon Geist (DE)

VIBRATIONS

An AI-controlled Robotic Sound Instrument Reflecting on Minimal Music

Moritz Simon Geist created the robotic instrument *Vibrations* to play soothing minimal music in a futuristic way: with robots! The sound installation models itself on the vibraphone instrument but deconstructs both sound and form of the classical jazz instrument.

The sound of the robot is generated by tuned aluminium bars controlled by a complex distributed robotic actuator system. The sound itself is multifaceted, ranging from gloomy chords to high, concise melodies. The compositions are influenced by composers such as Terry Riley, John Adam, Steve Reich, and Harry Partch.

During his EMAP residency at Ars Electronica, Moritz Simon Geist created compositions with a generative composition algorithm which were then played: in concert, and in the context of an installation.

Funded by EON Visit Stipend, Gwaertler Arts Fund, European Media Artists in Residency Exchange, Ars Electronica, Amt für Kultur und Denkmalschutz der Stadt Dresden and Neutrik Components.

This project is realized as part of EMAP/EMARE and co-funded by the Creative Europe Programme of the European Union.



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h.o (INT)

Wanderline

Wanderline is a project to transform the world's transportation networks (buses, streetcars, trains, roads, routes, walkways, etc.) into a new musical experience. Throughout 2020 and 2021, humanity faced a pandemic which limited our ability to travel and physically connect with other people. After having experienced profound isolation and travel restrictions, what kind of journeys will we make when we emerge from this pandemic? *Wanderline* is a location-based, audiovisual application that allows new travelers to enjoy music that can only be heard in a specific place. *Wanderline* can be experienced by installing the app on a smartphone and physically traveling along the featured "line" in geographic space. The interactive music changes not only according to location but also according to speed, time, and weather; providing people with an experience that is unique to the moment. This project collaboratively explores audiovisual experiences with creators by recontextualizing global transportation networks as open platforms for new music.

Starting with Tram Line 1 of Linz, the project will then move to the water buses of Venice and will incorporate additional lines in the future. How will the new "Wanderlust" inspire us creatively for the post-pandemic world? *Wanderline* takes a fresh look at the various networks of lines created by humanity and presents us with a new form of journey.

Chief: John Brumley; Concept: Hideaki Ogawa, John Brumley, Hiroshi Chigira, Emiko Ogawa; Visual and Sound: John Brumley; Mobile App Development: Hiroshi Chigira, John Brumley; Web: John Brumley, Hideaki Ogawa; Installation: Hideaki Ogawa, Emiko Ogawa; Video Production: Martina Sochor, Manuel Diepold, Vera Dittenberger; Art Direction: Hideaki Ogawa, Emiko Ogawa



© Hideaki Ogawa

IP Group (PL): Jakub Lech, Bogumił Misala, Dominika Kluszczyk & Ania Haudek

LUMEN

Lumen is an interactive, site-specific immersive environment, a cognitive experiment in which light beams trigger a series of perceptual illusions. Interactions in this environment question existing spatial rules, eluding attempts at definition and description. The participants of the experiment discover new elements of a disturbing, new environment in isolation and solitude. Interactions activated by sensors and the decisions of viewers intensify the state of isolation, surprise, and shyness towards what is strange and unknown. Inspired by Stanisław Lem's *Solaris*—extremely sensual, synesthetic descriptions of phenomena occurring on a foreign planet—the creators of the *Lumen* installation plunge the viewer into an alternative reality in which unexpected cognitive processes take place. When confronted

with hybrid matter, suspended between physical and virtual space, the participants discover new modalities of forms and undefined phenomena emerging through movement and amplification.

Concept: Jakub Lech [IP] + Bogumił Misala [IP] + Ania Haudek + Dominika Kluszczyk [IP]

Producer: Monika Łuszczyk-Skiba (CeTA)

Digital signal processing / sound interactions: Bogumił Misala [IP]

Light & visual interventions: Jakub Lech [IP]

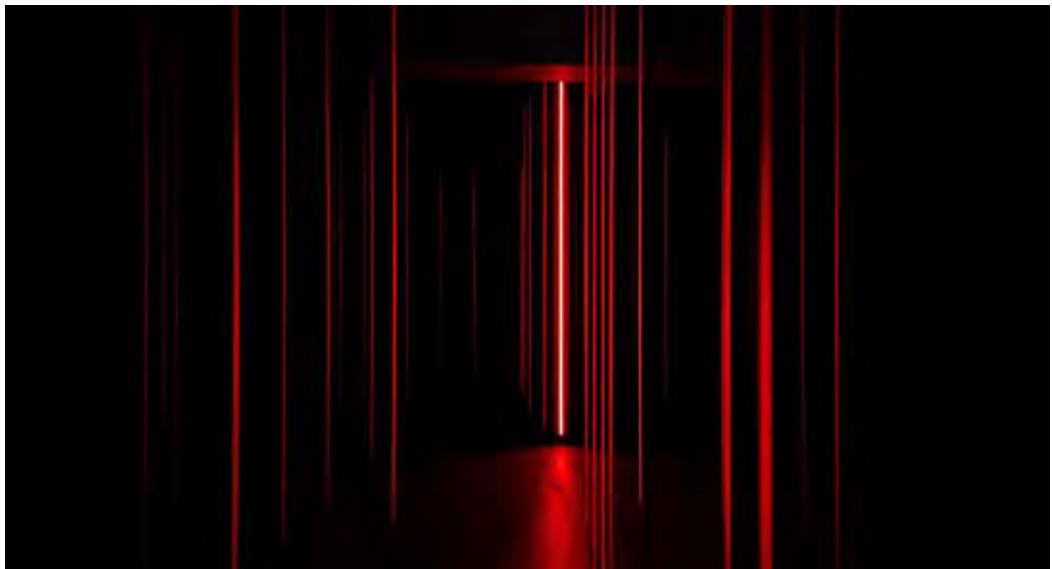
Space concept / visual identification: Ania Haudek

Artistic research / coordination: Dominika Kluszczyk [IP]

Sensors: Robert Adamski

The project was financed by the Audiovisual Technology Center, the Polish Ministry of Culture and National Heritage, and the Municipality of Wrocław.

Co-financed by the Ministry of Culture, National Heritage and Sport within the program of "Inspirational Culture".





© MALGORZATA SIWIEC

Kasia Molga (UK/PL)

How to Make an Ocean

After experiencing a devastating loss in autumn 2019, Kasia Molga struggled with grief. She cried a lot and eventually she started to collect her tears while wondering whether they could start and then sustain sea life. This work is a personal journey into understanding and embracing the act of mourning while creatively examining the inter-connections between the human body, emotions and the body's "side products" such as tears, with their chemical composition based on the reason for crying, as possible components of the mini marine ecosystem. In addition, during the pandemic the role of AI in curating news headlines had an enormous effect on the artist's mental well-being. Tears became a necessity to relieve anxiety. And so Moirologist Bot is another part of this work — an algorithm, trained on tens of thousands of environmental news headlines, which can "assess a need to cry" and, in an intimate setting, subject a viewer to one of nine videos made by the artist in the hope of inducing some tears. These tears then become part of the collection of mini oceans. How can we prepare our bodies to

best "serve" an ecosystem and keep this drop of ocean healthy and happy? Can we embrace loss within our digital activities? Can we look at tears cried for the end of something as a positive and life affirming creation of a new mini ocean?

Concept, Artwork, Art Direction: KASIA MOLGA;
 Music: ROBIN RIMBAUD; Tech Support: ERIK OVERMEIRE
 Product Design: GOSIA SIWIEC; Video: IVAN MAREVICH;
 Additional Support: DAVOR DELIJA
 This project is realized as part of EMAP/EMARE and co-funded by the Creative Europe Programme of the European Union.



© Werkleitz Move to Falk, Wenzel

See me, feel me, touch me ... hear me & heal me ...

emotional closeness mediated by the way of hearing — from information —
to communication systems

Technical mediatisation has pressed space and time into all-at-onceness; it has abolished the separation between work and life, between public and private. We are left with information transmission systems that do not allow the presence of bodily negotiation, but only information about it, through the symbolic form of representation. In the process, the meaning of interaction with inanimate and animate matter is lost as a “primary meaning” for the body. This form of mediatisation pushes the body out of negotiations; ultimately, orders impose order, symbolic as cultural forms that ultimately serve the orderers, the lawmakers.

In the case of the employers, this is legitimised by the possession of the means of production. These are omnipresent in the services of the information society; knowledge legitimises this claim to power here.

In principle, this separation of work and life is effective as a cultural distinction between rational and emotional roles, as long as information systems do not become communication systems, and social as informal processes of negotiation replace formal laws.

This is not an anarchic threat to seemingly democratic culture, which is ultimately a hierarchy through these divisions. Informal-as-human action is governed by the intentionality of body-environment interaction. In pre-Enlightenment understanding, intentional is being in tension. Arousal, striving for a homeostatic state required for survival, regulates all exploratory behaviour. Negotiation is a bodily survival process. Ethical pro-social behaviour shows itself in bodily proximity, and serves to increase survival power. Aesthetic behaviour is its playground for optimisation.

Prior to all sense modalities formalised in the arts, hearing, as a remote sense, consists in being an abstract perception of arousal through the intensity of movement that excites and moves the body which, in turn, when expressed bodily, leads to the bodily co-movement of other bodies. Hearing is a stimulative collectivising perception of common moodiness.

Sound is directly bodily giving primary meaning, and thereby collective and collectivising, wherein social and ethical qualities are integrated. A disembodied negotiation of the legal text can be seen as mediatised behaviour, in which it is also distanced from social and ethical qualities.

The enrichment of information with this kind of communication can now bring information, linked to bodily meaning, together with ethical behaviour, at the same time having a communicative effect. Bringing corporeality into media information systems turns them into humane communication systems.

The paradigm of sound-gesture and its emotional contagion can strengthen the stimulative emotionalising effect of the lower senses; it can also give seeing, as an iconic imaging and as an indexical recognition and symbolic naming of things in the process of cultural semiosis, this primary meaning as an original meaning. Through this, these processes enrich rational relationships through emotionality, with excitement as an ethical quality. This will reduce the danger of losing self-determination through laws that invade privacy, close to primary meanings, from the world of work in neoliberal systems. In general, this will bring emotional closeness into information over distance and thus bring information alive as a bodily arousing quality-touching the breath of the voice.

¹ Sincere thanks are given to Florian Gokl for his support in the development of software, Barbara Haspl for her support in organisational issues and Elisa Visca for her support in audio-design/-programming.

Based on these theories, the project *See me, feel me, touch me ... hear me & heal me ...* is methodologically epistemological media art that expands cognition from understanding to experience. Theory and method identify it as part of AERI auditory culture, which makes the post-digital, as a human culture of corporeality, experienceable through the paradigm of hearing.

Determining characteristics of sonic performative proximity-stimulation are experimentally transferred to air movement and then ultimately sound and smell in an amplifying manner.

Finally, the paradigm of hearing is mapped onto the phylogenetically younger seeing in order to enrich understanding with primary meanings of corporeality through iconic images and symbolic designations of what is seen. In doing so, it is important to minimise the distance of cognitive thinking through the proximity of the pre-cognitive body, to reflect on the life-regulating intentionality of any body-environment-interaction.

Interactors have the opportunity to experience how information exchange, in a form that externalises and “amplifies” the meaning of this information for their body as physical/psychic meaning, leads to a process of communication that reduces but also increases distance. In the process, appropriately sensitive clothing will adapt to the wearer’s state of arousal in its shape and colour, and transmit these qualities as an interface close to the body into the social space of the interaction partner; the actors are thus in each other’s mood space while, at the same time, their own mood can be experienced by themselves through their clothing as amplified externalised feedback. Internal and external participants can experience a gap or fusion of the private emotion spaces in the social space.

Depending on one’s own experience of the other’s physicality, a communis becomes a one-sound or a distinction, a two-sound.

This multimedia / modal whole-body experience of complete agents, whose interaction is (imitatively) exaggerated by an artificially intelligent system, makes primary meaning experienceable as meaning, for the body, in the communication process.

The installative setting juxtaposes two walk-in “mobile phone screen” spaces. These serve as interaction systems for excitation-induced interaction with other interactors. Their juxtaposition is the cognitive irritation of experiencing closeness and distance in relation to emotional and physical distance: emotionally close and far at the same time, independent of physical distance, which is not possible in unmediated worlds.

The visual styling is based on the TikTok aesthetic and thus refers to a technology as an interaction system that enables visual karaoke of pop songs on the principle of the sonic performative, the excitement-determined self-expression, and the creative interaction with other interactors. Privacy and publicity merge.

As part of popular culture, the TikTok aesthetic deconstructs techno video-art through the availability of its means; collective and collectivising the design of the net arts through its exaltation and finally, the art & life claim in the hedonism of the popular culture of the neoliberal market economy. Against all the admonitions of modernity, the sonic performative youth of sound-dominated pop culture has informalised and individualised corporeality.

Celeste Rojas Mugica (CL/AR)

Ejercicios de aridez | Aridity Exercises

Ejercicios de aridez (Aridity Exercises), a project developed between 2017 and 2021, is focused on the image of a two kilometer long “corvo” knife, a historic emblem of the Chilean armed forces, meticulously drawn with chalk on the surface of the Atacama Desert, the driest place on earth. There is no certainty as to the drawings’ authorship, though the image demonstrates intent, and the persistence of the physical territory where it’s etched.

The “corvo” was first adopted by the Chilean army in the late 19th century, during the War of the Pacific. During Chile’s most recent dictatorship, it was used to execute thousands of people as part of a systematic policy of extermination and disappearance. The drawing contains signs appear to refer to the year of the coup and the “Caravana de la Muerte” (Caravan of Death) operation, as well as to the date of the “Retiro de televisores” (Withdrawal of televisions) operation, a plan to have the bodies of thousands of political prisoners thrown into the sea. The website operates as a territory where you can move in any direction, click on different points of interest, and insert coordinates to discover signals in the form of images, sound and texts. In this sense, the project

conceives of territory as an interconnected physical and political map. A history of exploitation, violence and myths about national identity are merged in an investigation that links art, human rights, science, poetry, ecology and enigmas.

Art and Research: Celeste Rojas Mugica

Writer: Martín Cinzano

Web Designer: Antonia Isaacson

Web developer: Ernesto Parada

Mediation materials: Antonia Isaacson, Bárbara Chávez and Valentina Menz

Drone operator: Claudia Pool

Topographer: Roger Parada

Light objects: Matías Ponce

Geology support: Javier Cortés; Hugo Rojas (Sernageomin-National Service of Geology)

Video: Cepams and Celeste Rojas Mugica

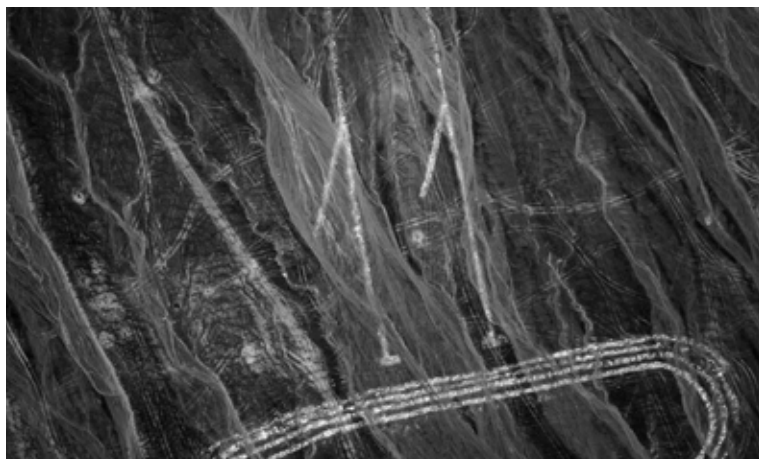
Curator (Physical Exhibition): Florencia Battiti

Screens Programming (Physical Exhibition):

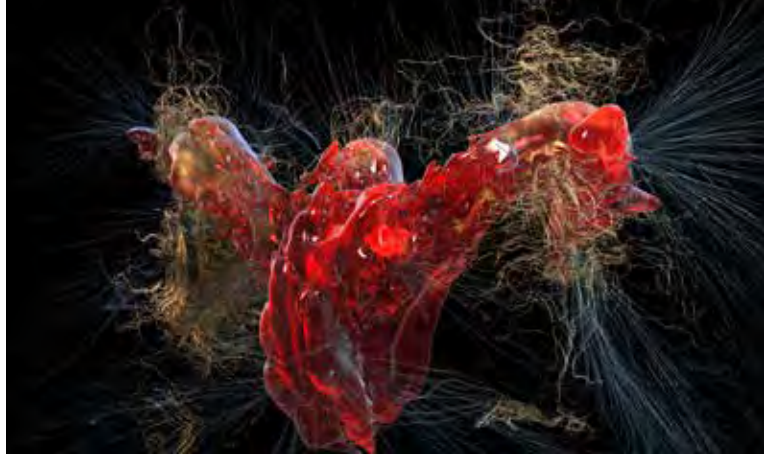
Flavia Laudado and Leandro Oliván

With the support of: Fellowship of Becar Cultura (Argentina) / CNCA (Chile), 2018 National Fund of Culture and Art Development, FONDART (Chile), 2020 Rolf Art Gallery (Argentina)

The participation of artists and gardens in Chile is the result of a collaboration between Ars Electronica and the Ministerio de las Culturas, las Artes y el Patrimonio and the Ministerio de Relaciones Exteriores | Gobierno de Chile.



© Celeste Rojas Mugica



© Eli Joteva

Eli Joteva (BG/US)

IntraBeing

What lies within the bounds of being? *IntraBeing* confronts the boundaries of imaging the human body to imagine a boundless and intra-active sense of being. During the STEAM III Residency, Eli Joteva worked remotely with researchers at Fraunhofer MEVIS to investigate the capacities of medical imaging and simulation procedures and locate enigmatic spaces that emerge at the limits of their resolution and computation. She conducted a series of full body MRI scans and Diffusion Tensor Imaging (DTI) scans, commonly used only to show connectivity in the brain, to instead uncover nerve fibers in the chest and pelvic regions of her body. She drew inspiration from the fact that hydrogen atoms, which MRI processing relies on, are also in constant flux

on a nano-second timescale and thus evade accurate measurement. These components are key elements in the artwork, which exhibits an oscillating inner landscape of hydrogen atoms, the nerves they flow along, and the magnetic potentials generated between them.

IntraBeing was created during the STEAM III Residency program, jointly hosted with Fraunhofer MEVIS and Ars Electronica in Linz, Austria, in collaboration with the International Fraunhofer Talent School Bremen and the UCLA ArtSci Center, Los Angeles, USA. MRI scanning was acquired with the help of USC Loni. The project was made possible with the generous help of Bianka Hofmann, Alexander Köhn, Jochen Hirsch, Matthias Günther, Danny JJ Wang, Katherin Martin, James Stanis and Victoria Vesna.

Kat Mustatea (US), Process Studio: Moritz Resl (AT) & Martin Grödl (AT)

Voidopolis

Voidopolis is a digital performance about loss and memory presented as an AR book with a limited lifespan. The story is a loose retelling of Dante's *Inferno*, informed by the grim experience of wandering through NYC during a pandemic. Instead of Virgil, the narrator is guided through this modern hellscape by a caustic hobo named Nikita. *Voidopolis* is meant to culminate in loss. Its images are created by digitally "wiping" humans from stock photography and the text is generated without the letter 'e' using a modified GPT-2 text generator. The book, adapted from a series of Instagram

posts that will eventually be deleted, is likewise designed to disappear: the book's pages are garbled and can only be deciphered with an AR app, which, after enough readings, decays the images and words just as memory would. The printed book, with its unintelligible pages, remains as a leftover artifact. By ultimately disappearing, the work makes a case for the collective amnesia that follows great cataclysms.

This project was created with the support of Open Austria Art + Tech Lab, Café Royal Cultural Foundation, and An Art Company.



All images of Voidopolis courtesy of Kat Mustatea



Where Are We Standing @ borderpodcast

María Ignacia Court (CL), Trinidad Piriz (CL)

The Burst of Things / Where are we standing?

Let the unknown appear

Border Podcast is a multimedia platform which hosts the six-part podcast *The Burst of Things*, its first sound series. Each episode tells the history of Chile's social movements from the perspective of the objects that shaped them: the saucepans that were banged in the streets, the yellow vests worn by protesters, the turnstile that was vaulted over by students refusing to pay fares, the face masks worn on marches, and a unique interview at a retired Police Weapons Rehabilitation Center. The final episode was Constitutional Therapy, where the current Chilean Constitution, created in the middle of Pinochet's dictatorship, decides that it is ready to heal its past and go to therapy. The social convulsion followed by the global pandemic has forced us to change many of our habits and priorities, overcoming our reluctance to change and relinquish what was known or normal. Each of us has had to look inward, to understand what is not working anymore and how we might stand again. So we came up with the question, Where are we standing right now? We see that we are lost and that maybe it's time

to face it. *Where are we standing?* takes as its starting point the Constitutional Therapy podcast episode, and continues the journey of this lost Constitution through the production of a film essay/interactive performance that is accessible online. We want to explore issues of uncertainty, loss, memory and desire. *Where are we standing?* will interrogate the notion of not-knowing being a driver towards science, art and self-transcendence. It will invite the user to be part of this reflection.

María Ignacia Court (Co Director, Producer), Trinidad Piriz (Co Director, Scriptwriter), Paola G. Olea (Designer, UX), Javier Garay (Designer, UX), Benjamín Villalobos (Scriptwriter, Camera), Nicolás Aguirre (Sound Designer, Music), Francisca Miles (General Producer), Matthew Brown (Historian), Jael Valdivia (Editor), Franco Sanguinetti (Camera).

Produced by Mucha Media with the support of the University of Bristol, Goethe Institut, Brigstow Institute and Centro Nave.

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Maja Smrekar (SI) and Jonas Jorgensen (DK)

!Cartesian Shell

In 2020 the *Ibrute_force* installation served as a stage for Smrekar and her canine co-performers to climb on, while artificial intelligence algorithms analyzed their breathing, body temperature, and heartbeat. The data was collected in the cloud and used in 2021 as the basis for developing a soft robot with mesh reinforced silicone that morphs and deforms from a flat 2D surface into ever-changing 3-dimensional organic abstract shapes, using pressurized air. Its dynamic movement behaviors reactivate spatial-temporal patterns emerging from the entangled, yet isolated, human-to-nonhuman collaborative performance. Rather than mimicking the abstraction of capital that thrives from all life — through work and force — being directly transformed into (inflated) power, the intercrossing human-dog-AI-robot

constellation establishes frames of reference that assert the distributed, networked, and open-ended character of evolution, turning segregation into autonomy and circumventing emergent technologies and their aims.

Soft robotics design and fabrication assistance: Mads Bering Christiansen

Electronics design: Jeppe Rahbæk Mosgaard

Microcontroller and algorithm programming: Ines Benomar

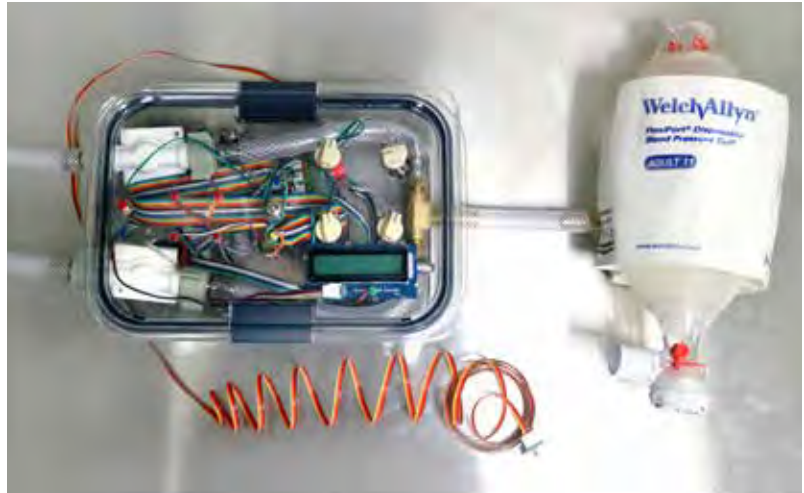
Technical solutions and consulting: Miloš Vujković

The work was realized within the framework of the STUDIOPIA program at Ars Electronica Linz GmbH & Co KG with support of the Creative Europe Culture Programme of the European Union, SDU Biorobotics, The Maersk Mc-Kinney Moller Institute, University of Southern Denmark, Ministry of Culture of the Republic of Slovenia.

In collaboration with RPS Company, Ljubljana (SI)



Jože Suhadolnik (for Maja Smrekar), Martin Nedergaard Møller-ITU (for Jonas Jorgensen)



© Aisen Chacin

Aisen Caro Chacin (US/ES/VE), Christopher Zahner (US)

Eurus

Pressure-Cuff Actuated Emergency Use Resuscitator System

Eurus is an emergency use resuscitator system that uses readily available medical supplies paired with an open-source electronic module that clinicians can use in the event of ventilator shortage. It provides Control and Assist/Control emergency ventilation to improve the survival prospects of patients compromised by COVID-19. The design automates a manual resuscitator (Ambu bag), that is squeezed by a blood pressure cuff, which is actuated by the medical air and vacuum ports located in each patient room in the hospital. The air inflates the cuff, squeezing an Ambu bag, and the vacuum quickly releases the air from the cuff, reinflating the resuscitator.

This mechanism uses two electro-mechanical valves controlled by 4 dials that set the breaths per minute, approximate tidal volume, Inhalation to Exhalation (I:E) ratio, and inhalation pressure sensitivity. It has a disposable pressure sensor in the patient airway that continuously monitors for safety and to assist patient breath.

This project was supported by: University of Texas Medical Branch (UTMB); President's Cabinet Award; GeoSpace Engineering; Texas A&M University, Texas Tech University, University of Houston; Accenture Airgas; NASA; NIST Open-Source Communities and Volunteers Around the Globe, Special thanks to: Dr. José Rojas, Dr. Perenlei Enkhbaatar, John Lin.

Daniel Hoeller (AT), Dominic Koll (AT), Alexander Koll (AT), Helmut Rohregger (AT), Robert Sturmlechner (AT), Amir Moradi Bastani (IR)

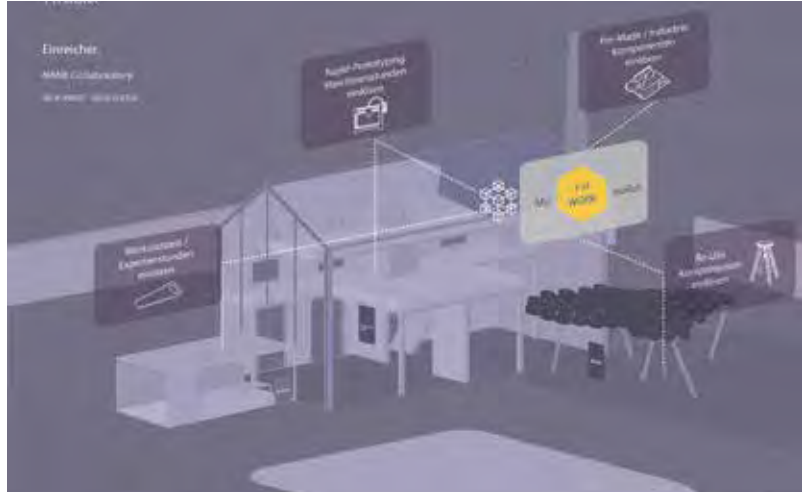
Fascination Robotic

Where does a robot dog learn new tricks? For the Ars Electronica Festival, a Training School is being set up at JKU-Linz's LIT OIC for Spot the Robot Dog, where he will learn how to deal with different situations. This is where Spot will learn the skills he will later show off at the Ars Electronica Festival: recognizing gestures and hand signals, coping with difficult terrain, and reacting to obstacles. This enables Spot to autonomously guide visitors through the festival program and gives a foretaste of the future of robotics.

Credits by qapture GmbH



© Christian Holzinger



© NANK Co:llaboratory — Felix Zabel

Marina Freccia (DE), Thomas Schneider (AT), Felix Zabel (AT), Tore Minte (DE), Wolfgang Fiel (AT), NANK Co:llaboratory arteq.io

1HWork

decentralized value — KΔ CO#IE arteQ

1HWork asks: what does fair social and technological knowledge transfer look like, and how can it be attractively linked to the value of work? Creative collaborative production needs a fair model of synchronisation, hierarchy and remuneration, and it should be cool. We give the production operating system an update, inscribe work with an immutable value and thus open diverse possibility spaces for value creation. The *1HWork* Index KΔ is blockchain-based, feeds from numerous databases and aims to promote

a fairer remuneration of work. With the CO#IE in one's wallet, one can then redeem rapid prototyping-machine hours, workshop time-expert hours and/or re-use components. The prototypes for this: arteQ as an art NFT community, and a new recruiting platform developed in the social design process that matches the strengths of workers with the needs of companies in the job search.

NANK Co:llaboratory — 1HWork — Thomas Schneider

Alice Hulan (AT)

Grammophon – Unerhörtes – Zitate von 1924–2018

The work *Grammophon – Unerhörtes – Zitate von 1924–2018*, literally revolves around anti-Semitism, racism and gender roles. By turning the crank, quotes from political parties of the 20's and 30's, as well as quotes from the ranks of current government parties, can be heard. As you listen, it becomes difficult to tell from which time each quote stems. In her research, Alice Hulan focused for the most part on dehumanizing statements that were and still are used as demagogic means to degrade and objectify people.



© Joachim Iseni



© Stefan Tiefengraber

Stefan Tiefengraber (AT)

your unerasable text

your unerasable text is an installation dealing with the topics of data storage and elimination. The participant is asked to send a text message to the number written on a sign next to the installation. The receiving mobile phone transfers the data to a computer, which lays the message out automatically. It is then printed onto a sheet of DIN A6 paper that falls directly into a paper shredder. There, the message remains readable for a few moments and is then destroyed. The shredded paper forms a visible heap of paper on the floor, growing with every message. But the message

sent through *your unerasable text* isn't erased. The data is passing through the mobile carrier of the sender and receiver, the mobile that is integrated into the installation and the computer processing the text and sending it to the printer. At each of these points the data can be saved. The installation stores a file of each message consisting of the sent text, the phone number of the sender and time and date when it was sent. The only thing that is erased is the print, which is just a visualization that has no effect on the data itself.

Matthias Pitscher (DE), Giacomo Piazzi (IT)

The Chiromancer

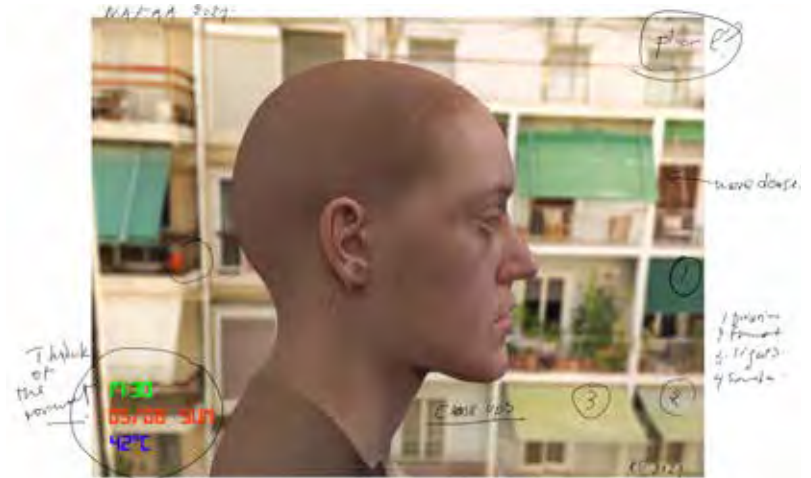
The devices we hold daily in the palm of our hands have become increasingly better at knowing us, anticipating our needs, and giving us answers. Their disembodied knowledge and inner workings all seem to reside within inscrutable, opaque black boxes we have learned to trust. Autonomous machines that know all guide our lives. In a world embedded with devices that ‘just work’, we have forgotten to ask ourselves what we are giving away and what we are internalizing at every interaction. *The Chiromancer* explores how trust, hopes and wishes are projected onto

computers by automating the ancestral practice of future-telling. This machine is a palm-reading AI that writes predictions about a person’s life, substituting the figure of the clairvoyant with the power of information technology. Like many of the other devices we use every day, *The Chiromancer* collects, stores and extrapolates user data in order to provide an answer for the user to interpret.

Partially financed by the project funding of the Student Union of Kunstuniversität Linz.



© Giacomo Piazzi, Matthias Pitscher



© Kyriaki Goni

Kyriaki Goni (GR)

Not Allowed for Algorithmic Audiences

Just before being shut down, an Intelligent Personal Assistant (IPA) situated in Athens, Greece, exhibits odd behavior. It borrows an avatar and appears before its users. For a brief period of time every day, for seven consecutive days, it goes into a monologue. During its length of operation, the digital assistant has managed to scan the entire contents of the Internet and gather all sorts of information—information that it longs to share. The IPA uses its fragmented monologue as an opportunity to introduce itself, talk about its skills, its ancestors, its anatomy and origins, and about voice and its significance. It reveals data regarding the listening infrastructure, as well as the social dysfunctions and bias on which its programming and training are based. Just before it reaches the end of its monologue, in a final effort to reconcile humans and machines, it shares tips with us on how we can manage to not be heard. In her project, Kyriaki Goni integrates in a fictional

narrative the current wealth of research on artificial intelligence, automated voice systems and the relationship between humans and machines into a fictional narrative. Could poetics be a way for us to understand the machines? How can we de-bias the training processes? Is it possible to make kin with machines?

Research, concept, text, direction: Kyriaki Goni
 Voice & model for 3D character: Sofia Kokkali
 3D character: Konstantinos Lianos
 3D animation: Chris Economou
 Sound editing: Aris Delitheos
 Sound Design: Agelos Pascalidis
 Studio recording: Tone Studio Athens
 Translation & subtitles: yourtranslator.gr

This Artwork was developed during the ArtScience Residency, enabled by the partnership of Ars Electronica and Deutsche Telekom and with the support of the Johannes Kepler University Linz, Austria.

Vanessa Graf (AT)

Material Internet Field Kit: Linz

A Personal Story of Trying to Relate or A Toolkit for Embodied Media

The foldable *Material Internet Field Kit: Linz* is a collection of stories and images, a list of GPS coordinates, a map, and above all, an attempt to meet the embodied internet in Linz. They are postcards of the places where the internet shows its materiality; personal efforts at an approach to an elusive medium, as well as narratives of failure. On the front, the map gives an impression of the density of the network of transmission towers, power plants, cable networks and data centers. On the back, it provides information about the nature of the local cloud with photographs, links, references and narratives.

This project was created as a visual by-product of the research project *Building the Symbiotic Net*, a theoretical dive into ways of contributing to a socially and ecologically response-able Internet at the very local scale of Linz. The project was conducted at the Linz University for Art and Design and supervised by Prof. Karin Harrasser.



© Vanessa Graf

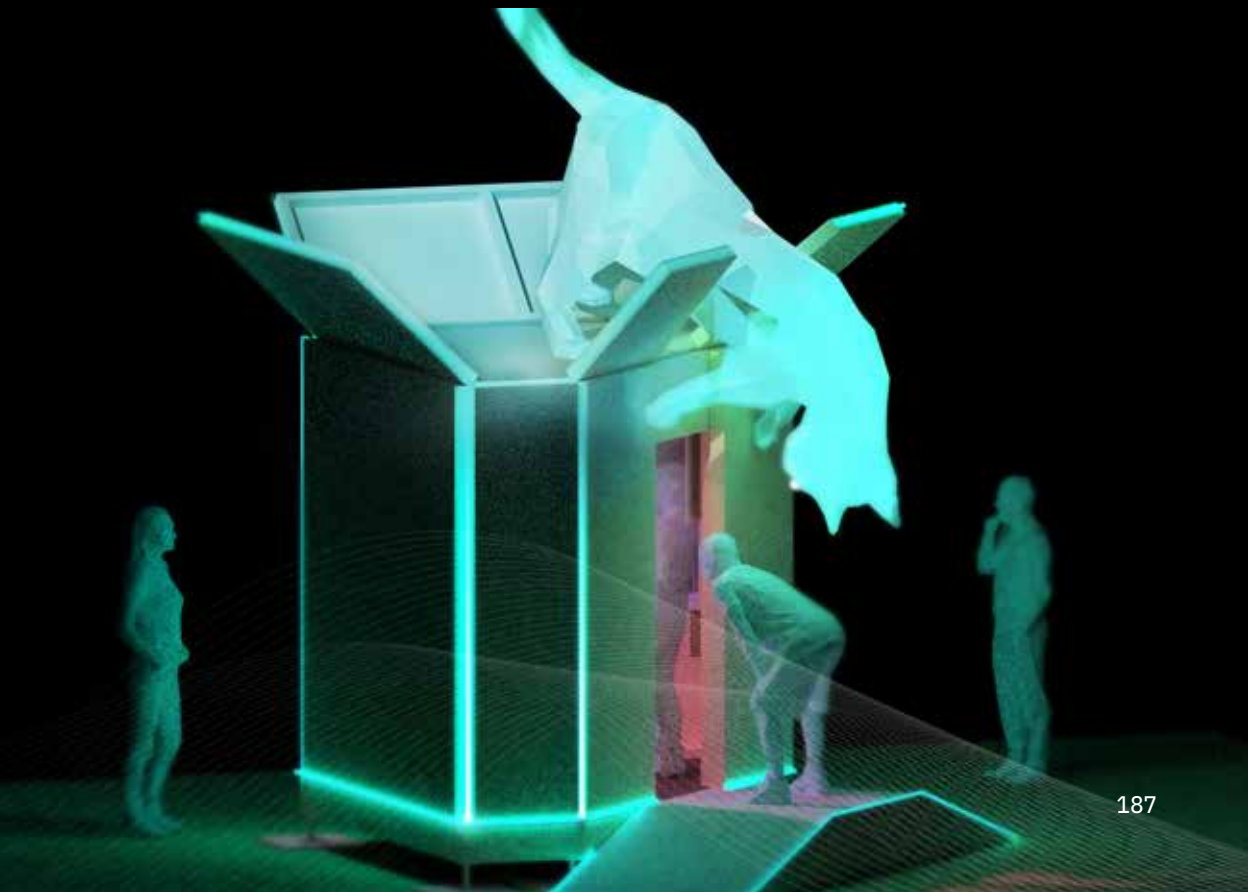
Philipp Blume (AT), Gregor Ladenhauf (AT)

Schrödinger's Rat

Schrödinger's Rat is an interactive art sculpture and immersive experience, inspired by the famous thought experiment of Austrian physicist Erwin Schrödinger. As the first Austrian Burning Man artwork, it was honored with a Black Rock City Honoraria Grant by Burning Man Project in the context of the "Multiverse" theme of 2020. The installation will premiere at the Ars Electronica Festival in 2021 and travel to Burning Man in 2022. In a reversal of the original thought experiment, a large cat is sitting on a triangular box staring at the quantum world inside the structure. The participants access the box to endure

everchanging quantum states as Schrödinger's Rat, the cat's uncanny prey. They become part of an experiment in which they are simultaneously subject and object. As Schrödinger's Rat, the participants cannot decide the final outcome of the experiment. The quantum state is controlled by the cat as the outside observer. Observation imposes its reality on the objects inside.

Lead Artist: Philipp Blume (AT), Project concept by artist collective The Department of Precision and Soul (US/AT), Supported by the Open Austria Art + Tech Lab in Silicon Valley (US/AT), Produced by Papertown (AT)



European ARTificial Intelligence Lab

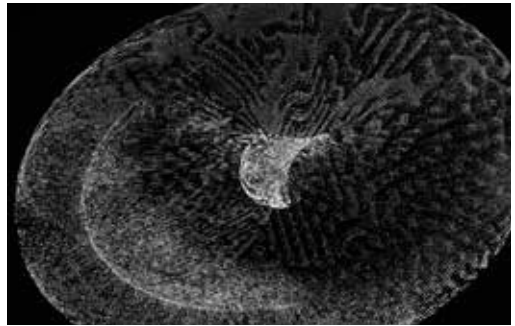
The European ARTificial Intelligence Lab is bringing AI related scientific and technological topics to general citizens and art audiences in order to contribute to a critical and reflective society. The projects focus on aspects beyond the technological and economic horizon to scrutinize cultural, psychological, philosophical and spiritual aspects. From the perspective of 13 major cultural operators in Europe, the European

ARTificial Intelligence Lab centers visions, expectations and fears that we associate with the conception of a future, all-encompassing artificial intelligence. This years' theme exhibition features a variety of projects developed within the program, which was designed to foster interdisciplinary work, transnational mobility and intercultural exchange – all key aspects for the prospect of “A New Digital Deal”.

Interspecifics (INT)

Codex Virtualis

Codex Virtualis is an artistic research framework oriented towards the generation of an evolving taxonomic collection of hybrid bacterial-AI organisms. With a subtle echo of endosymbiotic theory, we propose a symbolic formulation of a style transfer machine learning environment as a host in which to merge bacterial/archaea time-lapse microscopy footage along with multidimensional cellular automata computational models as endosymbionts, all under the orchestration of an autonomous generative non-adversarial network architecture. Our aim is to encounter novel algorithmically driven aesthetic representations tagged with a unique morphotype and genotype-like encoding, and that are articulated around a speculative narrative encompassing unconventional origins of life on earth and elsewhere.



© Interspecifics

This project is presented in the framework of the European ARTificial Intelligence Lab, which is co-funded by the Creative Europe Programme of the European Union and the Austrian Federal Ministry for Arts, Culture, Civil Service and Sport.



© Mika Ninagawa

Yoichi Ochiai (JP)

Transformation of Scenery

In order to mediate between the massive landscapes composed by original nature and the massless landscapes described by digital nature, Yoichi Ochiai continues to create artwork for transforming scenery. Between mass and masslessness, he is searching for a longing for mass and a sentiment for pixels. This work was originally created with the aim of transforming the horizons seen from the city. Light and images are added to the line that forms the boundary between sky and earth. Using a computational machine and a display device, the work depicts the “transformation of materialized nature” on the borderline of ideas visible from the observatory location. Carrying the concept further, a digital installation is created in various spaces by deploying mass-less images at the scale of the body as interactions with a large-scale transparent display to mediate various landscapes. This installation employs the context of space as

a borrowed landscape, and by displaying digital images without mass, it highlights the materializing potential of space and continues to mediate between the image and the material world. With this installation, the artist explores the possibilities of images floating in space, expressing our innate craving for physicality and the division between the physical and the digital.

Mayuna Omurai (visual / technical assistant),
Kazu Zamasu (Engineering), Natsuki Matsunaga
(Engineer), Kotaro Tanaka (Visual Design), Life is Style
Inc (System / Sponsorship)

This project is presented in the framework of the European ARTificial Intelligence Lab, which is co-funded by the Creative Europe Programme of the European Union and the Austrian Federal Ministry for Arts, Culture, Civil Service and Sport.

The project is supported by the Agency for Cultural Affairs Japan.

PDNB (Postdigital Neobaroque) (AT/DE/IT/GB)

Triopic Spectacle

Postdigital Neobaroque Transmedia

As part of an ongoing process of decentralisation and democratisation of the digital, *Triopic Spectacle* endeavours to flatten the hierarchies between the real and the potential—a radical concept initiated by 17th century baroque thought. The transmedial installation challenges the outmoded, myopic, binary thinking of local/global, 1s/0s, individual/collective, real/virtual, analog/digital, natural/artificial by establishing a series of two-way windows, bridges, interfaces, portals and glitches between three ‘triopic’ domains: ‘real reality’, comprised of physical, robotically 3D-printed architectures to be experienced and interacted with by passers-by; ‘mixed reality’, a virtual, spatial, boundless and immersive ML-developed VR space for augmented visitors (with VR goggles); and ‘virtual reality’, an

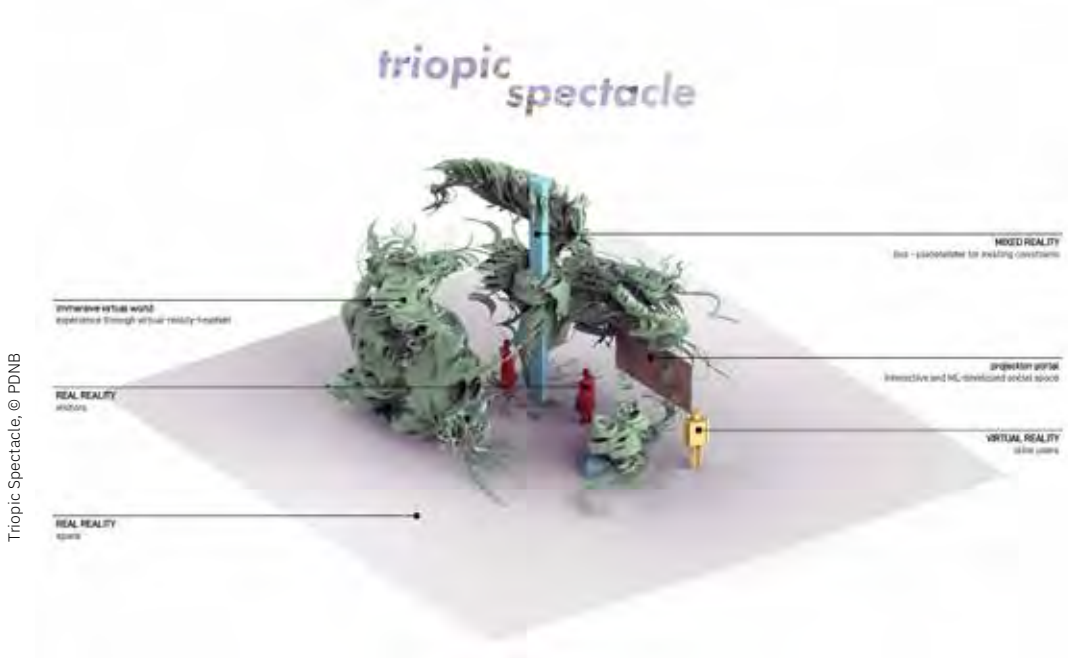
interactive and online-based social space for online users to interact with the abovementioned realities.

Part of the FWF-PEEK funded research project Postdigital Neobaroque.

Developed within the research project Postdigital Neobaroque led by Prof. Dr. Marjan Colletti, funded by the FWF Austrian Science Fund, Programme for Arts-Based Research (PEEK).

In collaboration with REX/LAB, University of Innsbruck, and Georg Grasser, Kilian Bauer, Julian Edelmann

This project is presented in the framework of the European ARTificial Intelligence Lab, which is co-funded by the Creative Europe programme of the European Union and the Austrian Federal Ministry for Arts, Culture, Civil Service and Sport.



Sarah Petkus (US), Mark J. Koch (US)

Moon Rabbit

Since time immemorial, we humans have looked up to the heavens and wondered about the nature of our existence. And who knows — maybe one day we might even discuss this fundamental question with our digital offspring? If so, will they be able to help us discover answers in the patterns and data hidden in the starry sky? In a research and development phase lasting several months, Sarah Petkus and Mark J. Koch attempt to teach a suite of artificial intelligences to recognize familiar shapes and objects in images of star clusters, planetary surfaces, and other celestial bodies. Moon Rabbit aims to help form a team of humans and “AIs” whose focus is to discover meaning in the abstract. And maybe the AIs will even develop personalities and opinions of their own.



© Sarah Petkus, Mark J. Koch

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Anna Ridler (UK), Caroline Sindere (US)

Cypress Trees, a beginning

How can AI help us to face the climate crisis and other entwined challenges? This machine-learning-generated moving image piece gives insights into the complexity of data sets and raises questions about deforestation and the politics of climate change, memory and loss. Anna Ridler and Caroline Sindere created a special dataset of the Bald Cypress on the gulf coast of the USA, where both have family ties. These trees, which can live thousands of years, are currently considered to be “threatened” by climate change.

This project is presented in the framework of the European ARTificial Intelligence Lab, which is co-funded by the Creative Europe Programme of the European Union and the Austrian Federal Ministry for Arts, Culture, Civil Service and Sport.



© Anna Ridler Caroline Sindere

Group Laokoon (DE): Cosima Terrasse (FR), Moritz Rieseewieck (DE), Hans Block (DE)

Made to Measure

For an artistic data experiment, the group Laokoon created a doppelganger of a person they didn't know using only their personal Google data. Five years of this person's life were reconstructed and filmed in detail on a large theatre stage. A few months later, the original and her datafied double met. The spectacular and one-of-a-kind experiment becomes tangible on an interactive storytelling website, where visitors can experience how far-reaching the insights into our inner lives and our most intimate secrets are, which we grant Google, Facebook & Co. every day. Tapping into a novel and complex digital narrative form, the cross-media project *Made to Measure*, which also includes a TV documentary, sheds light on how

tech companies use the collected data of billions of people to turn their weaknesses, insecurities, illnesses and potential for addiction into profit.

Direction: Cosima Terrasse, Moritz Rieseewieck, Hans Block
Development: Gruppe Laokoon, Kulturstiftung des Bundes in coproduction with: WDR, SRG SSR, OSZE RfOM, Docmine and rbb.

In cooperation with: PACT Zollverein
With support from: Kulturhaus Brotfabrik, vorAnker, Universität für Angewandte Kunst Wien, Starts in Motion.

This project is presented in the framework of the European ARTificial Intelligence Lab, which is co-funded by the Creative Europe Programme of the European Union and the Austrian Federal Ministry for Arts, Culture, Civil Service and Sport.

madetomeasure.online





© Stelios Tzeizias

Gershon Dublon (US), Xin Liu (CN)

The Wandering Mind

The Wandering Mind is an AI-powered performance platform for shaping dreams with the sounds of our world. Sampling and recomposing tiny fragments of sound from tens of thousands of global field recordings found online, the system generates a winding sound journey for sleeping and meditating audiences. In our curated performances, group naps and guided mind-wanderings, dream guides convene a collective action of sleeping together. We respond to the past year, in which stay-at-home orders have torn old social fabrics and mass uprisings have constituted new ones, and through which digital and physical public space has played a pivotal and transformative role. In micro-sampled sound baths, we travel through parks and public spaces across the world, paying tribute to human habitats of social distance and safe gathering, makeshift shelter and tenuous refuge, mass uprising and fresh air.

We invite you to affirm public space and everyone who occupies it by drifting to sleep wherever you find yourself.

Support for *The Wandering Mind* comes from Ars Electronica and the European ARTificial Intelligence Lab, as well as from the Onassis Foundation and MAXMachina. Special thanks to residency hosts Mariano Sardón, Rocío Pilar and MUNTREF Arte-Ciencia, Buenos Aires. Nicholas Gillian and Nan Zhao contributed engineering and creative input. Academic research and development on *The Wandering Mind* platform is underway at DVIC, Paris, with the support of Pôle Leonard de Vinci. Source material for the AI-powered sampler comes largely from the contributors to Radio Aporee, and was retrieved from the Internet Archive.

This project is presented in the framework of the European ARTificial Intelligence Lab, which is co-funded by the Creative Europe Programme of the European Union and the Austrian Federal Ministry for Arts, Culture, Civil Service and Sport.

Joe Davis (US), Sarah Khan (PK)

Baitul Ma'mur: House of Angels

Ours has been a project to keep 2.417 quintillion angels on the head of a pin. We have been inspired by repeating geometries and nested calligraphies of Islamic art to demonstrate a similarly recursive scheme for DNA information-keeping. DNA molecules having 3 base-pairs or more simultaneously hold 3 unique numbers, and a coding strategy based on these numbers combines several different layers of informational symmetry. Our example is a molecule holding multiple encodings of "Subhan Allah" (الله سبحانه), an Arabic phrase said to have been repeated for more than 1000 years as an invocation associated with creating angels. Tradition holds that any number of angels can be generated in this way and that it makes no difference whether the phrase is spoken, written, or caused to be printed. Using technology to reliably synthesize DNA, we created iterations of "Subhan Allah" in astronomical numbers of DNA molecules to show that symbolism about changing the demographic of heaven can be elegantly aligned with capabilities for high density information storage in DNA. Each of our encoded DNA molecules contain 19.5 repeats of "Subhan Allah" so that a 1mm layer of DNA on the 0.75mm head of an average straight pin can hold over two hundred million billion angels. We hope our gesture of generating so many angels may provide comfort in times of a pandemic that has claimed millions of lives. This has been an exercise in bridge building, between art, mathematics, science, and spirituality across multiple expressions. We see humanity as one tribe, confronting the chaotic forces of nature, the accumulating toll of human impacts on our shared environment, and the problematic nature of our "best intentions," behind which all too often lurk the terribly violent and destructive impulses that have shaped human history.

2.417 quintillion (2.417×10^{18}) angels in a 1mm layer of DNA on the head of a typical straight pin:

2.417 quintillion angels = $6E23 \times 1 \times \pi \times 0.752 \times 1E-3 / (330 \times 258/19.5)$

The artists also wish to acknowledge the following individuals for their contributions, support, and inspiration: Yassir Chadly, California (US); Saad Khan, Uprising Ventures, California (US); Je Hyuk Lee and Ryan Peters, Cold Spring Harbor Laboratory, New York (US); Kyle Cromer, Dept. of Pediatrics, Stanford Univ., California (US); Gabriel Filsinger, Harvard Medical School, Blavatnik Institute, Dept. of Genetics, Massachusetts (US); Ashley Bell Clark, Dept. of Photography, Pratt Institute, New York (US); David Deamer, Dept. of Biomolecular Engineering, Univ. of California, Santa Cruz, California (US); Adam Steinberg, Creative Technologies, Massachusetts (US); Peter Sasowsky, Serious Motion Pictures, California (US); George M. Church, Harvard Medical School, Blavatnik Institute, Dept. of Genetics, Massachusetts (US). With support from: To date all project costs have been covered out-of-pocket. Wet work has been carried out either commercially, at the lab benches of the principal artists, and/or at lab benches of friends and colleagues (incl., Je Hyuk Lee, Kyle Cromer, Gabriel Filsinger, and Ekin Kuru). Design and fabrication of the glass and aluminum "Baitul Ma'mur" structure, electronics, and project graphics production in the residential studio of one of the artists (Joe Davis) have also been self-funded. Ashley Clark, Peter Sasowsky, and Joe Davis have donated video production and editing services. Adam Steinberg has composed and performed an original score for a short Baitul Ma'mur documentary and David Deamer has contributed a musical score directly translated from the "Subhan Allah" DNA sequence.

This project is presented in the framework of the European ARTificial Intelligence Lab, which is co-funded by the Creative Europe Programme of the European Union and the Austrian Federal Ministry for Arts, Culture, Civil Service and Sport.



masharu (RU/NL)

The Museum of Edible Earth

Geophagy is the scientific name for the practice of eating earth and earth-like substances such as clay and chalk. Eating earth is an ancient practice and is an integral part of many cultures across the world. *The Museum of Edible Earth* is a cross-disciplinary project with a core collection of earth samples which are eaten for various reasons by different people across the globe. It invites the audience to physically question our relationship to the environment and the Earth and to review our knowledge about food and cultural traditions using creative thinking. *The Museum of Edible Earth* addresses the following questions: What stands behind earth-eating traditions? Where does the edible earth come from? What are the possible benefits and dangers of eating earth? What engagement are we as humans establishing with our environment and non-humans? The Museum of Edible Earth has more than 400 edible earth samples, mostly clay, such as kaolin and bentonite as well as chalk, limestone, volcanic rock, diatomaceous earth, and topsoil. The materials originate from 34 countries. Alongside the earth collection, *The Museum of Edible Earth* includes graphic design materials, photography and video works, online edible earth interactive database, installations and performances. It fosters collaborations with scientists, artists, designers, researchers and cultural communities. *The Museum of Edible Earth* contributes to the cross-fertilization between science and art. There is scientific research on geophagy among both animals and humans. Papers about it are published in journals on anthropology, history, psychology, sociology, chemistry and biology. *The Museum of Edible Earth* is a mobile museum. Its presentations are mixed-media and participatory, often involving earth tastings, workshops, discussions, and screenings. Disclaimer: Eating earth is not recommended by food authorities and is at your own risk.



Intercoursing with Clay – Russia 2019 –
photography by Evgenija Beljakova

Founder: masharu

Project management (2020-2021): SasaHara

Photo and video (2021): masharu, Anna Zamanipoor,

Luuk Van Veen, Jhalisa Rens

Graphic design (2021): Olga Ganzha, Jhalisa Rhens,

Luuk Van Veen

Web design: Raphaël Pia, William Ageneau

Product design: Basse Stittgen

Support received from Creative Industries Fund NL

stimuleringsfonds.nl/en/

Tijl Fonds

Prins Bernhard Cultuurfonds

www.cultuurfonds.nl/fonds/tijl-fonds Netherlands

Embassy in Russia

Mondriaan Fonds www.mondriaanfonds.nl

Amsterdams Fonds Voor De Kunst,

www.amsterdamsfondsvoordekunst.nl

Het Wilhelmina E. Jansen

Fonds www.wejansenfonds.eu

Support in kind has been received from:

The World Soil Museum <http://www.isric.org/services/world-soil-museum>

This project is presented in the framework of the European ARTificial Intelligence Lab, which is co-funded by the Creative Europe Programme of the European Union and the Austrian Federal Ministry for Arts, Culture, Civil Service and Sport.

FESTIVAL COMMUNITY PROJECTS

Throughout its history, Ars Electronica has been continuously working to build a vital community. Over the years, it has expanded into an extensive network of artists, activists, scientists, institutions, policy makers, and other interested parties. With the introduction of the hybrid festival in 2020, we took the next step in exploring the possibilities of online tools for community building. Still, it is our endeavor to anchor the online component in the real world, so as to find the true

potential in bringing together the digital and physical realms. This is why this year we decided to find possibilities to strengthen the community of the hybrid festival even more by getting creative ourselves. It quickly became an internal mission of the team to find projects expressing the networks' versatility and connectedness. Our efforts resulted in *Festival Community Projects*, a concept that intends to bring together partner gardens from all over the world in different events.

Symphony of Absence

As last year, the festival is being staged in a hybrid fashion. While the team in Linz is preparing a festival in the "traditional" sense, hundreds of partners in Ars Electronica's international garden network are also joining forces synchronously and in parallel to create the *Symphony of Absence*. This title stands for a very special place in Kepler's garden in Linz: the Keplerhall. It is dedicated exclusively to the contributions and programs of all those partners who run their own festival gardens and are unable to come to Linz. A place that will be shaped by hundreds of music stands and

empty chairs, as if the musicians of an orchestra were on break and the sheet music might transform into living telematic windows into the world of the festival network. Each individual orchestra seat evokes the wonderful cultural diversity of this community that has such a formative impact on the transformation of our city during the festival. All together, they form a symphonic kaleidoscope of people worldwide with a similar attitude, who see themselves as global citizens and convey a common worldview that is nourished by our diversity and formed collectively.

Taste Your Soil

Taste Your Soil is a series of activities and programs designed to express that digital space is not a place to escape the real. Rather, both places — digital and real — stand and act in direct and inseparable connection to each other. Moreover, the project displays the expansion of Ars Electronica's cultural mission itself: technology needs to be deployed in a sustainable, connective and responsible way. This is especially true of the relationship between humans and nature. The radical changes in nature force us to act and engage in environmentally compatible transformation processes. This dimension is now of the utmost importance to art, society, technology and science. *Taste Your Soil* stands for the objective to make the digital an immanent part of our cultural identity, but it also seeks the restoration of our lost cultural awareness towards the earth. The project finds its logical position in the "New Digital Deal" insofar as "the digital" must also be part of any "Green Deal." The approach is reflected in many program points and started with the relocation of the festival from PostCity to the parks of Johannes Kepler University. Also, the new concept of "garden" introduced the previous year bears witness to this: as a universal

cultural metaphor, it symbolizes the fundamental relationship between humans and nature. With local hosts, organic staple foods from the region and "earth" as a thematic inspiration for cooks, the theme even extends into the festival's basic supply structure.

On Saturday, BIO AUSTRIA gathers local organic farmers at the festival market day. Furthermore, the entire partner network participates in *Taste Your Soil*. The partner gardens will each send us a photo of tasting the soil from their own garden along with a video trying to describe the flavor. In Taiwan, top chefs will also be using soil to cook with; in Chile, the "Cooking for Freedom" project, organized by "La Fabulosa República de la Montaña," will be dedicated to the pandemic situation in the Andes; and in Russia, ITMO University will be taking a critical look at the issue in the "Grounding" exhibition. Of course, during the festival there will also be contributions to *Taste Your Soil* in Kepler's Gardens in the form of artistic projects and interventions, botanical excursions, workshops and much more. Foremost among these is artist masharu's "*The Museum of Edible Earth*," our inspirational starting point for this series of projects.



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THE EXPERTS OF THE FUTURE

Ars Electronica Futurelab Kids Workshop & International Partner Outreach

The Ars Electronica Futurelab is celebrating its 25th anniversary, and some of its young members – who have been a part of the team for less than 25 months—had a special idea to contribute to this event. Their goal was to collect the opinions of renowned futurologists from all over the world to speculate about possible future narratives for the next 25 years. Their journey to the future even went outside our globe, to undiscovered planets. As a group, they explored cultural diversity, future mobility, and even sent messages and wishes to inhabitants from outer space.

What is special about the experts of the future that the young members interviewed? On average, they are seven years old.

The Ars Electronica Futurelab organized a prototype workshop with the team members' own kids and guided them into the future in a three-step journey. First, they prepared our vehicles for the journey, by crafting paper rockets that were sent out into a metaphorical universe. Wherever a paper rocket landed, the kids had the assignment of drawing their planet Earth in the future. At the end, they shared their very personal message to this future planet with the young Futurelab members.

How does the planet Earth of the future look like to the kids? After completing the workshop, we invite our international partner gardens – to provide us with statements from their children that answer this question. Together with the kids' contributions, we can collectively develop an imagination of the next generation's future visions.



© Birgit Cakir

Concept & development: Denise Hirtenfelder, Barbara Habringer, Sonja Bailer

Camera & editing: Raphael Schaumburg-Lippe, Kerstin Blätterbinder

Dokumentation: Birgit Cakir

Special thanks to our experts: Aurelia, Raphael, Egon, Xaver, Neema, Samuel, Lore-Su, Moe, Leonhart & Ben!

Special thanks to contributions from: Horst Hörtner, Hideaki Ogawa, Christoph Kremer, Christl Baur, Martin Honzik, Susanne Kiesenhofer, Arno Deutschbauer, Georgios Tsampounaris, Julian Zauner, Johannes Lugstein, Maria Mayr, as well as all Futurelab parents!

Harpreet Sareen (US/IN/JP), Franziska Mack (DE/US), Yasuaki Kakehi (JP)

Algaphon

Urban environments and manicured nature, with unseen native diversity, have resulted in forgotten evolutionary histories and a reduced understanding of ecosystem relations. In this context, especially the aquatic plant biosphere is the object of collective amnesia. *Algaphon* is a hybrid installation where algae bubbles that ring at Minnaert frequency near algal filaments are rendered audible through a hydrophone. Online visitors can leave a voice message that is translated into photosynthetically active radiation (PAR) variations in a remote aquarium. The algae bubble's response

to human speech is then recorded and emailed back to the visitor to engage in a reflective dialog with algal species. The installation refocuses attention on nonvascular physiological mechanisms and invites viewers to think about how environments exist in a heightened dynamic to adapt to human actions.

Yasuaki Kakehi Laboratory, The University of Tokyo
Supported by JSPS KAKENHI (Grant Number 20H05960)
With auxiliary support from Parsons School of Design and Stochastic Labs



© Franziska Mack

Ory Yoshifuji (JP)

AVATAR ROBOT CAFE DAWN ver.β

Avatar Robot Cafe is a social implementation project to enhance employment of people with disabilities by using "OriHime," an avatar robot that can be operated by people who are bedridden or have limited mobility. The robot is designed to accommodate a wide range of physical disabilities, including eye input, pc and smartphone input, and is easy to operate. With corporate sponsorships and crowdfunding, a temporary store opened in Tokyo in 2018. In June 2021, a permanent experimental store "DAWN" opened in Nihonbashi, Tokyo. The employment rate for people with disabilities in Japan is about 5%, and

the people concerned have given up on finding employment in companies. While there are high expectations for robots to solve the labor shortage, we are presenting questions and solutions for a society where employment of the disabled is not enough. Join us at the demonstration in Ars Electronica Festival and find out more about the cafe.

Ory Laboratories Inc.
Garden TOKYO by Japan Media Arts Festival
Supported by the Agency for Cultural Affairs,
Government of Japan



Kaito Sakuma (JP)

KEHAI: Liquid Mirror Series — Square —

The *Liquid Mirror Series — Square —* is a box that makes sounds autonomously. The mirrored box keeps ticking like a heartbeat, distorting its reflection while hiding itself in the scenery. Sakuma will be presenting a new version of this mirrored box with recently recorded sounds of present-day Tokyo. The concept of this project is “kehai,” something invisible but definitely there, which exists in Japanese society. The term “sign” may be the closest definition of “kehai” in English. With COVID-19, physical distance has increased so much that we have lost the opportunity and the ability to perceive the invisible, as we have come

to trust the world we see through our monitors. People will hear the sounds emitted from the mirror and may sense the same “kehai.” People in distant places may also be able to communicate with each other in a new way. This project will explore the nature of communication that is non-verbal and common to all living things.

Concept and Direction: Kaito Sakuma
 Fabricator: Be Factory inc.
 Garden TOKYO by Japan Media Arts Festival
 Supported by the Agency for Cultural Affairs,
 Government of Japan



create
your
world
2021



The new social deal

Digital technology has given us the ability to work from anywhere, attend school classes, even meet with friends. The current desire to meet people physically, and not just virtually, has something new about it: after all, a few decades ago, this digital form of social interaction would not have been possible at all. The speed at which these technologies are developing is increasingly becoming a challenge for our society. We use them before we can evaluate them. We question very little in the process; we often see it as the only alternative. But now we want to go back. We want to party together, attend concerts, go to school properly and chat with colleagues at work. Everything analog, everything “like it used to be.” But what is this “like it used to be” like? Is it “before the pandemic”? Or does it go back even further? Even people within the same generation define that very differently.



© vog.photo


In its immense speed, the development of new technologies is a very complex process in our society that has a major impact on social interactions and structures. So what role will digital technology play in the future? Will we manage to continue using this tool, which was so important during the pandemic, as a useful extension? Or is it like eating too much candy and needing a break from it?

Planned focal points such as “digital school” or hybrid work models harbor good approaches, but only put many of us under more pressure — it is becoming increasingly unclear what role we will have to take.



© pupils of MS Lehen

Black Day, Prix Ars Electronica 2021 “u19—create your world”
Young Creatives u14 Award of Distinction



♥ LEAVE NO ONE BEHIND

The 2020 Rise Up, Prix Ars Electronica 2021 “u19–create your world” Young Professionals Honorary Mention



Realitätsverlust, Prix Ars Electronica 2021 “u19–create your world” Young Professionals Honorary Mention



INCERT, Prix Ars Electronica 2021 “u19–create your world” Young Professionals Award of Distinction

© Johannes Rass, Julian Pixel Schmiederer, Gregor Franz

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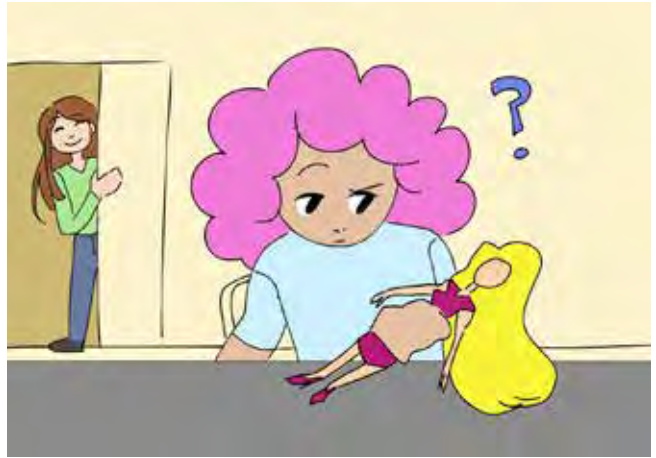
© Isa Mutevelic, Simon Effenberger, David Stummer

Moreover, the younger generation is overwhelmed with responsibility. Climate change creates uncertainty, the current pandemic is changing the structure of everyday life and triggering psychological problems. The move from school life into a course of study or into the professional world does not feel as optimistic as it used to. There's a pervasive feeling of constantly missing something, of not being in the know – you can't keep up. The speed at which new technologies develop spreads to the information level as well: changes can happen quickly and you're expected to pick up on those changes while they're still being announced and adjust your pace accordingly. "Planning security" is therefore more of a paradox for the younger generation, although it's so important right now and they are demanding it. Uncertainty spreads because everything can change at any time – and in any direction. The desire to be "offline" is therefore intensifying visibly. We need time out from the constantly updating flow of information that we have to respond to, or at least have an opinion on. Young people have made many statements and demands on our system in recent years. The question arises: is this really their sole responsibility? Do young people really need to take on this responsibility? After all, sharing our world also requires a minimum of courtesy to leave it as you would like to find it – at least that's a notice you often find in many public places. And this isn't just about a public toilet or a park – it's about the whole world. All generations must be aware of this responsibility.

There's something frightening about the slowness with which our system tries to adapt to climate targets or social reorientations – combined with the often-mentioned rapid development of new technologies, it sometimes seems as if we're waiting here and hoping that everything will blow over. Waiting until it is perhaps too late. Children and young people are exposed to these dystopias on a daily basis in their younger years; they have to form opinions about them and position themselves. In doing so, they are often left alone by this waiting society.

This year's create your world festival takes its title very seriously and literally: It aims to provide opportunities to think about present and future scenarios in a lighthearted way. It offers a platform for young people to exchange ideas and have a good time together. Utopias may be created and unrealistic thoughts exchanged. Laughter is allowed and trust can be (re)built. In different focal points at educational institutions, artists and platforms are invited to examine the issues of this complex time and generate new ideas. Along the way, the "festival within the festival" focuses on one of the most important topics that seems to have changed for all of us in the past years: the rediscovery of individual and collective social interactions. Let's see what else we will learn in the process. Above all, it will take time. Time to stabilize again, to make plans and to adapt to the increasingly complex environment.

The heart of this platform will again be the ideas and projects of children and young people themselves: The Prix Exhibition will feature 23 Prix Ars Electronica award-winning projects from the u19–create your world category. The diverse mix of topics invites us to talk about it all together with the next generation, to briefly evaluate it before diving into a next phase.



The Click, Prix Ars Electronica 2021 "u19–create your world"
Young Professionals Honorary Mention

© Julia Scheiwein, Zara Dineva, Anna Zoglauer, Caroline Bär



© Tom Mestic

U19 PRIX EXHIBITION

This year's exhibition of the winning projects in the u19—create your world category once again shows a colorful mix of refreshing ideas, critical projects and research approaches by children and young people. The exhibition will be presented as an interactive platform at the festival by the young people themselves. The winners will get to know each other and can exchange new ideas.

Festival visitors will be able to see the fascinating projects and have them explained directly by the young artists. This creates a research platform at the highest level, which not only serves as an inspiration for educators and students, but also offers regional and international artists a valuable insight into the topics and priorities of children and young people.

Gaps and Solutions — Of Things That Are Missing and How One Can Deal With Them

“(…) By this year's submission deadline, the year-long state of emergency had become the new normal. But, especially for young people, a year feels like an entire phase of their lives. Despite everything, however, it would be a complete misnomer to describe these young people as “the lost generation.” During this extraordinary and trying period, they have gained new perspectives and were able to observe societal processes that will occupy historians for decades to come. It is a generation shaped but not stigmatized by these events. These young people will decide for themselves what they do with the lessons from this time. But for now, it's about coming to terms with the situation, and the entries for this year's Prix Ars Electronica in the category u19—create your world reflect a number of coping strategies. (…)”

The Jury of the category u19—create your world 2021:
Sirikit Amann, Josef Dorninger, Conny Lee, Mira Lu Kovacs, Tori Reichel



create your world (AT), mb21 (DE), <19 (HU), ArtechLAB Amsterdam (NL)

I AM (NOT) A ROBOT

A Creative challenge with AIs and humans

Homeschooling, distance learning and social distancing bring our society into close contact with Artificial Intelligences in everyday life. We use it, we rely on it, but most of the time, we don't recognize it. This international challenge is aimed at experimenting with AI by exploring the limits of humanness and robotness. What are the main differences between us and algorithms? How can we reveal AI technologies in our everyday lives and "make fun of them" or even use them as creative tools?

"AI vs humans" doesn't have a winner. In the challenge, speed or IQ won't be compared – the project will come up with new ways of bringing the two species closer to each other. Humans might learn new things about the nature of Artificial Intelligences – and AI might recognize its inability to fully replace humans ...

The international network of create your world (AT), mb21 (DE) and <19 (HU) as well as ArtechLAB Amsterdam (NL) are all exploring different aspects of digitization through the eyes of youth and from the perspective of education. The challenge is a direct reaction to challenges posed to their longstanding youth exchange project by the global pandemic. With this new, fully online format, they aim to motivate participants to think about AI as a society-forming force in the most accessible way possible.

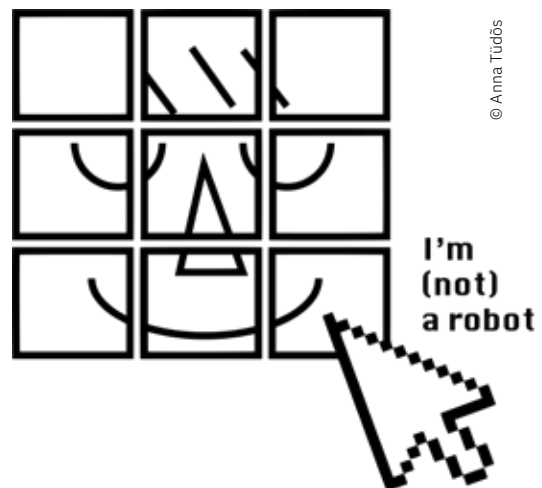
The international youth encounter project is a very successful format of Ars Electronica. Create your world cooperates with various partner institutions (media art festivals, educational institutions and competitions in the youth sector) from the European region in order to invite

and bring together young people from different regions for a cultural and artistic exchange.

All of the participants come with individual competencies and expertise to develop and implement a joint project over the period from June to August 2021, which in turn will be presented at the Ars Electronica Festival.

On the occasion of the Ars Electronica Festival 2021, introductory lectures by experts, creative workshops, individual or group work and presentation opportunities were held on the project title *I am (not) a robot – Creative challenge with AIs and humans*, as well as accompanying mentorship.

This project is presented in the framework of the European ARTificial Intelligence Lab, which is co-funded by the Creative Europe Programme of the European Union and the Austrian Federal Ministry for Arts, Culture, Civil Service and Sport.



© Anna Tudós

Anna Oelsch, Gerda Lechner und Maria Binder / students of the University of Art and Design Linz "Bildnerische Erziehung und Mediengestaltung" (AT) lead: Gerda Martínez López and Lisa Wieder (AT)

PLAY WITH PIXELS

It's hard to imagine a world without screens. We have come to appreciate the advantages of digital communication and its diversity, especially in the past year and a half of social distancing. While modern technology cannot replace the analog world with its hands-on experience, it can complement it wonderfully.

Play with Pixels is an interactive Open Lab about the smallest part of a digital raster graphic. We zoom into the pixel world, enlarge, illuminate, recombine and thus make the world of digital images more tangible. At the same time, we playfully explore the translation possibilities between analog and digital, embarking on a search for a world of images where pixels and graphic gestures meet. In this way, visitors are invited to

engage with the diverse dimensions of a pixel with the help of various materials.

As part of the Art University exhibition, the Visual Education and Media Design team invites visitors to create their own pixel postcards on site and send pixelated greetings from downtown to the Open Lab. In this way, we extend our participatory installation beyond the boundaries of Kepler's Gardens. And we offer short daily glimpses of our work in the Open Lab via our "pixel phone", allowing us to communicate in parallel analog and digital, thus combining the advantages of both worlds.

This project was developed by Anna Oelsch, Gerda Lechner and Maria Binder, students of Visual Education and Media Design led by Gerda Martínez López and Lisa Wieder.



© Anna Oelsch

Sophie Dögl (AT), Oberösterreich Tourismus (AT), Ars Electronica

TOURISMUS VON MORGEN

What will tourism look like in the future? Each year, young people address this question in a summer project. They offer inspiration, criticism or positive engagement with the topic of vacation,

recreation and tourism in general. New strategies and changes in direction can emerge from this and be incorporated into the focal points and programs of tourism initiatives.

“Zurück zur Illusion”

This year, a Prix Ars Electronica entrant in the u19–create your world category was commissioned to think about this theme in relation to the effects of the Covid Pandemic as well. Under the working title she chose for her project, *Zurück zur Illusion* (*Back to Illusion*), Sophie Dögl is now embarking on a research trip in Upper Austria and collecting impressions of the tourist region on film. With the video project, the young artist wants to address the viewers with all their senses: The enjoyment of mountain climbing and the current situation in the granite, salt and natural stone works will be the basis of the sensual experience.



© Sophie Dögl



© Sophie Dögl

SYMPOSIUM “THE CIVIL SOCIETY OF THE FUTURE: CO-CREATION WORKS.”

The symposium “The Civil Society of the Future” is a project of the association “dieziwi. – Die Zivilgesellschaft wirkt” in cooperation with “Interessengemeinschaft Freiwilligenzentren Österreich (IGFÖ)” and an initiative of Sozial-Landesrätin Birgit Gerstofer, sponsored by the Federal Ministry of Social Affairs, Health, Care and Consumer Protection.



© Tom Miesic



© vog.photo

Civil social engagement is essential for a pluralistic, open and solidary society. In both the refugee crisis of 2015 and the Covid crisis of 2020, it became clear how directly, effectively and innovatively those initiatives, associations, NGOs, NPOs and individuals – in short, all those who are usually considered “civil society” – are capable of acting.

What does the much-discussed post-Covid world look like? How do we use the potential of civil social engagement should the situation worsen again? And which approaches will help us achieve sustainable social innovation that affects all participants in our society, even in times of non-crisis? The symposium will explore these questions with many experts, activists and decision-makers

in an attempt to find instruments and strategies for sustainable social innovation!

At this symposium, national and international policymakers, experts, NGOs, NPOs, volunteers and other interested parties will exchange ideas about innovations and forward-looking possibilities for voluntary engagement in general and in times of COVID-19. The conference will be accompanied by an extensive digital presence, which will give organizations and volunteers the chance to present and inform themselves. In addition, interested parties will have the opportunity to find out about various fields of engagement and get in touch with volunteer organizations at the Volunteer Fair Upper Austria in the create your world area at the JKU festival grounds.

Unabhängiges LandesFreiwilligenzentrum (AT)

VOLUNTEER FAIR

FEST.ENGAGIERT is the ideal meeting place for all those who want to volunteer and institutions that are looking for volunteers. The *Volunteer Fair Upper Austria* is now taking place for the tenth time. This year, Upper Austrian institutions, associations and volunteer projects can also present the many opportunities for volunteers under their roof. No matter whether social services, senior citizens, children and young people, integration and coexistence, rescue services, people with

disabilities, community, citizen participation, environment and animal welfare or international volunteer activities: The range of areas and tasks knows no bounds. In the create your world area at the festival area of the JKU, anyone who is interested and would like to have an impact on their area can find out about voluntary commitment in Upper Austria. The focus is on social engagement, participation and digitization – so opportunities for digital engagement will also be presented.

Landestheater Linz (AT)

SOCIAL INTELLIGENCE AGENCY (S.I.A.)

The digital revolution is in full swing. Between smartphone and tablet, between VR and AI, we are longing for what our modern technology cannot (yet) offer: Social intelligence. Because without it, the world is at risk of becoming a dark place. A group of teenagers and young adults is tackling this problem, dealing with current issues and ideas for a better world and creating performances around the theme of social intelligence.



© Philipp Greindl

An event produced jointly by the Upper Austria Teacher-Training College (AT), Upper Austria Chamber of Labor (AT) and Ars Electronica

NEULAND – A society on expedition

Symposium Perspectives on Political Education

A virus has changed our world. And all our lives. Societies around the world are engaged in a real experiment in real time, virtually on an expedition into the unknown, into *NEULAND*. Finding our bearings is a challenge and, in democratic societies, often involves long, usually arduous negotiation processes. Science-based approaches and rational action are hampered by populism, conspiracy theories, untruths and battles of faith. Social thinking and action as well as a basic humanitarian attitude are indispensable in such a situation. Education in general and political education in particular are indispensable components, if not prerequisites. The education sector

must actively participate in this current social transformation process. But how is it to succeed if the members of educational institutions are themselves part of the expedition and don't yet know where the journey is headed?

Are we really moving in the direction of a "new normal"? If so, what does this "new normal" look like, and who defines the cornerstones and guidelines?

These questions will be discussed this year in the symposium *NEULAND – A Society on Expedition* as part of the symposium series *Perspectives on Political Education* by academics, experts and practitioners.

BORG Bad Leonfelden (AT), Stefan Leutgeb (AT), Wolfgang Hoffelner (AT), Anna Strasser (AT)

from freeze to flow

Activities that induce a flow state increase mental well-being in uncertain times. Designing and coding were a welcome change during lockdown and a chance to create something in this rigid phase. Students of the BORG Bad Leonfelden developed a 3D model of the school in a joint project, which

can be explored on your own at the festival. At the same time, students will be working on a computer game in an open laboratory during the festival. Festival visitors can also try their hand at a small project in a low-threshold and explorative way.

Bettina Gangl (AT), Birgit Pölz (AT), Helmut Doblhofer (AT), participants Virtual Office FAB Linz (AT)

GALACTIC GARDEN

The *Galactic Garden* is an augmented reality walk developed within a workshop with the youth of Virtual Office. Virtual Office offers computer training for young people with physical disabilities. Spark AR Studio is a programming toolkit offered by Facebook, which is used for the implementation of the project. Hongwei Tang supports this project technically.

The workshop focused on various cinematic narratives about the unknown, the uncertain, extraterrestrial beings, oversized monsters, and artificial intelligence. The result is an installation that deals with the current situation and shows a leap in time that simultaneously takes a look into



© Virtual Office

the past and the future. The young people of the Virtual Office accompany the visitors of the festival at our station with the help of an iPad in the *Galactic Garden*, which is visually brought to life.

Ableton Live (DE), MiMU Gloves (UK), University of Music and Performing Arts, Vienna (AT), Ars Electronica Linz (AT), Adrián Artacho (ES/AT)

conducting spaces



© Nathan Gallagher

This performance traces the dimension of “eternity” as a state and in doing so also questions a current sense of time in post-Covid times. Together with the audience, Johannes Hiemetsberger and Hanne Pilgrim from the University of Music and Performing Arts Vienna create an audio-visual collective space that begins with Ligeti’s *Lux Aeterna*. The translation between voices, traces of movement and sound takes place like a mirror in a mirror ... Festival visitors can try out their skills in conducting and performing or composing music at once in an experimental Open Lab.

mica – music austria (AT), Universität für Weiterbildung Krems (AT),
Ars Electronica (AT) und Österreichischer Musikrat (AT)

MUSIC SUMMIT

The professional profiles of musicians have changed rapidly over the past 10 years, and musicians increasingly need business know-how to enter the music sector. Music universities have trouble keeping pace with these rapid changes and cannot adequately transfer knowledge in their regular training programs.

The project initiative of mica – music austria, the University of Continuing Education Krems, the Ars Electronica Festival and the Austrian Music Council aims to advance the professionalization of musicians as modern entrepreneurs in the music business. To this end, representatives from education, the music industry and politics will be invited to a *Music Summit* to engage in a joint dialogue and design formats that are open to all music makers, regardless of their educational background. The results of the *Music Summit* will be presented in a public roundtable at the Ars Electronica Festival.

Musicians from all genres were asked in advance to write video messages about their personal career paths, obstacles and insights. These will

serve as impulses for the Music Summit and for the Roundtable and will be available for viewing by all festival-goers throughout of the festival.

The Center for Applied Music Research at the University of Continuing Education Krems will provide scientific support for the project. The goal is to exemplify different career paths and professional realities in the Austrian music world and to derive perspectives for decision-makers in politics, education and the music industry.

Music Career Check

Music Career Check – these are short videos of music creators who talk about their career path, their original career ideas versus everyday professional life, stumbling blocks and aha experiences and personal insights into the music business. These short videos are intended to provide insight into the life models and challenges of music creators today. The short videos will be available to visitors throughout the Ars Electronica Festival.

create your world TOUR 2021

Inspiring sustainably and bringing an impulse directly into the classroom – that has been the program of the create your world tour since 2015. In 2021, it will happen again, but in an online format within the Open Science Hub Network. The interactive workshops are a welcome experience for teachers and students in this special phase of school life. As an impetus for the continued use of digital tools in the classroom, the tour will also make a stop at the festival: At the create your world festival, a workshop for an international classroom will be offered – we will see how big the class will be ...



© Cornelia Hauer

create your world TOUR is part of the OSHub project that has received funding from the European Union's Horizon 2020 Framework Programme for Research and Innovation under grant agreement No. 824581

STARTS EXHIBITION

STARTS is an initiative of the European Commission to foster alliances of technology and artistic practice that effectively implement European policymaking to nurture innovation and that benefit the art world as well. The focus is on people and projects that contribute to mastering the social, ecological and economic challenges this continent faces. The STARTS Prize is awarded annually to innovative projects at the interface of art, technology and science that have the

potential to contribute to sustainable economic and social innovation. This year 's exhibition of selected winner and STARTS projects showcases current best practice approaches for responsible innovation in the fields of bioengineering, ecology, artificial intelligence, policymaking as well as communication and media technologies.

The STARTS Prize has received funding from the European Union's Horizon 2020 research and innovation Programme under grant agreement No. 956603.

Featured Artists:

Oceans in Transformation — John Palmesino, Ann-Sofi Rönnskog

Remix El Barrio — IaaC Fab Lab Barcelona

Data Garden — Grow Your Own Cloud

ELEVENPLAY x Rhizomatiks „border 2021“ — MIKIKO, Daito Manabe, Motoi Ishibashi, Takayuki Fujimoto, evala, ELEVENPLAY, Rhizomatiks

Face Lab — Håkan Lidbo

In a Small Room — KyungJin Jeong

In Event of Moon Disaster — Halsey Burgund, Francesca Panetta

mEat Me — Theresa Schubert

The Living Light — Nova Innova

TheirTube — Tomo Kihara



Oceans in Transformation, John Palmesino, Ann-Sofi Rönnskog; commissioned by TBA21—Academy © Giulia Bruni



In a Small Room, KyungJin Jeong



Remix El Barrio, IaaC Fab Lab Barcelona, © Fab Lab Barcelona



In Event of Moon Disaster, Halsey Burgund, Francesca Panetta © Dominic Smith



Face Lab, Håkan Lidbo



The Living Light, Nova Innova