

KEPLER'S GARDEN

POST-POSTCITY: Ars Electronica at JKU

Gerfried Stocker (AT)

Farewell to POSTCITY . . .

In 2015, the Ars Electronica Festival used POSTCITY as a venue for the first time. With an impressive area of almost 100,000 square meters, unique architecture, gigantic halls, deep and branching catacombs, and expansive roofscapes, it immediately sparked enthusiasm and marked an evolutionary pivot for the festival. There is no question about the transformative impact the space at POSTCITY had on the structure and atmosphere of Ars Electronica. Over the next five years, both would become inextricably linked into the new signature of the event, as the many festival formats distinctly connected to areas and floors at POSTCITY attest.

Kicking off in 2015 with *POSTCITY—Habitats for the 21st Century*, the festival explored what constitutes a modern urban sphere in light of the Digital Revolution tackling the topic from five different angles: future mobility, future work, future citizen and future resilience. The 2016 edition, *Radical Atoms—And the Alchemists of our Time* stepped even further out into the future, to feature astonishing projects interlinking the digital and physical domains, and opening up a completely new way of looking at the exchanges between technology and nature. In the wake of an artificial intelligence boom owed to companies like Facebook, Uber and Co., the 2017 festival *AI—the Other I* examined the imminent relationship between machines and human beings, with an emphasis on ethical issues in the advent of rapidly evolving machine learning systems. In 2018, *Error—the Art of Imperfection* took a closer look at the concept of “error” from various perspectives; in the conviction that a sense of imperfection—an elemental trait to our understanding of humanity—is essential in a world of ever-increasing precision. Throughout its five years at POSTCITY, the festival expanded quite a bit, peaking at last years’ 40th anniversary *Out of the Box—*

The Midlife Crisis of the Digital Revolution, which highlighted the fascinating history and successes of the enterprise. It featured 1,449 artists and scientists from forty-five countries and a total of approximately 110,000 visitors—a more than worthy end to an era. Still, to this day we are zealous about this brilliant space, and thankful to the POST AG for enabling this development.

. . . and off to new shores: the Ars Electronica Festival at Johannes Kepler University

Finding fresh collaborations—or strengthening existing ones—plays a vital role when exploring new shores. This years’ inauguration of the new Ars Electronica Festival site at the JKU campus is an exciting step towards an even more intense and fruitful partnership with the local university. In many ways, this is a very logical development, considering the thematic affinities between both institutions and the international orientation so intrinsic to the realms of art and science. Both share a clear commitment to science, and a fact-based, responsible way of dealing with each other, as a basis on which to develop a significant, cross-institutional statement for science and art in light of current and future challenges.

JKU’s stunning location will also shape the festival’s spirit and form, much like the POSTCITY did in its time. Since its ground-breaking ceremony in October 1966, JKU consistently evolved its course program and grew considerably in size. The campus now has an area of 364,000 m², encompassing 27 buildings as well as a beautiful park with a duck pond—the perfect setting to offer not only a variety of programs and formats, but to experiment creatively with the surroundings. In the winter semester of 2019/20, the university had about 3,300 employees and 19,493 enlisted students, almost 15 percent of the latter with an international background. In combination with the many scientists, artists and other

interested people attracted by the Ars Electronica Festival each year from all over the globe, the new location promises to be an open-minded, knowledge-oriented, innovation-driven and collaborative environment for the participants and festival visitors. This year, in contrast to previous festivals, the on-site program of *In Kepler's Gardens* at JKU campus will be smaller due to precautionary measures for coronavirus, and will focus even more on mediation and guided tours. The extended partnership between Ars Electronica and JKU will be further expressed within the local festival program, especially in the presentation of cutting-edge projects by the

Linz Institute of Technology (LIT): "Responsible technology" – the values and mind-set promoted by Ars Electronica couldn't be better framed than in this condensed self-description of LIT's visionary approach.

Finally, it goes without saying that the JKU campus program will be seamlessly integrated into the local-physical networked events hosted by the festival in cooperation with partners in more than 120 cities worldwide. *In Kepler's Gardens* thus initiates the new period of the Ars Electronica Festival at JKU, in the spirit of diverse forms of collaboration, celebrating the pluralism inherent to art, science and society.

In 2020, *Kepler's Garden* will be the venue for three exhibitions:

- JKU LIT @ Ars Electronica
- Garden Exhibition
- STARTS Exhibition





Gerald Bast (University of Applied Arts),
Meinhard Lukas (Johannes Kepler University)

Manifesto Innovation through Universitas.

The University of Applied Arts, in alliance with Johannes Kepler University, aim to bring something new into the world and to mediate university education through dialogue.

To do so, they are introducing the joint manifesto Innovation through Universitas.


The more it seems like the world is coming apart at the seams, the more important it becomes to search for what holds it together. This impetus has driven academia for centuries, propelling science and the arts to new heights. Only those radical enough to get to the bottom of things will discover something fundamentally new. These are individuals who are dissatisfied with derivations of what we already know and what is familiar. They stand for eruption instead of deduction. This is the only way to unhinge the world. Archimedes' statement rings true today and continues to serve as a guideline in modern times.

Discovery was once a harmonious act, simultaneously involving science and art. The *uomo universale*, or universal man of the Renaissance, re-discovered the world through comprehensive education, a critical spirit, creative power, and a humanistic attitude. He helped himself to all of this knowledge and the arts as if they flowed out of the same wellspring. He was only interested in the gist of the matter. Any questions regarding access, methods, and media were of secondary importance, because he could follow any and all paths and master all techniques. He was connected to Virgil by the longing to recognize

rerum cognoscere causas, the cause of things. Beyond any reminiscing on the history of art and science, ideas on education and research during the Renaissance deserve our attention today. Humboldt's concept of *universitas* is also becoming increasingly fitting again, during a time marked by granular, nearly atomized knowledge and increasingly meaningless specialization. The humanistic educational canon enriched by the development of digital competence (and not mere skills) can, and indeed must, be the European educational system's answer to meet the challenges coming from East and West. In quantifying the knowledge universities generate, this statement cannot be without consequences. The fixation on citations, reputational rankings and surveys, external funding, the number of students actively taking exams, and other quantifications fall short of the mark. Civic responsibility and social relevance must be the dominant variables. Universities are, first and foremost, society's intellectual and scholarly centers. By virtue of their autonomy and resilience, they must play a leading role in shaping social discourse. Those who advocate for more *universitas* must

not reduce science to mere truth or art to beauty. Science and art mutually benefit each other there where – despite their differences in perspective, findings and methods – converge and ultimately intermingle with each other. Knowledge and sensuality, ratio and emotion – as well as empiricism and imagination – can intertwine to fuel and inspire each other. So let us bring something new into the world by transcending parameters and becoming involved in a dialectic of science and art, a synthesis of truth and beauty, and a symbiosis of knowledge and creativity. Let us accept the enormous challenges of our time for the benefit of a humane and diverse society. These are the aspirations with which the University of Applied Arts and Johannes Kepler University aim to forge an alliance in support of innovation through *universitas*. May this alliance also serve as the momentum to broaden perspectives in a so-called knowledge society and re-think the increasing economization of knowledge.

Complete version:
www.jku.at/en/news-events/news/manifesto-innovation-through-universitas/



JKU LIT @ ARS ELECTRONICA

Linz Institute of Technology,
Johannes Kepler University

Christopher Lindinger (AT), Gerald Bast (AT)

Creative Cohesion

The digital revolution, demographic changes, and the climate crisis addressing the complex, conflicting fields of our time requires an epistemic landscape that is conducive to traversing academic parameters. Crossing the borders between disciplines should be considered a starting point for possibilities—even essential as to interlink them—rather than an act of deconstruction. The *Innovation through Universitas* calls for a new, transdisciplinary university culture. It signals the beginning of an alliance to support creative innovation between Johannes Kepler University Linz and the University of Applied Arts Vienna, systematically entwining art and culture with science and technological design to encourage and inspire symbiotic progression. It is a call to action, and an appeal to supporting transdisciplinary university collaboration and creating procedures and ‘real-world’ labs that can incorporate experimental approaches, both large and small. Tapping into the transformative potential of various disciplines in order to acquire concrete insight into the future of research and education requires pioneering

approaches and unique individual projects. Turning an idea into a reality throws into relief what can be perceived and institutionalized as added values. Among this year’s goals is a call for proposals to support projects at the interface of art and science, as well as to create “Transformation Labs”.

The Linz Institute of Technology at the Johannes Kepler University published a special, two-stage open call for submissions, selecting a total of twelve “transformational projects” aimed at transfusing science and art. These will be on display during the 2020 Ars Electronica Festival. The call’s second phase focused on taking researchers’ ideas and intensifying discourse with artists. When it comes to observing just how art and science interact, the “Transformation Projects” have been extremely insightful and compelling, demonstrating that initiatives centered on bringing together art and science require applied creativity. Knowing that a certain artistic work will soon be part of the Ars Electronica Festival and prominently displayed to a wider audience

not only changes the speed at which decisions are made, but also how they are made. Thinking about how a layman — who is unaffiliated with the scientific community — will perceive a project is incorporated into the initial concept and has a lasting influence on the design process.

An additional consideration is knowing that artistic ideas repeatedly provoke and incite scientific and academic problems that, in the context of research, may seem unusual or even far-fetched and improbable. *Pangolin Scales* is a project in which users control a scaled, armored coat using their brainwaves. When activating a certain area of the brain, certain scales on the armored coat move. In order to meet the artistic requirements, a new type of brain-computer interface featuring a total of 1,024 channels was created, capable of capturing data with a never-before-seen level of resolution. The flowing, fluid boundaries between science and art shift perspectives, inspiring innovative methods, developments, and solution strategies. A security loophole at the JKU's Science Park 2 building serves as a starting point for a composition piece titled *Exposed Building*. A weak point in the building's networked security technology has affected the Science Park's electronic locking system and the system has been taken over. By controlling the buzzers built into the door locks, the building is transformed into a walk-through, polyphonic, sound-emitting body. The cacophony of sound revolves around how vulnerable "smart" buildings are, and again reminds us of subsequent risks.

Art opens up an entire new realm of possibilities to convey scientific research and its relevance. *AI Truth Machine* uses artificial intelligence to detect

deception. An interactive, mock courtroom serves as a 'reality' laboratory. Visitors are questioned by an AI truth machine and asked to lie during questioning. The interrogation results raise questions as to whether or not artificial intelligence can replace judicial decision-making processes, and focuses on both hazards and potential of verifying the truth via machine.

Robots Talking to Me is a four-part series focusing on the impact that art and design has on the repertoire of research by not only radically re-defining the relationship between man and machine, but emphasizing fundamental changes in our work environment. Visitors involved with a virtual-reality puzzle game titled *Serum 13* work with a machine partner that provides recommendations on decisions to obtain a life-saving serum. In an effort to analyze the psychological parameters of communication and build confidence between the human and AI partner, the players have to decide whether or not they want to believe what they are being told.

A second step to develop transdisciplinary prototypes and implement joint project ideas involves creating "Transformation Labs" for scientists and academics at Johannes Kepler University, and for artists at the University of Applied Arts. *Full Dome* is an immersive research and presentation dome serving as a crystallization point for lab activities, opening up visual and emotional levels of perception with stunning intensity. Two "Transformation Lab" projects will use the *Full Dome* as part of the 2020 Ars Electronica Festival. *Cross Perception* is a project that allows audience members to experience the algorithmic bias of artificial intelligence and to explore the question

of what experiences and expectations shape the audience member's perceptions.

Just as certain information is inevitably discarded during machine learning procedures in order to model and compress data, humans also look for simple explanations to multifaceted sensations and sensory impressions.

In order to mutually access various subject areas and scientific disciplines, the Johannes Kepler University and the University of Applied Arts will physically move closer together. Both institutions will become part of the Center for Arts and Sciences located in Vienna at the former Postal Savings Bank.

Designed by Otto Wagner, the Savings Bank building will provide unique spatial proximity to support transdisciplinary, scientific and artistic synergies. The program will also include joint lecture series for extant degree programs, as well as developing study and research formats to interpret art and science as an entity, without questioning their respective, independent identities. Supporting transdisciplinary efforts in research and education also raises a question as to how academic performance is evaluated and assessed, taking alternative ways to measure success that perhaps do not include the number of publications and impact factors into

consideration. Removing disciplinary constraints drives progressive research, moving away from the more traditional, subject-specific sets of rules, and serving as a gauge for student employability. The correlation between art and science in tertiary education supports core skills for future professions that include creativity and non-linear thinking, as well as flexibility and social intelligence. Dialogue between science and art is changing the research mindset and, in times of unpredictability, uncertainty and fluctuating cohesion, provides a new, vital foundation for contemporary universities to evolve beyond the cumulative boundaries of tradition from past decades.

The broadening of methodological horizons, interdisciplinary advancement of knowledge and dissolution of traditional patterns of behavior are consistent with the complexity shown by our present-day networked systems. Characterized by tendencies towards specialization and fragmentation, structures dating back to the industrial age continue to be broken down as part of the contemporary knowledge economy. Transdisciplinary action is not an end in itself, but rather, a powerful tool enabling universities to fulfill social responsibility by meeting current challenges head-on.

Linz School of Education (AT)

STEAM Popup Lab

Since the boundaries of school subjects are rather artificial and hardly mirror the diversity of knowledge needed to understand important matters in depth, STEAM Popup Lab aims to blur those borders and highlight the importance of collaboration between the sciences. STEAM Popup Lab offers the possibility to create your own path by moving within a net of educational experiences, where you can choose which direction to take. It is a virtual journey to understand the meaning of patterns all around us. Patterns are everywhere, from fractals in nature to blood vessels in the human body, through the oscillating signals produced by the sensors of a phone. You can control robots, fold origami patterns, measure the signal of a playground swing, be part of a live chemistry lab session, and more.



© Alicia Hofstätter

Linz School of Education, Johannes Kepler University
Supported by Land Oberösterreich

Andreas Stelzer (AT), Rudolf Scheidl (AT)

Magic Darts

or, when every throw is a perfect hit

Darts is a popular game, but difficult to master. In this version of darts, players always hit the bullseye. What looks like witchcraft is revealed to be a mechatronic system: a novel microwave sensor network detects the approaching dart, algorithms compute its trajectory and continuously estimate the place and time of impact at the dartboard. Ultrafast hydraulic actuators enable the dartboard to move the target into position in a few hundredths of a second. Such technologies will affect our future daily life: in autonomous cars, with microwave radars allowing us to see in the dark, with fog or dust; when algorithms need to estimate the motion of potential obstacles; or in exoskeletons, where hydraulic actuation enables ultimate compactness, low weight and energy consumption far beyond the limits of current technologies.

Institute for Communications Engineering and RF-System, Johannes Kepler University, Institute of Machine Design and Hydraulic Drives, Johannes Kepler University / Supported by Land Oberösterreich



CAD-Rendering, from Florian Wolfslehner

Institute of Robotics, Johannes Kepler University Linz (AT)

Robots in Action

Fast and sensitive!

Robotics in general, and industrial robotics in particular, are perceived as unknown but omnipresent all at once. Robots are controlled machines; created by humans to help humans. Their control is getting more and more intelligent, and exceeding human capabilities. By means of selected examples, the Institute of Robotics at Johannes Kepler University will showcase what modern industrial robotics means, and that it can be fun. Two industrial robots will serve drinks; one will fill up a cup and the other will serve it on a tray. The catch is that the first robot will fling the filled cup through the air while the second robot balances a tray with four, fully filled cups. In the second demo, two collaborative robots will solve the Rubik's Cube.



© Inst. of Robotics, JKU

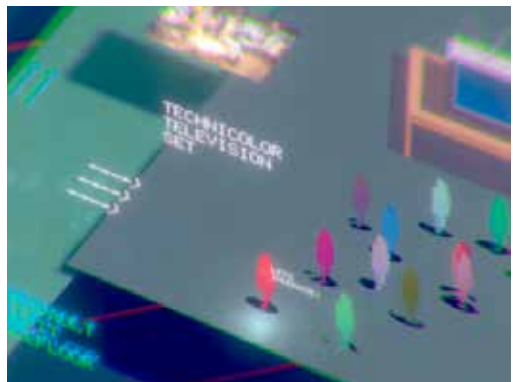
Institute of Robotics, Johannes Kepler University

Judith Igelsböck (AT), Friedrich Kirschner (DE), Sarah Buser (CH), Mónica Rikić (ES),
Leoni Voegelin (CH), Tomás Montes Massa (CL), Laura Zoelzer (DE)

Enacting Innovation

Enacting Innovation is a participatory staging of the social fabric surrounding contemporary innovation practices. Participants will negotiate the roles and situations that are frequently encountered in innovation processes and act out conflicts with each other and the technical infrastructures typically employed within such contexts. The simulation is inspired by social scientific research on “innovation scripts” — the recipes followed in dealing with the omnipresent societal and economical pressure to prove innovative ability. The aesthetic dramatization of these innovation scripts aims to make innovation dynamics “experienceable” to the festival audience and provokes thinking about our powers and powerlessness when it comes to steering and interfering with processes of societal change and renewal.

Institut für Organisation, Johannes Kepler University
Studiengang Spiel und Objekt, Hochschule für
Schauspielkunst Ernst Busch
Supported by Land Oberösterreich



©Friedrich Kirschner

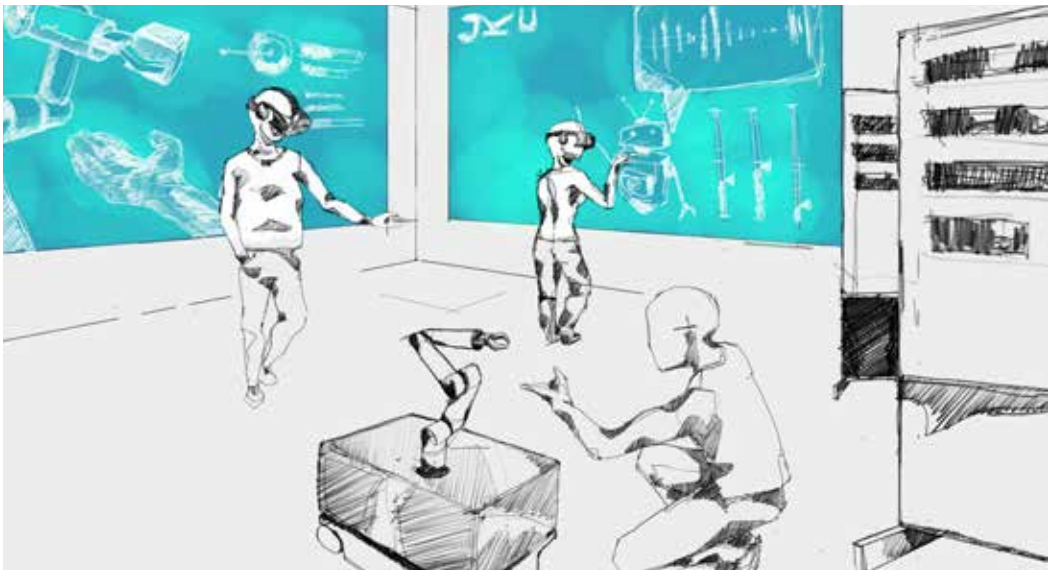
LIT Robopsychology Lab, Johannes Kepler University Linz (AT)

Robots Talking to Me

How should robots communicate with people? What voice makes AI assistants sound trustworthy? Do we even have to listen to robots or should we always be in command ourselves? Under the title *Robots Talking to Me*, the *LIT Robopsychology Lab* presents four installations that give tangible expression to questions of human-machine relationships and invite participation: In the virtual reality game *Serum 13*, players immerse themselves in the world of a biotech lab. Tricky tasks must be solved to produce a saving serum. An AI assistant is on hand to provide support, but the question remains: When to trust the AI, when to decide for yourself? *CoBot Studio* also takes you into virtual space. In the production halls of Rubberduck Inc., an industrial robot's communication signals have to be interpreted and rubber ducks have to be sorted. *Chimera* is a mobile collaborative robot that

physically interacts with the audience. The project *Vote Panel – The Future We Want* invites you to vote on fundamental questions about the design and use of intelligent machines. For each question that is addressed on one of the haptic panels (e.g. Should robots simulate emotions?), visitors can give a pro or con vote via a web interface. Intermediate results are displayed on the panels, thus capturing the voters' mood in real time.

Serum 13: LIT Robopsychology Lab, Johannes Kepler University, Polycular OG
 CoBot Studio: LIT Robopsychology Lab, Johannes Kepler University, Ars Electronica Futurelab, Polycular OG, Joanneum Robotics, Austrian Research Institute for Artificial Intelligence OFAI, Blue Danube Robotics GmbH, Center for HCI, University of Salzburg
 Chimera: Joanneum Robotics
 Credits *Vote Panel – The Future We Want*:
 LIT Robopsychology Lab, Johannes Kepler University, Florian Reiche/Otelo eGen
 Supported by Land Oberösterreich



© LIT Robopsychology Lab

LIT Law Lab, Johannes Kepler University Linz (AT)

AI Truth Machine

The installation *AI Truth Machine* deals with the chances and challenges of finding truth through a machine. In a fictitious courtroom, the aim is to determine who is better suited to distinguish the truth from a lie in a court case: An artificial intelligence or a judge? Before being questioned by the *AI Truth Machine*, a visitor is asked to lie about a given topic. In contrast to a judge, the machine provided by *Converus*[®] determines the truth in a completely different way. The AI-supported truth-finding process differs from the judicial interrogation methodology in the extremely precise analysis of eye movements and pupil dilation during an interrogation. After completion of the questioning, the result is presented and the question is to be clarified whether an AI can actually replace a judge.

LIT Artificial Intelligence Lab, Johannes Kepler University
LIT Law Lab, Johannes Kepler University
Converus[®]

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LIT Law Lab, Johannes Kepler University Linz (AT)

Digital Government in a Box



© LITLawLab

The installation *Digital Government in a Box* shows the mode of operation, potentials and limits of a digitalized public administration. The visitors interact with the *Digital Government* via a futuristic input terminal, all while visual effects enhance the experience. Accompanied by a short film, the visitors experience certain digital administrative

processes in the box. The topics addressed are the networking of data stored in state registers for (partially) automated administrative processes, the autonomization of official decisions through the use of machines and the tension between data protection and data transparency. The installation stimulates reflection on the possibilities and risks of digital administration, on efficiency, citizen friendliness and fundamental rights limits of digitization. It aims to make current tasks for legal research visible and to point out differentiating solutions.

LIT Artificial Intelligence Lab, Johannes Kepler University
LIT Law Lab, Johannes Kepler University
Converus[®]

Supported by Land Oberösterreich

Mathias Gartner (AT), Vera Tolazzi (AT)

The Transparency of Randomness

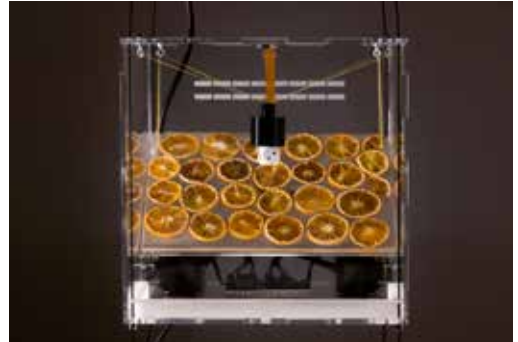
The Transparency of Randomness is an interactive installation through which visitors can directly experience the complex interplay of randomness and stochastics in current mathematical and physical research.

27 transparent boxes, floating in space, continuously generate random numbers through dice. Through a variety of natural materials, the random number generation process is influenced by the complexity of nature and its structures. The ensemble of randomly generated numbers forms the basis for a real-time calculation that demonstrates the impressive role of randomness in scientific research. Immerse yourself in randomness and become an active part of the installation with your self-generated random number.

Institute for Theoretical Physics, Johannes Kepler University

Special thanks to team members Andreas Ganhör, David Eilmsteiner, Michaela Haslhofer, Gabriel Häusler and badcap.at.

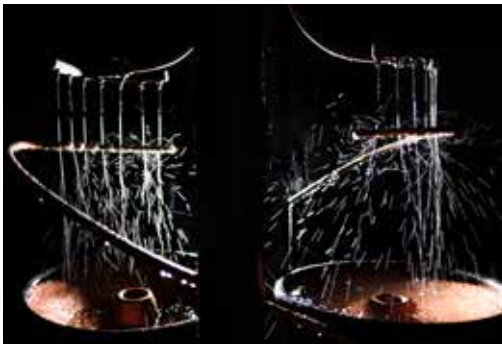
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© Vera Tolazzi

Leon Kainz (AT)

dancing water Visible Electrostatic Energy



© Su-Mara Kainz

This installation is based on a simple physical principle: the generation of electrostatic charges using water. The charged water droplets whirl in dynamic tracks around copper rods and react to nearby bodies. The physical phenomenon

underlying this installation is called electrostatic induction, wherein the same charge carriers repel each other, and different ones attract each other. It enables the energy of the falling water droplets to be converted into electrostatic charges. The objects have no need for electronics or hidden energy sources; only the water pump needs electricity.

Leon Kainz: concept, know-how, implementation

Su-Mara Kainz: artistic accompaniment, video, photo

Yuti Kainz: artistic realization, illustration

Institute of Experimental Physics, Soft Matter Physics

Division (SoMaP), Johannes Kepler University

Institute of Semiconductor and Solid State Physics,

Johannes Kepler University

Supported by Land Oberösterreich

Johann Höller (AT), Thomas Lorenz (AT), Florian Gruber (AT), Ursula Niederländer (AT), Tanja Illetits-Motta (AT), Raphael Blasi (AT), Andreas Rösch (IT), Stefan Küll (AT)

Treeversity

Treeversity focuses on the relation between complex data sets and the potential of data visualization to convey complex information at a glance. JKU's database contains approximately 268,000 enrollment records on 153,000 students, faculties, courses, rooms, exams, schedules and so on. A mirror of the University's inner workings, diligently recording successes, failures and developments. A portrait of its life...

Treeversity illustrates this life as a tree. Courses, grades, and exams become branches, creating different types of trees. Fully grown or still nascent, withering or growing erratically. Each tells a story of the human behind it. You can imagine someone studying full-time, or balancing work, study, and children all at the same time. Realizing a bad choice or having found their destiny. Together, the trees reveal more. In all of the studies, what are the conditions, the evolutions, the successes, and drop-outs?



TreeVisit, © Lorenz

Treeversity shows the university as a living forest, providing an instrument to analyze its mechanisms at the same time.

Institute of Digital Business, Johannes Kepler University
Ambientartlab: Thomas Lorenz, Florian Gruber
Supported by Land Oberösterreich

Michael Roland (AT), Michael Mayr (AT), Robert Holzinger (AT), Markus Vogl (AT)

Exposed Building



© Michael Mayr

The slick surfaces of floors and walls conceal a baffling array of pipes and cables that provide a building's essential logistics and infrastructure. A building even has a certain "intelligence" due to the emergence of networking and automatization.

The building evolves into an organism, kept alive and communicating with us through these channels. At the same time they expose a vulnerability. When we open its shell, through a maintenance hatch or a control cabinet, we gain access to all sorts of vital parts of the building, in this case the electronic locking system of the office rooms. By controlling the buzzers built into the door locks, we transform the Science Park 2 building into an orchestra and it resounds like a huge walk-in instrument. The installation playfully provokes thought about the vulnerability of modern technology and its growing risks for society.

Institute of Networks and Security,
Johannes Kepler University
Supported by Land Oberösterreich

Institute for Machine Learning, LIT AI Lab, LIT Robopsychology Lab,
Johannes Kepler University (AT); Inseq Design (AT)

K – JKU's Interactive Robocar

K is a likeable little robocar: small in size, but very smart on board!

Named after JKU's famous patron, Johannes Kepler, it drives itself autonomously on changing terrain, can predict the movement patterns of pedestrians and playfully interacts with its environment. To correctly assess demanding situations and derive fast driving maneuvers, an aggregated use of technologies such as SLAM (Simultaneous Localization and Mapping), Reinforcement Learning and Image Recognition is needed. Via its LED-equipped shell and nonverbal cues, *K* communicates inner states and intentions to the people around it. Our robocar might get annoyed if you block its path for too long but, for the most part, *K* is in a good mood.

K optionally shares its camera view and a visual representation of its inner perceptions in real time with an external screen. Audience groups can thus “see through the eyes” of the robocar and develop a better understanding of modern AI



Foto Skizze Robocar

methods. With *K*, research at JKU in the fields of AI, Autonomous Driving and Human-Robot Interaction is made tangible to all.

Institute for Machine Learning, Johannes Kepler University
LIT AI Lab, Johannes Kepler University
LIT Robopsychology Lab, Johannes Kepler University
Inseq Design
Supported by Land Oberösterreich

Melanie Baumgartner (AT), Florian Hartmann (AT), David Preninger (AT)

The Elephant in the Room

© LIT Soft Materials Lab and Division for SoMaP



New trends, ranging from bio-inspired robotics to personalized healthcare and monitoring, create undreamt-of possibilities for a worthwhile future. Innovation that is sustainable is innovation that remains. With this vision in mind, *The Elephant in the Room* presents how technology can progress ecologically. Robots from biodegradable and edible materials become state-of-the-art through human-machine collaboration. The soft, nature-inspired designs imitate living beings in material, form and movement, and thus pave the path to a smart, sustainable future.

Can we sustainably develop technology by design?
Facing ever-growing amounts of e-waste – 50 million tons of it in 2019 alone – sustainability must become a principle of research and development.

This project is supported by the LIT Soft Materials Lab and Division for Soft Matter Physics (SoMaP), Johannes Kepler University
Supported by Land Oberösterreich

Thomas Faseth (AT), Harald Pretl (AT), Christoph Guger (AT), Anouk Wipprecht (NL)

The Pangolin Scales

1.024 Mini Brain Sensors to control a Fashionable Dress

The Pangolin Scales demonstrates the world's first 1.024 channel brain-computer interface (BCI), which is able to extract information from the human brain with an unprecedented resolution. This information is used to control the Pangolin Dress interactively, and will be shown live on a model during the Ars Electronica Festival. The 1.024 channel BCI will also be used as an input device for the BR41N.IO Designers' Hackathon during the Ars Electronica Festival. *The Pangolin Scales* is realized by a cooperation

between researchers from the Institute for Integrated Circuits at JKU, the brain-computer interface experts from g.tec medical engineering GmbH and high-tech fashion designer Anouk Wipprecht.

Thomas Faseth, Institute for Integrated Circuits, Johannes Kepler University
Harald Pretl, Institute for Integrated Circuits, Johannes Kepler University
Christoph Guger, g.tec medical engineering GmbH
Anouk Wipprecht, fashion-tech designer
Supported by Land Oberösterreich



© Jeff Cacossa

g.tec neurotechnology GmbH (AT)

BR41N.IO Hackathon

The Brain-Computer Interface Designers Hackathon

A BCI provides a direct link between the brain and an external device. Twenty years ago, BCIs could only spell or move computer cursors. Today, they are being used in many different fields of neuroscience, such as motor rehabilitation for stroke patients, assessment and communication with comatose patients, device control for disabled people, cognitive training and neuromarketing. Machine learning, dry electrodes, wireless electrode caps and other technologies are making BCIs more powerful and practical for a growing number of users.

The BR41N.IO Brain-Computer Interface Designers Hackathon Series has been created to show these current and future developments, and the unlimited possibilities of BCIs in creative and scientific fields, bringing together programmers, engineers, designers and artists. Each team must

design and build a wearable BCI-headpiece that can measure brain activity in real-time to create any sort of interaction. The hacking projects use EEG electrodes and amplifiers, and challenge programmers to code an interface that enables them to control devices, robots or applications, post messages on social media, make paintings, or enact a myriad other applications only with their thoughts. BR41N.IO also challenges creative minds to design a BCI headset with 3D printers, handcrafted materials and sewing machines.

BR41N.IO aims to promote awareness of artificial intelligence, life science, art and technology, and how these can merge into innovative and exceptional BCI systems.

BR41N.IO is organized by g.tec neurotechnology GmbH
BR41N.IO is sponsored by IEEE Brain Initiative

IFG-LIT (AT)

How to Become a High-Tech Anti-Discrimination Activist Collective

New technologies have penetrated all aspects of our lives and promise a wide range of improvements and efficiencies. Contrary to general perception, though, the algorithms on which these technologies are based are neither neutral nor do they treat everyone equally. They are as biased as the structures, institutions and developers that make them, which means racism and sexism are mostly unconsciously but systematically inscribed in their functions and outputs. The project addresses this problem and asks how discrimination in the development and application of technology can be overcome. Two lecture-performances by Safiya Umoja Noble and Lisa Nakamura question how digital media (re) shape our perception of ethnicity in particular, and identity in general. They uncover systemic

racism and sexism in new technologies and provide perspectives on how we can achieve alternative and equality oriented technological developments. Four participatory workshops with experts from different fields — Adriaan Odendaal, Adriana Torres Topaga, Andrea Maria Handler, Astrid Mager, Doris Allhutter, Hong Phuc Dang, Karla Zavala, Martyna Lorenc, Nushin Isabelle Yazdani — will implement analysis as practice.

We would like to facilitate a creative conversation and mutual exchange between experts, facilitators and workshop participants.

Project concept and organisation: Doris Weichselbaumer, Waltraud Ernst and Julia Schuster, Institute for Women's and Gender Studies (IFG), Johannes Kepler University Linz, www.jku.at/ifg
Supported by Land Oberösterreich

FULL DOME

Martin Kusch, Director | Fulldome / VR & AR Lab

Ruth Schnell, Head Department of Digital Arts, University of Applied Arts Vienna (AT)

Fulldome / VR & AR Lab

University Research Infrastructure Environment

Since its inception in 2013, the Fulldome / VR & AR Lab at the Department of Digital Arts in Vienna directs and participates in an ensemble of artistic research projects, with a particular focus on the research and development of new digital applications for Fulldome, virtual reality, and augmented reality environments. Blurring the boundary between the physical and virtual worlds and allowing users to experience a sense of immersion, these media environments have become increasingly pervasive and influential in our daily lives. Questions and experiments on holistic audiovisual spatial experiences and on topics that are decisive for the future development of our society are central to the research lab. Since the inauguration of the Fulldome / VR & AR Lab, students, teachers, and researchers from many disciplines have been benefitting from the interdisciplinary exchange and knowledge-sharing around these new methods of capturing, synthesizing, and re-envisioning our world.

The dome installed at Ars Electronica is part of the Lab's infrastructure.

Applications and usage examples:

- _ Development of new artistic grammars in the field of immersion
- _ Research of new narrative image and audio concepts
- _ New concepts and formats in the fields of virtual reality, interactivity, artificial intelligence, gaming, online communities and social networks
- _ Interdisciplinary platform for new creative processes
- _ Interactive 360° virtual walkthrough to produce a new quality of physical experience
- _ Research and practical experiments in perceptual research

Fulldome / VR & AR Lab at Department of Digital Arts, University of Applied Arts Vienna.

The Lab received financial support from Rector Gerald Bast, University of Applied Arts Vienna; the European Union Culture Program 2007-2013, for E/M/D/L (European Mobile Dome Lab for Artistic Research), and for the SAVATAP (Socially Aligned Visual Arts Technology and Perception), HRSM Infrastructure Project funded by the Austrian Federal Ministry of Education, Science and Research.

Other ongoing collaborations are: SPOTOn Mozart Project, with Mozarteum Salzburg / TRANSFORM Project, with Johannes Kepler University and Donau University Krems / Le-Fo Project, with University for Art and Design, Department of Interface Cultures and Donau University Krems; all supported by the Austrian Federal Ministry of Education, Science and Research.





A compilation by the Department of Digital Arts, University of Applied Arts Vienna (AT)

Fulldome Program: Future Room and Liminal Spaces (re-edited) 360° film screening

The Fulldome Program of the Digital Arts Department at the University of Applied Arts Vienna presents experimental immersive works in collaboration with the University's Science Visualization Lab, Trans-Media Akademie Hellerau, and the transdisciplinary performance company, *kondition pluriel*. *Future Room* and *Liminal Spaces* (re-edited) reveal the artistic potential of the full-dome, as does the 360° screening of works by researchers, teachers, and students.

From abstract generative animations to politically relevant statements, the immersive experiences in the fulldome program of the Department of Digital Arts represent a diversity of artistic positions. The *Future Room* is a participatory immersive installation for a 360° fulldome environment based on a speech recognition system. Audience members are wrapped in a cloud of information as they voice their choices from an array of subjects: Artificial Intelligence, Education, Energy, Finance, Genome Editing, Migration, Politics, Religion, and Work. The re-edited version of *Liminal Spaces* is comprised of animations that treat the dome as an intermediary membrane between the inside and the outside. The 360° film screening section presents short films and animations, most of which were produced in collaboration

with the Department of Digital Arts, University of Applied Arts Vienna. Works by Martin Reinhart/Virgil Widrich (AT), *kondition pluriel* (CA), and the Science Visualization Lab, University of Applied Arts Vienna (AT) will be shown, among others.

Participants/Collaborators:

The *Future Room* was created by the Department of Digital Arts (Fulldome & VR/AR Lab) at the University of Applied Arts Vienna, in collaboration with *kondition pluriel* in the framework of the HRSM Project, Socially Aligned Visual Art Technology and Perception (SAVATAP). A cooperation project of the University of Applied Arts Vienna (PI Gerald Bast), the Department of Digital Arts (PIs Ruth Schnell, Martin Kusch) at the University of Vienna, the Department of Basic Psychological Research and Research Methods (PI Helmut Leder) and the Austrian Research Institute for Artificial Intelligence (PI Robert Trappl), funded by the bmbwf. Concept and idea: Gerald Bast, Martin Kusch, Ruth Schnell, Peter Weibel; artistic concept and realization: Martin Kusch, Ruth Schnell.

Liminal Spaces was created by the Department of Digital Arts at the University of Applied Arts Vienna, in collaboration with *kondition pluriel*, Ruth Schnell, and the Trans-Media-Akademie Hellerau, Dresden. The 360° film screening section presents works by Laurus Edelbacher / Johannes Lampert, Roman Hansi, Thomas Hochwallner, Patrick K.-H., *kondition pluriel*, Stefan Krische, Martin Reinhart / Virgil Widrich, the Science Visualization Lab, Peter Várnai, and the live performance *Transient Topologies* by MONOCOLOR.

Raumperspektive.com; Institut for Computational Perception, Johannes Kepler University Linz (AT); Cross-Disciplinary Strategies, University of Applied Arts Vienna (AT)

Cross Perception

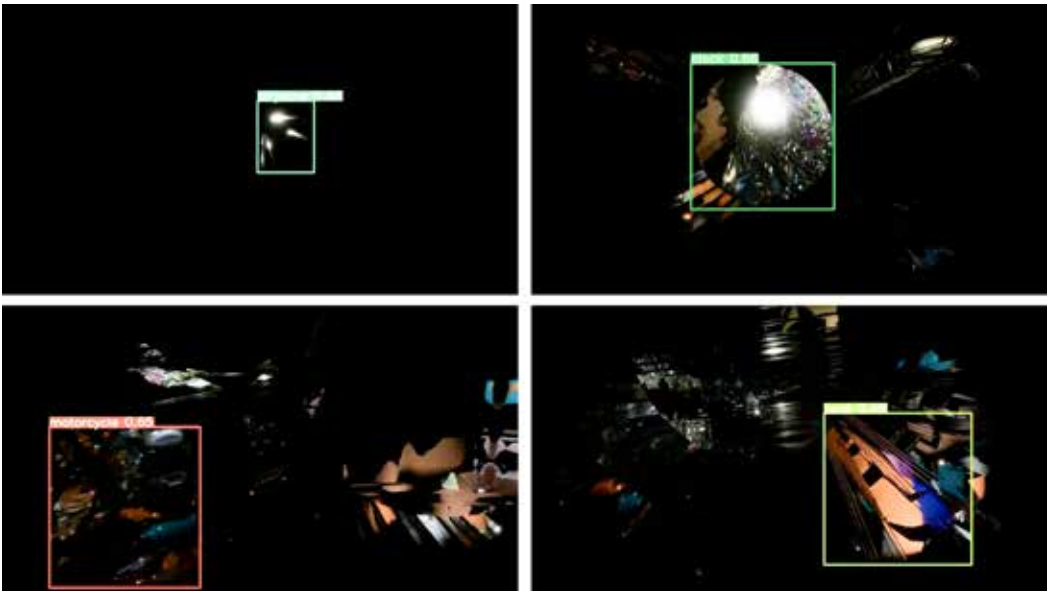
work in progress

Collaborative project of the University of Applied Arts Vienna and Johannes Kepler University Linz) in the context of the cooperation project TRANSFORM, together with Johannes Kepler University and Donau University Krems, funded by the Austrian Federal Ministry of Education, Science and Research.

A limitless space. Everything moves — light, shapes and colors. Human and machine let their sight wander and try to recognize something. The human beings search for orientation, the device calculates. It has been optimized for this purpose and fed with data.

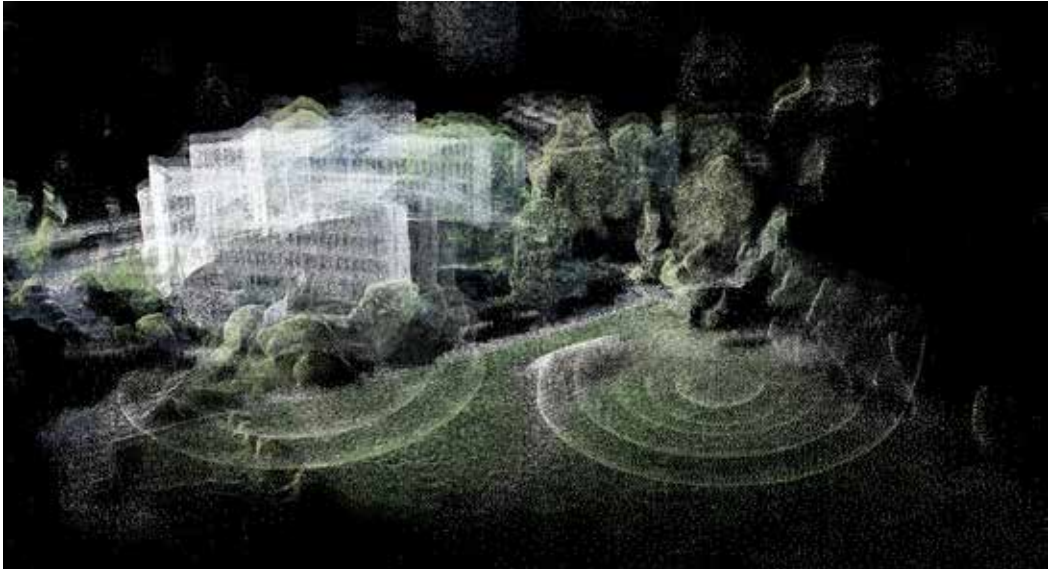
The machine recognizes an object, imagines how it sounds out loud. The sound influences the human expectation: Machine and human perception become intertwined. The machine is not always right; its pool of experience is limited. It transmits its bias to humans.

With the involvement of Kathrin Hunze, Thomas Hack, Raumperspektive.com; Silvan David Peter, Jan Schlüter, Institut for Computational Perception, Johannes Kepler University Linz and Christine Böhler, Martin Gasser, Cross-Disciplinary Strategies, University of Applied Arts Vienna



Department of Digital Arts, University of Applied Arts Vienna (AT);
 Institute of Technical Mechanics, Johannes Kepler University Linz (AT)

site-inflexion



© Essl Hucek

Collaborative art and science project in the framework of “Innovation durch Universitas” (University of Applied Arts Vienna and Johannes Kepler University Linz) and TRANSFORM Project, together with Johannes Kepler University and Donau University Krems

site-inflexion is a cross-disciplinary collaboration between the Department of Digital Arts, University of Applied Arts Vienna and the Institute of Technical Mechanics at Johannes Kepler University Linz. Artists and scientists from both universities, actively engaged in creating media art and/or pursuing innovative interdisciplinary research, joined forces to create an interactive multisensory environment for a mobile architectural dome structure. The two research units intertwined their artistic and scientific research methodologies and strategies to develop *site-inflexion*, an immersive experience in a fulldome environment. The purpose of the project was to create a

tangible audiovisual composition revealing the inextricably connected nature of space and sound. Acoustic parameters manifest in visual distortions, allowing users to experience the spatiality of sound through the multisensory perception of our (urban) environments. This production involves real-time visualization and sonification software, ubiquitous computing, sensor networks, tracking technologies, photogrammetry, 3D-scanning, microphone arrays, laser-scanning vibrometers, pre-rendered material, and mobile locative technologies.

The project is part of TRANSFORM HRSM, a collaboration between the University of Applied Arts Vienna, Johannes Kepler University, and Donau University Krems; funded by the Austrian Federal Ministry of Education, Science and Research. Department of Digital Arts (Director, Ruth Schnell), University of Applied Arts Vienna: Marian Essl (AT), Jakob Hütter (AT), Johannes Hucek (AT), Martin Kusch (DE); Institute of Technical Mechanics, Johannes Kepler University Linz (Director, Michael Krommer): Andreas Brandl (AT), Alexander Humer (AT), Astrid Pechstein (AT)

GARDEN EXHIBITION

Mathieu Zurstrassen (BE)

god is dog spelled backwards

god is dog spelled backwards is a 360° kinetic artwork, and a tribute to Guy Debord's *La société du Spectacle*, first published in 1967.

"In 2019, I finished this kinetic sculpture which it meant a lot for me to complete. It had almost spontaneously earned the title: *god is dog spelled backwards*. The choice of title seemed at first, to me, only an obvious orthographic evidence, an artifact intended to divert the attention from the relevant. It was also a nod to the Fluxus movement, for which I've always had a deep fascination. That being said, I learned a little later – while trying to find any reasonable argument for this uncanny choice – that it had been actually used for the first time in 1967, to name a three-minute film directed by Dan McLaughlin. The film features 3000 years of art history in just under three minutes. At a rate of eight works of art per second to original music by Beethoven (5th Symphony). The artwork battery-operated and was at the basis of a short movie project in

which I would move the device in various contexts and take short, 15-second videos. This is a way to share the importance of the context in which an artwork is displayed to the public."

Production: M.Zurstrassen, 2019

This work was made possible thanks to the support of *La Fédération Wallonie Bruxelles*

This project is co-funded by the European Commission's DG CONNECT, in the framework of the Horizon 2020 programme of the European Union under the S+T+ARTS programme's Regional STARTS Centers.



Mathieu Zurstrassen (BE)

Above The Below

_ /bə'loʊ/

_ /bə'loʊ/ is an exterior sound installation, featuring a pipe emitting an audio file emerging from the ground. The audio file is a lecture from the book *How to Analyze People on Sight*, written in 1921 by Elsie Lincoln Benedict and Ralph Paine Benedict. The morphology of the artwork forces the listener to assume uncomfortable positions to listen to the file. It takes a while to understand the seven hour file is, in fact, a lecture of a book about the analysis of *poses & postures*, and for the listener to grasp they are probably being analyzed by someone else. In the words of the Benedicts: "For life is largely a problem of running your own car as it was built to be run, plus getting along with the other drivers on the highway. From this book you are going to learn which type of car you are and the main reasons why you have not been getting the maximum of service out of yourself."



Above The Below, © Zurstrassen

Production: M. Zurstrassen, 2019

This work was made possible thanks to the support of La Fédération Wallonie Bruxelles. This project is co-funded by the European Commission's DG CONNECT, in the framework of the Horizon 2020 programme of the European Union under the S+T+ARTS programme's Regional STARTS Centers.

Mathieu Zurstrassen (BE)

Elsa on the Moon

Elsa on the Moon is a kinetic sculpture tribute to Elsa Von Freytag Loringhoven, eccentric baroness and contemporary of Marcel Duchamp; ambiguously attributed with the creation *Fountain*, in 1917. Or was it Louise Norton? The fact is that, in recent years, *Fountain*—already charged with a sulphurous reputation—also poses the question

of the exclusivity of creation. At a time when we are starting to reveal the involvement of the other "genre" in contemporary creation, the creator seizes History as an element in motion, changing with every perspective. In an effort to somehow give shape to time, *Elsa on the Moon* acts as a pendulum clock that jumps every 30 minutes. Like a small leap in a known and controlled landscape, it inaugurates a joyous reflection on creative veracity by focusing on the creation rather than its author(s). A perfectly balanced Elsa slowly jumps as if she were freed from terrestrial gravity.

Production: M. Zurstrassen, 2019

The work was made possible thanks to the support of La Fédération Wallonie Bruxelles. This project is co-funded by the European Commission's DG CONNECT, in the framework of the Horizon 2020 programme of the European Union under the S+T+ARTS programme's Regional STARTS Centers.

Elsa on the Moon, © Zurstrassen



Sebastian Wolf (DE)

lovesmenot

lovesmenot is meant to hint at the often-neglected value of human action. It deals with an eternally relevant issue — automation as a blessing. The technization of our every day is exciting and leading humanity forward; however, the value of human labor, the value of craftsmanship and the arts are often forgotten. The human element, poetry, emotions are optimized away. In this sense, automation does not always yield the best possible result. This work tries to reflect that; in the most poetic way it mechanizes a deeply human action that is meant to answer one of the purest human questions “does he/she love me?”



lovesmenot © Yagın Si

Simone Barlian (AT), Jan Phillip Ley (DE), Theresa Muhl (DE), Kerstin Reyer (DE), Sophie Netzer (DE), Lena Bammer (AT), Tobias Saatze (DE)

Lochtopia feat. SISI

In ever faster, ever larger cities, private space is becoming smaller and smaller. We mostly move anonymously through public space. How can this

anonymity be broken and how can these places be reclaimed for the community? Cities are organized, manifested memories that have accumulated over a long period of time and come alive through physical interaction. The Internet acts as their digital counterpart and offers new spaces of possibilities. To visualize and experience these accumulated memories is only possible within communities, their stories and images. The project Lochtopia feat. SISI poses the question: how to connect concrete and digital urban spaces? In performative space scenarios, visitors can appropriate public space with the help of digital space and record these manipulations of urban space in a digital, space-related archive.



© Sophie Netzer

Christina Gruber (AT)

Zugzwang

The Compulsion to Find a Common Baseline in Sound

Zugzwang – German for “compulsion to move” – is a situation found in chess and other turn-based games where one player is put at a disadvantage because they must make a move when they would prefer to pass and not move.

In this case, it explores how a non-human centered approach towards the use of technology can help us to tune in with our companion species & environments. Sound can connect and, depending on the vantage, received, propagated, and perceived. The attempt to tune-in with our environments opens possibilities to critically discuss questions around listening, talking, and connecting with all our companions, living and non-living. Listening doesn't merely extend to caring for each other, but to eavesdropping on other species to prevent threats. But though sound is omnipresent, we have problems understanding it. Miscommunication and distortion are constant. Can listening once again become a central asset to



© Christina Gruber

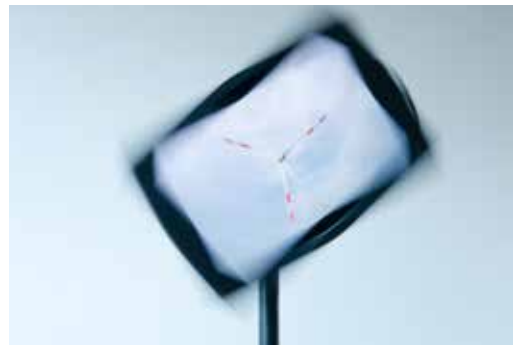
learn about our environment? Though access to machine learning allows us to interpret planetary sounds, will this prevent further misunderstandings? How can we avoid a too human-centered perspective and start to think as a connected network, resonating on Earth?

AMRO—Art Meets Radical Openness, servus.at Research Lab

Domas Schwarz (AT)

Derotation

Derotation shows two objects which are rotating in the opposite direction. The video of a windmill is displayed on a rotating display and both rotations happen at the exact same speed. As you see the rotation of the mast around the center, it seems that the rotor blades are standing still. The speed of the animated rotor blades depends on the speed of the stepper motor. The microcontroller and tablet get the synchronized data by wireless lan connection as they react to different wind speeds. The power consuming usage of the motor concurs with the renewable generation of energy through wind turbines. The whole process



© Domas Schwarz

can stand for consciousness and responsibility of our ecologic footprint, but also for the problem of saving electricity.

Kunstuniversität Linz / Timebased Media
Markus Schmidinger

Sunjoo Lee (KR), Ko de Beer (NL)

Machine in Flux — Wood

A documentation and cartography of time and environment inspired by the growth mechanism of the tree's annual rings. The machine sensitively responds to changes of light, wind, temperature, humidity and sound—and inscribes these influences using ink on paper. It starts by drawing a circle, then follows its own line and continues to draw the next line. The spiral motion enables the machine to autonomously grow its own drawing which resembles the tree's annual rings. Through time a unique, unforeseen pattern emerges. The finished drawing shows where and when the light had been shining, temperature fluctuations, the direction and strength of the wind, and so on, through the delicate differences in the countless lines. It is an exploration into the smallest programmable building blocks that make up complex natural phenomena, and discovering the capacities of machines to emulate nature.



© Sunjoo Lee

Made in support from MAD emergent art center and BioArt Laboratories
Funded by Cultuur Eindhoven
Advised by Prof. Sass-Klaassen and Prof. Sterck from Wageningen University & Research
This project is co-funded by the European Commission's DG CONNECT, in the framework of the Horizon 2020 programme of the European Union under the S+T+ARTS programme's Regional STARTS Centers.

Felix Lenz (AT)

Political Atmosphere

Political Atmosphere is the result of a several-months-long research process of tracing the invisible connections between flight turbulence, climate change and war. About a century ago, Lewis Fry Richardson—a British meteorologist and peace researcher— theorized that the same

methods he used to forecast atmospheric turbulence could be applied to predict political turbulences like conflicts and war. By considering contemporary climate science, this installation further explores his hypothesis in the context of the Anthropocene. The complexity of these relations is made tangible by means of a data-driven mechanical siren and an ADS-B antenna, which allows for receiving, processing and visualizing the surrounding flight traffic. Each flight slowly accelerates the latent build-up of potential until a threshold is passed and a mechanism releases the siren. The roar of the siren, both literally and metaphorically, has become a part of reality in conflict-torn areas. At last, it is starting to echo back on western society.

Produced at & with generous support of: Design Investigations (ID2), University of Applied Arts Vienna



© Lukas Preisinger, Werkstätte Digitale Fotografie

Jip van Leeuwenstein (NL)

A Diverse Monoculture

Dionaea Mechanica Muscipula

The project *A Diverse Monoculture* questions the future relationship between mankind and nature: is it possible to deploy robots to find a new balance within our ecosystem? *A Diverse Monoculture* is a family of several robot species, which together form a hive of new predators. These predators are used in an attempt to restore the balance within our ecosystem. The introduction of the robot predator within the ecosystem offers all the advantages of the predator without a loss of control. The first robot predator in the family is the *Dionaea Mechanica Muscipula*, the creature is designed to attract and digest oak processionary moths. The *Dionaea Mechanica Muscipula* is developed to reduce the population of oak processionary moths, which are an increasing plague. These moths are active at night and attracted to light. The robot will lure in nearby moths with its light, situated in his mouth. The mouth acts as a trap, which contains the curious moths.



Some moths are allowed to remain in the mouth since they spread pheromones that attract other moths. The other moths are processed toward the stomach of the robot where a chemical reaction of the Micro Fuel Cells will power the robot.

Ilona Bradford, Bram van Leeuwenstein, Bart Verburg,
Texas van Leeuwenstein

Marlene Reischl (AT)

Still There



Still There is a video installation dealing with irritation as a state. Situations in which the perceivable does not appear to be clearly assignable can cause discomfort, uncertainty and also fascination. In an attempt to insert an inconsistent fact into your own logic, strange in-between stages are produced that may seem eerie, due to their abstract aesthetics. Manipulated through Frame Blending, the computer transforms the images it has been given to generate new intermediate ones by itself.

Lukas Truniger (CH), Itamar Bergfreund (CH), Bruce Yoder (US)

Ethereal Fleeting

A continuous series of clouds, generated by a silvery machine-like sculpture, float over their surroundings and then slowly dissolve into thin air. This seemingly natural phenomenon can be observed in strangely repetitive patterns. Its formation is programmed and conceals an algorithmic poem, coded in the winds. The air is used as an ephemeral storage medium, its content gradually dissolving over time. This is a metaphor for our modern societies, where we are constantly – both consciously and unconsciously – writing our stories in the atmosphere, and manifesting energy into tangible, if transient, forms. This installation is an attempt to synthetically reproduce a natural marvel outside its expected context. Though it might seem doomed to failure, it raises various questions regarding how we interact with our environment, and our desire to imitate – and eventually control nature.

Concept: Lukas Truniger, Itamar Bergfreund, Bruce Yoder
Artistic direction & visual design: Lukas Truniger
Support: Burning Man 2018 Honoraria Art Grant, Mirage Festival

This project is co-funded by the European Commission's DG CONNECT, in the framework of the Horizon 2020 programme of the European Union under the S+T+ARTS programme's Regional STARTS Centers.



© Lukas Truniger

Jef Montes (NL)

Marinero

Tailored by weather

Inspired by the contrast of the sea and plastic pollution, *Marinero* is intended to create an architectural blueprint that transforms organically over the course of time due to different weather conditions. The blueprint is one woven square that forms the basis for diverse variations. All produced *Marinero* fabrics are used (no waste). Because the finishing is already incorporated within the woven pattern, the materials take their shape from the various conditions rather than using traditional cutting and tailoring techniques. The vision is to design a new kind of production system resulting into adaptive garments that grow with us individually. The weavings have a warp of monofilament and a weft of integrated variable threads. In addition to weaving, we will also experiment with knitting techniques. The combination of these threads causes friction and results in dynamic shapes during different



© TEAM PETER STIGTER

meteorological conditions such as: rain, heavy wind or drought.

S+T+ARTS, Aitex textile institute Alcoy, Empa material laboratories St.Gallen, Haratech 3D print, Wood K Plus Linz, Johannes Kepler university Grand Garage Linz, IED Madrid university of design, Fashion & Technology university Linz, TextileMuseum/TextileLab Tilburg, Wageningen University Research, Creative Industries Fund NL

Yinan Liu (NZ), Jermaine Leef (NZ), Uwe Rieger (DE/NZ), Holly White (NZ)

Kōrero Paki (Our stories of the legends)

A cultural journey performed through 3D holographic sculptures on mobile displays

Kōrero Paki takes key moments from the Maori mythology and transforms them into 3D holographic sculptures displayed on personal handheld devices. The Kōrero Paki project uses an anaglyph stereoscopic display method to create holographic mini sculptures. Viewed with simple red/cyan cardboard glasses, these sculptures are perceived as hovering above the surface of a smartphone and appear to be dancing in the viewer's hand. The audio-visual content consists of five chapters. These are presented in the form of abstract digital sculptures designed to remind the viewer of "holographic carvings." Using a simplified motion capture process, a performer transforms the drawings into animated narratives. The overarching story includes the creation, the journey from Hawaiki, the significance of the whale, the ceremonial welcoming onto the Marae, traditional weaponry, and performing arts. Placed

at the intersection of visual arts, performance, and creative technologies, Kōrero Paki is a collaboration between the arc/sec lab and Manaia M.

arc/sec Lab: Yinan Liu (NZ), Uwe Rieger (NZ), Kathy Yuan (NZ)
 Manaia M: Jermaine Leef (NZ) and Holly White (NZ)
 Artwork by Maori Erstich (NZ) and Te Ahuora Macfarlane
 Performing Artist: Eds Eramiha
 The project is funded by Creative New Zealand and supported by the University of Auckland



© Yinan Liu, Uwe Rieger

Yasuaki Kakehi (JP), Daisuke Akatsuka (JP), Juri Fujii (JP), Yoshimori Yoshikawa (JP), Joung Min Han (KR)

Air on Air

As we blow and make soap bubbles using our breath, we sometimes feel our presence within the floating bubbles. This work is a participatory physical installation that connects distant lands online with bubbles. The breath blown by an online participant is detected by a microphone on the tablet or the PC and transmitted to the installation site as data. A bubble machine at the installation site then creates soap bubbles based on the strength and length of the breath data. The bubble machine is also equipped with a webcam, and online participants can see the bubbles as if you are blowing soap bubbles in person at the venue. At the installation venue, multiple machines line up, each releasing bubbles based

on the breath collected by online participants. This online installation allows participants to look at the sky in a remote location across a distance. And it also gives them a way to communicate to the remote location "physically" through soap bubbles in these times of restricted mobility.

Project Members:
 Yasuaki Kakehi,
 Daisuke Akatsuka,
 Juri Fujii, Yoshimori
 Yoshikawa, Joung Min
 Han, Special Thanks:
 Wataru Date
 Yasuaki Kakehi Lab.,
 The University of
 Tokyo



© Yasuaki Kakehi



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.

- _ Design by Decay, Decay by Design: Andrea Ling (CA)
- _ EDEN – Ethique – Durable – Ecologie – Nature: Olga Kisseleva (RU)
- _ c o m p u t e r 1. 0: Soft Monitor: Victoria Manganiello (US), Julian Goldman (US)
- _ Perception iO: Karen Palmer (UK)
- _ plasticpreneur: doing circular (AT)
- _ SOCIALITY: Paolo Cirio (IT)
- _ Topographie Digitale: DataPaulette (FR)
- _ Hybrid Living Materials: The Mediated Matter Group (INT)
- _ aqua_forensic: Gjino Šutić (HR), Robertina Šebjanič (SI)
- _ Re-Textile 3D: Ganit Goldstein (IL)
- _ The Wrong: David Quiles Guilló (ES)
- _ CONTAIN: OpenCell (UK)

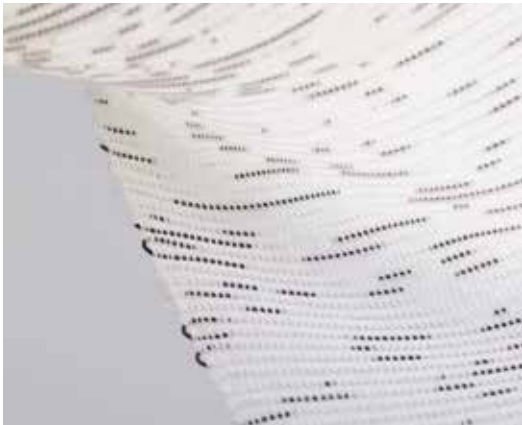
Design by Decay, Decay by Design: Ally Schmalting



SOCIALITY: Paolo Cirio



EDEN: Olga Kisseleva studio



compute r1.0: Victoria Manganiello



Perception IO: Karen Palmer