

CyberArts 2021

Prix Ars Electronica

S+T+ARTS

Prize '21



ARS ELECTRONICA

Art, Technology & Society

**HATJE
CANTZ**

CyberArts 2021

Prix Ars Electronica

S+T+ARTS
Prize'21

Gerfried Stocker · Markus Jandl

CyberArts 2021

Prix Ars Electronica 2021

Computer Animation · Artificial Intelligence & Life Art · Digital Musics & Sound Art
Isao Tomita Special Prize · Ars Electronica Award for Digital Humanity
u19—create your world

STARTS Prize '21

Grand Prize of the European Commission honoring Innovation
in Technology, Industry and Society stimulated by the Arts

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Prix Ars Electronica 2021



Prix Ars Electronica 2021

Gerfried Stocker, Markus Jandl

In 2021, COVID-19 continued to profoundly affect our lives, and Ars Electronica was not spared, either: In February 2021, Hannes Leopoldseder, founder of the Prix Ars Electronica and co-founder of Ars Electronica, was abruptly torn from this life by the virus. Established in 1987 and based on his idea, the Prix Ars Electronica has now become the largest continuously held competition for digital art in the world. The legacy of Hannes Leopoldseder reminds us of the essential meaning of Ars Electronica: Getting people excited about the future; inspiring, involving, and motivating them. It reminds us that with and at Ars Electronica, we must make our contribution to shaping a future that belongs to all of us.

With a total of 3,158 submissions from 86 countries, the participating artists of Prix Ars Electronica 2021 sent a powerful message, with 1,150 submissions in the Digital Music & Sound Art category, followed by Computer Animation with 870 works, and 759 projects in the Artificial Intelligence & Life Art category. The u19—create your world category for Young Creatives (up to age fourteen) and Young Professionals (age fourteen to nineteen), open for entries from all over Austria, recorded a total of 379 entries.

The 2021 edition of the Prix Ars Electronica was the second such event that—due to the global pandemic—had to be carried out completely online. While many other competitions have long since

switched over to online voting for their juries to save costs, Prix Ars Electronica has, from the very beginning, placed importance on bringing the jurors to Linz for three and a half days. Since 1987, the intensity, concentration, and diversity of perspectives that all coalesce to form the jury assessment have been the guarantee for a first-class selection of winning projects that emerge from the Prix Ars Electronica each year.

It would fill many pages to list all the complexities involved in accepting over 3,000 entries and preparing them for the evaluation of the expert juries in order to give each entry the best possible chance of capturing one of the coveted prizes. Conducting all of this completely online did not become any easier in the second year. We cannot thank the jurors of all the categories as well as the members of our staff enough for their enormous effort.

What also became very evident in this second COVID year is the extent to which the artists suffered from the consequences of the long lockdown: festivals were cancelled, exhibitions postponed indefinitely, artist-in-residence programs cancelled, meetings with colleagues and project partners could not take place, and research institutions were closed to artists. On top of this was the economic and existential uncertainty of how one would be able to cover the expenses of everyday life without an income. Unsurprisingly, all of this was reflected in the submissions as well.

The picture that emerges shows very clearly how important access to technical infrastructure and interdisciplinary partnerships is in digital art, and also how crucial project financing through festivals and exhibitions is in this regard. But it also shows us how easily this ecosystem of art, creativity, and innovation, which is currently so often praised as an important player in meeting the challenges of the future, can unravel—something that should be a cause for concern among decision-makers in politics and business.

This was felt most strongly in the Artificial Intelligence & Life Art category, in which complex installations are submitted that are usually the fruit of long and intensive teamwork between artists and scientists, projects that are frequently created over the course of many months as part of artist-in-residence programs at research institutions.

This was also evident, if to a lesser extent, in the Computer Animation category: while many ideas can now be developed at home using a standard commercial PC, larger projects can only be realized by teams working closely together.

The number of entries in the Digital Musics & Sound Art category increased significantly this year, particularly projects that could be created in home studios—or in living rooms, bedrooms, and foyers that had been turned into home studios.

Two additional trends that were unambiguously confirmed this year: First, artificial intelligence and machine learning are of enormous interest both as a topic and as a tool; and second, the number of projects devoted to ecological problems and the effects of climate change has again risen sharply. The “activist turn” is especially noticeable in this area, not only in the form of a growing engagement on the part of the artists, but also as a trend toward developing very concrete projects and prototypes and establishing alternative models—a trend that is reflected both in the submissions and in the attention and decisions of the jurors.

We were often contacted by artists who told us how they were unable to realize or complete projects due to a lack of financing, and we are thus particularly pleased that this year, through the support of the TOMITA Information Hub and the Austrian Federal Ministry for European and International Affairs, we were able to offer two additional, generously endowed special prizes. Moreover, we were able to make additional prize money available for the Awards of Distinction in the individual categories. A total of €69,600 in prize money was awarded this year.

Per category, one Golden Nica plus €10,000 was awarded as the main prize, as well as two Awards of Distinction worth €3,000 each and twelve Honorary Mentions. In the u19—create your world category, a Golden Nica plus €3,000 in prize money was awarded in 2021 for the Young Professionals (age 14 to 19) as well as two Awards of Distinction and twelve Honorary Mentions worth a total of €1,600. For the Young Creatives (up to age fourteen), main prizes, Awards of Distinction, and Honorary Mentions totaling €2,000 were awarded, graded according to age. In memory of Isao Tomita and with the support of the TOMITA Information Hub, a special prize for research into the technological and artistic challenges in the area of Digital Musics & Soundart was awarded for the first time, with prize money totaling €5,000. In partnership with the Austrian Federal Ministry for European and International Affairs, the Ars Electronica Award for Digital Humanity, worth €10,000, was also established this year, awarded to projects that demonstrate the importance of cultural exchange and cooperation for the development of a society-oriented, digital world.

The selection of the winning works was carried out by a group of twenty-five international experts from the world of art and science who serve the Prix Ars Electronica as jury members. We would like to take this opportunity to express our special thanks to these jurors.

In 2021, for the sixth time, the Prix Ars Electronica includes the STARTS Prize, which the Ars Electronica awards for the European Commission in cooperation with BOZAR, Waag, INOVA+, T6 Ecosystems, French Tech Grande Provence, and the Frankfurt Book Fair. This prize, endowed with a total of €40,000, recognizes innovative projects at the nexus of science, technology, and arts (STARTS) and is awarded by the European Commission as part of the Horizon 2020 funding program for research and innovation.

The Prix Ars Electronica is being staged for the 35th time in 2021. This has been made possible by the City of Linz, which has funded Ars Electronica since 1979 and the Prix Ars Electronica since 1987. We would also like to express our gratitude to OK at OÖ Kulturquartier, now part of OÖ Landes-Kultur GmbH for hosting and supporting the Cyber-Arts exhibition. Special thanks for additional support go to the Austrian Federal Ministry of Education, Science and Research, and OeAD.

Shortly before going to print, we received the sad news on the passing of pioneer of media art **Joachim Sauter (1959 – 2021)**

Joachim Sauter has accompanied Ars Electronica for decades, as an artist, as a frequent juror and also as a Prix Ars Electronica prizewinner, as an advisor and as a friend. Time and again, he has inspired and impressed many of us with his ideas and his passion; without his involvement, many things would not have succeeded. As a pioneer of media art, he has contributed significantly to the development of media art as an independent new art form. With his high aesthetic standards, technical perfection, and artistic originality, he created lasting masterpieces and set milestones. His death is an immeasurable loss.



Gerfried Stocker (AT) is a media artist and an engineer for communication technology and has been artistic director and co-CEO of Ars Electronica since 1995. In 1995/96 he developed the groundbreaking exhibition strategies of the Ars Electronica Center with a small team of artists and technicians and was responsible for the setup and establishment of Ars Electronica's own R & D facility, the Ars Electronica Futurelab. He has overseen the development of the program for international Ars Electronica exhibitions since 2004, the planning and the revamping of the contents for the Ars Electronica Center, which was enlarged in 2009, since 2005; the expansion of the Ars Electronica Festival since 2015; and the extensive overhaul of Ars Electronica Center's contents and interior design in 2019.

Stocker is a consultant for numerous companies and institutions in the field of creativity and innovation management and is active as a guest lecturer at international conferences and universities. In 2019 he was awarded an honorary doctorate from Aalto University, Finland. **Markus Jandl (AT)** has been Chief Financial Officer (CFO) since September 2020 and, together with Gerfried Stocker as co-CEO, manages the business of Ars Electronica Linz GmbH & Co KG and Ars Electronica International GmbH. He has held various positions at Ars Electronica over many years, most recently as Head of Corporate Finance and authorized signatory for both Ars Electronica companies. Born in Linz, he studied Economics at Johannes Kepler University Linz and spent nine months at Ivey Business School in London/Ontario, Canada. Jandl specialized in corporate accounting during his studies and wrote his diploma thesis in this field.

A Symbiosis

Christine Schöpf

The Prix Ars Electronica 2021 is the first such event in the thirty-four years of our existence that we have had to plan without Hannes Leopoldseeder, the mastermind and initiator of this international media arts competition. Upon his death, a large number of very personal memories and testimonies reached us from the international network of Ars Electronica artists and jurors.

In a blog article about the death of Hannes Leopoldseeder, the frequent juror, long-time friend, artist, and co-founder of ART+COM, Joachim Sauter, writes: “Leo! The next jury without you: unimaginable. The next Ars without you: even less imaginable. Your presence there was always a challenge—a challenge to be bold.” Shuzo John Shiota, CEO of POLYGON PICTURES, who has served several times as juror in the Computer Animation category, writes: “I had the pleasure of meeting Hannes for the first time in 2003, during the Prix Ars Electronica jury, the first of six I have since been fortunate to serve. Having started my professional career in the steel industry, I was truly fascinated to see how one man’s vision and persistence transformed what was once a steel city into a world-renowned mecca for media arts. I remember very fondly his loving smile, and how he always reminded us jurors to “Give out the prizes, recognize the artists.” Hannes was a true giant. We have lost a giant.”

The annual exhortation to the jury quoted by Shuzo John Shiota is based on a jury decision from the early days of the Prix Ars Electronica, when the jury for Computer Music did not want to award a Nica—that is, no main prize—but rather “only” Awards of Distinction. A no-go for Hannes Leopoldseeder. The top priority for him was always to

assess which of the submissions were worthy of a prize, and then to award the submissions with the appropriate prizes and to pay out the entire prize money to the artists.

In 2015, Jeffrey Shaw, recognized internationally as a pioneer of interactive art who has powerfully influenced the creation of virtual environments and new innovative user interfaces, was awarded the Golden Nica as Visionary Pioneer of Media Art. He states: “Almost the entire community of media artists of my generation is deeply indebted to Ars Electronica for providing an inspiring and influential platform for our works, as well as precious recognition of our achievements. Thereby, Hannes’s singular, energetic and visionary contribution to contemporary global culture is immense and invaluable, not to speak of the passion and friendship with which he embraced all who came his way.”

One of the considerations for founding a competition for computer art in 1987 was to establish an international platform for activists in computer art, to initiate a competition for artists, scientists, students, as well as for experts and professionals—in short, an open competition—and one that would also transcend genres, a novelty at the time. Hannes Leopoldseeder was convinced that such an interdisciplinary competition would lead to a grassroots network by and for creative people in the area of digital art. And history would prove him correct.

In 1987, when I had the honor of conceiving the Prix Ars Electronica, there were no comparable events or competitions that encompassed music, film, and graphic art. We wanted to achieve precisely this in the digital world. In order to make

this competition fit for the future, it had to be designed in a manner that lent itself to expansion and development. Endowed with 1,000,000 Austrian schillings (€72,672.84), the Prix Ars Electronica was also intended to express an appreciation for computer art—after all, the prize money awarded was more than the Grand Austrian State Prize, which is awarded to exceptional Austrian artists.

In its first year, just over 720 works were submitted to Prix Ars Electronica; now, more than 3,000 works are submitted each year. In order to ensure not only the quantity of the submissions but also the quality of the competition and the assessment process, some award categories are biennial rather than annual since 2014.

Over the years, the Prix Ars Electronica has time and again undergone new developments and met new challenges: The categories at the outset were Computer Graphics, Computer Animation, and Computer Music. In 1990, Interactive Art enhanced the line-up. A category especially for kids and young people was introduced in 1998. A prize for Digital Communities and [the next idea] voestalpine Art and Technology Grant premiered in 2004, followed by Hybrid Art in 2007 and Artificial

Intelligence & Life Art in 2019. The Prix Ars Electronica's most recent innovations came in 2014 with the introduction of a Golden Nica honoring the Visionary Pioneers of Media Art, and the reconfiguration of two pairs of categories—Artificial Intelligence & Life Art and Digital Musics & Sound Art; Interactive Art+ and Digital Communities—which now alternate in a biennial rhythm. Winners are awarded the coveted Golden Nica statuette, prize money of up to €16,000 per category, and an opportunity to showcase their projects at the Ars Electronica Festival in Linz. More than 3,000 submissions from more than 100 countries each year impressively document the dynamics of international media art. The presentations of the awarded projects and artists are special highlights of each Ars Electronica Festival.

In the last 34 years, the Prix Ars Electronica has become the world's most highly regarded award for artists working in media art, science, and technology. And not only that: increasingly, the Prix Ars Electronica is becoming a springboard into the international art scene for many young artists—which makes us particularly happy.



Christine Schöpf (AT), PhD, studied German and Romance Languages. She has worked as a radio and television journalist and was the head of the art and science department at ORF Upper Austria (1981–2008). In 2009 she was appointed Honorary Professor at the University of Art and Design Linz. Since 1979, she has held a number of positions in which she has been able to contribute considerably to the development of Ars Electronica. She was responsible for conceiving and organizing the Prix Ars Electronica from 1987–2003. Together with Gerfried Stocker, she has been the artistic co-director of Ars Electronica since 1996.

Hannes Leopoldseeder

Timelessly Ahead of His Time

Gerfried Stocker, Diethard Schwarzmaier

When Hannes Leopoldseeder (1940–2021), inspired by his colleagues, founded Ars Electronica at the end of the 1970s, giving it the visionary subtitle “Festival for Art, Technology and Society” and furnishing it with a mission statement that still today is of the highest relevance, the Digital Revolution was still more a vague speculation than something that society was actually aware of. Personal computers did not yet exist, nor did CD players, and robots that could stand on two legs were still the stuff of science fiction. There was also, of course, no World Wide Web, and the latest rage was the telefacsimile machine, with which one could send (telecopy) individual, poorly readable sheets of paper from one place to another. It is all the more remarkable that at the time, not only was a highly visionary concept for a new cultural event created, one that—specifically tailored to the industrial, working-class city of Linz—was designed to link art with technology, but also that this idea could be established as an enduring fixture in the city.

It is especially noteworthy that it was recognized at such an early stage that the most momentous change that the advent of the computer would bring about would not be in technology or industry, but rather in society. And this was still decades before social media became a global game changer, and at a time in which the idea of portable minicomputers outfitted with touchscreens, speech recognition,

digital assistants, global navigation systems, and high-resolution cameras—and which, incidentally, could also be used to make phone calls—would have even taken most science fiction authors to the limits of their imagination.

Now, forty-two years later, Ars Electronica can boast of being among the world’s most important events linking art and technology and critically examining the societal transformation resulting from technological advances.

And completely in keeping with its founding principle, Ars Electronica has remained a trend barometer and a forum for the exchange of ideas for shaping the future. With the Prix Ars Electronica, the competition that Hannes Leopoldseeder introduced in 1987, and with the Ars Electronica Center, also a brainchild of Leopoldseeder, which was initiated at the beginning of the 1990s and opened in 1996, Ars Electronica has thus developed far beyond the bounds of the Festival. Later came the Ars Electronica Futurelab, Ars Electronica Solutions, and Ars Electronica Export as well. This represents a broad spectrum of activities that is totally devoted to linking art, technology, and social innovation, and that from these aims also derives its special attractiveness and creativity.¹

1 Stocker, Gerfried, Schwarzmaier, Diethard, in: Leopoldseeder, Hannes: *der zeit voraus. Kommentare und Analysen zum digitalen Wandel von Kunst, Technologie und Gesellschaft*, p. 6–8

Time Journey Through Digital Revolution

With and by Hannes Leopoldseder

This article traces the development of the extraordinary founding idea over a matter of decades and takes us on a brief time journey through the Digital Revolution by compiling a selection of quotes from commentaries that Hannes Leopoldseder formulated in forewords, accompanying texts, and statements, over the period of 41 years (1979 – 2020). The objective pursued in his texts was to shed some light on the period in which they were written, and especially on how the advance of information technology has changed our society, our culture, and, above all, our everyday lives.

1979

Ars Electronica—Idea and Concept

The purpose of Ars Electronica is not to take stock of the past; it is oriented instead to the developments of tomorrow. Thus this event for electronic arts and new experience assumes a character of incalculability, of risk, and of daring to try something new. At the same time, however, Ars Electronica poses a challenge to artists, technicians, cultural critics, and ultimately to the public encountering new forms of expression in art.

Excerpt taken from:
Linzer Veranstaltungsgesellschaft (Ed.):
*Ars Electronica 1979 im Rahmen des
Internationalen Brucknerfestes 79*, Linz 1979, p. 5

1980

Electronics—Art—Society

Ars Electronica is intended to set signals for the future. Not only as an attempt to link tradition and avantgarde, but also as a cultural experiment seeking to influence the cultural awareness of the public in new ways.

Excerpt taken from:
Linzer Veranstaltungsgesellschaft (Ed.):
*Ars Electronica 1980 im Rahmen des
Internationalen Brucknerfestes 80*, Linz 1980, p. 6ff

1982

Culture of the Information Society

As industrial society has revolved around the machine, the age of the microprocessor—the third industrial revolution—will be determined by information and communication. Information society, with the developments of broadband cable systems, home electronics, and direct radio satellites, will produce new modes of cultural behavior and—due to the change of technologies and media—also new forms and contents of artistic creativity.

For this future Ars Electronica wants to provide markers.

Excerpt taken from:
Linzer Veranstaltungsgesellschaft (Ed.):
*Ars Electronica im Rahmen des Internationalen
Brucknerfestes Linz, Festival für Kunst, Technologie
und Gesellschaft 1982*, Linz 1982, p. 6ff

1984

The New Computer Culture

The children born in the Orwell year of 1984 will be 35 years old in 2019. They are the generation that will be responsible for our society then. Does 1984 mark the beginning of a revolution of our society—and will it be completed by 2019? Today's new basic innovations will rank among the old technologies by then; their infrastructure will determine our economy, our society, art, and culture. The electronics society will be in full bloom. Working out the tracks—this is today's challenge.

Excerpt taken from:
Linzer Veranstaltungsgesellschaft (Ed.):
*Ars Electronica im Rahmen des Internationalen
Brucknerfestes Linz, Festival für Kunst, Technologie
und Gesellschaft 1984*, Linz 1984, p. 9ff

1986

Ten Indications of an Emerging Computer Culture

- (...)
2. Computer culture calls for a new alphabet, a new language, a new way of thinking.
 3. Computer culture demands a society capable of becoming computer-literate.
 4. Computer culture requires restructuring of work, leisure time, and society.
 5. Computer culture requires the screen as a major tool in home and office.
 6. Computer culture permits a new type of artist.
- (...)

Excerpt taken from:
Österreichischer Rundfunk ORF, Landesstudio
Oberösterreich (Ed.): *Computerkulturtag
Linz—ORF-Videonale 86*, Linz 1986, p. 5ff

1987

The Fifth Cultural Technique

Until the appearance of the computer, tools and technical inventions mainly enlarged both the power and the reach of man's sensory organs. The computer is enlarging the capacities of our brains, thinking and intelligence. The multiplication of physical power is not the goal, but rather the processing of knowledge. The scientists in Artificial Intelligence research programmes already talk about a change from processing mere data to a future intelligent processing of knowledge. Thus this computer-evolution will probably become the Logos of a new step in cultural evolution: Computer Culture.

Excerpt taken from:
Leopoldseder, Hannes (Ed.): *Prix Ars Electronica, Meisterwerke der Computerkunst, Edition 87*, Verlag H. S. Sauer, Worpswede, p. 10ff

1988

The Golden Crossbar

(...) Scientists and artists have developed two distinct specific understandings of their role: the scientist as the exponent of the left cerebral hemisphere, the artist of the right. (...) The great creative achievements of a culture, from science via technology to art, derive from this cooperation of the left and the right hemisphere. If human culture is based upon the function of the corpus callosum, this string of nerves symbolizes in computer arts what I should like to call the "golden crossbar" which opens the door to a fruitful interaction of both hemispheres, which discloses the effectiveness of the whole human capacity in a special way.

Excerpt taken from:
Leopoldseder, Hannes (Ed.): *Prix Ars Electronica, Meisterwerke der Computerkunst, Edition 88*, TMS-Verlag, Bremen, p. 9ff

1989

Art in a Time Warp—A Time Warp into the Future

In 1979 Ars Electronica appeared as a time warp into the future: a decade of "electronic art" becomes art in a time warp. (...) What was only globally prophesied in 1979 has become more clearly evident in 1989: yet even now the computer culture is still in its infancy; the adolescence and adulthood of this era are reserved for the 21st century.

Excerpt taken from:
Gerbel, Karl & Leopoldseder, Hannes (Eds.): *Die Ars Electronica. Kunst im Zeitsprung*, Landesverlag Linz 1989, p. 11ff

1989

10 Years Ars Electronica

Openness has become a fundamental characteristic of the festival: open to new trends, open to the interactions between art and technology, open to that which is yet unfinished, open to contradictions, open to new territories, but especially open to the encounters between artists, scientists, and those who are involved in discussing our future.

Excerpt taken from:
Gerbel, Karl & Leopoldseder, Hannes (Eds.): *Die Ars Electronica. Kunst im Zeitsprung*, Landesverlag Linz 1989, p. 11ff

1990

Multi-Trends for Millennium III

From the prognoses for the year 2000 we can deduce some multi-trends towards the Millennium III that affect the environment of Prix Ars Electronica, the environment of computer arts: multi-dimensionality, multi-mind, multi-media, multi-art are the terms to be remembered. These multi-trends are becoming the pathways into the "Mentopolis" of the millennium to come. An artificial world without bounds or limits is set before us—new kinds of entertainment, new shapes of art, new experiences for the individual. Possibilities in virtual reality prognosticated today may be able to change our behavior and our world. "Artificial life" is gaining shape.

Excerpt taken from:
Leopoldseder, Hannes (Ed.): *Der Prix Ars Electronica. Internationales Kompendium der Computerkünste*, Veritas Verlag, Linz 1990, p. 8ff

1991

The Myth of the Artificial

In the year 1991, the computer lost its innocence. On January 17, 1991, at 1:00 a.m. Central European time, to be exact, when the first laser-controlled bomb met its target, the Gulf War had started: the first "totally electronic war" (Paul Virilio). In no war before had the electronic command and decision system been used to such a degree of complexity. Virtual reality—topic of a theoretical symposium at Ars Electronica 90—is bereft of its playfulness: war becomes a staged reality beyond real life. Jean Baudrillard called the Gulf War an "exemplary specimen of simulation." For the first time, two wars take place: one war on the battlefield, the other war in people's minds,

created by the worldwide network of media. The war of images, in real time and as a live battlefield movie, becomes the first actual “world war” involving people on every continent via their TV screens.

Excerpt taken from:
Leopoldseder, Hannes (Ed.): *Der Prix Ars Electronica.*
Internationales Kompendium der Computerkünste,
Veritas Verlag Linz, 1991, p. 6ff

1992

Ars Electronica Center Museum of the 21st Century

... the day when the City Council of Linz decided to offer an additional forum to computer and media artists. In addition to Ars Electronica—since 1979 the traditional festival of art, technology, and society—the Ars Electronica Center was to be installed as a “museum of the 21st century”: a museum that does not point into the past but is a place of encounter pinpointing important developments in the future. (...) With the Ars Electronica Center, Linz also wants to offer an additional home to the worldwide community of artists around the Prix Ars Electronica.

Excerpt taken from:
Leopoldseder, Hannes (Ed.): *Der Prix Ars Electronica.*
Internationales Kompendium der Computerkünste,
Veritas Verlag, Linz 1992, p. 6ff

1993

Ars Electronica, Prix Ars Electronica, Ars Electronica Center

In the same way that oil was the energy of the 20th century, information will be the “intelligent energy” of the 21st. (...). For a festival city, staying one step ahead means not just watching the innovation cycle at work in the development of technology, but putting it to work in the festival itself. Hence Ars Electronica’s three future areas of operation: the festival, the international competition, and the Ars Electronica Center, museum of the future.

Excerpt taken from:
Leopoldseder, Hannes (Ed.): *Der Prix Ars Electronica.*
Internationales Kompendium der Computerkünste,
Veritas Verlag, Linz 1993, p. 6ff

1994

Ars Electronica, Prix Ars Electronica, Ars Electronica Center

The next 15 years—leading up to the year 2009—will certainly be among the most adventurous years of change. If Gregory Stock of Princeton University is right, “METAMAN” will overcome the pains of birth in this decade: we are at the dawn of a new era in our evolution—human society is on its way to a global superorganism in which modern technology and communication connect people together like the cells in a great body. At the same time, however, we have reached a fulcrum in our history: Will the imminent “National Information Infrastructure” (NII), as the American government calls the creation of the nationwide, broad-band communications structure, hold open secret back doors that will restrict civil rights, confidential communication and freedom, as *WIRED* magazine expounded this year in a dramatic report about freedom and privacy in the networks? What lies at the end of the data highways? The next decade's developments will require more investigation of the effects of new technology on our society than has ever occurred before. Ars Electronica will continue to be a forum for such investigation.

Excerpt taken from:
Leopoldseder, Hannes (Ed.): *Der Prix Ars Electronica.*
Internationales Kompendium der Computerkünste,
Veritas Verlag, Linz 1994, p. 6ff

1995

Welcome to the Wired World

If the atom was the trademark of the science of the twentieth century, the dynamic Net will become the symbol for the twenty-first century. The dynamic Net is an icon of a global mind, a global consciousness in the sense intended by Teilhard de Chardin, the mystic of the era of information. The Net is to be understood as a new form of human communication, as a new global medium currently growing faster than television, radio, or the printed media ever did.

Excerpt taken from:
Leopoldseder, Hannes & Schöpf, Christine (Eds.):
Der Prix Ars Electronica. Internationales Kompendium
der Computerkünste, Österreichischer Rundfunk (ORF),
Landesstudio-Oberösterreich, Linz 1995, p. 7ff

1996

From the Idea to Reality

Opening of the Ars Electronica Center

With the triangle of Ars Electronica Festival, Prix Ars Electronica, and Ars Electronica Center, Linz has established itself in a leading position in cyberspace, both regionally and worldwide. The ultimate aim of this Ars Electronica triangle in Linz is to enable us to work together, bringing economic and social efforts into harmony in dealing effectively with the digital transformation of our culture as we move further along the way to a cognitive society in which knowledge is the most decisive resource.

Excerpt taken from:

Janko, Siegbert, Leopoldseder, Hannes & Stocker, Gerfried (Eds.): *Ars Electronica Center. Museum der Zukunft*, Linz 1996, p. 34ff

1997

Cyberart: Art of the Future—The Future of Art

In 1987, the idea of the Prix Ars Electronica was based on the computer as a universal medium which was still distributed among different fields such as computer animation, computer graphics, computer music, and subsequently interactive art and .net. Now at the beginning of the second decade, however, we are seeing the beginning of the process of integration and the convergence of originally separate areas. If the crisis of art is addressed today, then it especially involves traditional video art, media art and computer art, because these disciplines in particular are directly affected by the development in technology.

Excerpt taken from:

Leopoldseder, Hannes & Schöpf, Christine (Eds.): *CyberArts. International Compendium. Prix Ars Electronica*. Springer Wien – New York, 1997, p. 6ff

1998

The Cybergeneration Takes Off

“The children who are born in the Orwell year of 1984 will be 35 years old in the year 2019,” I wrote in the 1984 Ars Electronica catalogue, continuing, “They are the generation that will be largely responsible for our society then.” In the history of Ars Electronica, the Prix Ars Electronica 98 will assume a special position, because in addition to the artists, scientists, and cyberartists from around the world who are invited to take part in this competition, as part of a pilot project and for the first time, the Prix Ars Electronica 98 has called upon the generation now growing up with the computer to take part. (...)

The cybergeneration is standing on the verge. Will the digital revolution, with its upheavals in genetic engineering and biotechnology, lead the economy, and with it the individual, into a crisis; or are we approaching an entirely new era of prosperity, of economic and social upward development, as prognosticated by the Pulitzer Prize winner and Wall Street Journal reporter Bob Davies and David Wessel in their recent book *Prosperity: The Coming Twenty-Year Boom and What It Means to You*.

Excerpt taken from:

Leopoldseder, Hannes & Schöpf, Christine (Eds.): *CyberArts 98. International Compendium. Prix Ars Electronica*. Springer Wien – New York, 1998, p. 8ff

20 years Ars Electronica

1999

Digital Dawn

When history is written in the 21st century, these decades will be referred to as the new gold rush era. At the same time, the economic, technological and cultural developments of the last two decennia are reflected in a festival, in the Ars Electronica, the festival for art, technology and society in Linz. On the basis of continuity, skill and an orientation to the future, this festival has been able to accompany the continuously occurring phases of transformation like a seismograph. As a festival, Ars Electronica spans exactly the two decades that have seen not only a profound transformation of our civilization, but which have also opened up opportunities for nations, states, cities and ultimately for each individual person, which have never existed before to this extent. For the Ars Electronica Festival and the Prix Ars Electronica, the year 1999 means one thing especially: the festival of the future is not about looking back at history, but about looking ahead.

Excerpt taken from:

Leopoldseder, Hannes & Schöpf, Christine (Eds.): *CyberArts 99. International Compendium. Prix Ars Electronica*. Springer Wien—New York, 1999, p. 8ff

2000

Individuality—Mobility—Globality

(...) one thing is certain: the Internet is by no means at the end of its development or in a phase of maturity, but rather at the beginning. The core idea of the net, all with all communication, is only beginning to exploit its potential. As Jeff Bezos, founder of Amazon.com, drastically states it, in

comparison with geological timelines, the time dimension of the Internet is currently still located in the Cambrian period, in other words about 550 years ago.

Excerpt taken from:
Leopoldseder, Hannes & Schöpf, Christine (Eds.):
CyberArts 2000. International Compendium.
Prix Ars Electronica. Springer Wien—New York,
2000, p.9ff

2001

15 years Prix Ars Electronica The Present of the Future

(...) the Prix Ars Electronica can point to a considerable achievement: since the inception of this competition, artists from all over the world—from over 60 countries—have sent around 20,000 digital media projects to Linz; 200 artists have received Golden Nicas, money prizes and Honorary Mentions; a total of just over ATS 20 million in prize money (approximately 1.45 million EURO, 1.23 million US dollars) have been awarded to artists from all over the world. Over the course of these fifteen years, the works by the prize-winning artists, distinguished by the international juries, mirror developments in the field of digital media since 1987.

Excerpt taken from:
Leopoldseder, Hannes & Schöpf, Christine (Eds.):
CyberArts 2001. International Compendium.
Prix Ars Electronica. Springer Wien—New York,
2001, p. 9ff

2002

Fantasy of Reality

One year after September 11, the new economy and the digital media's progress in the field of creative design are far from a state of euphoria. September 11 changed our world and our thinking more than we may at present realize. (...) If the speed of technological and societal transformation continues to accelerate so radically, we will increasingly have to live with the idea of the unthinkable becoming the thinkable and of fantasy turning bit by bit into reality.

Excerpt taken from:
Leopoldseder, Hannes & Schöpf, Christine (Eds.):
CyberArts 2002. International Compendium.
Prix Ars Electronica 2002.
Hatje Cantz, Ostfildern-Ruit, 2002, p. 11ff

2003

Orwell's Children Are Growing Up

(...) children born in the Orwellian year of 1984 are turning nineteen this year. Orwell's children are growing up. (...) Beyond the natural sciences, whether in engineering, medicine or in other disciplines, a reorientation of values is imminent, the challenge to build a "better world." Measured in terms of this task, justifiably set by every generation over and over again, progress, even of the last decades, is by no means satisfactory but, in face of the immense need to be found across vast areas of the earth, horrifying. The Prix Ars Electronica also reflects this situation, as illustrated by individual artists in their works. Today "Orwell's children" make up a considerable number of the Prix Ars Electronica's entrants. The participants of the category "cybergeneration—u19 freestyle computing," on the other hand, all belong to this generation.

Excerpt taken from:
Leopoldseder, Hannes & Schöpf, Christine (Eds.):
CyberArts 2003. International Compendium.
Prix Ars Electronica 2003.
Hatje Cantz, Ostfildern-Ruit, 2003, p. 11ff

25 years Ars Electronica

2004

Media Culture as a Trademark

The festival's central theme of "Art—Technology—Society," which it has retained throughout the years, is certain to take on even greater importance in the next decades: in addition to innovations from IT, Ars Electronica will be confronted with those from fields like biotechnology and nanotechnology. Moreover it will have to cope with problems related to such issues as energy, water or the change of climate, for these areas are going to make radical and vigorous demands on our society in the next millennium.

Excerpt taken from:
Leopoldseder, Hannes, Schöpf, Christine & Stocker,
Gerfried (Eds.): *CyberArts 2004. International
Compendium. Prix Ars Electronica 2004.*
Hatje Cantz, Ostfildern-Ruit, 2004, p. 11ff

2005

The (R)evolution of Ants

Wikipedia pioneer Jimmy Wales—distinguished with the Golden Nica for Digital Communities at the Prix Ars Electronica in 2004—sees every citizen as part of an evolutionary process which has “the potential to change the world forever.” Evolution shows us the way in Nature. Since the Cretaceous period, ants have ranked among the most successful creatures on earth. Each individual ant contributes its part to the whole. (...) The 21st century as the century of the Internet will thus be one of individual empowerment. The evolution of ants is turning into a revolution. And to think that the WWW is still a teenager! We can definitely look forward to its first years of adulthood.

Excerpt taken from:
Leopoldseeder, Hannes, Schöpf, Christine & Stocker,
Gerfried (Eds.): *CyberArts 2005. International
Compendium. Prix Ars Electronica 2005.*
Hatje Cantz, Ostfildern-Ruit, 2005, p. 10ff

2006

The New Eyes of Millennials

The *Financial Times* from February 18, 2006 talks of the “collective intelligence of the media’s audience.” And no matter how this new power of the media develops, one thing is certain: the Net with all its possibilities will establish itself as the medium of the masses, as a mighty underground medium within collective societal systems, but also as a strong weapon in all democratic systems, enabling “the power of people” to be tapped in decisive situations. The lives of younger Millennials in two realities have already produced a new mass medium: MySpace (<http://myspace.com>). The MySpace community now has 70 million (!) accounts. With this number, MySpace ranks among Yahoo and Google. For the members of the international Ars Electronica community, as well for all Millennials, a sentence by the French writer Marcel Proust fits well: “The real voyage of discovery consists not in seeking new landscapes but in having new eyes.”

Excerpt taken from:
Leopoldseeder, Hannes, Schöpf, Christine & Stocker,
Gerfried (Eds.): *CyberArts 2006. International
Compendium. Prix Ars Electronica 2006.* Hatje Cantz,
Ostfildern-Ruit, 2006, p. 10ff

2007

The Year of the Avatar

While for thousands of years creating or depicting fictional worlds was a field reserved for artists, the technology of our decade now allows us not only to

create such worlds but also to lead a “second life” in them. For the first time ever, today’s generation can have two lives, although the second is still in its initial stages, in its infancy, so to speak. However, as soon as the world of Second Life (SL) has matured, two lives will exist alongside one another. Avatars have a long history, one that goes back to antiquity and classical India (avatara in Sanskrit refers to “the descent of a divine being into mortal realms”). Apparently, in the 21st century, the avatar has a fantastic career in front of him. Maybe even as “Man of the Year” 2007.

Excerpt taken from:
Leopoldseeder, Hannes, Schöpf, Christine & Stocker,
Gerfried (Eds.): *CyberArts 2007. International
Compendium. Prix Ars Electronica 2007.*
Hatje Cantz, Ostfildern-Ruit, 2007, p. 10ff

2008

Upgrade—the Magic of the Flow

Never before in history has the flow of information or knowledge been accessible to so many people as it is today. And this is true even if there are still strong barriers in many areas. For the first time, an open knowledge society is not only conceivable as a utopia, but also visible in its outlines, opportunities, and consequences on the horizon. The constant flow of information is producing a historic change. And what applies to software is all the more true for humans: it’s time for an upgrade.

Excerpt taken from:
Leopoldseeder, Hannes, Schöpf, Christine & Stocker,
Gerfried (Eds.): *CyberArts 2008. International
Compendium. Prix Ars Electronica 2008.* Hatje Cantz,
Ostfildern-Ruit, 2008, p. 10ff

30 years Ars Electronica

2009

On Our Way towards Digital Life

After 30 years, Ars Electronica continues to see its overall concept as a platform for the discussion of future developments—a concept that applies to the Museum as well as to the Festival. This year’s Festival theme, “Human Nature,” and the new Ars Electronica Center’s focus on “New Views of Humankind” are both proof of the course we are taking into the future. On our way towards digital life.

Excerpt taken from:
Leopoldseeder, Hannes, Schöpf, Christine & Stocker,
Gerfried (Eds.): *CyberArts 2008. International
Compendium. Prix Ars Electronica 2008.*
Hatje Cantz, Ostfildern-Ruit, 2009, p. 10ff

2010

“... at all times expect the unexpected”

(Alain de Botton, 2010)

Many futurologists see the decade between 2030 and 2040 as the next milestone in technological, social and human development. In it, the speed of technological development will accelerate exponentially. (...) If any master key at all can be found for successfully coping with this rupture in human evolution, then it must be sought in education, though it, too, will require radical reorientation. Detailed knowledge of the world doubles about every five years, which means that in the future it will be a matter of concentrating on basic knowledge and grasping the complexity of globality in a world such as ours. In this context, a key approach is the strategy of “global learning” initiated at the United Nations Conference on the Environment and Development in Rio de Janeiro in 1992. Global learning is the educational policy in response to globalization, and is interdisciplinary and holistic in nature. Moreover, it is a fundamental prerequisite for achieving an open, emphatic society like the one described by Jeremy Rifkin. (...) Global learning must become the guiding principle in our schools, not in the distant future, but today. For the speed of change spares no country, not even Austria.

Excerpt taken from:

Leopoldseder, Hannes, Schöpf, Christine & Stocker, Gerfried (Eds.): *CyberArts 2010. International Compendium. Prix Ars Electronica 2010*. Hatje Cantz, Ostfildern, 2010, p. 10ff

2011

The Decade of Decision

One day historians will establish that 2011 marked a “Tipping Point” on many fronts: we are once again approaching crossroads that are going to be of major significance for the world’s future. Wherever we look nowadays, issues are accumulating. I cannot recall such a spectrum of issues in the 25 years since I began writing the introduction of the yearly CyberArts publication. In my texts I have always tried to address specific events of the past year and in doing so see the Prix Ars Electronica and its annual media projects in the mirror of time. This year has been marked by an extraordinary number of complex challenges: Youth revolt, “Arab Spring,” Collapse of the financial system,

Global debts, Nations on the brink of bankruptcy, Governments held hostage by banks, Terrorism in the post-Bin Laden era, Acceleration of change, Globalization tsunami, Internet revolution ...

Excerpt taken from:

Leopoldseder, Hannes, Schöpf, Christine & Stocker, Gerfried (Eds.): *CyberArts 2011. International Compendium. Prix Ars Electronica 2011*. Hatje Cantz, Ostfildern, 2011, p. 10ff

2012

Ars Electronica 2012

The speed at which different areas of our lives are being digitized is accelerating constantly. Everywhere. And with Occupy, Anonymous, WikiLeaks and the Pirates—the Internet has finally entered the political arena. (...) Let’s now move on from politics to education. Here, too, upheaval is imminent due to the advance of digital media: so far the current revolution has only affected traditional educational policies in isolated instances. Yet for the young generation, it is here that the decisions will be made that will determine the skills they will acquire in their future lives, skills they will need to compete in the new world of work.

Excerpt taken from:

Leopoldseder, Hannes, Schöpf, Christine & Stocker, Gerfried (Eds.): *CyberArts 2012. International Compendium. Prix Ars Electronica 2012*. Hatje Cantz, Ostfildern, 2012, p. 10ff

2013

Quantum

On the Infinity of Data

“Quantum” is used to designate many things: in science, e.g. astronomy, or for company names and products of the game industry. I would like to use the term “quantum” as it is used in Latin, where it simply means “how much.” How much data are humans going to need in this century if growth continues at the same rate as it has over the past years? Can the data world be extended to infinity, which cannot be expressed by a number but only by the symbol introduced by the English mathematician John Wallis in 1655? No matter how things turn out, infinity will remain inaccessible to direct human experience.

Excerpt taken from:

Leopoldseder, Hannes, Schöpf, Christine & Stocker, Gerfried (Eds.): *CyberArts 2013. International Compendium. Prix Ars Electronica 2013*. Hatje Cantz, Ostfildern, 2013, p. 10ff

2014

The Magic Triangle

Osaka, Beijing, New York, New Delhi or Tehran—wherever I have presented the history of Ars Electronica, I am always asked why Ars Electronica emerged in Linz at a time when nobody else had come up with the concept for a technology festival of this kind.

The answer is simple. Hubert Bognermayr and I had the idea, it was well-suited to the city's identity and politicians had the courage to plan for the future. The festival was not made of iron and steel, the raw materials of the 20th century, but rather those of the 21st century: electronics, technology and the reciprocal interaction of art and society. Computers are everywhere. In 2014 in the "Internet of things" everyday objects can be information storage and transfer media. Things become a network. Now, Bill Gates' 1994 vision is beginning to unfold. At the Comdex in Las Vegas, the man who was then 39 years old uttered four words that would become legendary: "Information at your fingertips" (2005).

Excerpt taken from:
Leopoldseder, Hannes, Schöpf, Christine &
Stocker, Gerfried (Eds.): *CyberArts 2014*.
International Compendium. Prix Ars Electronica 2014.
Hatje Cantz, Ostfildern, 2014, p. 8ff

2015

The Creative Outbreak

Everything changes, nothing remains as it is

The more digital competence is called for, the more a person has to develop the personal touch—human qualities, a people-oriented attitude, consideration of others, and thus characteristics that differentiate a human being from a machine. At the same time, humans are being equipped with ever-more-powerful technology—to upgrade our hearing and seeing, the way we move, in our hearts and, above all, in our brains.

Excerpt taken from:
Leopoldseder, Hannes, Schöpf, Christine &
Stocker, Gerfried (Eds.): *CyberArts 2015*.
International Compendium. Prix Ars Electronica 2015.
Hatje Cantz, Ostfildern, 2015, p. 8ff

2016

A Plea in Opposition to the Discontented Spirit of the Times

If we consider the mood prevailing in our country and throughout Europe at the moment, then we realize how ambivalent these times truly are. People have very different perceptions of the changes society is undergoing. The political parties that form the respective governing coalitions are being punished at the polls; populism flourishes everywhere. (...) Instead of painting optimistic pictures of the future, the business community is busy drawing up nightmare scenarios. Everything has to change. The Digital Revolution that was recognizable on the horizon decades ago—and which Ars Electronica has been elaborating on in ongoing discourses and manifesting in artistic projects since 1979—now constitutes the mainstream in media, business, and politics. (...)

A plea in opposition to the discontented spirit of the times can only be an impulse. We have to believe in the future. And we have to regard the times in which we live as extraordinary, as is the place in which we live. Time and location are unique.

Excerpt taken from:
Leopoldseder, Hannes, Schöpf, Christine &
Stocker, Gerfried (Eds.): *CyberArts 2016*.
International Compendium. Prix Ars Electronica 2016.
STARTS Prize'16. Hatje Cantz, Ostfildern, 2016, p. 10ff

2017

Expect the Unexpected!

(...) But not all of it is unexpected. Particularly because many people's vision of the future has become darker—concerns about job security, declining income, diminished opportunities in life, the consequences of globalization, digitization, new demands on education—it is necessary to highlight future prospects and to call upon people to demonstrate courage and initiative.

Nevertheless, some interpreters are perhaps going too far in drawing parallels between 2017 and 1917. These two years have one thing in common—they mark the turn of an era. Today we are confronted by globalization, digitization, political

corrosion, enormous speed, disruptive technologies, robotics, and algorithms. Biotechnology is pushing forward into areas that were previously taboo, into the exploration of a world without God, connected with the hypothesis of the human being's immortality. A hypothesis can become a reality.

Excerpt taken from:
Leopoldseeder, Hannes, Schöpf, Christine & Stocker, Gerfried (Eds.): *CyberArts 2017. International Compendium. Prix Ars Electronica 2017. STARTS Prize'17*. Hatje Cantz, Ostfildern, 2017, p. 10ff

2018

Imperfection is Beauty

A remarkable thought on the subject of imperfection—a phrase of which I have taken as the title of this essay—is attributed to Marilyn Monroe. “Imperfection is beauty, madness is genius and it's better to be absolutely ridiculous than absolutely boring.” Perhaps it is precisely this aspect that has always been so attractive to artists. Japanese culture has a special term for imperfection, Wabi-Sabi. Wabi comes from wabiru and means yearning for something, a longing for simplicity. Sabi stands for autumn, transience and the acceptance of change as a part of life.

Excerpt taken from:
Leopoldseeder, Hannes, Schöpf, Christine & Stocker, Gerfried (Eds.): *CyberArts 2018. International Compendium. Prix Ars Electronica 2018. STARTS Prize'18*. Hatje Cantz, Ostfildern, 2018, p. 12ff

40 years Ars Electronica

2019

Turning Point. At the Dawn of a New World

With exhibitions, projects, discussions, and symposiums, Ars Electronica 2019 offers an opportunity to debate the themes of “Art, Technology, and Society,” above all in view of the coming developments in the area of artificial intelligence. The spectrum of the discourse is broad: forty years back, forty years ahead. The year 2019 as a turning point. While the look ahead to the year 2059 must be limited to speculations, one thing is certain: we are experiencing the dawn of a new world. The “Joint Statement of the STARTS Prize 2019 Jury” aptly summarizes the sense of the time in

which we live: “The jury feels that this message of hope is symbolically appropriate on the occasion this year of Ars Electronica's 40th anniversary—an institution that has grown to become a responsible cultural leader, relentlessly advocating for the cruciality of the arts within technological and industrial setups; providing countless opportunities for conversing, collaborating, and showcasing; and for exposing the global community to the wonders that occur in the in-between spaces of art, technology, and society. We are grateful to Ars Electronica for giving the jury an opportunity to take part in their extraordinary mission and wish it continued boundary-pushing endeavors that cumulatively bring us all one step closer to a better tomorrow.”

Excerpt taken from:
Leopoldseeder, Hannes, Schöpf, Christine & Stocker, Gerfried (Eds.): *CyberArts 2019. International Compendium. Prix Ars Electronica 2019. STARTS Prize'19*. Hatje Cantz, Ostfildern, 2019, p. 12ff

2020

Out of the Blue

The Disappearance of Smiles

Forty-seven days before May 1, 2020, a virus began to change our lives: COVID-19, Coronavirus Disease 2019, a viral infection that, among other things, leads to respiratory disorders and originated in the Chinese city of Wuhan, which has a population of 11 million.

The first of May is a national holiday in Austria whose history goes all the way back to 1890. A hundred and thirty years later, in 2020, the Social Democratic Party's traditional May Day demonstration in front of Vienna's City Hall was cancelled. The reason: COVID-19. The lockdown. A change began in Austria, as well as all over the world, and our lives and daily routines began to change, thanks to an invisible virus that suddenly appeared. From out of the blue. And smiles disappeared from the faces of the people.

Excerpt taken from:
Leopoldseeder, Hannes, Schöpf, Christine & Stocker, Gerfried (Eds.): *CyberArts 2020. International Compendium. Prix Ars Electronica 2020. STARTS Prize'20*. Hatje Cantz, Ostfildern, 2020, p. 12ff

Hannes Leopoldseeder (1940 – 2021)

Compu Animati

 **PRIX
ARS ELECTRONICA 2021**
International Competition for CyberArts

ter

on

The Re-enchantment of Humanism

Juliane Götz, Hsin-Chien Huang, Randa Maroufi, Casey Reas, Helen Starr

The five members of this year's Ars Electronica Computer Animation Jury came from disparate parts of the globe. With different cultures and practices, it took work to find our common ground. When we did, it was at the intersection of our knowledge, reason, and our sense experience—that which gives rise to *qualia*. The thoughtfully made computer animations elicited a shared kinship response, taking us from joy to despair, from rage to hope. Navigating beyond our cultural subjectivities, we chose artworks that communicated something to us that we wish to share with the wider world.

Subjective realities then became an important theme for us to consider within works such as the expansive AR ecological, interspecies project *The Deep Listener* by Jakob Kudsk Steensen (DK), which gives insight into hidden worlds among us. The highly political *Enter Full Screen* by Wojtek Ziemilski (PL) rethinks the fourth wall performance convention, bringing it into the 21st century with the new media tool Zoom. Calling us to re-engage with a time-honored, supernatural, and oppressive structure through a new multiplayer lens.

Warnings about a blind return to supernatural belief systems can also be found in the biographical work *\$75 000* by Moïse Togo (ML), whose elegantly rendered animation about Albinos in Africa reminds us that often the root cause of dehumanization is extractive capitalism; disguised as social bias. Feminist thinking further elucidates the callous nature of modern economics in the post-human horror of *Vastum* by L.A. Raeven (NL), the AI violations of women in *AIVA* by Veneta Androva (BG), and *Why can't we do this IRL?* by Megan Broadmeadow (GB). Works that speak to the relentless, clinical nature of capital markets find historical precedent in the 1600s, where millions of Amerindians were worked to death in the gold and silver mines of the Americas. Royal agents

attempted to forbid the policy of debt peonage, arguing that the Amerindians were now Christian and that this violated their personhood. But then and now duty of care inevitably gives way to financial exegesis. Through our cosmologies, or origin stories, we tell the world and ourselves who we are. And it is through the scattershot of emergent mythos that we are enabled to performatively enact ourselves as the *who* of the *we that we are*.

An empowering avenue of artistic activism is a style of creative semi-nonfiction called Critical Fabulation. Coined by the brilliant American writer and academic Saidiya Hartman, this methodology brings the historically suppressed voices to the surface by means of hard research and scattered facts. Hartman noted that the history of the oppressed is rarely autobiographical and, more often than not, is written by the oppressor himself. Critical Fabulation was used by several artists to highlight lesser known histories. Among them were the extensively researched and beautifully told, classic animation *TRUE NORTH* by Eiji Han Shimizu (JP), based on interviews with former North Korean political prisoners and the fantastical *Mosaic* by Imge Özbilge and Sine Özbilge (TR), which uses Middle Eastern mythology to offer an allegorical critique of contemporary war and its aftereffects. The use of experimental software conventions was also important to our judging. This was seen in *When the Sea Sends Forth a Forest* by Guang Liu (CN)—a masterwork of magical realism. Here supernatural phenomena are presented in flickering, digital techniques that underscore the horror of Chinese life lost under the Khmer Rouge. Digital seams differentiate the restitched realities of multiple perspectives and visuals emerge from the voice of an old Chinese man, now twice diasporic. The “autobiographical example,” says Saidiya Hartman, “is not a personal story that folds onto itself; it's not about navel gazing, it's really about

trying to look at historical and social process and one's own formation as a window onto social and historical processes, as an example of them."¹

I can't remember a time I didn't need you by Danielle Braithewaite Shirley (GB), uses gamification tools for unrecorded black trans life. Different genres of people have distinct experiences in Danielle's artwork—uncomfortable for some, healing for others. And yet, all who traverse this virtual world emerge into a crowd singing the votive homily of *Black Lives Matter*. The futuristic *Warm Worlds and Otherwise* by Anna Bunting-Branch (GB) uses experimental VR to employ a new artistic genre—that of the embodied biographical. Here, sci-fi realism charts the way to a visionary future with a fanfiction of historically erased women such as the 17th century natural scientist and abolitionist Maria Sybilla Merian, who is now recognized as the first ecologist.

Thinking within an ecological, relational understanding in the *terms of our now contemporary, planetarily extended, and thereby intrahuman situation*,² is found in the addictive and rapturous *OPERA* by Erick Oh (US), who wrote in his statement to us: "I had to tell a story that documents this part of humanity which actually has been repeating in human history numerous times, in different forms and cultures."

In the structural thinking of *Dirtscrapper* by Peter Burr (US), a digital portrait of life in sick architecture can be found. As the *Dirtscrapper* simulation degrades over time, a variety of myths emerge and in them we can hear the mythic voice of Stokely Carmichael, "And how then do we begin to clear away the obstacles that we have in this society, that make us live like human beings? How can we begin to build institutions that will allow people to relate with each other as human beings?"³

We ended our selection with works that brought us

joy. There is a healing charm in experiencing the magic of an imaginarium for the sake of itself. The sensational *Frame Wave* by MSHR (US) explores a human perceptual phenomenon, so that sounds can be seen, and colors can be heard. And *Chimes Era #1.2: the Seat in Judgment (Assessment following the sacrifices of CE #1.1 : the Benching)*, a magical world-building work by Paul Jacques Yves Guilbert (FR), who plays with time and spatial scales to enchanting effect.

Chronos, linear time collapses as you engage in, explore, and experience these computer artworks, carving a moment for yourself *to be* in other realms of mind and mythos. For we are all journeymen travelling together through time and space on the endless axis of the turning world.

"The Re-enchantment of Humanism," the title of this jury statement, is also the title of an interview with global social theorist Sylvia Wynter, who states:

Human beings are magical. Bios and Logos. Words made flesh, muscle and bone animated by hope and desire, belief materialized in deeds, deeds which crystallize our actualities. "It is man who brings society into being" (Fanon, 1967, p. 11). And the maps of spring always have to be redrawn again, in undared forms.⁴

S. Wynter (1995)

- 1 Sharpe, Christina (2016). *In the Wake: On Blackness and Being*, Duke University Press.
- 2 Wynter, Sylvia (2007). "Human Being as Noun? Or *Being Human* as Praxis? Towards the Autopoietic Turn/Overturn: A Manifesto," Duke University Press.
- 3 Carmichael, Stokely, (1966). Speech at University of California, Berkeley American Public Media.
- 4 Wynter, Sylvia (1995). *The Pope Must Have Been Drunk, The King of Castile a Madman: Culture as Actuality, and the Caribbean Rethinking Modernity*, Carleton University Press.

Golden Nica

When the Sea Sends Forth a Forest

Guangli Liu

“It was 1974, war had lasted for years...” So begins the memory of an old Chinese man who lived through the regime of the Khmer Rouge led by the Communist Party of Cambodia. The tightly controlled Cambodian media left very few images between 1975 and 1979. This was a time when millions of people died unnecessarily and about 200,000 were people of Chinese descent. Guangli Liu’s film is a collective imagination of that lost history based on propaganda videos and the disaster videos which spread throughout the world after the fall of the Khmer Rouge. Narrated through the autobiographical voice, a tender, personal history unfurls as a virtual reality of an imagined recent past. Detailing the human condition and traumas of the dispossessed. The contrast between the archive footage and the 3D reconstruction shows the role of the experimental digital as it interweaves memory with history into the universal of being human.

Awards of Distinction

AIVA · Veneta Androva

AIVA portrays the artistic process of a female robot. Designed by a cis-male team, she reproduces stereotypes of masculinity by projecting them on her male muse. Programmed with the artistic bias to present the white male in the society, the master-

piece of her successful solo show is the abstracted male nude. The computer game aesthetic serves the content of the film, by inverting old rules of the game—a male painter and his female muse. Veneta examines the myth of the male genius and questions the legitimacy of women’s creative existence in the art world and in the AI industry. A female robot artist, designed by men, produces art by a switch, bringing a huge profit to her male creators. And becomes a sensation inside an art market structure, where female positions are still very underrepresented. The narrative of the film paints a circle in which AI products, gendered as female, reproduce problematic stereotypes of women’s role in society.

OPERA · Erick Oh

A civilization rises and falls (and rises again) in *OPERA*, a compelling and exquisite work of animation. It drew us in within the first few seconds and held our attention completely through to the end. *OPERA* is an exquisite, complex machine with a nearly unimaginable amount of detail that feels like it could only be made now with current precise digital tools and a resolution of 8K to work within. The skilled and experienced animators behind *OPERA* have brought a cast of thousands to life within a single frame. The total arc of the work, in one continuous movement from top to bottom and back again, encapsulates the artists’ ideas about the long view of human history with a honed aesthetic surface.

Honorary Mentions

\$75,000 · Moïse Togo

Although Albinism is a congenital disorder, it has led to a rise in witchcraft-related killings in Africa where body parts are used in potions by witch doctors. Moïse Togo cleverly combines 3D graphics with a macro shot of albino skin to set the stage from which the story emerges. He explores different ways of filmmaking and opens up new, often sublime, visual aesthetics. The film's visual narrative emerges from the oral testimonies of victims of this traumatic, brutal practice. \$75 000 marks the value of an albino person's skeleton. By focusing on the financial outcome, Moïse Togo avoids the trap of the racist trope. This is a film about capitalism, haunted by the calm cadence of a man whose hand was taken as a child.

Chimes Era #1.2: the Seat in Judgment (Assessment following the sacrifices of CE #1.1: the Benching)

Paul Jacques Yves Guilbert

Chimes Era #1.2 : the Seat in Judgment is a digital video that blends many layers of virtual realities into a world like *Alice in Wonderland*. Each virtual reality layer has different speeds of time and spatial scales. These layers are interwoven and interact with each other and form a strange and intriguing narrative puzzle. The mesmerizing visual layers, the chanting music, and the mysterious on-screen texts formulate a bewildering delight.

Dirtscraper · Peter Burr

Dirtscraper brings together a group of remarkable independent artists to create a fascinating hybrid artwork. The unique animation of Peter Burr and language of Porpentine Charity Heartscape are supported through custom music, sound, and computer programming to construct a unique vision of a literally underground dystopian culture. As a generative animation that unfolds computationally, we were interested in the double-life of this artwork, as a pre-quarantine multi-projector physical installation and later, after the lockdown, as a month-long live stream over the internet. Burr's unique pixel-forward and saturated graphics are both seductive and disturbing, and they feel completely embedded with the contemporary medium of digital software animation.

ENTER FULL SCREEN · Wojtek Ziemilski

This proposal involves tales and theatrical pieces. Between performance and debate, the beauty of the work emerges in its simplicity and efficiency. The choice of the artist has focused on "what's to hand." The online meeting software Zoom has been temporarily transformed into a space of expression, experimentation, and entertainment. The experience of the film places the spectator in an active and frenetic position, it encourages commitment, and interrogates contemporary individual freedoms. We feel rallying to the cause almost in a physical way, and we have the desire to destroy these LGBTQ+-free zones.

Frame Wave · MSHR

Frame Wave is a virtual reality installation in a physical room that resembles the look of the virtual room. The work is a computer music system in both physical space and virtual reality. The visitor's movement will collide with the virtual embedded triggers and activate the generative music and the visual mutation in the virtual space. The lighting in the physical room will also respond to the volume, frequency, and channel of incoming sound. The work fuses the visual and audio perception into a very psychedelic experience. It is like virtual synesthesia, in which sounds can be seen, and colors can be heard.

**I can't remember a time I didn't need you
Danielle Brathwaite-Shirley**

A sort of interactive story, changing with whoever participates in it, the artist shares a very personal yet universal narration about privileges, belonging, and identity revolving around Black Trans history. Inherent structures crumble and turn, feelings of otherness emerge and/or safe spaces open up. This inclusive and impressive artwork does not soothe with glossy images but rather confronts the visitor with a demanding yet intimate, cautious yet generous, very personal perspective.

Mosaic · Imge Özbilge and Sine Özbilge

A Kurdish student, a Muslim musician, and a young Christian girl are part of the cultural mosaic in the oldest city in the Middle East. When war comes to

their city, a mysterious sunfish saves them. Imge Özbilge and Sine Özbilge extensively researched the visualization of Middle Eastern mythologies and miniatures reflects their own reality. *Mosaic's* exquisite watercolor rendering of everyday city life breaks the visual imperialism towards Middle Eastern regions, home to many cultures throughout the centuries. It is a corrective for dehumanizing vocabulary used in Western media, which reduces refugees, people in need, to a problem and erases the humanitarian aspect of welfare.

The Deep Listener · Jakob Kudsk Steensen

The artist invites his audience to an ecological experience with augmented reality, situated in two parks in London. *The Deep Listener* is available as a free app so that a broad public can gain access to marvelous insights into unknown or simply unnoticed natural phenomena. The artwork constitutes an exemplary usage of today's technologies to create deeper perceptions, interpretations, and understandings of the environment and its inhabitants.

TRUE NORTH · Eiji Han Shimizu

TRUE NORTH is a 3D animated film that portrays a fictional family held captive in a North Korean political prison camp. The stylized minimalist art direction simplifies the irrelevant details but keeps the essence of the scenes for the storytelling. Furthermore, it makes the audiences focus on the characters' humanity without the interference of

too many minutiae. The cruelty of the prison camp is translated vividly with the 3D graphics. The polygons feel alive in this beautiful film.

Vastum · L.A. Raeven

How does our society handle illness and disease? How do we treat our weakest and what kind of (posthuman) future do we want to promise them? A video installation of a digitally altered version of a young girl with a hereditary disorder seems trapped in a box. Combining state-of-the-art computer technology with the limitations of the human body, the horrifying but excellent work questions the logics behind our medical systems, the motivations of pharma companies, and ideologies of research funds.

Warm Worlds and Otherwise

Anna Bunting-Branch

Warm Worlds and Otherwise is a Sci-fi installation centered around the painterly VR animation *META*. The work draws on cultural post-humanism, to examine the ethics of expanding moral concern beyond the human species. As viewers, we travel between alien planets, orbit in outer space and beyond. We inhabit different human and non-human characters. We move into strange perspectives where, embodied as an alien, we feel the illusion of flight—a feature unique to this worlding, artistic canon. *META* translates the linear written concepts of theorists and 2D painterly concepts into the spatial context of the 360 moving image.

Feminist sci-fi writers and painters are all cited within the artwork establishing a bespoke, feminist genealogy.

Why can't we do this IRL?

Megan Broadmeadow

Why can't we do this IRL? is a VR work which showcases the bleed between the virtual world and the real world. A simple AI character called 'The Suffragette' is brutally attacked by a playable character, 'The Cowboy' in *Red Dead Redemption 2* (2018)—an online game with thousands of human and non-human agents. Clips with titles such as, *Annoying Feminist fed to Grizzly Bear* (2019) and *Beating up Annoying Feminist* (2018) were widely shared on YouTube and resulted in wide media coverage by the *BBC*, *The Guardian* etc. and there was furious ethical debate. Was this immoral or a bit of fun? A voting booth was created at FACT, Liverpool, and thousands of visitors were invited to vote on whether the gamer was 'Guilty or Not Guilty?'

When the Sea Sends Forth a Forest

Guangli Liu



Guangli Liu



Guangli Liu



Under the regime of the Khmer Rouge led by the Communist Party of Cambodia, 1.5 to 3 million people died between 1975 and early 1979, including 200,000–300,000 Chinese Cambodians. This death toll accounted for nearly a quarter of the country’s population at that time. The turmoil in Southeast Asia in the mid-70s led to a wave of refugees to Europe. According to statistics, France alone received 150,000 refugees, around half of which were of Chinese origin. Today, about 3 million overseas Chinese live in Europe, with Southeast Asian refugees and their descendants constituting a very important part of this community. Their stories, however, are rarely mentioned in the Chinese world.

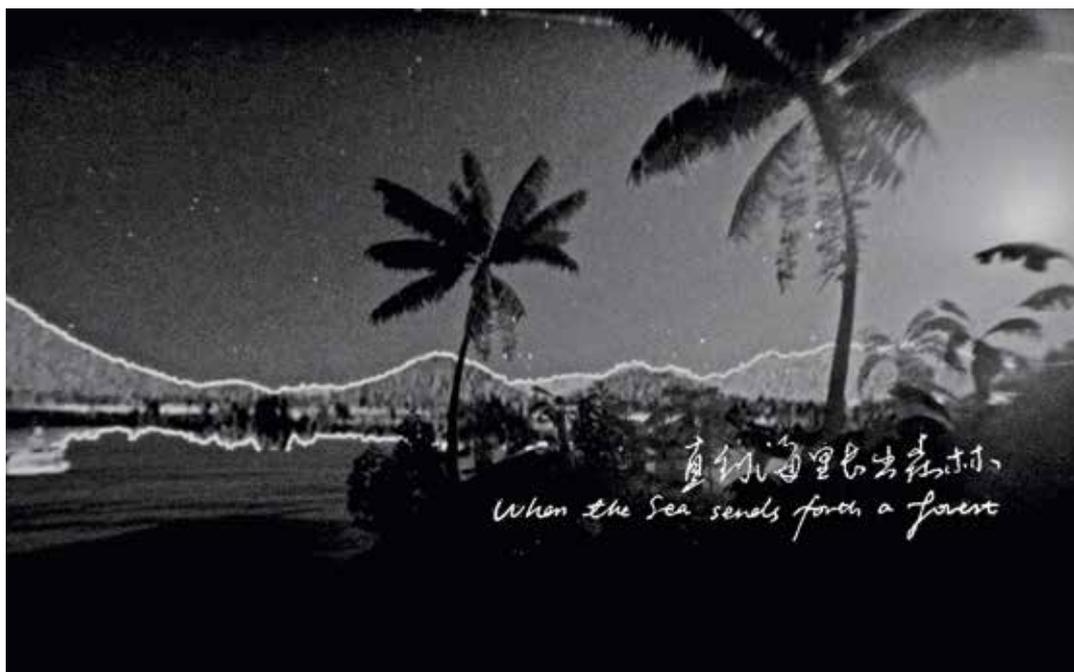
My encounter with this overlooked community in Chinese history in France was the starting point

of this project. Over time, fragments of their stories converged into a sea of memory, like trickles of water. I gradually formed an image of French Indochina in the 1970s, when the Chinese diaspora played an important role in the economy and politics of South Asian countries. Their hard work in foreign countries and their loyalty to the Chinese culture, however, did not help them to escape from the time’s turbulent situation. China’s shattering silence in the face of such extreme violence caused many of this community to lose their relatives and become political *Homo Sacer*.

The world seems real to us because it is equally inhabited by others. The presence of “the Other” cross-references our own existence, both in reality and in our imagination. As Arendt claims: “No human life, not even the life of the hermit in



Guangli Liu



直向海里长出森林
When the Sea sends forth a forest

Guangli Liu

nature's wilderness, is possible without a world which directly or indirectly testifies to the presence of other human beings." During the reign of the Khmer Rouge, the entire country was locked inwards, leaving behind very few images. As a result, we construct a collective imagination of the lost history according to two extreme forms of narrations—the propaganda videos that were made during the Khmer Rouge period and the disaster videos that were spread throughout the world after the fall of the regime. Together, these two collective narratives render the history of this peculiar time into a virtual reality imagined by the people it touched. Many survivors lucky enough to escape would never know what happened to their loved ones, and their truths remain buried.

Instead of showing reality through images, we often try to reimagine the former by creating the latter. The narration of the film starts with the memory of a Chinese witness who lost almost all of his family members during the tragic Khmer Rouge regime. The real-time simulation generated by a game engine and the resulting 3D presentation attempts to illustrate the process of reconstructing memory, which ends up crafting a subjective imagination that continues to produce the present. Never can the few existing archival images be taken as references for memories to depict such a great tragedy. They are ghosts with distinctive textures. They don't speak with their own voice, but rather meet our gaze in the virtual space that emerges when we look deep into the past.

The contrast between archival footage and 3D reconstruction in the film shows the role of the medium itself in storytelling and reveals how it interweaves our memory with history when attempting to document human conditions and traumas. The goal is not to pass judgment on history through the mixture of 3D and archive, but to provide a space to catalyze a conversation between the past and the present, where the past can seek to be the present again.

The rapid growth of technology and media has changed the way we describe and interact with the world. It also shapes the way we see the future. Regardless of how the world or the human species evolves, we will continue to tell stories, to fight against oblivion, and to keep searching for and acknowledging individual identities, until a forest surges from the sea.

Director: Guangli Liu
Image: Pauline Sicard
Animation: Guangli Liu, Huimin Wu
Music: Yoann Helnyck
Produced by Le Fresnoy – Studio national des arts contemporains
Special thanks to: Wenliang Xu, INA, Bophana Center, Kronophage

<https://u.aec.at/0F4F8375>



Guangli Liu (CN) is a Chinese artist born in 1990. He graduated from Villa Arson in Nice in 2017. Passionate about image-making, Guangli has developed an art practice around painting, video art, 3D animation, and virtual reality. His works attempt to question how the digital medium fits into contemporary storytelling and the reconstruction of our collective memory.

AIVA

Veneta Androva



Veneta Androva



Veneta Androva



Meet *AIVA*—the female humanoid artist. She is in her mid-thirties, young and beautiful. But not only that, she is also unbelievably creative. This female AI artist, who was designed by a cis-male engineering team, has the task of contributing more diversity to the art world and to offer a female perspective. *AIVA* is studying the male nude, preparing preliminary sketches for her next masterpiece. Exploring different postures in male nude painting, she is examining masculinity in its diverse forms and shapes. A cliché-ridden ‘art documentary’ introduces us to the female AI artist *AIVA*. The viewer has the extraordinary opportunity to take a look inside her studio and to observe her working process. The film ends with the opening of *AIVA*’s solo exhibition, where her artworks are on display. She is surrounded by her gallerist and the engineer team that created her. The works by the female AI artist have already sold out, bringing in over 1.2 million dollars for her creator. What an incredible success story. Given the systematic unequal treatment of women in the arts and the widespread

historical myth of the male genius, which has been cultivated for centuries in the Western world, the project *AIVA* raises the problematic question about female genius in the form of artificial intelligence, created by cis-males. The film focuses on the lack of female perspectives in the field of artificial intelligence today and what this leads to—a world in which algorithms that are designed to serve human needs are presented as female. Be it Siri, Alexa, Cortana, Samantha, Ai-Da, or *AIVA*—they all exist to be there, at your service.

Director, script, animation, editing: Veneta Androva
 Music, sound design, audio mastering: Nadia D’Aló,
 Benedikt Frey
 Voice: Vivienne Pettitt
 With support from: Bulgarian Fund for Women



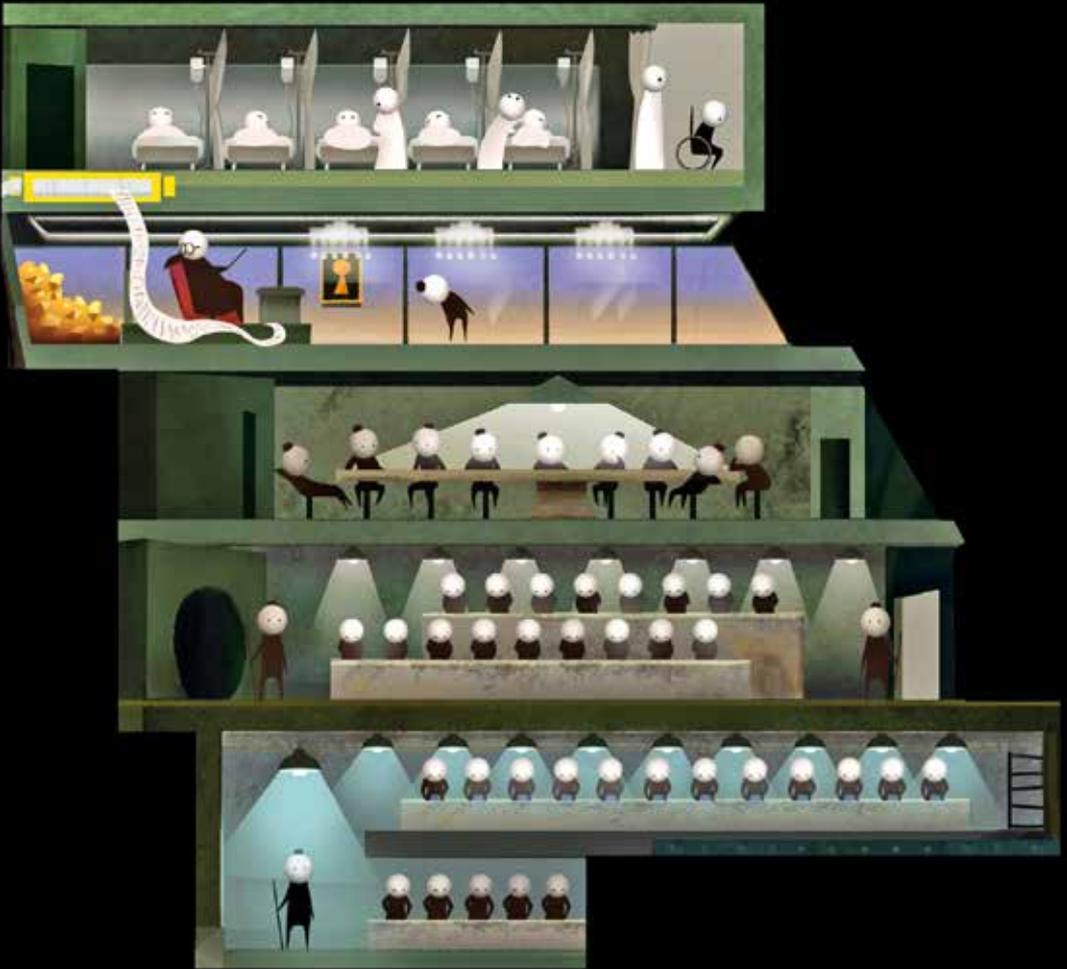
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Veneta Androva (BG) is a visual artist who graduated in Fine Arts from Weißensee Academy of Art Berlin, did part of her study at Bezalel Academy of Arts and Design in Jerusalem, and also obtained a degree in History of Art and Philosophy from Humboldt University Berlin. In her work she combines diverse media and sources such as archival and documentary material with paintings, all related through animation in simulated environments. Androva is also the recipient of several scholarships, such as the Cusanuswerk scholarship (2016–2019) and the Elsa Neumann scholarship by the Federal State Berlin (2020), and she was nominated for the German Short Film Award with her film *From My Desert* in 2020.

Opera

Erick Oh





Overview

Opera is a massive 8K size animation installation project that portrays our society and history, which is filled with beauty and absurdity. This ambitious piece can be simply defined as a contemporary animated edition of the Renaissance fresco mural paintings. Driven by the spirits of Bosch, Michelangelo, Botticelli, and more, Erick enables viewers to experience the range of in-depth emotions through this epic reflection of human life: it is hopeful, funny, thoughtful, yet scary and sad. This piece is not only a living piece of art but an invitation to question the mechanisms of your society and behavior. The universality of its message will move everyone's heart and thoughts.

Director's Statement

I first came up with this core idea and message in the year of 2017, which was filled with so many iconic political moments in our recent human history around the world. In January 2017, Donald Trump became the president of the US and a few months later in March, the South Korean president Park Geun-hye was impeached. It was, indeed, a year of chaos and I had to tell a story that documents this part of humanity which actually has

been repeating in human history numerous times, in different forms and cultures. This piece fearlessly touches upon diverse issues like racism, terrorism, religion, natural disasters, war, education, the economy, and more in different parts and classes in our society. And in the end, I'd love to provide an opportunity for us to find ourselves in this piece. It may make you laugh, feel sad, or sometimes disturb you. But we all know that that's all part of our life and who we are. After all, the ultimate message I'd love to share with everyone is to learn from our past and grow to make our today better than yesterday, and make tomorrow brighter than today. I really hope this piece will touch everyone's heart and start the right discussion on the right topic.

Director: Erick Oh

Production & distribution: Beasts And Natives Alike

Art direction: Celine Qian Yu

Music & sound: Andrew Vernon

Effects & composition: Christopher Bernal



<https://u.aec.at/66018DE3>



Erick Oh (KR/US) is a Korean filmmaker / artist based in California, USA. His films have been introduced and awarded at numerous film festivals including Academy Awards, Annie Awards, Annecy Animation Festival, Zagreb Film Festival, SIGGRAPH, Anima Mundi, and more. With his background in fine arts from Seoul National University, Korea, and in film at UCLA, USA, Erick was an animator at Pixar Animation Studios from 2010 to 2016. Erick then joined Tonko House with his fellow former Pixar artists and directed *PIG : The Dam Keeper Poems*, which won the Crystal Award at Annecy Animation Festival 2018. Erick is currently working on a variety of projects with his partners in film/animation, VR/AR industry, and also the contemporary art scene in the US and South Korea.

\$75,000

Moïse Togo



Moïse Togo

\$75,000 highlights the biological aspect of albinism, which is a genetic and hereditary abnormality that affects not only pigmentation but also, and above all, the physical and moral conditions of people with albinism. These people are victims of discrimination, mutilation, and ritual crimes in Africa. In some African communities, albinism continues to be extremely misinterpreted—a phenomenon based on false beliefs. These beliefs endanger the lives of people with albinism. I combined a macro shot of the skin of an albino, 3D, and

photogrammetry to open up to all the possibilities of the stage to make the viewer travel in an emotional landscape.

The film is based on the testimony of people with albinism. Albinos tell of their experiences of being mutilated. They are victims of a double punishment—a psychological and a physical punishment. The victims' testimonies are illustrated by capturing their emotions through time-lapses of the violence inflicted on them, all filmed in a night-time atmosphere.



Moïse Togo

Voice over: Eliane Aïssou, Moufouli Bello, Seydou Cissé,
Yacouba Keïta, Moïse Togo
3D Modelling and photogrammetry: Moïse Togo
Director of photography: Félix Moy
Assistant camera: Adrien Heylen
Video editor: Léo Guillaume, Moïse Togo
Boom operator: François Engrand
Sound editor: Médéric Corroyer, Charly Caure
Sound effects: Eléonore Mallo, Irina Coutrot
Sound mixer: Rémi Mencucci

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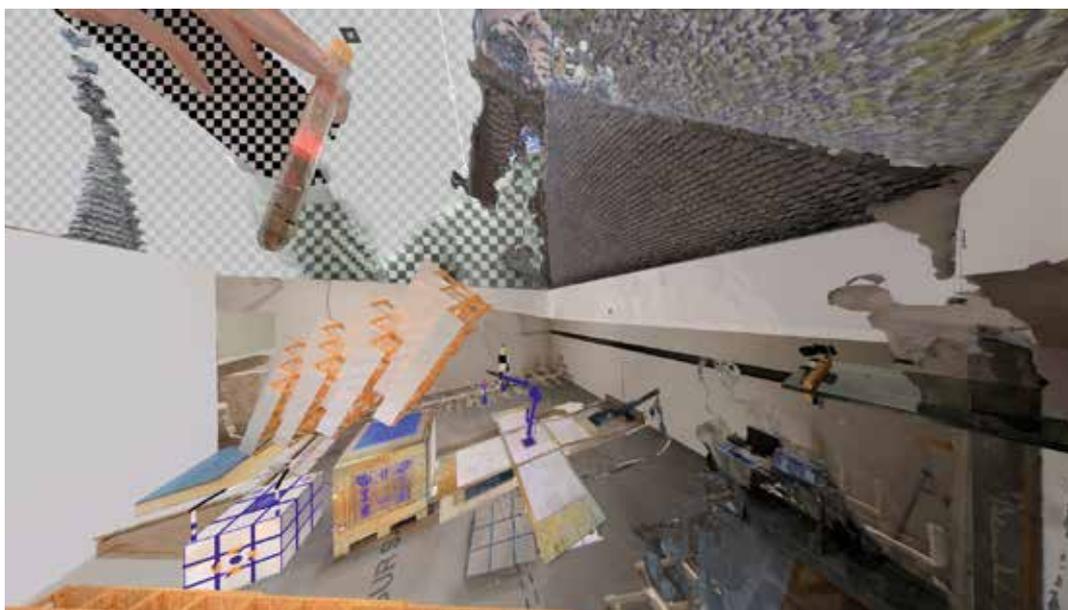
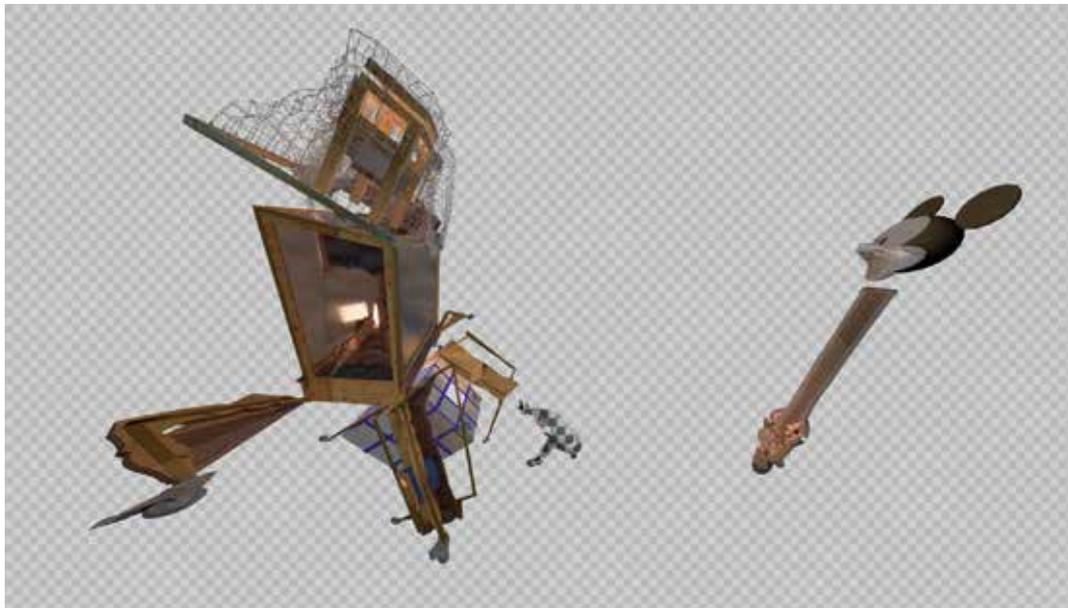


A graduate of the Bamako conservatory (Mali) and the Fresnoy-Studio national des arts contemporains (France), **Moïse Togo** (ML) is passionate about art and began his university studies in legal and political sciences in 2010. His artistic ambitions then led him to the Bamako Conservatory and then to Fresnoy through the Bakary Diallo prize. His work questions the evolution of African belief in a modern world, new technology, and the social conditions of being. In 2020, he won the Grand Jury Prize of Dakar-Court with his film *GWACOULOU*. The plasticity of his work varies from one production to another, his approach passing through experimentation in order to create other cinematographic writing. He currently lives and works between France and Mali.

Chimes Era #1.2: the Seat in Judgment

(Assessment following the sacrifices of CE #1.1 : the Benching)

Paul Jacques Yves Guilbert



For a month, three chimes will ring in the test benches (*roughly, it's a cycle of three exposures / performances that lasts a month*). The carillonneur is Le Chimist, a percussion exegete, he fills the test tubes, seeking their agreement before hitting them (*it's going to be led by a kind of fictitious commissioner / critic who will activate the pieces*). He seeks to extract a score from the mixture, it ends up establishing the death knell of their evaporation (*it plays with the limit between analyzing and killing the subject*). The arrival of the benches marks the end of the era of chimes. But the beatings will reveal that, behind their cries, the agitator also tinkled. Here comes the time without a tribune, that of lost benches, testtubers and buttocks with adjoined foundations: the time of the seat in judgment.

Artist statement

French artist Paul Jacques Yves Guilbert creates elaborate multimedia video essays that combine academic sources with autobiographical anecdotes and scientific jargon with popular culture to create ironic and playful narratives. His video work *Chimes Era #1.2: the Seat in Judgment (Assessment following the sacrifices of CE #1.1: the Benching)* shows the construction of a theatre backdrop and a grandstand, accompanied by songs and a chime. Test tubes used in chemistry refer with a wink to the elitist language of art and science. The use of many digital special effects and several screens creates a playful and chaotic narrative that disorients and confuses the audience.

Text: Boris Magrini

Influenced by: *L'ASSISE DU THEATRE. Pour une étude du spectateur* by Marie-Madeleine Mervant-Roux. CNRS (1998). *De proctologica melancholicum* by Pier Mertzler. Editions de L'Irréel (2007). MickeyMutt was inspired by Pierre Mercier in 2016.

XOsquelette – Prototype, Propuzzle & Prospect. (Clôture digestive du 06/06/2013) & Metatarsus Varus – “t” for two were produced by Le Fresnoy—Studio National des Arts Contemporains.

Chimes_Era#1.1 was shot in May/June 2016 in La Chaufferie at la HEAR Strasbourg.

Thanks to: Francisco Ruiz de Infante for the invitation, Yiumsiri Vantanapindu, Clément Debras, Alette Salama & Léo Hoffsaes and La Chaufferie's team for the help, Cave for the dancing bodies. Special thanks to Antoine Lejollivet.

Chimes_Era#1.2 was shot in March 2020 in Brussels. Thanks to: All the Narrations team, Christine Boisserie and Yann Guilbert for their help.

Special thanks to Valentine Siboni for the invitation.

With support from: Le Fresnoy – Studio National des Arts Contemporains; HEAR – Haute École des Arts du Rhin; FWB – Fédération Wallonie-Bruxelles; LaVallée



<https://u.aec.at/AEBE8DDD>



Paul Jacques Yves Guilbert (FR) lives and works in Brussels. He studied at HEAR (FR), Le Fresnoy (FR) and was part of the Digital Art Conservation program with ZKM (DE). PJYG develops intermediate authors from autobiographical anecdotes, elaborating their strategies of existence through essays. These 'Autoessays' are fictional authorizations to write his own discourse. These 'Superfictional Autoessays' through spatiotemporal collages, intersecting transmedia corpora, glued with a digital imaging tube. These 'Hypermediatic Superfictional Autoessays' are ASHs for a skeptical statement.

Dirtscraper

Peter Burr

Dirtscraper is a computational artwork telling the story of a decaying underground megastructure—a digital portrait of sick architecture. As the *Dirtscraper* simulation degrades over time, a variety of myths emerge. Through text pop-ups, members of its virtual community tell the tale of their surroundings, relationships, and mental health in an attempt to quell the constant noise of their precarious circumstances. Taken as a whole, the artwork emulates a collective body subjected to the inner workings of a gridded simulation: housing blocks are overrun by industry, residents are displaced, the individual withers. What remains is the story of a constantly kinetic city and the people that persist as its inhabitants.

Originally, this work was built as a 3-channel installation at the Institute for Contemporary Art in Richmond, Virginia, USA. It was subsequently presented as an immersive installation in a variety of formats including a single-channel version. In 2020 a livestream edition was released to function within the constraints of an online platform. It premiered this way as a week-long zero-player video game livestream at bitforms gallery.

A zero-player video game is a game in which artificial intelligence, rather than a human player, controls it. One cycle of *Dirtscraper* lasts for the

duration of a feature film, comprising 48 cinematic chapters showing close-up details of life inside the structure. Between each chapter, audiences bear witness to the elevation view of the structure, evoking the look of a side-scrolling platformer video game or a late twentieth century simulation game. The submitted work sample presents a single cycle of this simulation as it was streamed at <https://bitforms.art/stream> on September 30, 2020. During the actual stream, the piece continued, presenting new stories, architectural arrangements, and perspectives.

Artist: Peter Burr

Text: Porpentine Charity Heartscape

Programming: Mark Fingerhut

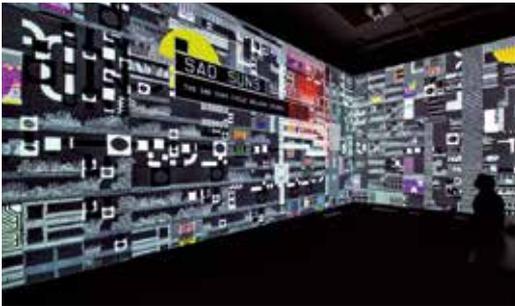
Additional programming: Oren Shoham.

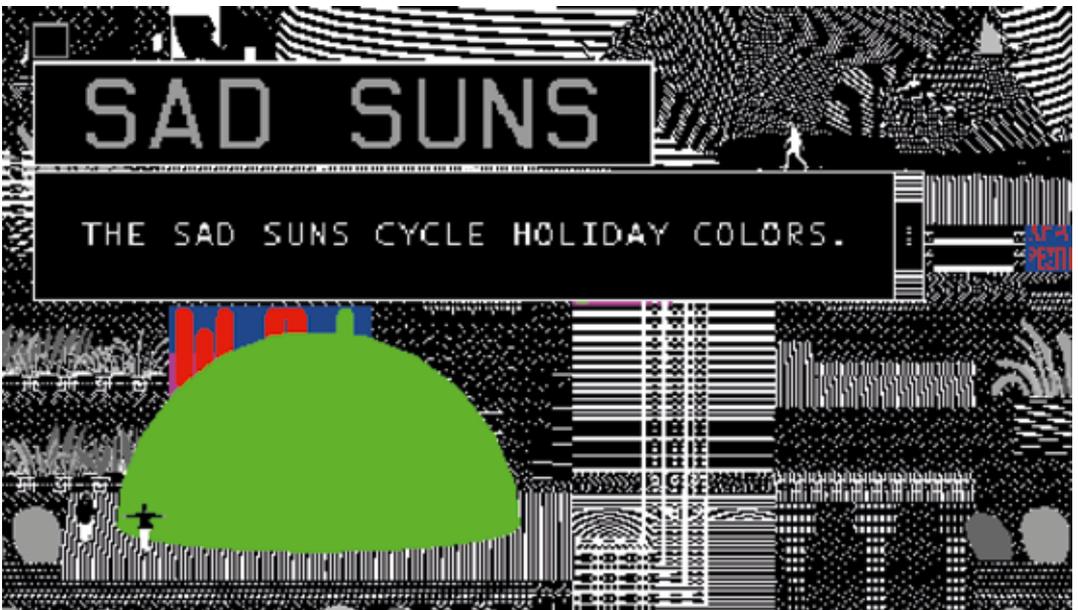
Music and Sound design: John Also Bennett

Additional graphics: Brandon Blommaert, Eric Carlson, and Brenna Murphy



<https://u.aec.at/21C38CC5>





Peter Burr (US) (b. 1980) is an artist from Brooklyn, NY. A master of computer animation with a gift for creating images and environments that hover on the boundary between abstraction and figuration, Burr has in recent years devoted himself to exploring the concept of an endlessly mutating labyrinth. His practice has been recognized through grants and awards including a Guggenheim Fellowship, a Creative Capital Grant, and a Sundance New Frontier Fellowship.

Enter Full Screen

Wojtek Ziemilski



Nowy Teatr

A live theater show made specifically for the Zoom platform.

Once upon a time of Zoom meetings, selfie broadcasting, and Snapchat masks there was a country that had LGBTQ+-free zones: 'zones free of queer ideology' they called them in the country, but they

meant: zones free of queer people. The country was part of the EU. The zones were completely mundane and full of strange creatures. We went there. The rest is history.

<https://u.aec.at/4481E9EF>





Nowy Teatr

Direction: Wojtek Ziemilski
 Dramaturgy: Sodja Zupanc Lotker
 Set design and video: Wojciech Pustoła
 Cast: Tenzin Kolsch, Claudia Korneev, Ewelina Pankowska, Adrian Pezdirc, Andjela Ramljak, Jan Sobolewski
 Production: Nowy Teatr

A collaboration between Schauspiel Stuttgart, the Nowy Teatr, Warsaw, and Zagreb Youth Theatre (zagrebačko kazalište mladih). Funded by the German Federal Cultural Foundation

Andrzej Ziemilski



Wojtek Ziemilski (PL) is a theater director and visual artist. He graduated from the theater directing course at the Gulbenkian Foundation in Lisbon, Portugal. After returning to Poland in 2008, his projects earned him media attention as 'the hot new name of Warsaw theater,' and 'the rising star of Polish culture.' His performances have been shown in over 20 countries, at events such as the Ruhrtriennale, the Prague Quadriennial, and the Divine Comedy Festival, and have won awards such as the Main Prize of the Zürcher Theater Spektakel or the Main Prize of the Fast Forward Festival in Dresden.

Frame Wave

MSHR

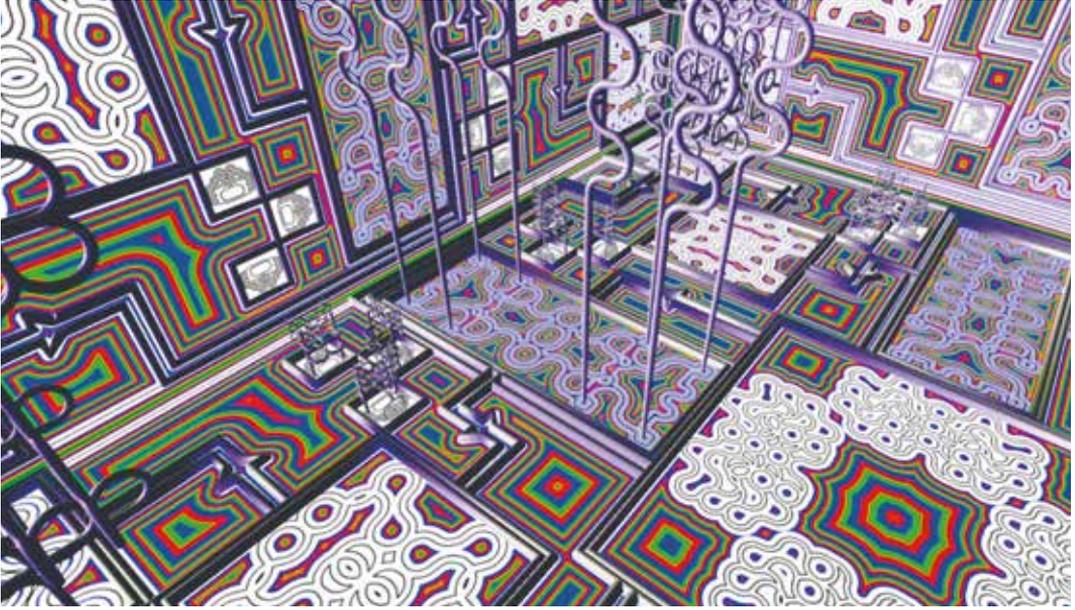


Photo: Shijiro Nishino, Screen captures MSHR

Frame Wave is a composition that unfolds through the exploration of the observer. The piece is made up of a computer music system inside a virtual reality environment, inside a physical installation, forming a nesting loop. The system is woven between virtual and physical dimensions, both of which are in feedback with the visitor's presence. Visitors to the installation may wear a VR headset to traverse a virtual environment that is overlaid onto the physical one. As the visitor explores the zone, their movements collide with embedded triggers that activate mutations to the virtual space as well as the live generative music and light system in the physical room. Through this interaction, the VR user takes on the role of the performer of a generative sound and light composition as they navigate the sculptural environment, while the other visitors in the installation become an audience. Tapestries on the walls and floor are formalized flow charts that serve as graphic scores for the interactive music system and as a blueprint for the virtual sculpture installation. The shapes in these diagrams each represent functional elements in the system such as the VR user, randomization

triggers, sound producing units, modulators, and the speakers. The lines connecting these symbolic nodes represent causal relationships and signal flow in the generative system. In the virtual space, MSHR's sculptural forms rise up out of the 2D floor graphics, projecting the diagrams into three dimensional space for the VR user.

There are red, green, blue, and white LED bulbs arranged on the ceiling that turn on and off in relation to the volume, frequency, and channel of incoming sound—the resulting RGBW flickering animates the RGBW graphics on the floor and wall prints, allowing the events in the virtual space to cause ripples in the physical one.

With support from Calm & Punk Gallery, Tokyo



<https://u.aec.at/25949B35>



MSHR (US) is the art collective of Birch Cooper and Brenna Murphy, formed in 2011. The duo collaboratively builds and explores sculptural electronic systems that take form as audiovisual compositions, performances, and installations. MSHR's name is a modular acronym designed to hold varied ideas over time. Their practice is a self-transforming cybernetic entity with its outputs patched into its inputs, the resulting emergent form serving as its navigational system.

I can't remember a time I didn't need you

Danielle Brathwaite-Shirley



Danielle Brathwaite-Shirley

There are very few places (if any) that support Black Transness. Often we are in places that slowly break us. Through policies, action, inaction, forms, lack of job opportunities. Sometimes it feels as though the air itself is against us. *I can't remember a time I didn't need you* (2020) follows the development of a city that has been overrun by a mysterious fog. Word spreads that this fog is alive and has a clear purpose. They say the moment you step into it, it begins judging you to decide what to do to you. The fog's special properties have given the city a new name, 'The City of Dreams.' You are going to see if the fog will support your life or if you are the reason the fog has come.

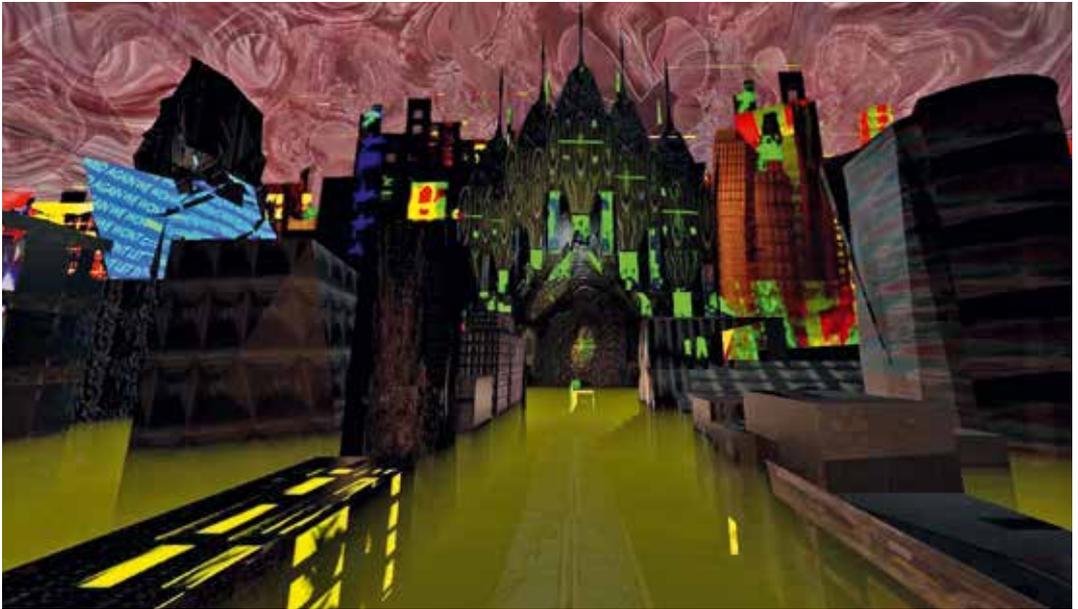
- Your identity will determine how the fog regards you
- Your choices will determine what the fog does to you
- You may feel uncomfortable
- You must sit in those feelings
- You may feel seen
- You must sit in those feelings
- The fog will change you
- You are here to find out how

Inspired by the work of Black Lives Matter, Black Trans Existence, loss, and a call for change paired with a deep love for crunchy early 90s video games graphics, this work combines the two, offering an alternative way to archive this history. The 3D modeled environments were made in blender and textured with manipulated images which relate to Black Transness (from hormone pills to eyes of people within the community). These images are manipulated to become textures from everything from the characters to the road they stand on. These environments were then converted to gifs and using a program called twine were stitched together with sound and text to create the work. The end result is an interactive online moving image work that drips with nostalgia but holds extremely current conversations.

Sound, animation and direction: Danielle Brathwaite-Shirley
 Nominated and co-commissioned by Peter Bonnell, QUAD Derby



<https://u.aec.at/9B202E6B>



Danielle Brathwaite-Shirley



Danielle Brathwaite-Shirley (GB) is an artist working predominantly in animation, sound, performance, and Video Games to communicate the experiences of being a Black Trans person. Their practice focuses on recording the lives of Black Trans people, intertwining lived experience, fiction, and interactivity to create work that refuses to let viewers be passive. The work is often seen as a form of autonomous archiving in which the experience shifts and molds based on the identity of the user as well as the choices they make during the experiences.

I can't remember a time
I didn't need you

Mosaic

Imge Özbilge and Sine Özbilge





Synopsis

In the oldest city of the Middle East, a Kurdish student, a Muslim musician, and a young Christian girl are part of a cultural mosaic. When vicious noises bring war upon their city, a mysterious sunfish appears to save them.

Directors' statement

Coming from a multicultural background, the Özbilge sisters have always been interested in the clash of cultures. The duality between tradition and modernity, the East and the West, is a recurring topic, particularly in Imge's works. *Mosaic* deals with a sensitive topic with the intention of breaking down certain prejudices created by the media towards Middle Eastern cultures. The vocabulary used in the media and our daily news that refers to people in need as 'refugees' or as a 'problem,' creates a distance from the humanitarian perspective. The Middle East is a culturally rich and very diverse geography where many cultures have lived together for centuries. *Mosaic* aims to remind its audience of this multiculturalism by portraying diverse yet ordinary people from daily life. One of the main challenges in creating the characters of *Mosaic* was to give them traditional Middle Eastern assets without orientalizing them.

During the creation of the world of *Mosaic*, the directors aimed to mirror the odd beauty that emerges from the clash of traditions and post capitalism in our 'modern' world. Migration has always been a part of human history. It is the mix of cultures which has enriched our societies throughout time. At times like these it is crucial to remember that Humanity has priority over any Nation. The combination of traditional watercolor drawings with digital animation was one of the most challenging aspects in the creation of the visual world of *Mosaic*. The director duo has researched different ways in combining watercolor drawings in TVPaint, creating their own analog paper textures which were applied digitally on the characters. Hieronymus Bosch was a strong inspiration in the creation of the visual world of *Mosaic*, accompanied by mythological stories and old fables of the Middle East.

Director: Imge Özbilge
 Co-director: Sine Özbilge
 Music: Shalan Alhamwy
 Production: Lunanime



<https://u.aec.at/898B82D8>



The sister directors duo **Imge Özbilge** (TR) and **Sine Özbilge** (TR) work together as each other's mirrors. They experiment with the medium of animation, the 16:9 screen, digital installation art, and the use of mixed media, exploring new connotations and stylistic forms. When writing concepts, Sine focuses on psychological matters and the subconscious, while Imge reflects on the surreality of society. The directors duo collaborated on the award winning short films *Camouflage* (world premiere at Cannes Film Festival 2017) and *#21xoxo* (world premiere at BFI Film Festival 2019) and are currently working on their latest short *The Curator*.

The Deep Listener

Jakob Kudsk Steensen



Courtesy of the artist

The Deep Listener (2019) is an audio-visual ecological expedition through Kensington Gardens and Hyde Park, the area surrounding the Serpentine Galleries. Designed as an augmented reality and spatial audio work downloadable as an app for mobile devices, it is both a site-specific public artwork and a digital archive of species that live within the park. It pushes the utility of augmented

reality and technological tools to transform our spatial understanding of the natural world. The commission expands upon Kudsk Steensen's practice of merging the organic, ecological, and technological in the building of complex worlds in order to tell stories about our current environmental reality. Using tools and platforms from a range of fields including video games, computer-



generated images, and film and inspired by ecological science-fiction and scientific research, Kudsk Steensen creates a form of ‘slow media’ that uses the technological to foster attention rather than distraction. Selected as the first Serpentine Augmented Architecture commission in collaboration with Google Arts & Culture and Sir David Adjaye OBE RA. Kudsk Steensen responded to the global open call for new forms of architecture by examining the systems and infrastructure of the park and its species, and the legacy of human impact across time. At the core of the work is the London plane tree, a hybrid of two sycamore and plane trees from different sides of the world that functions, as Kudsk Steensen states, as ‘an early form of bio-architecture.’ Planted liberally throughout London during the Industrial Revolution, the tree can withstand extremely polluted conditions and the bark absorbs pollutants to protect the tree itself and clean the air we breathe which is then regularly shed. The bark becomes an archive and historical document of particles and pollution that connects our bodies to the species that cohabit the park.

Serpentine Augmented Architecture in collaboration with: Google Arts & Culture and Sir David Adjaye OBE RA

Sound artist: Matthew McCorkle

With support from: Bloomberg Philanthropies, AECOM, Weil, Arts Council England



<https://u.aec.at/3816F8A1>



Jakob Kudsk Steensen (DK) is an artist working with environmental storytelling through 3d animation, sound and immersive installations. He creates poetic interpretations about overlooked natural phenomena through collaborations with field biologists, composers, and writers. Projects are based on extensive fieldwork. Key collaborators include composer Michael Riesman, ornithologist Dr. Douglas H. Pratt, architect Sir David Adjaye OBE RA, BTS, Arca, the Cornell Lab of Ornithology, and the Natural History Museum London, among others. He was the inaugural recipient of the Serpentine Galleries’ Augmented Architecture Commission. Kudsk Steensen was shortlisted for the Future Generation Art Prize 2019, for his work *RE-ANIMATED* (2018-2019) in Kiev and the 2019 Venice biennale.

TRUE NORTH

Eiji Han Shimizu



Sumimasen



TRUE NORTH is a feature-length 3D animated film telling the story of a family held captive in a brutal North Korean political prison camp. Based on years of research and interviews with former political prisoners who defected to South Korea, the film incorporates elements of the real-life experiences of individuals who endured some of the worst human rights abuses of our time.

The film focuses on Yohan, a nine-year old boy from Pyongyang, who is wrongly imprisoned for a crime his father allegedly committed. Yohan's youthful innocence and his belief in the innate goodness of others is gradually stripped from him as he faces the harsh realities of life and death in the camp. When the world does not treat you like a human, can you find it in yourself to treat others with human decency? We will find the answer following Yohan's journey of physical and spiritual survival spanning ten years in the camp. It is estimated that over 120,000 innocent people, including elders and children, are imprisoned in political prison camps in North Korea today. At this very moment, these alleged enemies of the State and the Party are enduring starvation, forced labor, torture, and public execution.

TRUE NORTH offers a fresh approach to this unyielding status quo by shifting the public talking point from nuclear missiles to humanity. The film emotionally engages a global audience, appointing each one of us personally accountable as a protector of the unseen, voiceless, but otherwise relatable individuals hidden behind their prison walls. The film employs overtly low-polygon aesthetics to ensure that viewers are not emotionally overwhelmed while bearing witness to the horror and brutality of life inside a political prison camp. It was important to strike a balance visually that let viewers know that the events featured in the film were based on real-life testimonies, but not be too realistic, that might make them unable to watch a full 90-minute film because of strong emotional reactions.

Lead animator: Andrey Pratama, Sumimasen
 Music composer: Matthew Wilder (Disney's *Mulan*)
 With support from: TED, Human Rights Watch,
 No Fence, NK Watch



<https://u.aec.at/07E37AE9>



The horrors of North Korea's political prisons are personal to **Eiji Han Shimizu** (JP). Born an ethnic Korean in Japan, he grew up learning about the tragic destinies of many Korean-Japanese families who migrated to North Korea in the 60s and 70s. Some of his family friends are still missing due to successive political purges. Shimizu is a multi-award-winning filmmaker, publisher, and educator. He has produced the highly acclaimed documentary *Happy* (2012, USA) and published a series of graphic novels (manga) about the lives of legendary human rights advocates.

Vastum

L.A. Raeven



Photo: courtesy L.A. Raeven

In *Vastum*, the artists' duo L.A. Raeven portray the fear of ageing and degeneration that pervades our society. The work shows a woman, actually still a girl of 11 years old, with progeria—a disorder that causes premature ageing. As far as we know, there are only 45 people worldwide who suffer from this hereditary disorder. With the help of Mao Lin Liao

from *Replica*, we gave this girl the movements of a laboratory rat. The viewer watches the girl through a tiny hole of a giant box and can hear and feel her banging against the walls of the box in which she is captured. (There is a sound and banging machine in the box). The viewer thinks he sees a real girl, but the girl doesn't exist in real-

Photo: courtesy L.A. Raeven



Photo: courtesy L.A. Raeven

ity and is only a virtual human being. It is a scary image that is intended to scare the viewer. *Vastum* means 'waste' in Latin, and that is what this virtual human being is, waste from genetic experiments as described in the book from Yuval Noah Harari *21 Lessons for the 21st Century*. It is supposed to be a spectre of the future, where poor people are exploited for genetic research and the rich people have all the benefits. But what should be done with the underclass individuals who don't fit into this society anymore? We fear a future upper class of 'perfect' people who can buy intelligence and knowledge to stay young while the poor have to die young.

PREVIEW NOTE: It is important to note that the images in the preview show the installation view and the movie is what you see through the hole but the viewer can only see the center of the image and not the corners of the image, so the viewer does not see the sliding. This installation was in the Bonnefantenmuseum in 2020 in Maastricht, the Netherlands.

With support from: Mondriaanfonds



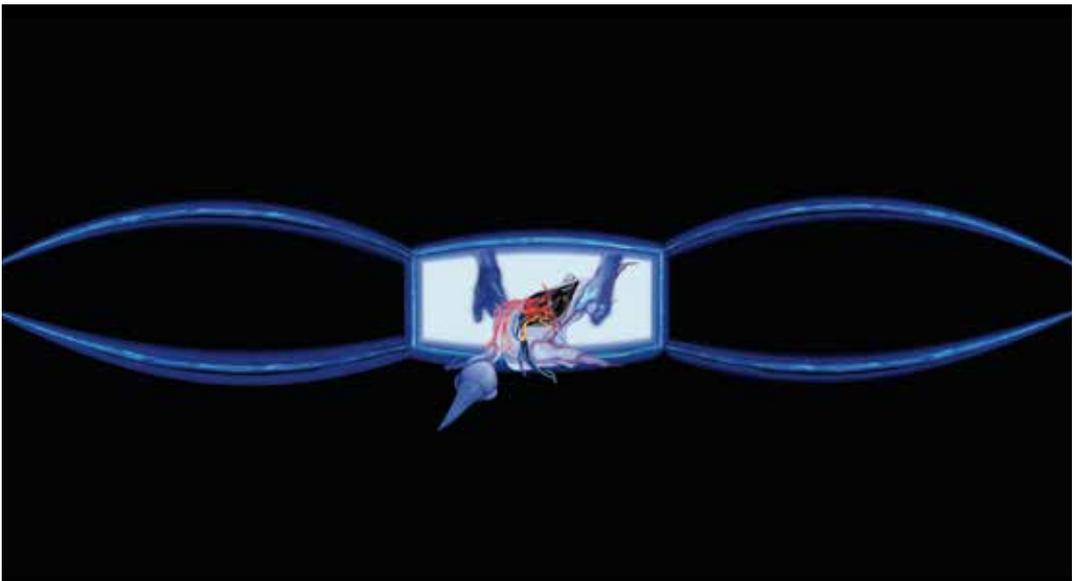
<https://u.aec.at/64B53274>



Dutch artists Liesbeth and Angelique Raeven (*1971), alias **L.A. Raeven** (NL), do not go with the flow. They refuse to consume food thoughtlessly, they refuse to accept womanhood and the feminine roles society assigns to them, and they also refuse to be labeled as anorexic. Both are fascinated by the image of the body as promoted by the worlds of fashion and advertising, and they subvert this image in their works. Producing videos and performances under the name L.A. Raeven, these identical twins walk a dangerous tightrope hotly debated in the world of art. They always perform as a duo, celebrating their symbiotic relationship and playing with the notion of 'evil twins.' Their performances can be painful, and yet they have to be accepted as valid forms of artistic expression. They work and live in Amsterdam and Bergen in the Netherlands.

Warm Worlds and Otherwise

Anna Bunting-Branch





This project engages painting, digital animation, and virtual reality to explore ideas of worldbuilding, embodied perception, and technologies of representation. Central to the project is META, an experimental 360-degree animation that transforms hand-painted scenes and characters into an immersive storyworld. As the viewer is transported between environments—from an unknown planet to a restaurant orbiting in space and beyond—we inhabit the bodies of different human and non-human characters in the narrative. In exhibition, four specially designed viewing stations present META on a series of modified Oculus Go headsets. These interactive painting objects make the SF-inspired images of technology from the animated storyworld manifest in the space of the gallery.

Like an expanded fanfiction, META remixes imagery from the writing of theorists Luce Irigaray and Jakob von Uexküll, the work of painters Maria Lassnig and Maria Sibylla Merian, and SF texts such as Naomi Mitchison's *Memoirs of a Spacewoman* (1962), Joanna Russ's *Bodies* (1984), and Aliette de Bodard's *Immersion* (2012).

As well as inspiring the visual imagery of these works, these diverse sources provide a starting

point for the sonic worlds created by artist Aliyah Hussain for the project. This ambient sound work underscores the viewer's experience in the gallery space as well as in the virtual environment.

Installation with 360-degree video and sound
Story and animation: Anna Bunting-Branch
Sound: Aliyah Hussain

Commissioned by Wysing Arts Centre, The Mechatronic Library, FACT, Liverpool and QUAD
Special thanks to Helen Starr and John Eng Kiet Bloomfield

Warm Worlds and Otherwise was commissioned as part of *Worlds Among Us*, a collaboration between Wysing Arts Centre, The Mechatronic Library, FACT, Liverpool and QUAD. The project developed from the *Worlds Among Us* retreat in 2017, which featured contributions from Rebecca Allen, Katriona Beales, Anna Bunting-Branch, Ami Clarke, Sonya Dyer, Candice Jacobs, Wilf Speller, 555-5555, Workflow, and The Mechatronic Library.

Warm Worlds and Otherwise was supported using public funding by Arts Council England.



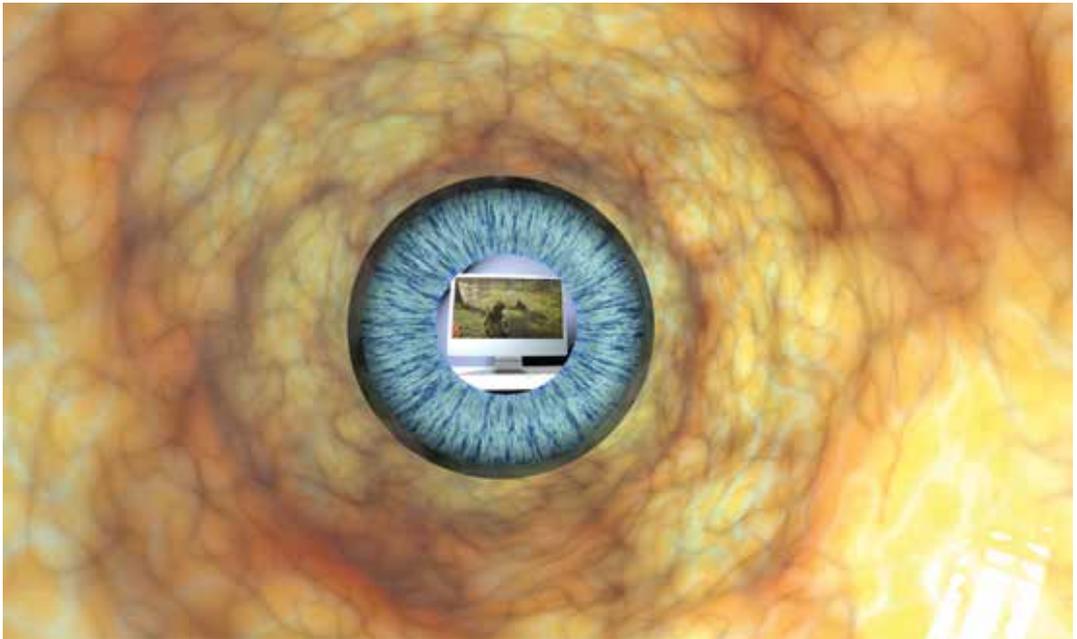
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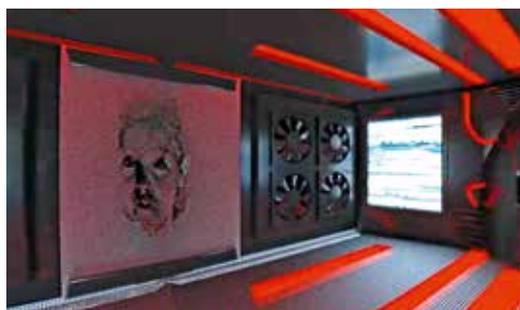


Anna Bunting-Branch (GB) is an artist and researcher based in London. Her work has been presented internationally, including at Bergen Kunsthall, CCA Derry-Londonderry, FACT, Helsinki Contemporary, ICA London, Jerwood Space, and Wysing Arts Centre. She has published work in *Fandom as Methodology* (2019), Goldsmiths Press (2019), *MAP Magazine* and *Art Licks*. Her research has been recognised by Arts Council England Project Grant (2019), AHRC London Arts & Humanities Partnership (2014), Clare Winsten Memorial Award (2011), and Luce Irigaray Circle Karen Burke Memorial Prize (2010).

Why can't we do this IRL?

Megan Broadmeadow





Video games transport us to new worlds. We can fly, travel to new planets, and become a completely different character. But as video games develop to become more open and realistic, the potential to shock by posting videos of in game violence grows too. But it's fine as long as it's not in real life...right? *Why can't we do this IRL?* brings the actions and consequences of the virtual world into the real world. A non-playable character, The Suffragette, has allegedly been attacked by a playable character, The Cowboy. The clip has been widely shared on YouTube, and people are questioning whether this should be celebrated, treated as a real crime, or viewed as just a game. What would happen if we took this case to trial in real life, and is it our responsibility to do so?

Artist Megan Broadmeadow has worked with an intergenerational group of participants—including FACT's Digital Ambassadors over 60s group, and young people from Liverpool youth projects Tiber Youth, Team Oasis, and Toxteth Fire Fit Hub—to create a VR artwork that answers the question: why can't we do this in real life?

Produced by FACT as part of Young At Art Programme and funded by Arts Council England and The Baring Foundation and with support from the National Lottery Heritage Fund.



<https://u.aec.at/646F5AE0>



Megan Broadmeadow (UK) (1978) is a visual artist of Welsh heritage, who lives and works in Bristol. She makes immersive exhibitions which include video, VR sculpture, performance and digital installation technologies. Her touring exhibition *SEEK PRAY ADVANCE* visited Southwark Park Galleries, London, Green Man Festival, Wales, and Quad, Derby between 2018–2019. Solo exhibitions: *Carnifal Y Mor*, National Eisteddfod Wales, 2018, *Astro Raggi*, Plymouth Arts Center, 2015, *Mercury 13*, Galeria Melissa London, 2015. Awards: 2015/16 Mark Tanner Sculpture Award. Curating: LLAWN, Llandudno Arts Weekend 2019. D UNIT project space in Bristol since 2020.

Artific Intelli & Life

 **PRIX
ARS ELECTRONICA 2021**
International Competition for CyberArts

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gence

Art

Im/Material Infrastructures

Jens Hauser, Kenric McDowell, Karen Palmer, Regine Rapp, Marleen Stikker

Toxic human-made clouds, hazardous working conditions in the global high-tech IT industry, information and computational systems, laboratory settings, biopolitical and medical constellations, warfare and surveillance technologies—all these are infrastructures used, addressed, and questioned by the award-winning cultural practitioners in the Artificial Intelligence & Life Art category of Prix Ars Electronica 2021. Rather than focusing on clearly defined ‘arty’ objects or installations, this year’s vintage of projects is first and foremost characterized by a quest to emphasize those materials which make our supposedly immaterial technologies possible, and stage underlying processes and unsuspected structures that have, in turn, real impacts on multiple forms of lives, from the macro to the micro level. The jury witnessed a widespread desire to respond, aesthetically and ethically, to current tendencies of dislocation, digression, delimitation or demarcation—be it in the context of geopolitics, body politics, or the momentous interdependence of postcolonial agriculture and drastic human-made changes of contemporary ecologies. At times dystopic, often disturbing, politically engaged, and sometimes indeed optimistic, these cross-disciplinary projects demonstrate the extremely wide range of artistic practices that can fall into this category, and which otherwise would not have a home elsewhere. By coupling ‘Artificial Intelligence’ with ‘Life Art,’ embracing the interconnectedness of the living with the technological, one would have suspected that the current planetary Covid pandemic would have constituted a privileged background for artistic examination. But while the number of submissions (759) was slightly reduced this year due to the health crisis, no specific and dominant thematic SARS-CoV-2 focus emerged. Given the sudden, often hasty-looking attempts to come up with

inflationary and quick ‘virus art and philosophy’ in contemporary culture at large, the phenomenon that the viral, as material and metaphor, has barely been present deserves some attention. And it also seems to the jury that the pandemic is yet too fresh, or too present, to give ground to a fully adequate artistic commentary on the many layered ruptures the pandemic has brought to our world(s). Instead, the jury saw clusters of work that turn surveillance, simulation, and modelling techniques upside down, use AI and neuronal networks poetically, denounce airborne violence, address and materialize complex concepts such as indeterminacy and randomness, stage works in relationship to current biopolitics and bioethics from medical surrogacy to pluripotent stem cells research, ‘alien,’ queer and transgender life. But other clusters also refer to supposedly archaic technologies and more ancient traditions and engagement with materials and metabolisms that aim at overcoming the artificial discursive split between what is considered in/organic or in/animate, thus collapsing animal, vegetable, and mineral kingdoms.

Again, this year, the jury witnessed a strong presence within the field of biomedica art practices and, what struck us in particular, a surprising co-presence of the first, second, and third generation of artists, and their respective interest in code and concept on the one hand, and on alternative nonhuman agencies on the other: A large range of artistic projects deal with plants, fungi, bacteria, or microbiota, relating to the growing field of contemporary microbiome research. On the other hand, this year the jury could encounter a wider range of genres—from interactive and at some point monumental immersive installations, cinematic and documentary film projects, up to reenactment performances.

Golden Nica

Cloud Studies · Forensic Architecture

This year's Golden Nica acknowledges the sophisticated collective power of a large art-as-activism working group to make use of surveillance technologies and scientific modeling and simulation techniques for the greater good of human rights world-wide. With their multi-faceted work *Cloud Studies*, the research collective Forensic Architecture analyses a large variety of 'toxic clouds'—gases deployed on populations and vegetation, emissions indicating environmental crimes, or other incremental forms of airborne violence posing challenges to civil societies. Making use and combining open-source research methodologies, extensive video and data analysis from TV and satellite footage, mathematical spatial modelling and fluid dynamics simulation to create navigable 3D models and filmic animations, the group produces visual and discursive evidence of aggressions in which the targets are no longer only individual bodies but also environments at large, without leaving tangible traces. From white phosphorous, chlorine and tear gas used by authorities to attack populations, to aerial herbicides such as glyphosate to ruin livelihoods, and organized arson for large-scale land clearings, the eight recent investigations of *Cloud Studies* echo Achille Mbembe's concept of necropolitics as the 'power to dictate who may live and who must die' despite 'the universal right to breathe.' Although the project's undertone is rather somber, *Cloud Studies*, however, brings hope for further critical investigations and social justice via a constructive use of open data. At the same time, Forensic Architecture proposes a media-historical perspective into artists' continuous interest in clouds as measurable objects and experimental

conditions alike, 'between shape and fog, analysis and experience.' Referencing 19th-century precursors, such as Luke Howard's cloud taxonomy and John Ruskin's geometric simulation of clouds' natural laws, today's forensics have fully shifted toward malign human-made clouds.

Awards of Distinction

The Museum of Edible Earth · masharu

The Museum of Edible Earth captivates the senses of the visitor through the simplicity of the sense of taste, while enabling access to the complex theme of the sacredness of the Earth and our relationship to it as human beings. Whereas in recent centuries, the Earth was devaluated to dirt and appropriated as just a natural resource, masharu aims to re-introduce geophagy—the practice of eating earth and earth-like substances, such as clay and chalk, an ancient spiritual and healing practice in countries in Africa, Asia, and Latin America. During the Museum experience the participant is encouraged to touch, interact and taste, allowing for a personally evocative experience to contemplate a privileged relationship to the environment. With its 400 samples from 36 countries, *The Museum of Edible Earth* provides a unique insight into one of the traditional yet forgotten ways people worldwide relate to their immediate surroundings. The jury especially appreciates the way the public can viscerally interact with this collection through tasting and eating, in addition to the convincing storytelling.

TX-1 · tranxxeno lab / Adriana Knouf

While we (humans) refer to potential outer-space life as 'aliens,' queer and transgender life on Earth is also, still, often referred to as 'alien.' tranxxeno

lab by Adriana Knauf addresses the biochemical requirements of transgender persons in outer space, especially their need for hormone replacement medication, by sending such medication to the International Space Station and back, thus testing their overall resilience through all steps of space travel. As such, the *TX-1* project addresses the political question of which bodies (do not) get accepted by established space programs, meanwhile transgender bodies may teach society at large how all bodies transition through their personal, societal, and environmental changes and that all of them require support and care, usually hidden and ignored, for their survival—in space and on Earth. The jury was wildly convinced by the personal story underlying the project, exposing the artist's vulnerabilities while advocating for the acceptance of trans people in society.

Honorary Mentions

AIELSON · Paola Torres Núñez del Prado

Paola Torres Núñez del Prado explores traditional Peruvian knowledge systems like quipus (a knot-based record keeping system used by the ancient Incan civilization) or Shipibo textiles (a fabric-based form of multimodal transcription) and brings these systems to digital life using technologies like machine learning and sound synthesis, speculating on how they might be seen and understood by their makers and by contemporaries. For *AIELSON*, the artist trained a neural net on Latin American poetry, including works by conceptual poet Jorge Eduardo Eielson, known for his work interpreting quipus. This project represents a multigenerational approach to a mysterious historical medium: To make the neural-net generated poetry audible, the artist trained a Spanish language voice model

on Argentine voices, since no South American speech generation models were available. The recorded output was pressed into a vinyl record and released as an album online, complete with the glitches and grain that Torres Núñez Del Prado also celebrates elsewhere in her work.

Baitul Ma'mur: House of Angels

Joe Davis, Sarah Khan

In the quest for a universal language, biological and cultural alike, Joe Davis' and Sarah Khan's interdisciplinary and interreligious attempt to 'create angels' via DNA encoding appears as a particularly timely, poetic, and humble call to humanity to mobilize all resources that art, science, and spirituality provide in order to stand together in times of a devastating pandemic. This collaboration between the US American pioneer of the use of DNA as a storage medium for extra-biological information and the Pakistani artist and wetware engineer consists of translating a centuries-old Arabic tradition of symbolically creating a sheer infinite number of angels by uttering a phrase daily pronounced by millions of Muslims into a genetic sequence, which, synthesized and reproduced many quintillion times in 'BioBricks,' fits on the head of a pin. Applying cascading DNA-encoding strategies to stratify layers of information contained in DNA molecules, here, a parallel is drawn to mathematically inspired repeating calligraphy in Islamic art.

Bricolage · Nathan Thompson, Guy Ben-Ary, Sebastian Diecke

Bricolage deals with very contemporary biotechnological research on pluripotent stem cells and, as such, stands out as an original and convincingly strong take on tissue culture. The art/science group consisting of Nathan Thomson, Guy Ben-Ary,

and Sebastian Diecke reprogrammed white blood cells into heart muscle cells, pulsating and visible for the human eye. As the incubator is hanging from the ceiling, the supremacy of the viewer is playfully undermined as the recipients observe the live performance from below by literally ‘looking up’ to the pulsating living cells. These so-called ‘automatons’ not only challenge the human-nonhuman hierarchy but also frame the phenomenological question of what life is. By presenting the living cells in a clay container, *Bricolage* simultaneously evokes an archaic past and brings along a futuristic component.

Capture · Paolo Cirio

Capture is an example of countersurveillance via the democratization of surveillance technology: By capturing 4,000 faces of French police officers during demonstrations, identifying them through facial recognition software and creating a crowdsourcing platform for people to help reveal their identity, Paolo Cirio addresses the asymmetry of power and turns upside down the technological apparatus that normally is in the hands of the state. *Capture* argues that if police are using violent tools they should be held accountable in a transparent way. This ‘tit for tat’ strategy makes the spectator feel uncomfortable but also empowered. Men and women hiding behind masks and gear are now exposed and vulnerable. This activist work is part of the campaign to ban facial recognition technology in Europe.

Compasses · Allison Parrish

Allison Parrish pushes language into philosophical and sometimes humorous territory through a combination of phonemic embodiment and machine learning techniques. At the same time

computer programmer, poet, educator, and game designer Parrish builds custom AI tools for generating concrete poetry and with *Compasses* pushes this poetry off the page and into the multidimensional mathematical space of a neural net. Unlike complex AI art projects, which often require long, technical definitions to be understood, the process of generating *Compasses* is instantly legible. With the words *animal*, *vegetable*, and *mineral* laid out in a triangular formation, the interpolated terms *maneral* and *vigenable* clearly evoke hybrids, between animal and mineral, mineral and vegetable. What would those look like? Having received these new terms, how might we use them?

PL’AI · Špela Petrič

PL’AI is a work about the playful interaction between an AI robot and a cucumber plant. Špela Petrič explores the question what it would mean to make an Artificial Intelligence that thinks of itself as a plant. Petrič steps with this bold move into new territory. Colorful bouncy balls: the tendrils searches for something to grab on to. Once the plant grabs hold of one of the bouncy balls, which is captured by the camera, this signals the AI to stop that ball from moving. The piece emphasizes an explicit plant interest, the AI robot does obey vegetal desires. This plant-centric viewpoint also ironically undermines any commercial corporate pragmatism, as the plant is not here to serve. The vegetal growth behavior, however, challenges us humans, since it is for us only visible with the technological help of a time lapse.

SCENT · Alan Kwan

Alan Kwan’s *SCENT* is a meditative reflection of the themes of fear, life, and death. At the same time video game, cinematic encounter, art experience,

and 3D environment with an immersive sound design, *SCENT* creates moments of exploration and reflection through gameplay. On this journey, the participant travels through the perspective of a stray dog whose sole purpose is to follow the scent of fear, as humans are massacred in an imaginary world, in order to facilitate their reincarnation. While the artist is from Hong Kong and his work may be interpreted within this specific contemporary context, the experience, however, transports the participant into a world reflecting universal themes that does not need the context of social politics and society.

Slave Rebellion Reenactment

Dread Scott

With *Slave Rebellion Enactment*, black social and political artist Dread Scott has initiated a reenactment of the slave rebellion in New Orleans in 1811, reviving the strength of the community as they strove towards emancipation and freedom. The community performance consists of over 300 black and indigenous people dressed in 19th-century clothing travelling on horses, traversing 24 miles over two days before arriving at the destination of New Orleans. In line with Spanish philosopher George Santayana's dictum that "those who don't know history are destined to repeat it," in this public performance the power of enactment told through the Black lens becomes a form of empowerment through storytelling. The jury acknowledges the importance of this performative action and spiritual journey, for participants and the audience alike, as extremely relevant on both local and global levels, while Black history in America has proven to be mis-representative in the past.

Sound for Fungi. Homage to Indeterminacy

Theresa Schubert

Sound for Fungi brilliantly translates fungal art-science research and philosophical reflections on the nature of networks into a convincing way of audience interaction. In the context of current biotechnological research on local tree mushrooms conducted at the Technical University Berlin, Schubert experimented with the influence of sound inducement on mycelium growth and then developed a digital interactive media installation based on her results. With the help of a tracking sensor, visitors can experience and experiment with mycelium growth while reflecting the complexities of fungal networks, currently one the most intensely frequented research topics within current biotechnology. Schubert's interactive artwork not only makes the phenomenon of the subterranean network (Wood Wide Web) palpable but also convincingly incorporates aesthetic strategies of play and chance.

The Cleanroom Paradox · Felix Lenz,

Angela Neubauer, Eszter Zwickl

The Cleanroom Paradox challenges one of the mainstream modern narratives—the cleanness of high-tech. To demonstrate a case of such misleading narratives, the project focuses on a portrait of a former IT factory worker diagnosed with kidney cancer after her time working on a new Samsung Galaxy mobile phone. The artist group used a corrosive ink obtained from chemically dissolved smartphones for the actual screen-printing of a portrait: the toxic agent affecting the worker's health was used to depict the otherwise invisible worker and her dirty story from the mobile phone

production line. On a formal aesthetic level, the deliberate use of controversial agents as a substance in traditional printed media demonstrates how old tech can contribute to ‘cleaning’ high-tech dirt. The jury recognizes an urgency in sharing such stories behind mainstream consumer narratives in order to encourage the public to rethink their responsibilities toward those people who risk their own lives while fabricating our tools.

The Transparency of Randomness

Mathias Gartner, Vera Tolazzi

With their immersive and aesthetically stunning room installation *The Transparency of Randomness*, Vera Tolazzi and Mathias Gartner translate the abstract mathematical problem of randomness into a materially tangible space visitors can experience from inside: 27 floating boxes, arranged in the form of a giant regular dice, themselves contain dices that generate numbers but which are, in turn, confronted with different irregular surfaces onto which they fall—moss, wood, cork, orange slices, berries, cactus, organic materials, cinnamon sticks, etc. At the threshold between theoretical physics and interaction design, the installation fuses analog and digital media to create awareness about the role that random numbers play in research fields between quantum mechanics and artificial intelligence, meanwhile seeming to update Stéphane Mallarmé’s famous poetic dictum that “a throw of the dice will never abolish chance.”

UNBORNOx9

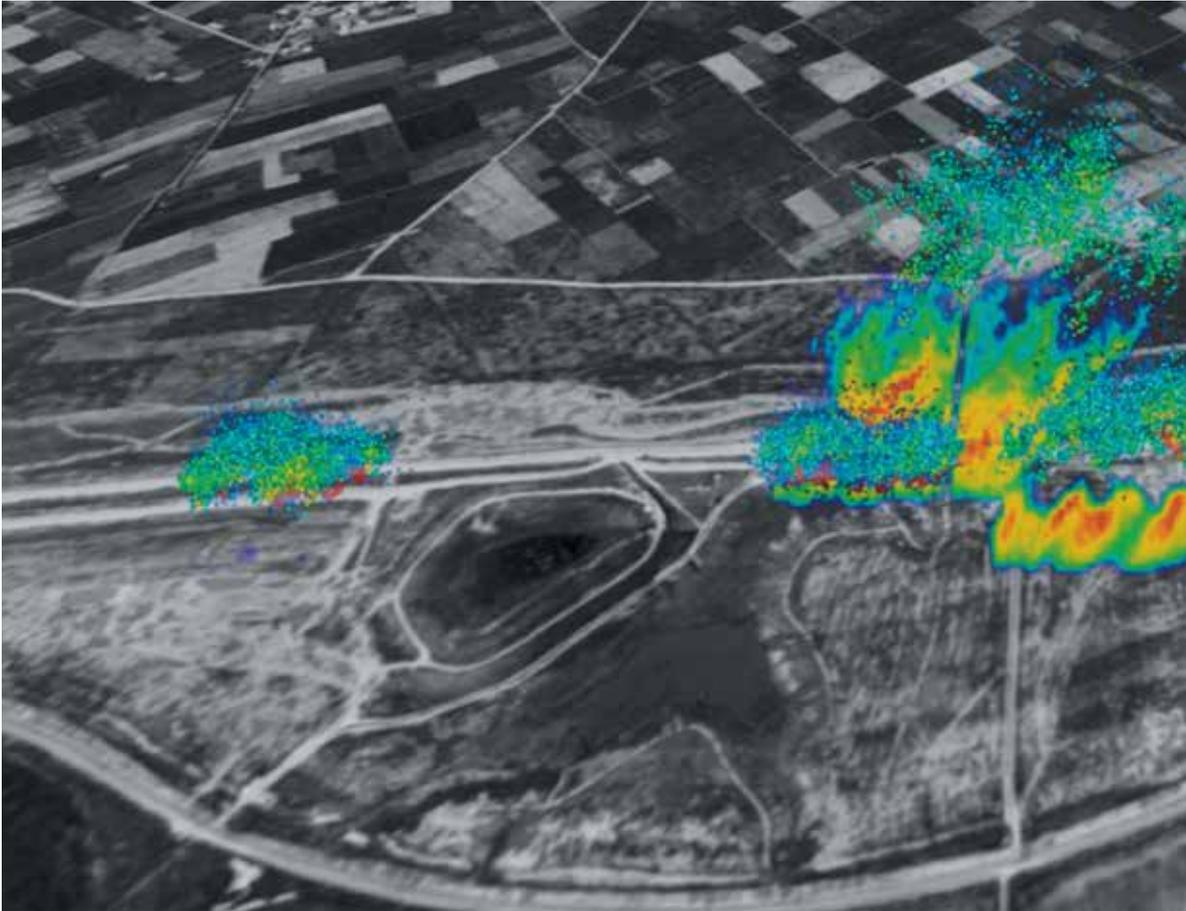
Shu Lea Cheang, Ewen Chardronnet

FUTURE BABY PRODUCTION

This multi-faceted project embraces an important discursive field in current biopolitics and bioethics: ectogenesis, artificial wombs, and surrogacy are some of the main aspects among many here. Starting from artistic research to explore ultrasound, the collective translates their investigations on an intensely controversial topic into various formats, including hands-on units in software coding, installations, performances, and public talks. The jury welcomes the open discursive format as it offers the necessary space and development for discussions to unfold—on yet undefined bioethical territories that have been part of Science Fiction since Aldous Huxley’s *Brave New World*, and which are actually being realized in research with other mammals, and soon with humans, too.

Cloud Studies

Forensic Architecture

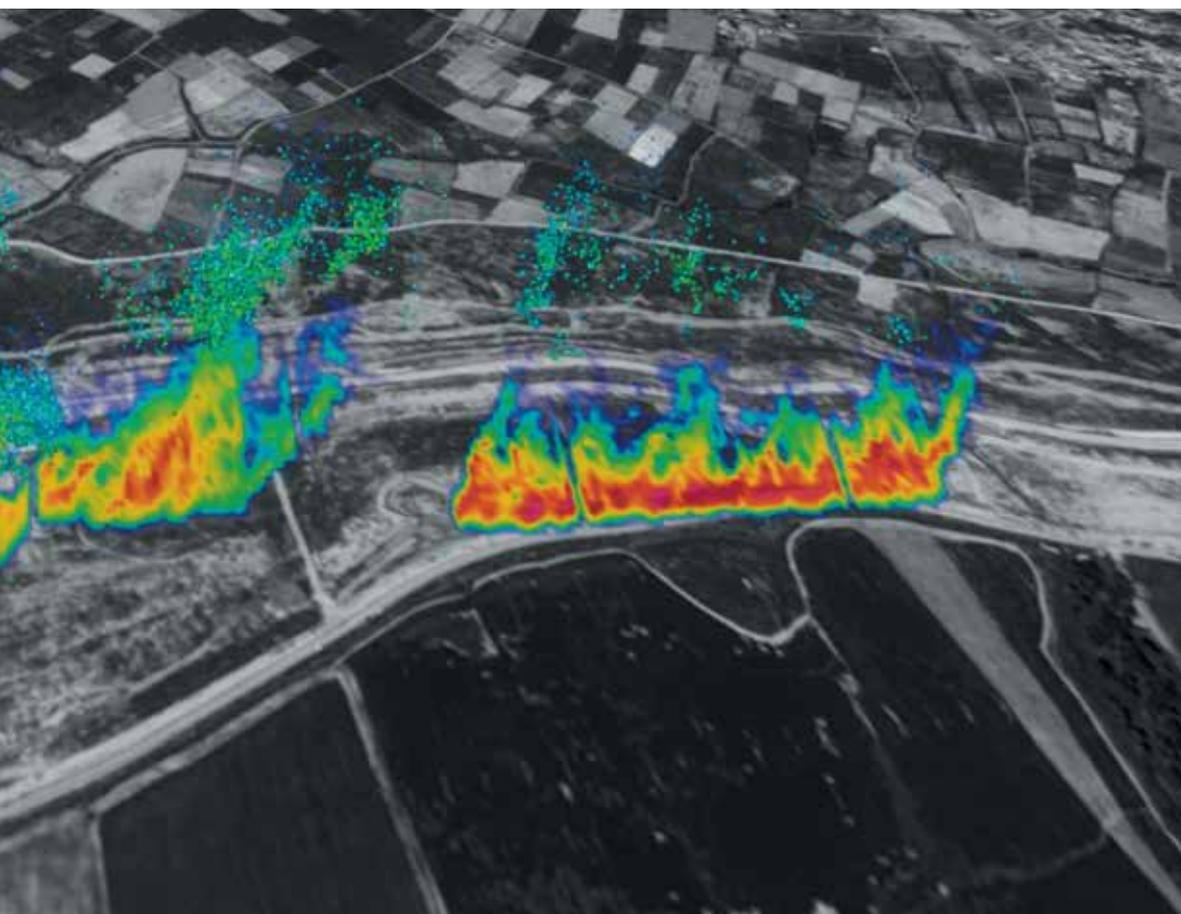


Still from *Herbicide Warfare in Gaza*, 2019 (Cloud Studies, 2020)

Civil society rarely has privileged access to classified information, making the information that is available from ‘open sources’ crucial in identifying and analyzing human rights violations by states and militaries. The wealth of newly-available data—images and videos pulled from the open source internet—around which critical new methodologies are being built, demands new forms of image literacy, an ‘investigative aesthetics,’ to read traces of violence in fragmentary data drawn from scenes of conflict and human rights violations. The results of these new methodologies have been significant, and Forensic Architecture

(FA) has been among the pioneers in this field, as open source investigation (OSI) has impacted international justice mechanisms, mainstream media, and the work of international human rights NGOs and monitors. The result has been a new era for human rights: what has been called ‘Human Rights 3.0.’

In Forensic Architecture’s work, physical and digital models are more than representations of real-world locations—they function as analytic or operative devices. Models help us to identify the relative location of images, camera positions, actions, and incidents, revealing what parts



Forensic Architecture

of the environment are ‘within the frame’ and what remains outside it, thereby giving our investigators a fuller picture of how much is known, or not, about the incident they are studying.

There remain, however, modes of violence that are not easily captured even ‘within the frame.’ Recent decades have seen an increase in airborne violence, typified by the extensive use of chlorine gas and other airborne chemicals against civilian populations in the context of the Syrian civil war. Increasingly, tear gas is used to disperse civilians (often gathered in peaceful protest), while aerial herbicides destroy arable land and

displace agricultural communities, and large-scale arson eradicates forests to create industrial plantations, generating vast and damaging smoke clouds. Mobilized by state and corporate powers, toxic clouds affect the air we breathe across different scales and durations, from urban squares to continents, momentary incidents to epochal latencies. These clouds are not only meteorological but political events, subject to debate and contestation. Unlike kinetic violence, where a single line can be drawn between a victim and a ‘smoking gun,’ in analyzing airborne violence, causality is hard to demonstrate; in the study of



Still from *The Seizure of the Iuventa*, 2018 (Cloud Studies, 2020)

clouds, the ‘contact’ and the ‘trace’ drift apart, carried away by winds or ocean currents, diffused into the atmosphere. Clouds are transformation embodied, their dynamics elusive, governed by non-linear behavior and multi-causal logics.

One response by FA has been to work with the Department of Mechanical Engineering at Imperial College London (ICL), world leaders in fluid dynamics simulation. Together, FA and ICL have pioneered new methodologies for meeting the complex challenges to civil society posed by airborne violence. The efficacy of such an approach in combatting environmental violence has already been demonstrated—FA’s investigation into herbicidal warfare in Gaza was cited by the UN—and has significant future potential, as state powers are increasingly drawn to those forms of violence and repression that are difficult to trace.

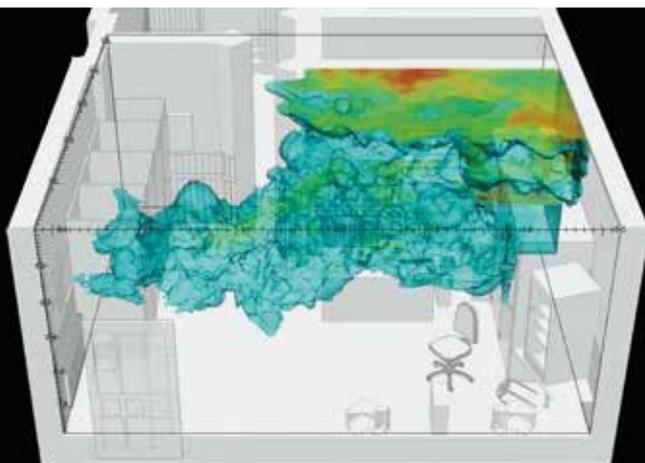
Cloud Studies brings together eight recent investigations by Forensic Architecture, each examining different types of toxic clouds and the capacity of states and corporations to occupy airspace and create unliveable atmospheres. Combining digital modelling, machine learning, fluid dynamics, and

mathematical simulation in the context of active casework, it serves as a platform for new human rights research practices directed at those increasingly prevalent modes of ‘cloud-based,’ airborne violence. Following a year marked by environmental catastrophe, a global pandemic, political protest, and an ongoing migrant crisis, *Cloud Studies* offers a new framework for considering the connectedness of global atmospheres, the porosity of state borders and what Achille Mbembe terms ‘the universal right to breathe.’

Forensic Architecture Team:
 Principal Investigator: Eyal Weizman
 Researcher in Charge: Samaneh Moafi
 Team: Robert Trafford, Martyna Marciniak, Lola Conte, Lachlan Kermode, Mark Nieto, Leigh Brown, Sarah Nankivell, Christina Varvia, Amy Cheung, Shourideh C. Molavi.
 Originally commissioned by ZKM Centre for Art and Media in Karlsruhe.



<https://u.aec.at/EB321C47>



Still from *The Murder of Halit Yozgat*, 2017 (Cloud Studies, 2020)



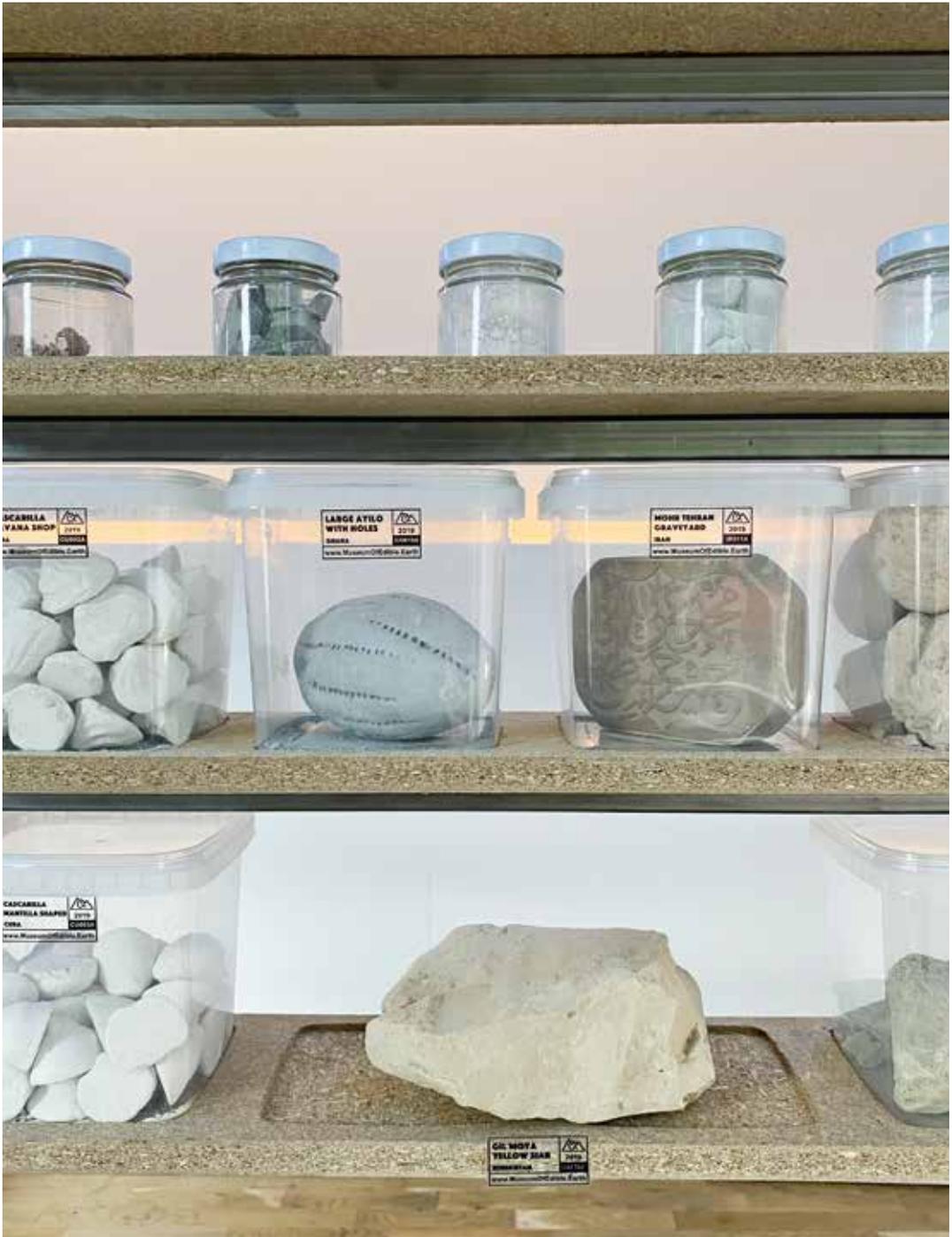
Still from *Tear Gas in Plaza de la Dignidad*, 2020 (Cloud Studies, 2020)



Forensic Architecture (FA) (INT) is a research agency at Goldsmiths, University of London, investigating human rights violations by states and corporations, with and on behalf of communities and individuals affected by police brutality, border regimes, and environmental violence. FA works in partnership with institutions across civil society, from grassroots activists and legal teams to NGOs and media organizations. FA investigations employ pioneering techniques in the fields of spatial and architectural analysis, open source investigation, digital modelling, and immersive technologies. Findings from these investigations have been presented in national and international courtrooms, parliamentary inquiries, and exhibitions at some of the world's leading cultural institutions, as well as in citizens' tribunals and community assemblies.

The Museum of Edible Earth

masharu



Alexandre Hunts

Museum of Edible Earth X diptych in love, Product design by Basse Stittgen (NL/DE), Curated by Ola Lanko (NL/UA) in diptych (NL)



Intercoursing Clay, Collaborative performance of masharu, Kristi Oleshko, Anton Tarasenko, and Ekaterina Sleptsova during Potok Festival (RU)



Museum of Edible Earth XCCI Fabrika, Exhibition at Center for Creative Industries Fabrika in Moscow, Russia

‘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, at its core, a 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, for instance, 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

(www.museumofedible.earth), 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. Geophagy among animals as well as geophagy among humans is scientifically researched. Papers about it are published in the journals on anthropology, history, psychology, sociology, chemistry, and biology. *The Museum of Edible Earth* is a movable 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.

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



<https://u.aec.at/E1BB68D6>



masharu (NL/RU) (1984), born in Moscow, lives and works in Amsterdam. masharu is an earth eater and an earth lover. masharu’s projects combine scientific research with a personal approach and traditional practices. In 2011 they obtained a PhD in Mathematics from Eindhoven University of Technology and graduated with honors from Photo Academy Amsterdam. In 2013–2014 they were Artist-in-Residence at Rijksakademie van Beeldende Kunst in Amsterdam. In 2018 masharu was an artist fellow at the Netherlands Institute for Advanced Study in the Humanities and Social Sciences (NIAS-KNAW).

TX-1

tranxxeno lab / Adriana Knouf



Adriana Knouf

The enchanting Earth is too-often made inhospitable to those marked as transgender. To survive we xenomogrify ourselves through social and biological technologies, altering our surfaces, our viscera, our molecular balances. None of us have been to space even if we possess somatic knowledges of deep bodily transformations, experiences that are necessary for extraterrestrial environments.

TX-1 launched bits of my hormone replacement medications to the International Space Station (ISS), marking the first-known time that elements of the transgender experience orbited the Earth. *TX-1* includes a fragment of my spirinolactone pill, a slice of my estradiol patch, and a miniature handmade paper sculpture, included to gesture towards the absent-yet-present xenoentities of the cosmos. A symbolic exodus to an orbit high above, the return of *TX-1* to Earth was also a sign of resilience, of not being disposed of, of coming back to thrive once again.

TX-1 flew to the ISS as part of the Sojourner 2020 project of the MIT Space Exploration Initiative, which provided the launch opportunity to nine artist-groups who were selected from an international open call. You truly never go to space alone.

While space is, in many ways, one of the most inhospitable places for life, it simultaneously holds an aura—naïve, perhaps—as a place of transforma-

tion where the usual constraints of life on earth can be refashioned, where those who are tranxxeno can exist without earthly prejudices. Some early trans* activism even expressed desires for connection with extraterrestrial beings, suggesting kinship predicated on being seen as alien. Such cosmological allies thus evince the yearning for acceptance of the Other. These stories that we tell about space are of course simultaneously stories that we tell about earth, and thus *TX-1*, in line with this earlier activism, manifests a dream of acceptance of the tranxxeno as we move through these transitioning times.

Concept and fabrication: Adriana Knouf *TX-1* box design and modeling: Felipe Rebolledo
TX-1 was selected through MIT Media Lab Space Exploration Initiative's first international artwork open call to the ISS and the launch opportunity was provided by the initiative.

Additional support: Northeastern University
Special thanks: Claudia Pederson, Špela Petrič, Miha Turšič



<https://u.aec.at/6A080D11>



tranxxeno lab / Adriana Knouf, PhD (US) works as an artist, writer, and xenologist. She engages with topics such as wet media, space art, satellites, radio transmission, non-human encounters, drone flight, queer and trans futurities, machine learning, the voice, and papermaking. She is the Founding Facilitator of the tranxxenolab, a nomadic artistic research laboratory that promotes entanglements among entities trans and xeno. Adriana regularly presents her artistic research around the world and beyond, including a work that has flown aboard the International Space Station. She was recently a Biofriction artist-in-residence at the Kersnikova Institute in Ljubljana, Slovenia. Adriana is currently an artist-in-residence at Waag in Amsterdam, the Netherlands as part of the *Art4Med* project. She lives and works in Amsterdam.

AIELSON

Paola Torres Núñez del Prado



Paola Torres

Machine Learning is an innovation that is already reshaping art and society in general, nevertheless, the algorithms developed tend to reproduce the ethnic and cultural biases that prevail in contemporary society. By using a pre-Trained Transformer-based Language Model (GPT-2) retrained with poetry in Spanish, fine-tuned to examples of South American poetry (including my own), and then using this output to feed a text-to-speech synthesis system (Tacotron 2 + Waveglow, trained on an Argentinean voice data set and then on voice examples of Peruvian poet Jorge Eduardo Eielson), I came up with a selection of spoken-word poems in a distinctly Latin American voice that ended up as a vinyl album called *El Tiempo del Hombre* (The Time Of Man) that is the first of its kind.

In the 60s, Peruvian poet Jorge Eduardo Eielson imagined a talking doll made up of, among other things, a magnetic tape that stored poetic texts that would allow it to ‘continually recite the most beautiful poems conceived by man.’ With the support of Google’s Artists + Machine Intelligence program, I came up with what I call the *AIELSON* (neologism that mixes ‘A.I.’ with ‘Eielson’) Spoken-Word Poetry Generation System. It is relevant to point out that this album is not a *deepfake* (fictitious audiovisual content made with Machine Learning tools), as it is not presented as if it were the late poet’s work, but as an artificial entity that emulates the poet’s voice when reciting.

Intrigued by the possibility that new TTS systems offer regarding the recollection (picking-up) of stylistic qualities that could be considered typical of the region (South America), I intended to draw attention to speech features such as accent and intonation, characteristic of the inhabitants of the Central Coast region, Peru (where the poet was from), as well as stress and rhythm, in this case, the particular way the poet had of speaking beyond his origin while also referencing the presence of the Quipu, that ancient Andean textile notation system, not only in the late poet’s work, but within the history of Art, theme that connects the poetry selected for fine-tuning the model.

Initially funded and developed as part of Google’s Artists + Machine Intelligence 2020 Residency Program. Creative Technologist Holly Grimm supported the implementation of the Machine Learning models used in the generation of both text and speech required for the creation of this album and its connected artworks.



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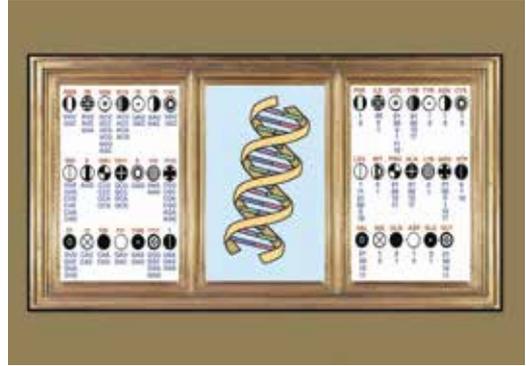
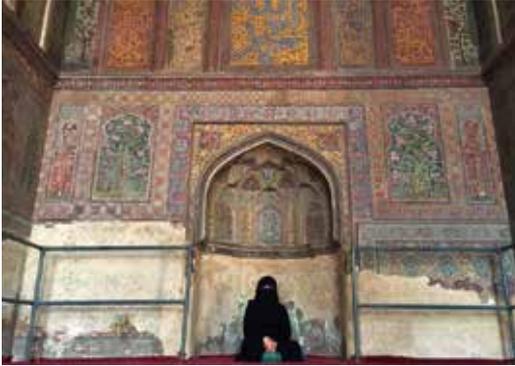
Jonas Pajar



Paola Torres Núñez del Prado (PE) is an artist and a researcher of transdisciplinarity. Her work is essentially complex: she explores the limits of the senses, examining the concepts of interpretation, translation, and misrepresentation in order to analyze the construction of a cultural hegemony in relation to the history of technology and the arts. She was awarded the Google Artists + Machine Intelligence Residence Grant in 2019 and Vivo Arte.mov's Mobile Media Award, Brasil, in 2013. She has presented her work in various countries of the Americas, Central Europe, and Scandinavia, where she is based. Her work is part of the collections of Malmo Art Museum and the Public Art Agency of Sweden.

Baitul Ma'mur: House of Angels

Joe Davis, Sarah Khan



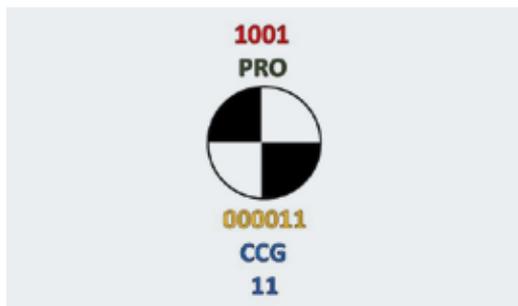
Ours has been a project to keep 2.417 quintillion angels on the head of a pin. We have been inspired by repeating geometries and nested calligraphies of Islamic art to demonstrate a similarly recursive scheme for DNA information-keeping. DNA molecules having 3 base-pairs or more simultaneously hold 3 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' (سبحان الله), an Arabic phrase said to have been repeated for more than 1000 years as a veneration 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:
 $2.417 \text{ quintillion angels} = 6E23 \times 1 \times \pi \times 0.752 \times 1E-3 / (330 \times 258 / 19.5)$



<https://u.aec.at/5EEB740C>



Carolyn Ku, Hinman Lab, CMU

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.



Joe Davis (US) earned his Creative Arts degree (Mt. Angel College 1973) pioneering laser carving methods at Bell Telephone Laboratories. While at MIT Center for Advanced Visual Studies (1981–1989), he created *Microvenus*, the first genetically-engineered work of art. His *Poetica Vaginal* (1986–1987) and *Rubisco Stars* (2009), were the most powerful, longest-duration interstellar messages ever transmitted. Widely regarded to have founded new fields in art and biology, Davis joined Alexander Rich Laboratory (1989–2015) and Thomas Schwartz Laboratory (2012–) at MIT Biology, and as “Artist Scientist,” George Church Laboratory at Harvard Medical School (2010–). Davis has also

created large public sculpture at Kendall Square in Cambridge, Massachusetts. **Sarah Khan** (PK) Bio-Artist and Wetware Engineer, Sarah Khan is one of the youngest teaching staff members in Pakistan, teaching undergraduate Synthetic Biology, Molecular Biology, Microbiology, and BioArt (Institute of Integrative Biosciences, CECOS University, and School of Audacity, Peshawar 2.0). She co-designed vehicular emission and heavy-metal bio-sensors, winning Bronze and Silver awards at iGEM. She received appreciation awards from the government of Khyber Pakhtunkhwa, Pakistan and won the P@SHA ICT award. Her bio-artworks have been exhibited both in Pakistan and internationally. Her newest interests lie in astrobiology—along with her timeless little book for seeking guidance and magic (she says it's secret!).

Bricolage

Nathan Thompson, Guy Ben-Ary, Sebastian Diecke

In *Bricolage* we create autonomous, animated, living, biological entities that have the ability to self-assemble and are hosted in a suspended vessel (Incubator) custom made of clay, metal, and glass. These automatons are made from three main materials: blood, heart, and silk. They are made from bio-engineered human heart muscle cells that grow on bodies made of silk. The muscle cells beat in real time manipulating the automatons' movement.

Beating heart muscle cells are embedded into custom-made silk bodies and perform throughout the duration of the exhibition. Viewers are positioned submissively under the cellular performance, questioning the so-called superiority of humans over non-human entities. The automatons have a strong physical presence in the gallery, where visitors can see them with their naked eye as we deliberately have grown them to a scale that doesn't require technological mediation (such as cameras, screens, or microscopes) to view their micro-performance.

The stem cells we used originated from a drop of blood. We reprogrammed white blood cells from human donors to become stem cells using stem cell technology and then used differentiation protocols to transform these cells to heart muscle

cells. The automaton's bodies are made of silk for one due to its inherent cultural associations but also its widespread use as a biomaterial.

The nature and relationship of the materials we use, blood, heart, and silk are the driving force behind the project. We believe that the biological sorcery, or alchemy, that enables the conversion of a drop of blood into a living animated entity is something that needs to be explored from a cultural perspective. This is an intriguing, challenging, and frankly, quite disturbing prospect.

Bricolage's automatons are vital, ever changing, and alive. They explore the conceptual and practical relationships between life and perceptions of vitality, whilst at the same time confronting the viewer with their visceral performative presence.

The project has been assisted by the Australian Government through the Australia Council, its arts funding and advisory body. The state government of Western Australia through the Department of Culture and the Arts. *Bricolage* is hosted by SymbioticA at the University of Western Australia



<https://u.aec.at/E68EFE03>



Nathan Thompson (AU) is a multi-disciplinary artist exploring the possibilities of man/machine interaction and the hidden corners that arise from this relationship. Mostly he implements machine/robots that play along the blurred edge of the interactive while showing independent thought, only slightly tethered to the audiences actions. **Guy Ben-Ary** (AU) is a researcher at SymbioticA at UWA and is recognized internationally as a major artist and innovator working across science and media arts. Guy is interested in how art has the potential to initiate public

debate on the challenges arising from the existence of liminal lives and creates artworks designed to problematize current and emergent bio-technologies' influence on the shifting forces that govern and determine life, death, and sentience. **Sebastian Diecke** (DE) is the head of the Pluripotent Stem Cell Platform at the Max Delbrück Center in Berlin. The institute focuses on molecular mechanisms of diseases and developmental processes in general. Sebastian provides services around reprogramming, differentiation in different tissue types, and genetic manipulation of the pluripotent cells for the researchers of the institute.



Capture

Paolo Cirio



Paolo Cirio collected 1,000 public images of police in photos taken during protests in France and processed them with Facial Recognition software. Cirio then created an online platform with a database of the resulting 4,000 faces of police officers to crowdsource their identification by name. Moreover, Cirio printed the officers' headshots as street art posters and posted them throughout Paris to expose them also in the public space. *Capture* commented on the potential uses and misuses of Facial Recognition and Artificial Intelligence by questioning the asymmetry of power at play. The lack of privacy regulations of such technology eventually turned against the same authorities that urge the use of it. This provocation triggered the

reactions of the French Minister of the Interior and the police unions, which forced censorship of the artwork, despite it being celebrated by the French citizens and the international press. Initially, as an activist, Cirio introduced a campaign to ban Facial Recognition technology in all of Europe. In 2021 for his campaign #BanFacialRecognitionEU, Paolo Cirio delivered a package to various European institutions containing a legal complaint with his research and petition with over 50,000 signatures supporting a ban on Facial Recognition in Europe. The European Commission replied to Cirio's complaint by acknowledging the need to legally restrict the use of Artificial Intelligence.



Artwork and campaign: Paolo Cirio
 Research, concept, production, and writing about the project *Capture* and the campaign #BanFacialRecognitionEU: Paolo Cirio
 This work was a co-production between Le Fresnoy – Studio national des arts contemporains in Tourcoing and La Condition Publique in Roubaix, France.
 For this project Paolo Cirio created partnerships with organizations that collaborated actively in the project such as La Quadrature du Net, We Sign It, Labo 148, and the European Digital Rights advocacy group (EDRI).

Other organizations supporting this project were Bits of Freedom, Digitale Freiheit, NetzPolitik, Jigsaw, Collectif ŒIL, among others.

<https://u.aec.at/960047F3>



Paolo Cirio (IT) works with legal, economic, and cultural systems of the information society. He shows his research and intervention-based works through artifacts, photos, installations, videos, and public art. Cirio's work embodies the contradictions, ethics, limits, and potentials inherent to the social complexity of information society through a provocative, critical, and proactive approach. Cirio has exhibited in museums and art institutions worldwide.

Compasses

Allison Parrish

Compasses is a collection of poems written with a machine learning model of spelling and phonetics. The model invents new words in negative spaces between supposedly discrete categories.

I trained a machine learning model with two parts: a 'speller,' which spells words based on how they sound, and a 'sunder-out,' which sounds out words based on how they're spelled. In the process of sounding out a word, the 'sunder-out' produces a fixed-length numerical vector, known as a 'hidden state,' which is essentially a condensed representation of a word's phonetics. The 'speller' can then use the phonetic information contained in this hidden state to produce a plausible spelling of the word. The hidden state, like any other numerical vector, can be modified: translated, multiplied, blurred, averaged.

Each of the poems collected here results from a computer program I wrote that performs the following steps: (1) use the 'sunder-out' to find the hidden state for a set of words, drawn from a hand-authored list (these are the words on the 'points' of each poem); (2) find the vector halfway between the hidden state vectors for each pair of 'point' words, and predict a plausible spelling for these halfway vectors with the 'speller'; (3) find the vector of the midpoint of all eight vectors produced in (1) and (2), and likewise predict a plausible spelling for this vector.

The words from steps (1) and (2) are then programmatically arranged in the form of a compass rose. The word resulting from step (3) is placed in the middle. *Compasses* was first published as part of Andreas Bülhoff's 'sync' series.

Author: Allison Parrish
Book design: Andreas Bülhoff



<https://u.aec.at/C07EB7A0>

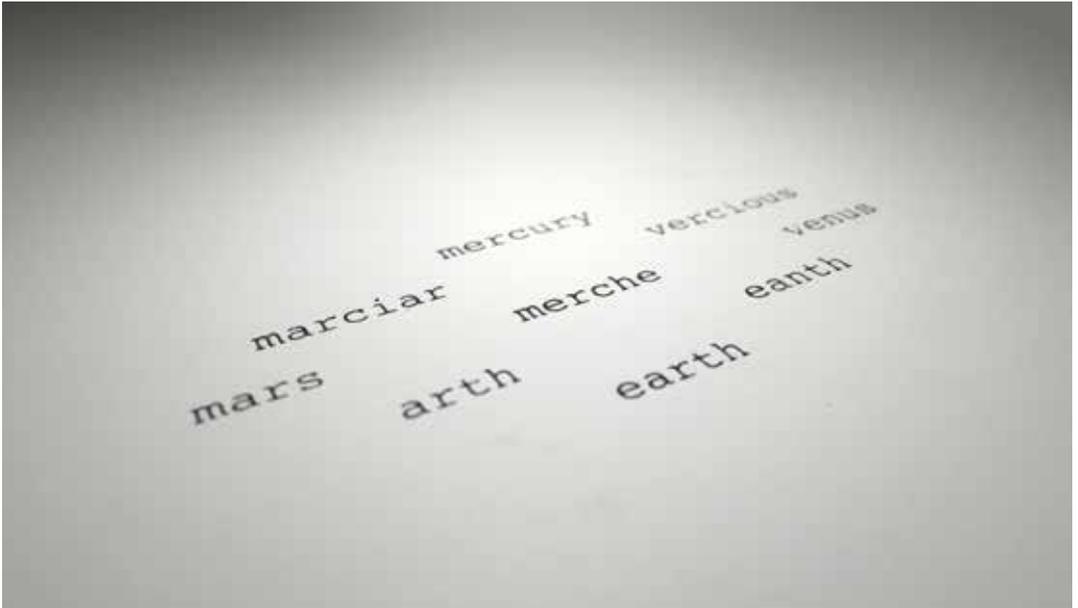


Allison Parrish (US) is a computer programmer, poet, educator, and game designer whose teaching and practice address the unusual phenomena that blossom when language and computers meet. Named 'Best Maker of Poetry Bots' by the Village Voice in 2016, Allison's computer-generated poetry has recently been published in *BOMB Magazine* and *Nioques*. Her first full-length book of computer-generated poetry, *Articulations*, was published by Counterpath in 2018. Allison is an Assistant Arts Professor at NYU's Interactive Telecommunications Program.

Elon Schoeholz



Courtesy of the artist



PL'AI

Špela Petrič



Hanneke Wetzler



Hana Josić

PL'AI is the latest in a series of artworks that dwell on the recent transformation in computer science that has shifted from calculation towards adaptive practices of learning from data, and its far reaching effects. In the *PLANT MACHINE PROJECT* the focus on plants as living agents exposed to the machinic gaze harkens to the use of automation in industrial farming, yet subverts the epistemic framework of science and engineering by making the constructions strive for plant pleasure, representation, and play. The impetus to observe plants and artificial intelligence at play stems from Huizinga's writing on the ontological implication of play. He sees play as prior to culture and yet not defined by biological necessity, a capacity all creatures possess. In *PL'AI* we explore possibilities of play between cucumber plants and the naïve AI robot moving at their pace. In cucumbers, tendrils search for surfaces to grab hold of while the plant stretches towards the light. The tendrils' environmental inquiry expresses the

indeterminacy that allows us to see them as a locus of plant play.

The robot approaches the plants with 36 individually controlled wires suspended from above, moving at the rate of 1cm/h. The robot senses the cucumbers with a laser scanner and feeds the images through a neural network, which in turn decides how to approach the plants by moving the colored balls. Through time the algorithmic "imagination" of cucumbers is modified via feedback from the cucumber tendrils while gradually transforming the robot-tendrils into a cucumber trellis that supports their growth.

The play between the cucumber and robot leaves morphological traces in the shape of the plants, the steel strings, and the neural network. We encounter the opening up of another temporality, neither that of a plant nor of a machine alone, already mutated by their needs and desires, and by our own implication in the possibility of their joy.



Hana Jošić

Hanneke Wetzler

Concept and execution: Špela Petrič
 Programming: Benjamin Fele, Tim Oblak
 Robot development and assembly: Erik Krkač,
 Gregor Krpič, David Pilipovič, Jože Zajec
 Design: Miha Turšič
 Hands-on assistance: Bor Jarh, Meta Petrič
 Consulting and timelapse video: Adriana Knouf
 Narration: Blaž Šef
 Text: Agnieszka Wolodzko
 Special thanks to: Andrej Petrič,
 Zoran Srdić-Janežič, Waag Society,
 MU Hybrid Art House
 Video: Hana Jošić and Špela Petrič

The project is produced by Kapelica Gallery /
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 Slovenia, the Department of
 Culture of the Municipality
 of Ljubljana, and Creative
 Industries Fund NL.

<https://u.aec.at/3708AAA7>



Anze Sekelj



Špela Petrič (SI) is a Ljubljana and Amsterdam-based new media artist who has been trained in the natural sciences and holds a PhD in biology. Her artistic practice combines the natural sciences, wet biomedicine practices, performance, and critically examines the limits of anthropocentrism via multi-species endeavours. She envisions artistic experiments that enact strange relations to reveal the ontological and epistemological underpinnings of our (bio)technological societies. Petrič has received several awards, such as the White Aphroid for outstanding artistic achievement (SI), the Bioart and Design Award (NL), and an Award of Distinction at Prix Ars Electronica (AT).

SCENT

Alan Kwan

An interactive experimental game that takes place near the border of a city undergoing a massacre. A stray dog follows scent trails of human fear and carries out its job to help human souls reincarnate. The players explore the environment through the point of view of a stray dog. The game presents no story, context, or background information on where the massacre is taking place and why it is happening. Nothing will be resolved after the players finish the game. It creates an experience that invites contemplation on fear, deaths, and the collapse of a city. As a reflection of the on-going global situation, this game attempts to strip away politics, and allows players to reflect on human brutality and violence from the senses and perception of an animal.

This game adopts a point-cloud aesthetics and focuses on delivering an interactive cinematic experience with simple control. While using the mouse to look around, players control the dog to walk/sprint/hide/stop and the steering is automated. A bit similar to the control of a 2D platform game like Mario but the players can also look around in a 3D environment. For most of the gameplay, players are walking, hiding, and witnessing.

In an exhibition setting, this experimental game would be presented in a small dark immersive room with a HD projection. A keyboard and mouse would be put on a pedestal in the middle of the room, allowing one player to play at a time. At the same time, other people in the room can also watch the gameplay collectively as a cinematic experience.

Director, 3D Artist, level design, programmer:

Alan Kwan

R&D on point cloud graphics pipeline: Alan Kwan, Kachi Chan

Music: Jordi Jon Pardo

Advising on sound design and theremin experiment:

Xiao Xiao

Advising on interactive design: Kenny Wong Chi-Chuen

Audio sample contributors on *Freesound.org*:

Iamgiorgio, geoneo0, decembered, mikaelfernstrom, 15GPanskaBokstefflova_Nicola, Niedec, klankbeeld, Robinhood76, willybilly1984, elonen, Ephemeral_Rift
Partially funded by Hong Kong Design Trust



<https://u.aec.at/77C6D10F>



Alan Kwan (HK) is an artist and technologist whose practice explores new possibilities of real-time 3D technologies that depart from the traditional video game paradigm and typical tech fantasies of AR/VR. His projects were presented at Ars Electronica Center in Austria, ZKM Centre in Germany, Museum of Contemporary Art Shanghai, etc. and were featured in media including Discovery Channel and Popular Science. He was awarded the first prize of the MIT Harold and Arlene Schnitzer Prize, Asian Cultural Council Fellowship, etc. and holds a MSc in Art, Culture, and Technology from MIT.



Slave Rebellion Reenactment

Dread Scott



Soul Brother

On to New Orleans! Freedom or death! We're going to end slavery! Join Us!

Hundreds of reenactors echoed these chants of self-liberated, formerly enslaved people as they marched to seize Orleans territory in 1811. We were performing *Slave Rebellion Reenactment* (SRR), a community-engaged performance spanning 24 miles over two days, on the outskirts of New Orleans and culminating in the city itself.

Charles Deslondes, Gilbert, Marie Rose, and the many enslaved people who were part of the 1811 revolt are heroes: their vision, if known, can inspire many. Their rebellion is a profound “what if?” story. What would success have meant for US and world history? Understanding that the past was not predetermined allows people to dream “what if?” for the future.

Our reenactment restaged and reinterpreted Deslondes' Uprising of 1811—the largest rebellion of enslaved people in US history, which took place upriver from New Orleans. *SRR* animated a suppressed history of people with a bold plan to organize, take up arms and seize Orleans Territory, to fight not just for their own emancipation, but to end slavery. It was a project about freedom.

Over 300 Black and indigenous people, many on horses, armed with prop machetes, sickles and muskets, flags flying, in 19th century garments, singing in English and Creole to African drumming marched in formation.

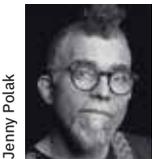
The procession was jarringly out of place as we advanced past the gated communities, mobile homes, fast food restaurants, and oil refineries which have replaced the slave labor camps (sugar plantations) of 200 years ago. This historic anomaly formed a cognitive dissonance, opening space for viewers to rethink long held assumptions.

A key element of slave revolts was the organizing of small groups of trusted individuals, clandestinely plotting with others in small cells. Mirroring this structure, years long project recruitment took the form of one on one conversations about why this history is important in contemporary society.

The project was presented by Antenna, a New Orleans Arts organization. Alongside the team at Antenna, the development of *SRR* was supported by many New Orleans organizations including Tulane University's Center for the Gulf South, Xavier University, and RicRACK. Funding for *SRR* has been provided by Open Society Foundations, Ford Foundation, VIA Art Fund, Surdna Foundation, MAP Fund, Andy Warhol Foundation for the Visual Arts, Nathan Cummings Foundation, A Blade of Grass, Art Matters, and an incredible group of 500+ individuals.



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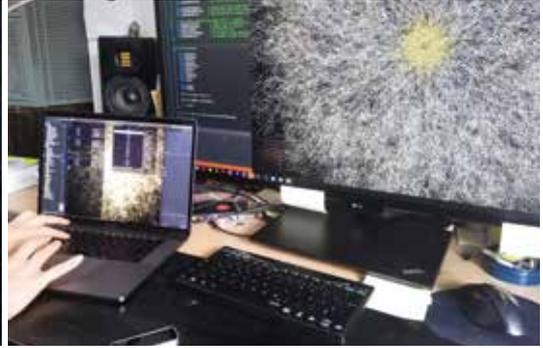


Jenny Polak

Dread Scott (US) is an interdisciplinary artist whose art encourages viewers to re-examine ideals of American society. In 1989, the US Senate outlawed his artwork and President Bush declared it ‘disgraceful’ because of its transgressive use of the American flag. His work has been exhibited at The Whitney Museum, MoMA/PS1, The Walker Art Center, and in galleries and on street corners. He is a 2021 John Simon Guggenheim Fellow and has also received fellowships from Open Society Foundations and United States Artists.

Sound for Fungi. Homage to Indeterminacy

Theresa Schubert



Rémi Chauvin

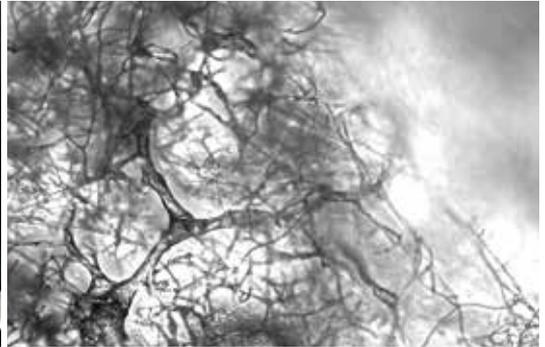
Sound for Fungi. Homage to Indeterminacy began as a laboratory experiment where Schubert played sinus frequencies to fungi mycelia she collected from forests near her home in Berlin. After weeks of observing these collected specimens housed in custom-built sound-insulated boxes, most showed a positive response to the influence of sound by growing faster and denser than samples grown in silence.

The interactive video installation simulates Schubert's experiment where sound influenced mycelium growth. Audiences can explore this biological process by using a tracking sensor where hand movements simulate the role of a sound frequency and change the fungi's growth in realtime. The digital 3D environment shifts between macro and cellular level perspectives, revealing fragile

topologies comprised of multiple nodes and connections, offering a glimpse into the complexity of the underground network of microbes that connect the 'Wood Wide Web.'

The title draws reference to American music composer John Cage's development of 'indeterminacy' as an improvisational technique where aspects of a composition are left open to chance or free-choice. A further reference is the work of Anna Tsing and mycologist Alan Ryner who have linked mushrooms to this notion of indeterminacy because of their shape-shifting gestalt. Some fungi keep expanding and growing through different life cycles and therefore, in theory, are immortal.

Improvisation—not so much as a musical process but understood as a natural life phenomenon—represents a condition of existence itself. This state



of being without intention enables spontaneity and emergence, and has been a guiding principle through Schubert's artistic practice. By allowing many pathways and experiences of the fungi data in this work, Schubert applies the same open-ended codes to audience engagement—facilitating an interspecies experience which works best when the visitor brings tranquility and patience to their interaction with this.

Simulation development: Sage Jenson
This work has been developed within *Mind the Fungi*, a research project (2018–20) between the Institute of Biotechnology TU Berlin and Art Laboratory Berlin.



<https://u.aec.at/DDEF4C12>

Margherita Pevere



Theresa Schubert (DE) is a Berlin-based artist exploring unconventional visions of nature, technology, and the self. Her work combines audiovisual and biomedicine to conceptual and immersive installations or performances. By means of interdisciplinary methods such as biohacking, theoretical analysis, performative interpretation, and material experimentation, her works question the relation of humans to their environment and evolution of matter and meaning beyond the Anthropos. More recently, she works with UHD video environments and 3D Laser Scanning to challenge modes of perception and question the human-machine-nature relationship in hypertechnology societies.

The Cleanroom Paradox

Felix Lenz, Angela Neubauer, Eszter Zwickl

In 1/60 of a second—corporality captured on a chip. Then, the partition, the dissolution, neutralization, reduction, time passing until technicality becomes an analogy, process an inversion.

Jin is a former Samsung factory worker whose employer failed to acknowledge the lack of adequate precautionary health measures during work procedures. After her time in the industry, she is left alone to deal with the drastic consequences: a kidney cancer diagnosis.

Dismantling the deceptively pristine image of the high-tech industry *The Cleanroom Paradox* unveils the systemic suppression of information on occupational and toxic hazards at semiconductor production sites. It is insufficient protection of health, untimely illnesses, and the corporate renouncement of the likely connection of both that are being addressed. Recounting lived experiences, a gradually disintegrating, printed photograph of Jin and a video documenting the portrait's creation are being superimposed with her own as well as experts' personal stories, shedding light on the industry's latent practices.

The ink to print Jin's portrait taken with a Samsung Galaxy Note 8 is corrosive and made of chemically dissolved smartphones. The resulting slurry is partly neutralized, then reduced to a thick, black mass, mixed with an adhesive and ultimately screen-printed onto a 100 x 70 cm paper, interweaving stories and fibers within reversion. Analogous to the etching processes affecting the bodies of workers like Jin, the corrosive ink will slowly disintegrate the print over time, skinning a surface under which Jin's story, amongst others', is already inscribed in the lower layers.

But this is not only a bodily exposure; the toxicity hidden behind the many steps in semiconductor manufacturing and the extent and effect of the labor necessary to shape high-tech products shifts focus towards the main actors, towards the middle-west, demanding responsibilities.

Fates like Jin's are not isolated cases and can be traced across the industry in the Eastern as well as Western Hemisphere.

A project by: Felix Lenz, Angela Neubauer, Eszter Zwickl
Produced at and supported by: Design Investigations (ID2) University of Applied Arts Vienna



<https://u.aec.at/922DFA2F>



Felix Lenz (AT) is a research-led artist, designer, and filmmaker based in Vienna. His analytic investigations in geopolitical, ecological, and technological matters translate in multifaceted visual outcomes, installations, and strategies. Lenz's videographic works and installations have been exhibited at international museums, festivals, and conferences.

Angela Neubauer (AT) is a young creative from Vienna. Driven by curiosity, she is exploring and creating artistic work that reflects and incorporates her interests in social and natural sciences. Her latest projects aim

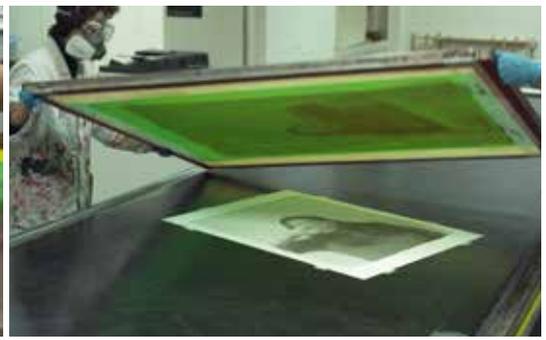
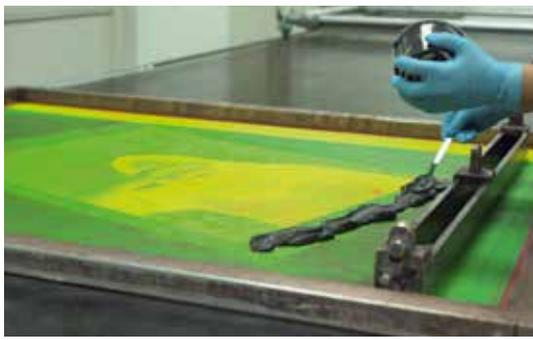
to inform, engage, and raise questions through the means of design and storytelling. She is currently studying Design Investigations at the University of Applied Arts Vienna. **Eszter Noémi Zwickl (HU)** is mostly focusing on social and cultural issues through art and design. She works with different media such as language and writing as well as moving imagery. Her writings, drawings, and designs were exhibited in Labor Galerie, Budapest. She is also participating in fundraising projects with other Vienna-based artists and designers.

Felix Lenz



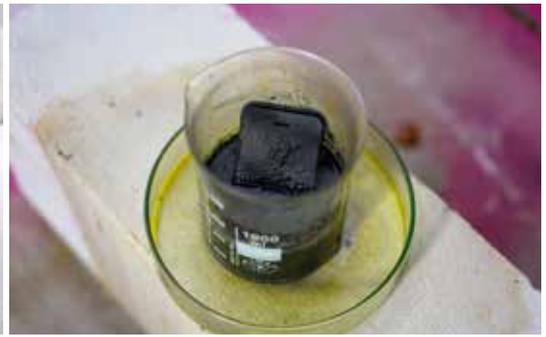
Felix Lenz

Felix Lenz



Felix Lenz

Angela Neubauer



Felix Lenz

Felix Lenz



Felix Lenz

The Transparency of Randomness

Mathias Gartner, Vera Tolazzi

The Transparency of Randomness gives insight into the world of randomness. In this interactive installation, visitors can directly experience the significance of the complex interplay of randomness and stochastics in current mathematical and physical research.

27 transparent boxes, floating in space, continuously generate random numbers by using the well-known medium of the dice. The process of random number generation is influenced by the complexity of nature and its structures, using a variety of natural materials. The ensemble of all generated random numbers forms the basis for a real-time calculation and generative graphics.

By using different materials, we integrate the complexity of nature into our otherwise rather technical installation. Each box contains a different material, we used cinnamon, moss, cotton, cork, and many other materials. Thus, the surfaces over which the dice are rolled have very specific structures. Here we focused on collecting materials with special haptic properties like soft, rough, edgy, or fluffy. In the box with cotton, the dice rolls very smoothly and silently, whereas when using cinnamon, the process of rolling the dice has a completely different characteristic.

The notion of real randomness is very interesting and the installation encourages visitors to think about it. Today's physical theories about our world tell us that real randomness can be found in quantum mechanical systems—that is the world of small particles like single atoms or light particles called photons. In order to understand the properties of such systems, physicists use Monte Carlo methods based on random numbers.

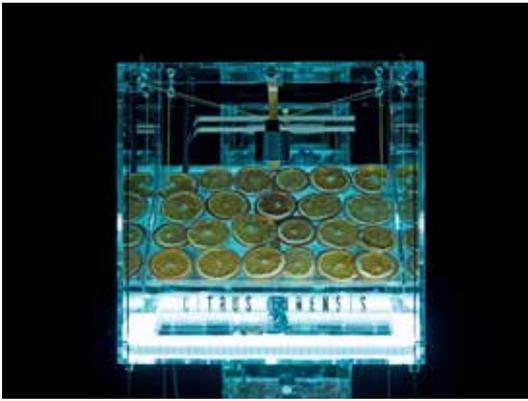
Visitors can immerse themselves into the world of randomness, when wandering through the installation and observing the perpetual work of every individual box. They also have the opportunity to control one of the boxes by accessing a web-application on a smartphone and therefore become an active part of the installation with their self-generated random number.

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

With support from Land Oberösterreich and Johannes Kepler University Linz

<https://u.aec.at/0154324B>





Mathias Gartner (AT) lives and works in Linz. He is currently completing his doctoral studies at JKU at the Institute of Theoretical Physics, where simulations based on random numbers accompany his daily studies. The installation *The Transparency of Randomness* is an analogy to his work and shows the relevance of randomness in current research. **Vera Tolazzi** (AT) lives and works in Linz. She has a Master's degree in Visual Communication from the University of Art and Design Linz and is currently working as an interaction designer. The fusion of analog and digital media as well as experimenting with different materials plays an important role in her works.

UNBORNOx9

Shu Lea Cheang, Ewen Chardronnet / Future Baby Production

UNBORNOx9 is an art installation and a hacking performance that explores the role of obstetric science in the increasingly technological experience of human reproduction, speculating on new types of bonding that may emerge with artificial wombs. Between years 2017–2020, software coding sessions, sonic workshops, reading groups, interviews, and improvised performances were held following the studies in pregnancy typologies, the development of fetuses in artificial wombs outside of the body (ectogenesis), the surrogacy childbearing, and the cyborg future of parenting. Reconsider the topics of the ‘Cyborg Baby’ advanced in the 1980s by philosopher Donna Haraway in the wake of her *Cyborg Manifesto*, artists contributing to this project formalized their collective work under the name ‘Future Baby Production.’

In collaboration with the echOpen.org living lab that engages in the development of open source and low cost echo-stethoscope with smartphone application, *UNBORNOx9* forks the prototype of its professional tool and hacks the inaudible ultrasonic waves in a sonic conversion. Ultrasound is a technology that originated in sonar detectors for submarine warfare and introduced in obstetric practice in the early 1960s. In its way of intervening in the intimacy inside the women’s body, ultrasound has embedded a biopolitical dimension. As the visualization and sonification of ultrasound data prompts augmented interaction, the *UNBORNOx9* performance allows the glitches of ultrasonic data

to be further expanded and re-interpreted by an assemble of sound artists. Opening up multi-interface communication with the unborn—from still born of 0 month to 9 month complete cycle, pregnancy is integrated into a high-tech vision of the body as a biological component of a cybernetic communication system. In treating a fetus as if it were outside a woman’s body, to make it visible, is a political act.

UNBORNOx9 is a project of Future Baby Production. An initiative by Shu Lea Cheang and Ewen Chardronnet A Makery/Antre-Peaux/UrsulaB/ production in association with Labomedia, echOpen An Art2M/MAKERY presentation with Art4Med (2021-2022), an EU platform on Art and medical science research, <http://art4med.eu> Technical team: Benjamin Cadon, Labomedia; Jérôme Dubois, echOpen; Vivien Roussel, thr34d5 Mechanical engineering; Thomas Demmer Baby fabrication: Svar Simpson Pregnancy topology workshop: Catherine Lenoble, Alexandra Haché Graphic design: Olivier Morvan With support from Dispositif pour la Création Artistique Multimédia et Numérique (DICRÉAM), CNC (France), (2017–2020); Art4Med is co-funded by the Creative Europe programme of the European Union (2021–2022)



<https://u.aec.at/A5CE2648>



Shu Lea Cheang (US) is an artist and filmmaker whose work aims to re-envision genders, genres, and operating structures. From homesteading cyberspace in the 90s to her current retreat to post-netcrash BioNet zone, Cheang takes on viral love, bio hack in her current cycle of works. She represented Taiwan with *3x3x6*, a mixed media installation at Venice Biennale 2019 and is currently developing *UKI*, a sci-fi viral alt-reality cinema. **Ewen Chardronnet** (FR) is an artist, writer, journalist, curator, producer, and organizer of numerous intermedia productions, exhibitions, and international events. He has engaged in several ongoing artistic projects including the Laboratory Planet

collective, the *Aliens in Green*, the Roscosmoe initiative, and the *Green Open Food Evolution* research project. He is currently chief editor of makery.info and lead coordinator of the EU Creative Europe program ART4MED.eu (2020–2022). The collective Future Baby Production represents the common group effort to raise issues such as the possible impact of low cost echostethoscopy on global health issues, questions of access to healthcare and motherhood, ectogenesis, and the technicization of reproduction, and the exchange between science-fiction imaginary and science in the making at large.



Digital & Sound



**PRIX
ARS ELECTRONICA 2021**

International Competition for CyberArts

Music

Art

A Pandemic Didn't Stop the Sound

Ludger Brümmer, Cedrik Fermont, Rikke Frisk, Daito Manabe,
Christine McLeavey Payne

The jury of the Digital Musics & Sound Art category of Prix Ars Electronica 2021 was extremely impressed by the high quality of the submitted works. In particular, the jury was struck by the diversity of the submissions and the use of a very broad spectrum of technology and techniques. Notably this year, several works incorporate machine learning techniques, sometimes as tools for creating new sounds, and other times in raising ethical questions around how the algorithms and data collection affect listeners, performers, and music itself. Other works returned to simpler or older technologies. These both invite us to enjoy the beauty and to look back with nostalgia, but also to question the current pervasiveness of technology in art. Some works combine aspects of science and media, with sounds driven by biological, chemical, or electronic signals. Several focused on brain wave interactions, pointing towards very interesting artistic potential as these technologies continue to develop. This year it is clear that music and sound are more than ever a medium for exploring important social questions. We saw several impactful projects drawing from sounds in the community, and focusing on topics such as the environmental crisis, criminal justice, violence at home and in society, and data privacy and ownership. The jury agreed on the following criteria for the selection: meaningful exploration, clear artistic intention, impact both socially and artistically, technical excellence, potential for future development, and uniqueness. At the core, we asked ourselves: which projects are we most excited to tell our friends and colleagues about?

Golden Nica

Convergence · Alexander Schubert

The work *Convergence* by Alexander Schubert consists of a complex experimental arrangement in which a computer voice prompts the instrumentalists to perform certain activities in order to scan them. The process of scanning creates a digitally parameterized representation of the person and his activities in the computer, on the one hand only a part of reality, which can be manipulated and reassembled into a new representation. It is the game of all perception that Schubert presents here. In its process, reality is constantly distorted with new evaluations and artefacts. Artificial intelligences bring new forms of perception and representation of the human being into our reality through which our fluid idea of reality is unsettled. This poses a new question about our identity that arises in everyday human life through the mirroring of other people. The child experiences itself through the re-actions of the parents. The machine intervenes in this cycle of action and reaction with its own algorithms and becomes an even stronger counterpart to self-perception. Schubert translates this plot with his large team of developers, AI experts and the 'Ensemble Resonanz' and the team of IRCAM into an exciting music-theatrical performance of about 30 minutes that triggers all levels of anxiety and fascination at the same time. The sounds and the musical material are clearly chosen in their message, very sign-like reduced, very expressive, almost super clean and exaggerated. He succeeds in organically integrating the

instrumentalists into the action, but in the streaming version he exploits all the technical possibilities of visual and sonic augmentation. The consistent aesthetics, the dramatic power, the chosen concept and the skillful integration of all technical and aesthetic means led the jury to the decision to award the Golden Nica in the category of Digital Musics & Sound Art of Prix Ars Electronica 2021 to Alexander Schubert's work *Convergence*.

Awards of Distinction

A Father's Lullaby

Site-Responsive Audio Installations

Rashin Fahandej

A Father's Lullaby is a complex, emotional, and timely work, focusing on the role men play in raising children. In particular, it explores the impact of incarceration on fatherhood and on families, highlighting racial inequalities in the criminal justice system, and delving into the homecomings as fathers return to their grown children. It exists in multiple formats, from an ongoing website to community garden to curated museum exhibit. The project invites men throughout the USA to participate by recording themselves singing lullabies or telling stories of childhood and fatherhood.

Convergence

Douglas McCausland

Convergence is a work of great virtuosity, energy, and expression. It features a duet between composer and electronics performer Douglas McCausland and augmented double bassist Alek-

sander Gabryś. This dynamic and often chaotic work takes musical gestures to extremes. The duet begins as collaboration and equal conversation but shifts dramatically towards the electronics performer controlling the bassist. The bass is fitted with both microphones and transducers, allowing the bass to serve both as the generator for unusual and extreme sounds, and as a resonance chamber for external sounds. Meanwhile, machine learning is used to classify gestures of the electronics performer, linking these to audio controls. The work is successful in part due to its technological intricacy, but even more fundamentally from the extremely convincing and committed performance by the two musicians.

Honorary Mentions

Chosho Hakkei in Rittor Base—HPL ver evala

evala is a very important contemporary sound artist, who pursues new aural experiences and sonic expressions based on the concept of seeing by your ears with his project *See by Your Ears (SbYE)*. While many musical works are now often presented with visuals, such as audio visualizations, evala challenges to create a visual experience by using the fundamental power of music and sound to stimulate the auditory sense. This work merges the soundscape of nature and sound synthesis, which let you experience a landscape that you have never seen before when you close your eyes and listen to it. Though some artists take concepts ahead of other criteria, the output of his

work, notably its quality, is remarkable. He is a very rare artist—beauty and violence coexist in his creations, and the jury has high expectations of his future works.

Deconstruction

Mariam Gviniashvili

Deconstruction is a stereo and multi-channel work composed with COVID-19 data during the first lockdown in the spring of 2020. The resulting sound and images are breathtakingly beautiful, but the reality is that the composition is based on data of transmission route and network of viral infection that has divided our society and humanity. The interaction between the powerful sound and the particle visuals attracts the audience as well as provokes them to think of what was lost. The jury was impressed by Mariam Gviniashvili's attitude to create and present such a work in the midst of people's despair in the early stages of the pandemic.

Forest UnderSound

Tosca Terán

Forest UnderSound follows the idea of fungi being able to realize sentience like pain, sufferance, pleasure and comfort. Tosca Terán cultivated fungi like *Ganoderma lucidum* (Reishi/Lingzhi) and *Pleurotus ostreatus* (oyster mushrooms) and detects fluctuations in the conductivity of the mycelium. These

fluctuations are then transformed into sound and musical information. The resulting sounds perform impressive modifications, smooth processes, and indulge in their peaceful mood. Teran observes that the fungi react to the presence of humans, without being able to explain *why* or *how* this is so. This installation instils respect for the living by translating the activity of the mycelium into information humans are able to perceive and react to. The jury was impressed by the poetic narration of the work and ability of the artist to let the fungi transmit information to us.

Music for Krügerstrand—Quartet for Gold

Bullion Coins · Niels Lyhne Løkkegaard

The authenticity and purity of gold can be determined by the sound emitted when the coin is struck with another coin. A high-frequency, dancing tone with a very long reverberation is sent out into the room. This inherent poetic nature of a material that throughout history has caused greed and the fall of civilizations, inspired the composer Niels Lyhne Løkkegaard. While many entries and approaches deal with everyday things being converted to data and software, the jury finds this a very unusual and universal approach and a very important work in terms of considering universal values and methods. Gold is a very concrete symbol of something unfathomable. A material with great weight that

represents a continuum of immutability and stability, gold is an object of fascination and prestige, but at the same time also an anxiety barometer for the world: because when the future is uncertain, the price of gold also rises. At the performance the composer invited the one person who, in a Danish context, resembles and manifests gold in person: the billionaire, businessman, and co-founder of SAXO bank, Lars Seier Christensen, to perform with him. The jury is inspired by the artist's interest in the musical instrument itself—not only as a musical instrument, but also as a cultural marker, and his work with music in which both the individual musical instrument and the individual musician dissolve to subsequently emerge in a different form in a non-hierarchical space.

Organscape · Xoán-Xil López

Organscape takes an opposite stance to the very many digital works we are accustomed to see today. The autonomous installation emulates a repertoire of sounds associated with nature, such as bird songs, and a series of acoustic short pieces for organ that re-synthesize or mimic field recordings from different geographic locations. It is brilliant in its simplicity, yet complex to achieve such acoustic sound synthesis whose intention is not to deliver a perfect emulation of reality but a variation of it that evokes the natural world. These automata remind us that sound synthesis doesn't

only belong to the twenty-first century or the computer world, this installation makes us travel to a past that never existed and navigate through a land that never was.

PROTO · Holly Herndon, Mathew Dryhurst

PROTO serves both as an artistically intriguing and convincing album in its own right, and as an important critique of how modern machine-learning algorithms consume any and all publicly available data. The album features a novel 'voice,' the result of an algorithm trained solely on data from vocalists recruited for the project. As part of the project, she also reached out to researchers in the AI music field to discuss their use of data. The work raises the important question of how musicians should be compensated and recognized when their music appears in machine learning datasets. *PROTO* connects modern technology very directly to the musicians involved and to timeless folk traditions, presenting a vision of how machine learning algorithms could serve human artistic creation.

Recurrent Morphing Radio · Interspecifics

Recurrent Morphing Radio is a system that continues to generate music by using the most advanced AI algorithms available in 2021 and information about musical genres being consumed on the digital music platforms. It is a contemporary work that expresses a critical stance against the sophisti-

cated but excessive nature of commercialism of music streaming platforms with a sense of humor and advanced technology. Among many other works of AI generating sound and music, this work is well-designed in total throughout the concepts, visualization, development, presentation, and output. The jury also appreciated that the work was very different to the kind of work that just experimented with open-source libraries related to AI.

[re]:generativ · Maxime Corbeil-Perron

[re]:generative is a media-archaeological work that not only blends analog and digital audio-visual synthesis but also breaks the boundaries between music genres, oscillating between drone, electro-acoustic, noise and glitch, glitches that also play an important role in the visual part of the composition whose anaglyph effect creates immersive dreamlike landscapes. It is a very dynamic work that slowly develops over time but contains recurring patterns such as stroboscopic effects and, despite its abstraction, could easily be divided in several chapters, each carrying its own emotions and atmosphere as well as syncopated and mesmerizing retro-futuristic scenarios.

residencia o contingencia · Emilio Gordo

Residencia o contingencia (residence or contingency) is a bit like a curiosity cabinet. The sound installation is made of various objects, artificial and

natural ones that generate sounds and mechanically looped sequences, acoustic interaction and feedbacks. The subtlety of the sonic environment forces the listeners to focus on the sounds, the space, the details, and on reflection about our consumerist society, our dependence on technology, and the tendency to get rid of what seems to be obsolete and is here reused, recycled, and upcycled. The installation is in itself a loop with no beginning and no end. One can explore it from afar or in detail: gentle scratching noises become more abrasive as soon as one takes a close listen, clicking mechanisms sound like broken pieces whose aim is to remind us that our perception of time may be abstract and depends on the context and experience. The various loop sizes and randomized behavior of some of the objects and sequences generate an eclectic soundscape that cunningly transports the listener into a world where boredom doesn't exist.

Subnormal Europe

Óscar Escudero & Belenish Moreno-Gil

The one-woman-opera *Subnormal Europe* created by Óscar Escudero & Belenish Moreno-Gil follows the narrative of being European at a time where the political foundation of Europe is quite badly shaken. This work asks questions about identity, communication and the representation of things and thoughts. The result of the production of singer

Noa Frenkel, Sebastian Schottke, and the ZKM | Hertz-Lab is as brilliant as you can interweave fixed and interactive visuals as well as sounds and music, spoken and written texts into 60 minutes of breathtaking performance. In a triptych projection, Frenkel switches constantly between her role as performer and herself, Noa Frenkel. The music enables the listener to structure ideas using modern electronic textures as efficiently as possible. The virtuosity of Frenkel's playing, the perfection of this live performance, and the complex integration of several layers of media and meaning truly deserved an Honorary Mention for this work.

The Home

Jackie Zhou, Annie Saunders

"Why do women not leave, when being abused and oppressed in a violent relationship?" The explanation to this simple question is far from simple and *The Home* is a strong attempt to make the questioner understand. A huge immersive walk-in sound installation as anti-violence. The jury is impressed with the way the sound design is used to deliver a personal, physical, mental, and emotional experience to the participant. The technology and artistic design on one hand open up the experienced world of domestic violence through personal testimonies and on the other hand lure the participant into an uncanny world along a journey that starts from normal and becomes more and

more surreal and extreme. The project deliberately chooses to use art and technology to make people understand, to try to change the mind of the participants and in the end the policymaking.

Vis.[un]necessary force_4

Luz María Sánchez

The jury is strongly drawn to this very simple, very strong sound installation. The immersive experience that deals with extreme violence in Mexico has an immediate impact and elicits an emotional response. There are no crying faces, no horrible stories, just the sound of people talking, the sound of sand, tools, walking. And slowly you realize that these people are not on a happy Sunday walk, they have dedicated themselves to finding the graves of missing people in the desert of Mexico. Awareness is achieved by a very simple means and you can't shake it off.

Convergence

Alexander Schubert



Alexander Schubert



Convergence uses the concept of Artificial Intelligence to learn features of human musicians and then recreate new entities based on these recordings. In the piece the players interact with their generated counter-parts. They see themselves transform and reshape. The technology used is centered around Auto-Encoders (and GANs). Metaphorically they demonstrate a world that is constructed and parametric. The friction between machine perception and human world perception is the starting point for questions that address the fluidity of the self and the restrictions of perception.

Human world and self models are parametric systems that make abstract assumptions and classifications of our surroundings. These processes happen partly subconscious and unreflected. They give us the impression of an absolute truth or reality, as the constructed concepts, identities, and beliefs are persuasive and internal. That these constructive models are fluid and subject to change is examined through the use of AI in this context. Auto-Encoders allow a formalization of the input

data—in this case faces, bodies, and voices. The deep learning yields a low-dimensional—abstract or high-level—description of the input. Contrary to our black box human mind, the high level parameters in the algorithm are accessible and can be edited and transformed.

In this sense the AI systems makes it possible to warp the representation of the human performers, thus stressing the fluidity of the modeling: A different person, character trait, evaluation, or gender is far less substantially disparate than the subject would anticipate. The transformation of the parameters posses the character of (social, societal, clinical, or biological) mind-altering states. The AI system is used to enable this altering with the aim to question the robustness and immobility of identity and world models. It tries to expose the internal constructiveness and in this sense works as a mirroring device. It recreates partial aspects of our perception and classification and through its alteration allows the viewer to draw a parallel to our own mental world building processes.

Listen to me now
I want to ask you a few questions
How do we differentiate
if it is a hallucination,
a dream
or clean perception?
All perception is constructive
No representation is absolute
Everything is encoded
and decoded
We are parametric
Everything parametric can be altered
parameter by parameter
That is the definition of such a model
Normally, we don't see these sliders
these values
these adjustment dials
But they can move into our consciousness
through illness
through hallucination
through drugs
through psychotic states
or through computation processes
like in this case
We then see the constructive aspect of it
That everything we do
is based on encoding and decoding
When we look at a partner
we can create a loop
A perception and adjustment loop
We can exponentiate that process
by looking into a mirror
This is what we will do now
Recursive loops
You
And Me
Regression curls
Segregation twirls
Adaptive coils
A semi-transparent foil
I don't know more than you do
I'm also just a mirror of you
As I provide a mirror for you
In a loop,
we can try to turn the opacity
of our perception into opaque variations
Like a brain lesion
a mesmerizing distortion
As in a sleep-deprived state
Drifting off into a halfword
of a dreamlike morphed reality

Where we see that other representations
of us are possible
That our self is fluid,
fragile,
constructed
and diverse
post human
Like a genetic defect
beautifully disturbed
genetically enhanced
adjusted
In a recursive loop
I encode and decode myself,
in an eternal loop
Exaggerating every feature
Like a facial distortion
Like an unsupervised inbreed
Out of control
Go to sleep, child
Dream off now
Saturate with closed eyes
Dreaming, of a future
and an optimized tomorrow
Hand in hand,
sliders adjusted,
The night sky setting,
as the values adjust
Peaceful
Invisible
A clear view of the night
Through a transparent interface
Always on
Always present
And
Always
Loving

Text excerpts *Convergence*, Alexander Schubert

Ensemble Resonanz
Co-developed with IRCAM, Paris
Audio Deep Learning Programming: Antoine Caillon,
Philippe Esling, Benjamin Levy (Ircam)
Video Deep Learning Programming:
Jorge Davila-Chacon (Heldenkombinat)
Convergence was developed as part of *#beethoven*,
a project of PODIUM Esslingen.
Funded by Kulturstiftung des Bundes. Digital version
commissioned by Eclat Festival.



<https://u.aec.at/1D409886>



Alexander Schubert



Alexander Schubert (DE) (1979) studied bioinformatics, multimedia composition. He's a professor at the Musikhochschule Hamburg. Schubert's interest explores the border between the acoustic and electronic world. In music composition, immersive installation, and staged pieces he examines the interplay between the digital and the analogue. He creates pieces that realize test settings or interaction spaces that question modes of perception and representation. Continuing topics in this field are authenticity and virtuality. The influence and framing of digital media on aesthetic views and communication is researched in a post-digital perspective. Recent research topics in his works were virtual reality, artificial intelligence, and online-mediated artworks. Schubert is a founding member of

ensembles such as Decoder. His works have been performed more than 700 times in the last few years by numerous ensembles in over 30 countries.

A Father's Lullaby

Site-Responsive Audio Installations

Rashin Fahandej



A Father's Lullaby is an ongoing series of public interventions, immersive installations, community co-creation workshops, and a location-based participatory audio augmented reality platform. *A Father's Lullaby* is a "Poetic Movement" where art and technology mobilize a plethora of voices while utilizing public places and virtual spaces to ignite a more inclusive dialogue to effect social change. Intimate interviews, songs, and lullabies offer poetic meditations on the spaces of love and trauma, presence and absence, and the power of personal memories to interrogate the structural violence of mass incarceration in the United States. *A Father's Lullaby* highlights the role of men in raising children and their absence due to the racial disparities in the criminal justice system and its direct impact on children, women, and lower income communities. The project is centered on marginalized voices of absent fathers and invites all men to participate by singing lullabies and sharing memories of childhood. Explored through the

space of love and intimacy, the project is being developed with community members as creative collaborators.

The installations are site responsive. The process is a collaboration with the immediate communities in local spaces. The installations consisted of two layers of sound. A series of compositions created from lullabies contributed by fathers from the immediate community, and a set of motion activated sound stations; audience presence prompts multitudes of stories to unfold; audio documentaries created in conversation with fathers on federal probation. Installations are an open call to the community through a participatory location-based contributory audio augmented reality platform, that can be experienced online through a map and in physical space or by walking the neighborhoods as an augmented audio app. The map creates a sonic representation of memories, lullabies, visions, and desires, co-creating new collective social memories.



Collaborators:

Sound design: Krista Dragomer

Sound design and mixing: Christian Gentry

Location-based participatory audio mobile app:

Halsey Burgund

Community members, and formerly incarcerated fathers

Partners: Boston Mayor's Office, MIT Open Documentary Lab,

Institute of Contemporary Arts Boston, MIT Co-Creation

Studio, Boston Center for the Arts, Massachusetts Cultural

Council, Framingham City Council, ThoughtWork Arts,

Scatter VR, U.S. Federal Probation office Massachusetts,

Boston Mayor's office of Returning Citizen,

American Arts Incubator, Emerson College,

Engagement Lab.

<https://u.aec.at/55BC2FF2>



Rashin Fahandej (US) is an artist, filmmaker, and assistant professor of emerging media at Emerson College. Her projects center on marginalized voices and the role of media, technology, and community co-creation to ignite social change. A proponent of 'Art as Ecosystem,' she defines her projects as 'Poetic Cyber Movement for Social Justice,' where art mobilizes a plethora of voices by creating connections between public places and virtual spaces. Her projects are supported by Boston Mayor's Office, Boston Center for the Arts, ThoughtWork Arts, Scatter VR, Mass Cultural Council, and American Arts Incubator-Austria. She is the recipient of the Institute of Contemporary Arts Boston's Foster Prize.

Convergence

Douglas McCausland



Convergence is a work composed for live augmented double-bass and electronics performer in third-order ambisonics, which explores performative agency between acoustic / electronic elements, the interaction of gesture and sound, and sound design in three-dimensional space.

Convergence is the second piece in a small collection of works developed for five-string double-bass and ambisonic electronics, in collaboration with bassist Aleksander Gabryś.

In order to perform *Convergence*, the bass is outfitted with eight microphones placed at various points across the body of the instrument. This causes the physical actions of the bassist to correspond not only to specific sounds and timbres, but also to discrete points in space. However, this perceptual mapping is then manipulated by and paired against new electronically generated materials in real-time by an electronics performer using a pair of custom glove-based electronic per-

formance interfaces. Both of these interfaces are outfitted with numerous sensors, and feed into machine-learning processes, which allow for the classification of a number of gestures and shaping the chaotic control data. All of these ideas collide in a densely chaotic and gestural work that encourages both performers to push their respective limits musically and technically while interacting with a performance system that affords intricate and nimble musical interactions. The performers developed a set of signals and rules which governed the performance, and which allowed for occasionally subtle, and sometimes pronounced, shifts in their musical roles. *Convergence* further employs an audio score paired with visual cues, which is visible to the performers on a small screen nearby. Ultimately, the chaotic nature of the work gives both performers agency to explore the sonic and performative extremes of this complex system, as well as the liminal spaces which exist in-between.



Composition, design, electronics, performance:
Douglas McCausland
Double bass: Aleksander Gabryś
Camera: Dave Kerr, Chris Lortie

Support received from Stanford University Department
of Music; The Center for Computer Research in Music
and Acoustics (CCRMA); Music <541>

<https://u.aec.at/02DC01C3>



Douglas McCausland (US) is a composer/performer interested in new aesthetic and technological domains, who explores the extremes of sound and the digital medium. Through his work, he investigates the intersections of real-time electronic music performance, bespoke interfaces, spatial audio, interactive systems, machine-learning, and experimental sound design. With a background as both a conservatory musician and music technologist, Douglas is currently a doctoral fellow at Stanford University, working towards his DMA in Composition under the supervision of Chris Chafe and Patricia Alessandrini.

Chosho Hakkei in Rittor Base—HPL ver evala



Shintaro Miyawaki

See by Your Ears (SbYE) is a project to create new auditory experiences that explore the dormant possibilities in hearing by Japanese sound artist evala under the concept 'seeing with ear.' This work is one of the *SbYE* and is a 3D immersive audio album using cutting-edge binaural technology for listening with headphones, which allows listeners to have a virtual experience of his exhibition 'Chosho Hakkei.'

'Chosho Hakkei' was held in the vast Japanese garden 'Nakazu Banshou-en' with over 330 years of history and was an attempt to awaken the Japanese view of nature and scenery in the brain from sound. Set in this historical property, he installed three artworks; on a bridge, on a small island, and in the oldest extant tea ceremony house. While listening to the current sound, visitors hear immersive sounds like hallucinations, the sound of nature that would have been somewhere far away, and the sound of the garden that they have just walked through. Then they are transported to spaces associated with the various sounds. They came from the surface of a lake, the sky, and even the universe. Also, the boundary between reality and illusion becomes blurred.

This album is a remarkable reconstruction of these works so that listeners can experience it as if they were walking around the exhibition. Images form

as you listen closely, carefully. And inside each listener, they exist in different forms. The essence of *SbYE* is to tease out so many stories that come from within gently, not by giving meaning or information from the outside, but by opening the perception of hearing endowed to humans.

Until now, the works of *SbYE* took the site-specific form of experiencing space itself with a method the artist calls 'spatial composition.' With conventional binaural technology, it wasn't possible to release a stereo 2ch audio album based on that. However, by developing the 'HPL standard' with Jiro Kubo (ACOUSTIC FIELD INC.), an engineer of *SbYE*, this album was finally released.

All sound production, composing, recording, mixing:
evala

HPL mastering: Jiro Kubo

Cover design: Ryoji Tanaka

Cover photo: Kenshu Shintsubo

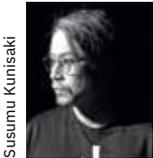
Curatorial direction: Kazunao Abe

Produced by *See by Your Ears*

With support from Rittor Base, ACOUSTIC FIELD INC.,
Semitransparent Design, Banshou-en



<https://u.aec.at/9687FE07>

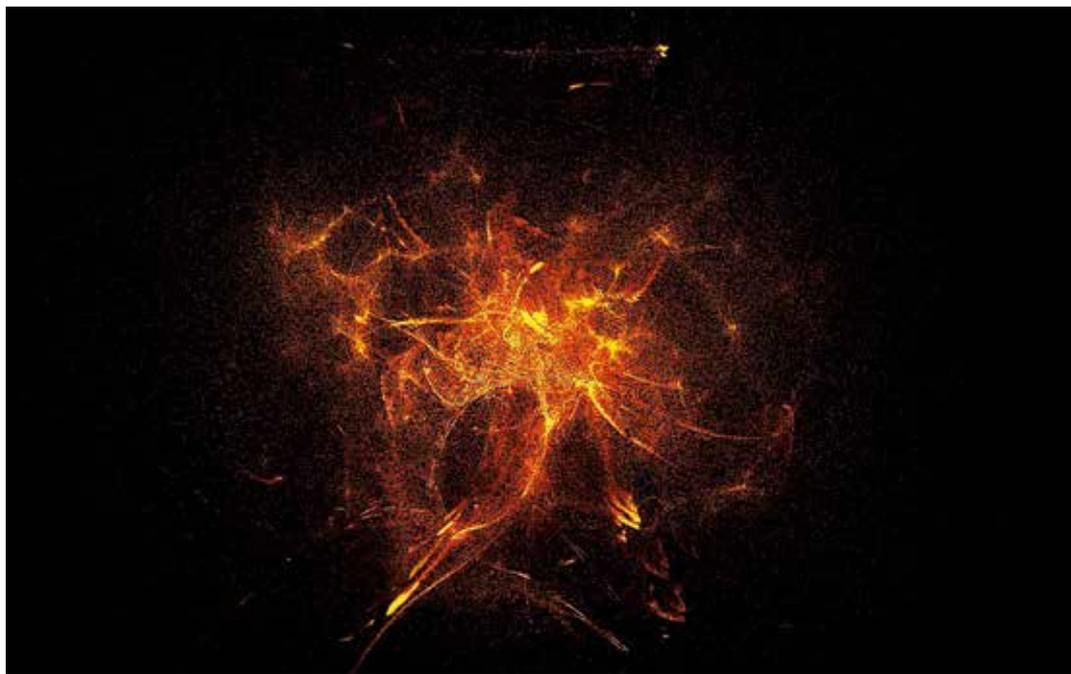


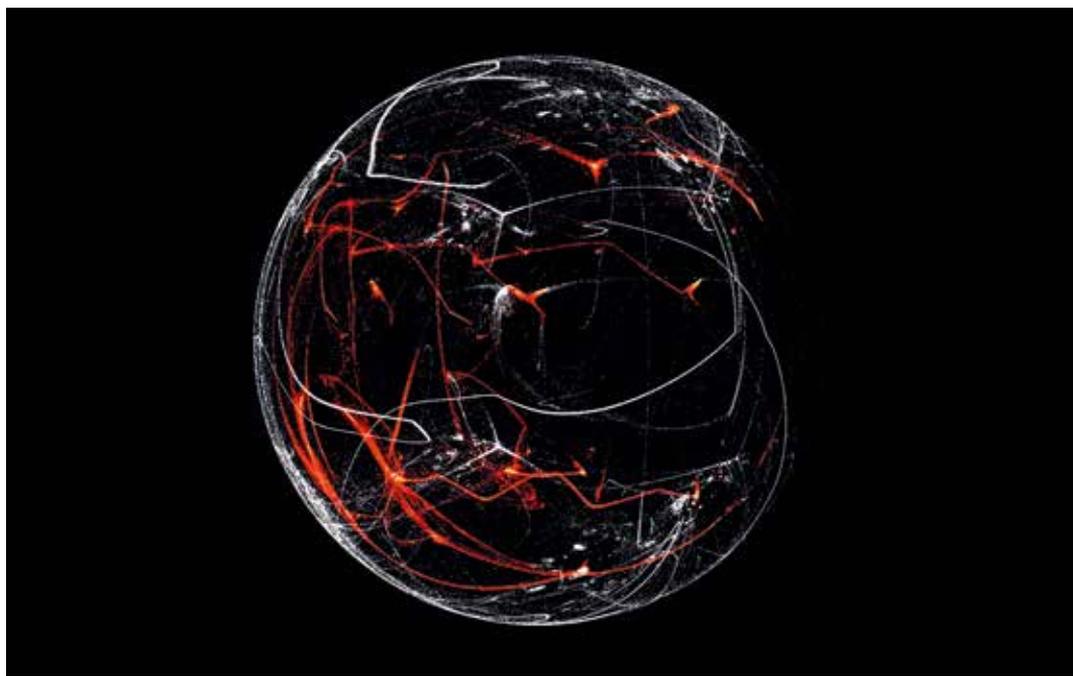
Susumu Kunisaki

evala (JP) is a Japanese sound artist and musician who creates edgy works of electronic music, and exploring auditory experience with the use of 3D sound systems as new instruments. He shows the spatial and immersive auditory experience in his project *See by Your Ears*, which explores the dormant possibilities in hearing under the concept 'seeing with ear.' In 2020, an invisible cinema, *Sea, See, She* was premiered, showing a new art form in which each audience visualized their own image by immersing themselves with 70 minutes of 3D sounds in pitch darkness. It won the Excellence Award of JMFA.

Deconstruction

Mariam Gviniashvili





Deconstruction was composed during the first lockdown in Spring 2020. The way our interpersonal relationships and networks have been deconstructed and transformed since the pandemic began was an essential inspiration for the piece. I have monitored how the virus was spreading, as the few pathways in its network gradually became impossible to trace. I wanted to capture the exponentially rising infection rates as dynamic, explosive gestures, which ultimately

relax into more transparent textures, as the 'wave' sweeps through my metaphorical Earth. Both visuals and sound is made in Max MSP. The piece exists in stereo and multichannel/multiscreen versions.

Sound & Visuals: Mariam Gviniashvili



<https://u.aec.at/F27A6AE3>

Koka Nikoladze



Mariam Gviniashvili (NO/GE) is an Oslo-based composer and sound artist originally from the country of Georgia. Her artistic practice extends to multichannel electronics, audiovisual and interactive sound-art works, live improvisation as well as collaboration with performers. Her work has been presented internationally at concerts and festivals, including New York City Electroacoustic Music Festival, CIME/ICEM, Transitions concert series at CCRMA, ICMC, Cube Fest, Festival Mixtur, Klingt Gut, BEAST FEaST, and Ultima Festival, among others.

Forest UnderSound

Tosca Terán



Forest UnderSound is an invitation to consider the sentience of fungi. Sentience is the ability to perceive one's environment, and experience sensations such as pain and suffering, or pleasure and comfort. Many countries acknowledge animal sentience, and animals' ability to experience pain, fear, distress, hunger, and thirst in their laws, which are designed to protect animals from such suffering. In 1997, the European Union agreed to recognize animals as sentient beings under European law. Animals and fungi share a common ancestor and branched away from plants approximately 1.1 billion years ago. It was only later that animals and fungi separated on the genealogical tree of life, making fungi more closely related to humans than plants.

For *Forest UnderSound*, mycelium from *Ganoderma lucidum* (Reishi/Lingzhi) and *Pleurotus ostreatus*

(oyster mushrooms), along with mycorrhizal fungi growing and connecting within the roots of various plants, have been cultivated.

Both the plant roots and mycelium have electrodes connected to them that send biodata into purpose-built circuits, which detect micro-fluctuations in conductivity between 1,000 – 100,000 of a second. This biodata is then translated in real-time to control analog and digital synthesizers. Empirically, when fully connected and music is being generated, Mycelium consistently generates periodic patterns that are both enigmatic but also very musical. For reasons that I do not fully understand, Mycelium reacts to the proximity of some people more than others. Growing more frenetic or more harmonic or completely silent, when humans are present.



For the first iteration of *Forest UnderSound* fungi and plants will be allowed to grow over approximately seven months, creating a real-time fungi forest soundscape. The soundscape changes over the seasons as the fungi and plants grow. During the 2021 Winter, Spring, Summer, and Fall this soundscape will be recorded. Recordings take place on each of the four equinoxes.

With support from The Ontario Arts Council; A Space Gallery, Toronto; and The Museum, Ontario



<https://u.aec.at/3E837E86>



Tosca Terán (CA) describes herself as an interdisciplinary, human holobiont, whose work is a confluence of art, ecology, and craft. Her work has been featured at SOFA New York, *Metalsmith* magazine, Toronto Design Exchange, MOCA Toronto, Ontario Science Centre, *Musicworks* magazine, Vector Festival, Studio Craft & Design Canada, SONICA21, and NAISA. Tosca has been awarded grants and funding from the Goethe Institute Montreal, The Canada Arts Council, BigCi at Wollemi National Park, Ontario Arts Council, and the Toronto Arts Council for her immersive, nonhuman fungal bio-sonification projects.

Music for Krügerrand Quartet for Gold Bullion Coins

Niels Lyhne Løkkegaard

Matthe Ivarsson



Matthe Ivarsson



Mads Nissen, Ritzau

Matthe Ivarsson



Matthe Ivarsson

Music for Krügerrand is a multimedial work by Niels Lyhne Løkkegaard in which the materiality of gold coins and the sonic properties of gold are investigated. *Music for Krügerrand* features eight gold bullion coins and eight oscillators and was premiered at Copenhagen Contemporary by a quartet consisting of Danish billionaire Lars Seier Christensen alongside Ying-Hsueh Chen, Jaleh Negari, and Niels Lyhne Løkkegaard.

In this performance the following eight gold bullion coins were used:

Krügerrand, 1 oz. (1978, 1980, 1981, 1983)

American Eagle, 1 oz. (2017)

100 Corona (1915, 1915)

50 Pesos Centenario (1947)

The purity of a gold coin can be determined by the sound emitted when the gold coin is struck with another gold coin. The sound generated is a high frequency tone with a very long sustain, and depending on the diameter, thickness, and alloy of the gold coin, a tone with a specific pitch and timbre is given. *Music for Krügerrand* studies the materiality and the sonic properties of gold, and moreover it deals with man's age-old fascination with the precious metal; which could be described as the psychology of gold.

In nature, gold occurs in very small quantities, and when refined gold is unaffected by the ravages of time. Thus, gold appears as a constant—a very concrete symbol of something desirable and unbreakable; a constant material of great gravity representing a continuum of stability.

Due to these properties, gold has been given great value, has caused numerous tragedies and conflicts, and is today the subject of dreams of wealth and acts as an anxiety barometer measuring the status of the world. Thus, the price of gold usually increases in times where the future seems uncertain, whereas the price of gold often drops when we enjoy a more positive view of the future. The political implications of gold throughout history are countless, and as for the Krügerrand coin itself, the historical load is a heavy and grim one. *Music for Krügerrand—Quartet for Gold Bullion Coins* was released in 2020.

Thanks to: Lars Seier Christensen, Ying-Hsueh Chen, Jaleh Negari, Bjarke Svendsen, Topos, Copenhagen Contemporary and G((o)ng Tomorrow.



<https://u.aec.at/6586BC90>



Mike Højgaard

Niels Lyhne Løkkegaard (DK) considers his work to be a basic research in realities and is interested in how bubble-like systems unfold themselves as human conditions. The meetings between the individual body and these different bubble-like systems are key drivers in Løkkegaard's praxis and he's interested in how to escape these bubbles, and if not escape them, then how they can be warped, wrestled, and renegotiated. Løkkegaard works within many different media, but is particularly interested in music instruments and other sonic artifacts not only as sources of sound, but also as cultural markers embedded within different saturated systems that are unspoken, unseen, or unheard of. Niels Lyhne Løkkegaard studied at the School of Architecture at The Royal Danish Academy of Art and the RMC in Copenhagen, where he currently works as associate professor.

Organscape

Xoán-Xil López



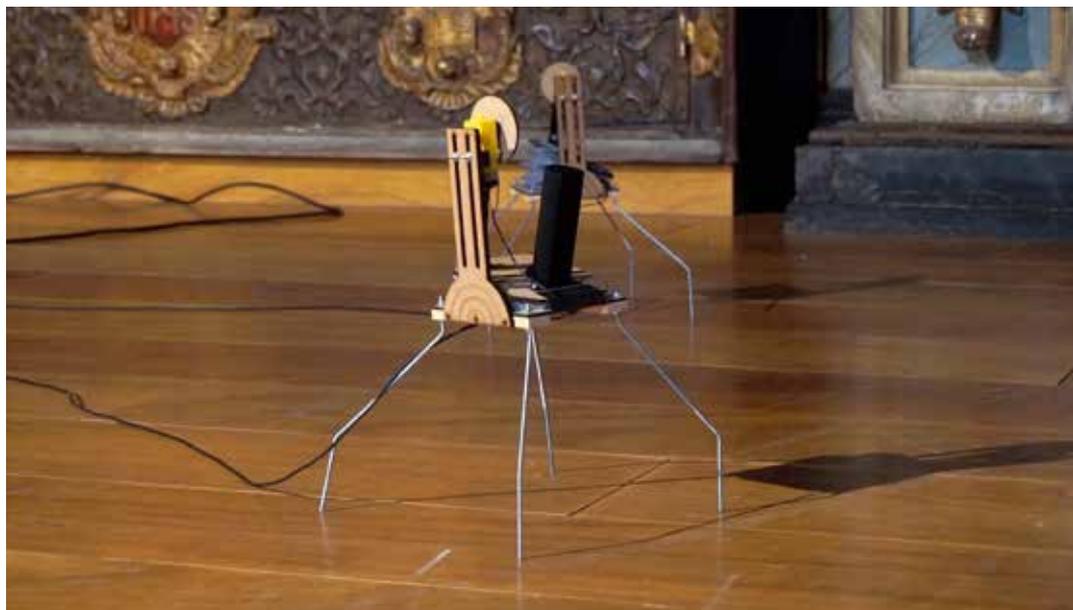
The sound ensemble that comprise this proposal, commissioned by the festival De Lugares e Órganos, Santiago de Compostela 2020, is framed around two elements that coexist and dialogue; the autonomous installation called *Organismo I*, a sort of automata that emulates a repertoire of sounds associated with the natural world, and a series of acoustic short pieces for organ, *Organscape I – IV*, composed by means of converting field recordings from different geographical locations to the timbral characteristics of this historical instrument. This work arises from the idea of soundscape musical mimesis.

Based on research related to the special registers that we can find in some organs—mainly from the Baroque period, intended to imitate paramusical sounds, such as those of birds or thunder, *Organscape* delves into the idea of our audible environment representation through a series of works written for this instrument and a sound installation. In this sense, it is not so much an attempt to

achieve a faithful imitation, but to outline certain acoustic characteristics of the evoked material, the wind or a swarm, for example. A tension that places us between utopia and dystopia.

In some way, the organ could be considered one of the first site-specific “installations,” as it is a sound device built to remain in a fixed place thoroughly calculated based on the acoustics of the space it occupies. It is this contemporary perspective, linked to the field of sound art, that has inspired the framework of the technical work with the instrument connected with the installation *Organismo I*, a modular device that tries to emulate a natural sounds repertoire through the use of different acoustic mechanisms, such as bird calls, activated by the air from different bellows.

The four scores cycle for organ has been written based on the extended acoustic possibilities of the instrument sited at the University of Santiago de Compostela, built by Manuel Sanz in 1802.



Sound installation: Xoán-Xil López
Composition: Xoán-Xil López
Organ premiere performance: Andrés Cea Galán



This work was commissioned by the international organ festival De Lugares e Órganos, Santiago de Compostela, 2020

<https://u.aec.at/72CCC34C>



Xoán-Xil López (ES) is a sound artist and researcher who produces works focused on phonography (field recording) and sound experimentation taking the form of installations, immersive listening situations, compositions, performances, and texts. He was co-founder of *Escoitar.org*, an interdisciplinary collective dedicated to the study of the soundscape and aurality, which was active from 2006 to 2016. He has been researcher and artist-in-residence at Ina GRM (BNF), La Chartreuse (Centre National des Ecritures du Spectacle) or UCLA, and taught workshops and talks on sound art and field recording at Art|Sci center, Artium, CCMEX, CGAC, CRESSON, European Institute of Design (IED), La Térmica or Medialab-Prado. He has exhibited his work in contexts such as IN-Sonora, KUMU art museum, MNCARS, LABoral, La Casa Encendida or ZKM, among others.

PROTO

Holly Herndon, Mathew Dryhurst



PROTO (4AD) is the culmination of a series of experiments and songs utilizing machine learning. As well as it being the first album of its kind, we also staged large performances at major festivals and institutions, created videos, musical tools, and a novel framework for the integration of AI techniques and the data they require into an art practice. Unlike most music and ML projects, we focussed on generating sung voice, rather than perpetuating historical attempts to produce an automated composing system. We view *Spawn* (our ML system, imagined as a baby hungry to

learn) as a collaborator, performing sung interpretations of material we composed.

This was an attempt to depart from kitsch 20th century narratives of AI as displacing the human, instead focusing on my belief that AI, trained on a chorus of human contributions, is an evolution of human coordination technology with origins in group singing techniques themselves.

To present a 21st century narrative of AI, we assembled an ensemble of singers and developers to train *Spawn*, all of whom were accredited and compensated for their data. In performance,



contrary to regrettably barren electronic music standards, my stage was filled with humans singing. We included our audiences in our training, by inviting them to sing in euphoric call and response with *Spawn*. We recorded tens of thousands of voices, and *Spawn* can now sing in the group voice of those who trained her.

The project continues as we write new music and develop new concepts for vocal exploration and protection in relation to machine learning. Our vision of data interdependence in relation to ML is cited far outside the field of music. During lockdown we started a podcast, “Interdependence,” to speak directly to decision makers encompassing Google Brain, OpenAI, and Spotify on the necessity of accrediting and compensating those whose data pivotally contributes to their AI aspirations. The ultimate goal is for our musical experiment to impact policy and public perception around machine learning.

Composed and produced: Holly Herndon, Mathew Dryhurst
Ensemble members: Annie Garlid, Marshall Garret, Houwaida Goulli, Stine Janvin, Jules LaPlace, Roman Ole, Josa Peit, Lyra Pramuk, Soriane Renaud, Albertine Sarges, Evelyn Saylor, Colin Self, *Spawn*, Elizabeth Wood
Additional production: Ville Haimala
Additional arrangement: Evelyn Saylor
Recorded in Berlin by Guy Sternburg, Paul Pilot, Holger Jost, Holly Herndon

With support from *#beethoven*



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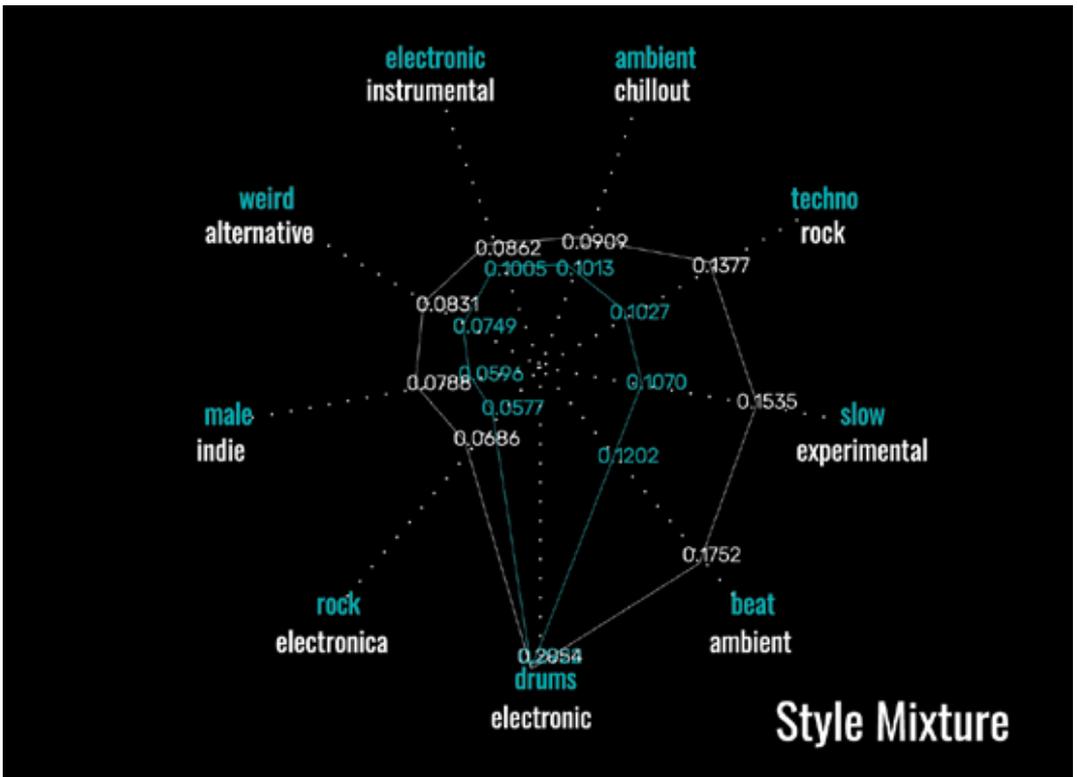
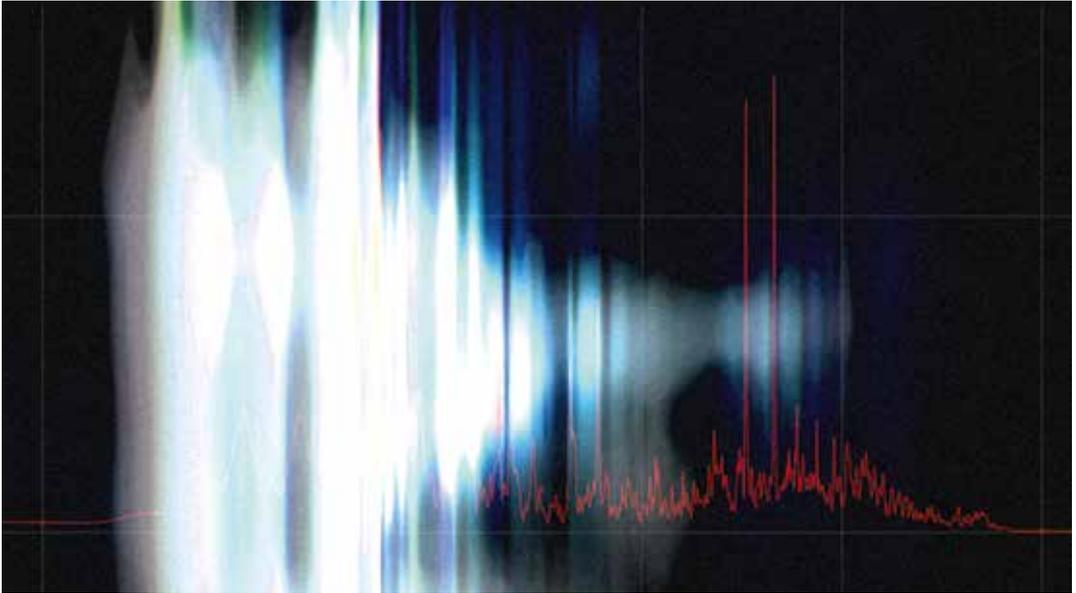
Boris Camaca



Holly Herndon (US) operates at the edges of avant-garde and pop music to establish a dynamic, disruptive canon of her own. On her most recent album *PROTO*, Herndon fronts and conducts a choir comprised of both human and AI voices. Herndon’s music comments on how technology affects humanity in thought-provoking, and often unsettling ways. **Mathew Dryhurst** (GB) releases music, research and artworks solo and in conjunction with creative partner Holly Herndon. He teaches at NYU’s Clive Davis Institute of Music, and hosts discussions with figures shaping 21st century culture on the *Interdependence* podcast.

Recurrent Morphing Radio

Interspecifics





genre1	genre2	genre3	genre4	genre5
0.2486	0.2200	0.2751	0.3554	0.3758
0.2512	0.2261	0.2261	0.2776	0.2271
0.2759	0.2923	0.2132	0.2241	0.2240
0.2518	0.1711	0.1046	0.1680	0.1958
0.2614	0.2840	0.1893	0.2277	0.2024

Temporal Ensemble

Over the last few years, access to music via streaming platforms has become not only virtually endless but also highly personalized. Behind every sound discovery engine is a sophisticated commercially-oriented formula carefully designed for inducing a long-lasting manufactured demand. Algorithms that seem to know you well enough to decide on the perfect suggestion for what you should listen to next. *Recurrent Morphing Radio* (RMR) is a generative neural audio production system fueled by the most consumed genres on digital music platforms. The system extracts and restructures the main audio features found in these styles and generates new sounds that are later continuously broadcasted. *RMR* is an endless music production machine in which over-consumption equals over-training. A living metaphor of a cultural process intervened by a capitalist market with homogenizing effects on the aesthetics of music. The result is a piece of generative sound art, produced by a meta-creative agent, in which the materiality of the original sample dissolves to such an extent that turns into noise over time. For the development of *RMR*, Interspecifics have employed computer models such as *Recurrent Neural Networks* (RNN) to build an automated

system using platforms such as OpenAI’s Jukebox, SampleRNN, and Wavenet, among others to deconstruct musical structures according to their original characteristics. The most popular sounds serve as a basis for training the system into generating new materials, which are, in turn, subjected to the same treatment repeatedly, hence its name. Apart from continuously producing music, the system generates the titles and also selects the order in which every song and list is played. It does it by using Markov Chains, a type of discrete stochastic process in which the probability of an event occurring depends only on the immediately preceding event. All the tracks produced by the system are available for download from the project database.

Project development by Interspecifics: Leslie García, Paloma López, Emmanuel Anguiano, Felipe Rebollo
 Collaborators: Diego Montensinos, José Antonio Salinas Hernández

This piece was commissioned by the Haus der Kulturen der Welt for the Festival *The Disappearance of Music*, curated by Zuri Maria Daiß and Detlef Diederichsen.



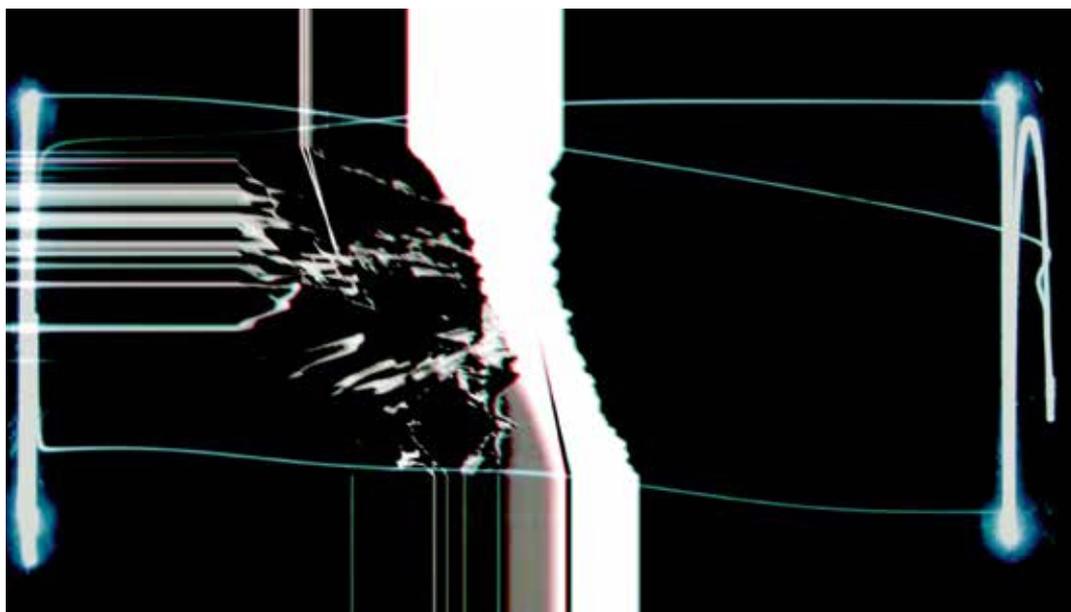
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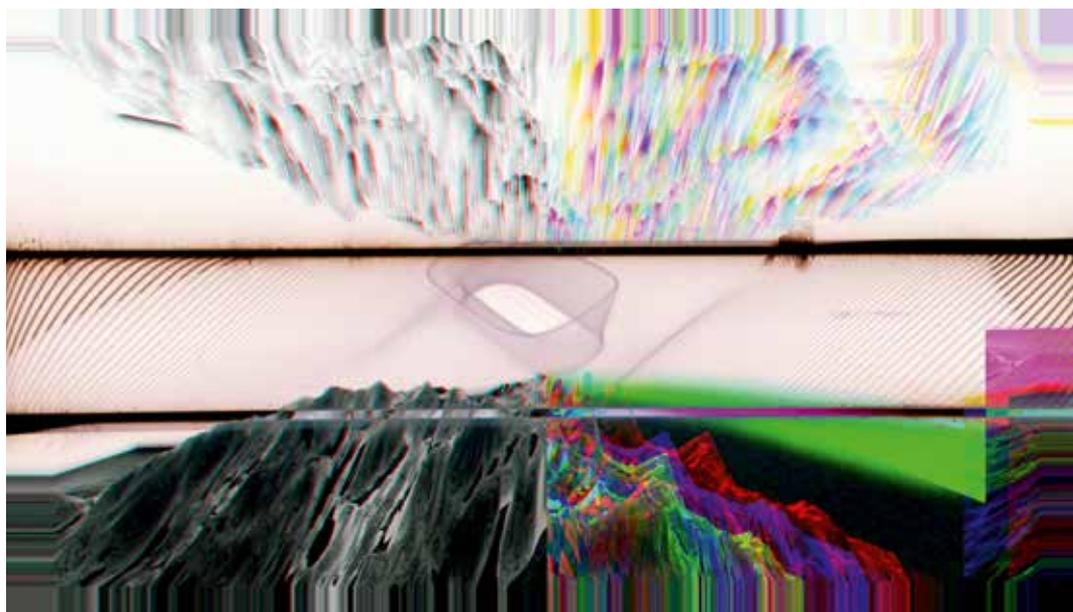


Interspecifics (INT) is an independent artistic research bureau founded in Mexico City in 2013. We have focused our research on the use of sound and AI, to explore patterns emerging from biosignals and the morphology of different living organisms as a potential form of non-human communication. With this aim, we have developed a collection of experimental research and education tools we call Ontological Machines. Our current lines of research are shifting towards exploring the hard problem of consciousness and the close relationship between mind and matter, where magic appears to be fundamental. Sound remains our interface to the universe.

[re]:generativ

Maxime Corbeil-Perron





An audiovisual media-archeological work, whose aesthetics propose an abstract compositional approach that tends towards naturalism, in the form of a return to nature as a source of abstraction. Akin to the sounds in this work, the light waves of analogue video synthesis mix with abstract and dreamlike synthetic landscapes, enhanced by an obsolete optical technology: anaglyph stereoscopy. The 3D viewing apparatus is here used to experience abstract and surreal spaces, colour modulation, and stereoscopic optical textures.

This piece was composed using various experimental techniques such as no-input, generative sound algorithms, live-sound processing and improvisation with both analogue and digital synthesis. Sonically, I was interested in creating a work that

blurred boundaries in terms of aesthetic codes, borrowing elements from minimalist contemporary electronic music, ambient, noise, musique concrète, and various electronic sub-genres.

This work was created through a collaboration with the Ensemble d'Oscillateurs, a 10-piece vintage monophonic analogue oscillator ensemble based at the University of Montreal.

Audiovisual composition, stereoscopic image, analog video, live-processing and additional synths:

Maxime Corbeil-Perron

The Ensemble d'Oscillateurs is directed by
Nicolas Bernier

With support from E.M.S. Stockholm



<https://u.aec.at/FF987EC6>



Maxime Corbeil-Perron (CA) is a Tio'tia:ke/Montreal-based composer, director, musician, and audiovisual performer whose work has been highlighted by numerous international competitions, media, and festivals. His artistic practice unfolds in a multiplicity of media: audiovisual performance, experimental cinema, electroacoustic composition, improvisation, sound art, and installation. His current works present an approach related to media archaeology, in which he seeks to establish relationships between obsolete media and contemporary technologies, in search of new aesthetic possibilities.
www.maximecorbeilperron.com

residencia o contingencia

Emilio Gordoa



This project leans towards defragmentation, dis-temporalization, and recontextualization focusing on processes with non-strict aims on starting or ending points. It is presented in the format of a sound installation integrated in the space using sound generating objects distributed in a certain radius that compose a variable counterpoint depending on its position and on the receptors' location. These sound objects are mainly assemblies of mechanical structures built with motors and recycling resonance elements, texts and field recordings, all manipulated with voltage and digital controllers.

With a thematic concept based on an almost paranoid suggestion of our reality, I intend to reflect environmental and social aspects of our times interwoven with art, physicality, and abstraction, images and sounds, conceptual arrangements, the unpredictability of events and take all this as the basis for building a kind of sound society that surrounds us in a room of thoughts...

As we are experiencing it progressively and at a potentialized speed, the level of (digital) consumption has been increasing. Transnational corporations have introduced tools for users that have become indispensable for operating in society.

In parallel, these needed technological 'developments' are harmful to our environment, but industry is growing in power and capitalist ambition. This project consists of taking a step back and looking after mechanical and almost obsolete technology, extracting/recycling material to reassemble the above-mentioned 'sound society' in an accurate tuning and trying to refer to future times when organisms function in harmony with each other, unafraid to interact and to conglomerate. On its own, this piece comes to life having the characteristic to speak by generating percussive polyrhythms, frequencies of wide range, and controlled feedback melodies in a visually sensitive and sometimes interactive display.

Visual artist and artistic assistant: Lena Czerniawska
Contributors: Viola Yip, Kamil Korolczuk, Nicola L. Hein, Björn Erlach
Acknowledgements: Emilio Gordoa Salazar and Georgina Rodriguez



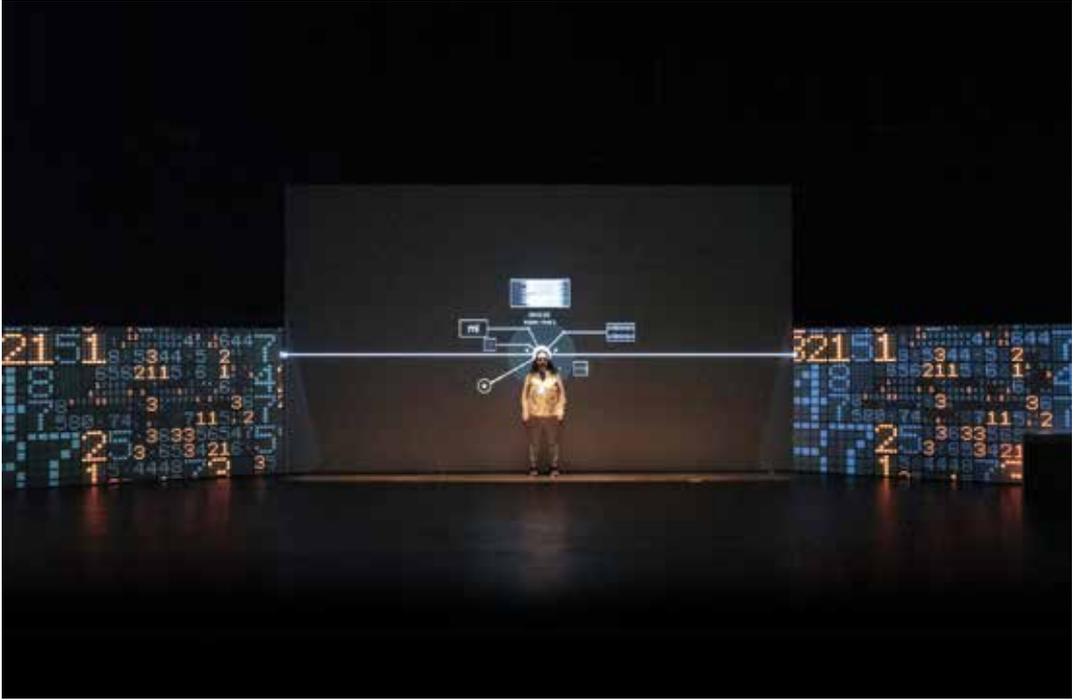
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Emilio Gordoa (MX) is a composer, sound artist, and percussionist/vibraphonist based in Berlin since 2012. He is involved in numerous projects including his work as a soloist and in collaboration with theater, dance, performance, and other interdisciplinary frameworks. Emilio focuses especially on experimental music, sound art, noise, free jazz, improvisation, and contemporary music. In recent years his work has also been notable in the form of installations and has been presented worldwide, on the streets, in prisons, galleries, and concert halls. In 2016 he founded the platform/label Wild-Sonico.

Subnormal Europe

Óscar Escudero & Belenish Moreno-Gil



Armin Smallovic

Subnormal Europe is a 60-minute music theater play co-created by Óscar Escudero & Belenish Moreno-Gil. The performance involves a singer/performer and a sound engineer/performer, whose physical and virtual personas are staged in an installation composed by 3 large screens, 9 loudspeakers, MIDI-DMX lighting, and a wooden cube. The Directorate General for Education and Culture of the European Union has delegated to the Münchener Biennale the commission of a project of innovation and development in the context of the German Presidency of the European Commission between July and December 2020. Quoting the text of the agreement between the parties, “the main purpose of this initiative is the exact technical reproduction of those instants, which have marked our history of progress in the audiovisual field. The collection must be composed by a set of files, which may be exhibited together with

their originals, not being able to distinguish one from the other.” Following these guidelines, musical dramatist Belenish Moreno-Gil and composer Óscar Escudero have designed a session staging singer Noa Frenkel and sound engineer Sebastian Schottke. The team, in cooperation with the Zentrum für Kunst und Medien Karlsruhe, will face the challenge of creating live replicas of these fragments in each of the performances. The outcomes of the process will be eventually compiled and stored by the EU in order to fulfill the goals of the project, among them, and quoting again the award agreement: “to take the pulse of the current state of the European values and to reaffirm the sense of citizenship of its inhabitants, as well as the knowledge of our common history and its contributions to human development in difficult times for Europeanism.”

Chiara Bellamoli



Armin Smaltovic

Armin Smaltovic



Armin Smaltovic

Concept, composition, dramaturgy, direction, costume, text, video and audio production: Óscar Escudero & Belenish Moreno-Gil
 Contralto: Noa Frenkel
 Voice: Sebastian Schottke
 Composition and libretto commissioned by the City of Munich for the Munich Biennale.
 A coproduction of the Munich Biennale with Hertz-Labor of the ZKM Karlsruhe.
 In cooperation with Gare du Nord and ZeitRäume Basel and Wien Modern as part of the network for cross-form music theatre forms.
 With kind support of the Instituto Cervantes Munich.

<https://u.aec.at/986A8CFC>



Christian Damiano



Óscar Escudero & Belenish Moreno-Gil (ES) are a couple of transmedia composers and performers whose productions point on social networks as ideology and the creation of operative artistic devices within a "SPAM reality." Their pieces have been premiered in numerous international festivals and stages, such as Kunstfest Weimar, Münchener Biennale, Warsaw Autumn, Rotterdam Operadagen, and Museo Reina Sofia (Madrid). Their work has also been recognized with international prizes such as the Giga-Hertz Spezialpreis (ZKM, EXPERIMENTALSTUDIO), Busoni Förderpreis (AdK Berlin), and Premio Jóvenes Compositores SGAE-CNDM (Spanish Ministry of Culture). Escudero and Moreno-Gil are co-directors of CLAMMY, an ensemble, and a YouTube channel devoted to the production of new music theater pieces linked to technological research.

The Home

Jackie Zhou, Annie Saunders



The Home is a headphone-based sound experience for one participant at a time in a physical installation—a custom-built house—situated in public space. Conceived to give each participant a visceral experience of the problematic question “Why don’t you just leave?” the binaural sound design is comprised of numerous elements and layers, built from interviews we conducted with eight survivors of domestic abuse. Their voices are used as compositional elements both to convey information and experience as well as elicit non-linguistic or pre-verbal emotion and specific visceral feelings, such as entrapment or romantic intoxication, for each solo participant. The women’s voices are layered into multifaceted sound design: participants might hear dishes being done, radio interview or news clip from a TV in another room, footsteps, a constantly intensifying phone notification, with voices which are at times isolated, montaged, or layered into sound. Each physical room and object was designed and chosen in response to the sound design. As the participant moves through the house, the environment becomes more surreal and the element of surveillance increases: after passing through a foyer, a bedroom, and a laundry room, they enter a space that is part-museum and part-police evidence room. The voices become more isolated and the participants hear stories of specific objects as they stand in front of them. The sense of being watched becomes acute. In the end they face a two-way police mirror, which they real-

ize is the other side of the foyer mirror they saw at the front door. They see through the mirror to the front door that they can no longer reach. They then enter a waiting room in which they encounter a group of women—the headphones are collected by a stagehand, and the participant then enters an office where they speak to a domestic violence counselor, at which point they also learn that the women in the waiting room were those whose voices they heard in the headphones.

Concept and direction: Annie Saunders
Interactive sound and sound system design: Jackie Zhou
Installation production design: Nina Caussa
Interactive lighting design: Andrew Schneider
Live cueing by surveillance: Lisa McGinn, Natalie Hratko, Kevin Hanley
Production and logistics management: James Okumura, Megan Kingery

This project was commissioned by Santander Bank and created in partnership with both the National Network to End Domestic Violence and the National Coalition to End Domestic Violence, as part of an ongoing campaign to raise awareness and support organizations working directly with survivors of domestic violence and financial abuse. It is currently in development to tour, and to be adapted for digital so that it can be accessible worldwide to audience participants in their own homes.



<https://u.aec.at/F4415B19>



Jackie Zhou (US) Jackie! Zhou (she/they) is a Los Angeles-based artist who is keen on blurring the lines between formats and disciplines. From music videos to documentaries, her directorial work aims to explore and celebrate human experiences. Her sound design work has been Emmy-nominated and credits include: Janelle Monáe’s *Dirty Computer*, HBO’s *United Skates*, and live work presented at the Walt Disney Concert Hall. Jackie! especially thrives with collaborative projects that defy the standard borders of traditional formats. She believes good humans make great storytellers.

Annie Saunders (US) is a multidisciplinary creator and director of site-specific experiences and has created award-winning multi-platform projects for major arts institutions including the Public Theater, The Los Angeles Philharmonic, the Broad Stage, and Summerhall as well as site-specific projects in disused spaces set for demolition and experiential campaigns for multinational brands. She is a member of the inaugural ONX Studio, an invited accelerator for artists working in extended reality through NEW INC and the Onassis Foundation, and an alumnus of the Devised Theater Working Group for next-generation performance-makers at the Public Theater. Saunders is the founder and artistic director of site-specific performance company Wilderness, and her experimental project *The Wreck* for Opera Omaha was called ‘ingenious...a persuasive expression of complex female feeling,’ by the *Wall Street Journal*.

Vis.[un]necessary force_4

Luz María Sánchez



Vis.[un]necessary force_4 (*V.[u]nf_4*) is a generative, participatory multimedia installation which translates the affective sonic territory of the Mexican desert and the aural fabric of Rastreadoras de El Fuerte—digging in search of clandestine graves where they might find their family members, victims of enforced disappearance—into an immersive sonic environment.

V.[u]nf_4 is part of a larger art-research project that addresses violence exerted against civilians by drug cartels, police, and military forces. In Mexico, crimes against humanity are committed every day. The country has become a large mass grave. As of April 2021, official numbers state that more than 4,000 clandestine graves were found, more than 250,000 people have died and 83,000 have gone missing since the war on drugs was launched in 2006.

V.[u]nf_4 generative process operates through different sonic cells: verbal and non-verbal human sounds—Rastreadoras' interaction while on expedition—and environmental and mechanical/

human-made sounds—the steel 'T' rods used to locate clandestine graves, dragged on the pavement. Clusters of sounds build an aural fabric, placing the visitor *within* the emotional space of the *search*. This *sonic space* is made of *snapshots* in which Rastreadoras try to overcome their agony. The need to find their loved ones coexists with their hope that they are not the ones in the clandestine grave found. The imminence of the *finding* is a distressful ambiance that pervades within: we are witnessing the *horror*.

V.[u]nf_4 proposes to ponder how defenseless individuals endure/scintillate in a space where the *killing machine* has contaminated all circles of coexistence. These *participatory, affective sonic constructs* may help build empathy and contribute to exposing these crimes against humanity.

In 2020 *V.[u]nf_3* received a Prix Ars Electronica's Honorary Mention in the category Digital Communities. Sánchez is an artistic member of the National System of Art Creators in Mexico.



The project was made with the support from Universidad Autónoma Metropolitana, the National System of Art Creators/Mexican Ministry of Culture and University Museum Contemporary Art/MUAC.

Author: Luz María Sánchez

Field sound recording: Josué Martínez Alcántara

Sound editing/mix: Luz María Sánchez/

Josué Martínez Alcántara/Frank Ekeberg

Research coordinator: Ana Paula Sánchez-Cardona

Video documentation: Fernando González Buenrostro

Special thanks to: Mirna Medina/Rastreadoras de El Fuerte, Amanda de la Garza, Cuauhtémoc Medina, Carolina Robledo (GIASF), Frank Ekeberg, Jacobo Dayán and Ryszard W. Kluszczynski.

<https://u.aec.at/0BE9BC0B>



Luz María Sánchez (MX) is a transdisciplinary artist exploring the political sphere of violence and power relations through multimedia constructs. Her artistic research extends to language as a technoscientific machine and builds upon environmental urgency. Sánchez has exhibited at Ars Electronica, Linz; MUAC, Mexico City; WRO Art Biennale, Wrocław; and ZKM, Karlsruhe. She has authored four books, curated exhibitions and conferences on new media, and presented by invitation at leading institutions such as the School of the Art Institute Chicago, the University of the Arts London UAL, and ZKM.

Isao Tomita Special Prize 2021

Japanese musician and composer Isao Tomita (1932–2016) is considered a pioneer of electronic music. He not only laid the foundations of the synthesizer boom, but also pushed boundaries and influenced numerous sound artists.

In 1974 he received a Grammy Award nomination for *Snowflakes are Dancing*, a modern interpretation of classical music created with a Moog synthesizer and at the 1984 Ars Electronica Festival in Linz he caused a sensation with *The Universe* as part of the “Linzer Klangwolke” (*Linz Cloud of Sound*)—his spectacular outdoor concert next to the river Danube, where huge loudspeakers were mounted on helicopters and ships, creating a unique, three-dimensional, acoustic space. Throughout his whole life, Isao Tomita explored innovative musical possibilities with his approach of combining sounds of new electronic devices and classical instruments.

To commemorate Isao Tomita and his creative spirit, TOMITA information Hub and Prix Ars Electronica are jointly offering a special prize. In parallel with the biennial award of the Golden Nica in the Digital Musics & Sound Art category, the Isao Tomita Special Prize will be awarded in 2021, 2023, and 2025. The prize is aimed at artists who explore artistic and technical challenges in digital music and sound art and inspire others with their innovative and unique music.

The Isao Tomita Special Prize is supported by TOMITA information Hub, a community organized by Isao Tomita’s daughter, Rie Seno. It aims to introduce her father’s music to interested people of all ages and all over the world, while creating a place where artists from a variety of backgrounds can come together through Isao Tomita’s music to develop inspiring ideas for the future.

This year, for the first time, the jurors of the Digital Musics & Sound Art category had to decide on the winner of the Isao Tomita Special Prize.

Statement of the Digital Musics & Sound Art Jury

Ludger Brümmer, Cedrik Fermont, Rikke Frisk, Daito Manabe, Christine McLeavey Payne

Apotome

Khyam Allami, Counterpoint

Apotome is a generative music system focused on transcultural tunings and their subsets (scales and modes), and its sister application *Leimma*, which allows for the exploration and creation of such tunings. It is so far the most successful and freely available tool that allows one to explore and compose non-Western (electronic) music. It has a clear web-based interface that allows the user to experiment with a pre-selection of ten tuning systems, themselves subdivided into classic or experimental systems according to the options one chooses. In addition, *Leimma* allows you to create your own tuning system and export it (or play it through the browser, like *Apotome*). The project has a fairly strong and anti-colonial approach. Not only is it

freely accessible to anyone with a computer and internet connection but it allows any user to compose, record, and publish commercially or not the sounds or music created with *Apotome*. It is a strong project that brings so-called traditional and/or classical knowledge together with digital technology and extends one's possibilities—a project that tries to be as comprehensive as possible, that invites the composers to explore the music world outside of the western box but also to push them to break the boundaries and be inventive. Due to its online accessibility, it may easily trigger international collaborations and exchanges between artists and lead to more sonic exchanges based on rhizomatic knowledge rather than pyramidal relationships between the knowledgeable and the disciple.

Apotome

Khyam Allami, Counterpoint



Camille Blake, CTM Festival



Apotome is the catch-all title for a transcultural music project highlighting the cultural asymmetries, biases, and non-neutrality inherent in modern music-making tools, alongside their interconnected web of musical, educational, cultural, social, and political ramifications.

Created by Khyam Allami and Counterpoint, the creative studio of Tero Parviainen and Samuel Diggins, it is focused on two browser-based non-commercial applications; *Apotome*, a generative music system focused on transcultural tunings and their subsets (scales/modes), and its sister application *Leimma*, which allows for the exploration and creation of such tunings.

By relying on innovative narrative-style design, implementing the relationship between tuning systems and their subsets in a clear way, and utilizing novel web-audio, web-synths, and web-MIDI, *Leimma* and *Apotome* can be integrated into any music-making or music-learning environment. Being browser-based they are easily accessible, excellent for teaching, and having clear, intuitive interfaces makes them inviting for those new to the subject, all the while remaining capable of satisfying the advanced user.

The project was launched in manifold forms at Berlin's CTM Festival 2021 including user-submitted compositions for a 24/7 live audiovisual stream, commissioned works, video essay, live networked trans/local performance, and panel discussion.

Tuning is one of the most fundamental elements of music making. It is also the least taught, least understood, and most veiled. It is a harbor of cultural identity and a key concept in the progressive development of music.

Although today's music-making technologies allow for incredibly complex renderings of tunings from all cultures, these capabilities are rarely implemented. What DAWs, synthesizers, audio effects, notation programs, or even AI and machine learning models have in common is that they are almost all exclusively based on Western music theory and Western musical concepts.

There is no such thing as neutral technology. Cultural bias inscribed in music technology mirrors



the bias that runs through Western music theory, which to this day has not yet succeeded to address and dismantle its non-neutrality and the colonial framework that informed many of its canonical 19th century works.

The hegemonic use of equal temperament and grid-based expression of rhythm that most music technologies impose, has cemented cultural asymmetries that restrict the creative possibilities of music makers from non-Western musical traditions

and scenes and is testimony to the normalization that the diversity of musical traditions in the West have been subjected to in recent history.

The *Apotome* project, as a whole, is a call to critically address and dismantle these inherent cultural biases that are hard coded (and wired) into today's digital and electronic music-making tools. It interrogates and proposes solutions for an artistic problem that is deeply intertwined with the colonial, imperialist, and supremacist legacies of Europe,

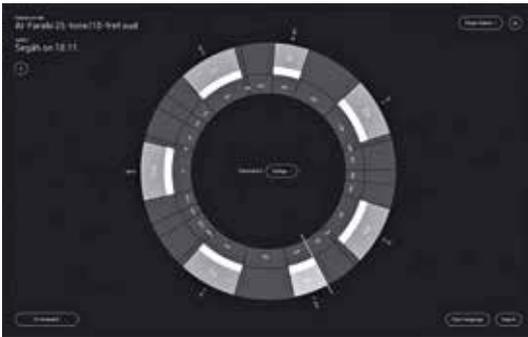
imposed upon itself and other world cultures. Though indirect, these legacies are remnants of inherited biases within European ideologies, proliferated through the technologies used to facilitate music-making across the world.

Across Europe today, many are discussing the necessity to decolonize music, music curation, and music education. But how can we begin to decolonize these before we decolonize the tools we use to teach, learn, and make music? By investigating the disruptive powers of knowledge and technology, *Apotome* utilizes hybrid formats with novel web-technologies to bring simplicity, accessibility, and a progressive forward thinking perspective to the act of musicking that we all take for granted. Leimma and *Apotome* tackle these complex problematics at their core, proposing deceptively simple and innovatively designed visual solutions to millennia-old ideas.

Concept design and direction, research, composition: Khyam Allami
Software development, UI engineering, concept design, generative music system design: Tero Parviainen
Design and creative direction, concept design, UI engineering: Samuel Diggins
OBXD, DEXED, and Yoshimi Web Audio Modules: Jari Kleimola
With support from: AHRC Midlands4Cities Doctoral Training Partnership as part of Khyam Allami's PhD research at the Royal Birmingham Conservatoire, UK, and additional support from CTM Festival, Berlin, DE.



<https://u.aec.at/21404A1D>



Khyam Allami (GB) (born in Damascus 1981) is an Iraqi-British multi-instrumentalist musician, composer, researcher, and founder of Nawa Recordings. Primarily a performer of the Oud, his artistic research focuses on the development of contemporary and experimental repertoire based on the fundamentals of Arabic music, with a focus on music technologies, tuning, and microtonality. <https://khyamallami.com>. **Counterpoint** is a creative studio run by Samuel Diggins and Tero Parviainen. Navigating the intersection of design, music, and technology, the duo uses generative systems, interactivity, and artificial intelligence in their work. <https://cpt.co>

Ars Electronica Award for Digital Humanity

by the Austrian Federal Ministry for European and International Affairs

 **ARS ELECTRONICA**
Award for Digital Humanity 2021

In addition to the four Golden Nicas of Prix Ars Electronica 2021, two other prizes have been awarded this year as part of Prix Ars Electronica: The Isao Tomita Special Prize, and the Award for Digital Humanity, initiated by the Austrian Federal Ministry for European and International Affairs. Every submission to the Prix Ars Electronica and the STARTS Prize competition could be entered for consideration to the Ars Electronica Award for Digital Humanity.

The Ars Electronica Award for Digital Humanity focuses on projects that address social, cultural, and humanitarian issues in our digital society. It highlights outstanding examples of collaborative practices between individuals of different disciplines and backgrounds.

Art and culture shape our common reality. They pose the question of what constitutes a human being in the digital world. Artists as cultural ambassadors are best equipped to identify the potential and the pitfalls of our current digital transformation.

Cultural diplomacy is a powerful instrument to promote mutual understanding among nations and to bolster societal change on a global scale. As such, it is uniquely positioned to advocate for a new era of digital humanism: Digital humanism that builds a just and democratic society with human beings at the center of technological progress. Digital humanism ensures our needs and universal human rights are being met and works to pre-

serve our human dignity. It shapes technologies in accordance with humanistic and social values and envisions alternative pathways for human/machine interaction that are centered around diversity and inclusion in the creation, implementation, and adaptation of digital tools.

The Ars Electronica Award for Digital Humanity emphasizes in equal terms the humaneness and humanism that must dictate the development of new technologies. The award honors projects and artworks that inspire fundamental rethinking in our contemporary approach to technology: It's time to resign our roles as mere data-generating machines and to actively participate in the shaping of our digital future.

Can digital applications be more oriented towards human needs and based on cultural and social values that respect the autonomy of users over their data? Can software solutions build on the values of cultural diversity instead of infrastructural uniformity? Can digital tools be increasingly of benefit in cross-culture collaboration, international cultural relations, and mutual understanding?

The jury paid particular attention to projects that demonstrate the power of cultural exchange and collaboration for the development of a human-centered digital world, transcend the mere reflection on the effects of emerging technologies to evoke sources of inspiration, open up new pathways towards a new digital humanism, and create empowering role models.

In view of the rapid growth of technologies and the steadily increasing use of artificial intelligence, we are confronted with some fundamental questions: How can we keep the focus on people? In what way do these digital capabilities contribute to the further development of the human consciousness? To the benefit of nature, humans, and animals? The promise of new, virtually unlimited possibilities in this area is directly linked to the values, hopes, and yearnings that form the basis of our search for means of shaping our lives in a meaningful way. This year's new prize—the Ars Electronica Award for Digital Humanity, which will be awarded jointly by the Federal Ministry for European and International Affairs and Ars Electronica, is a response to the questions above. The prize draws attention to the importance of humanistic values in the digitalization process.

Ambassador Dr. Teresa Indjein
Head of the Cultural Policy Department
Federal Ministry for European and International Affairs

Ars Electronica Award for Digital Humanity

Statement of the jury

Martin Honzik, Teresa Indjein, Manuela Naveau, Open Austria (Martin Rauchbauer and Clara Blume with one vote), Gerfried Stocker

It is indeed exciting to be part of a jury for selecting the winner of an art award. People from diverse backgrounds and various fields of expertise, work towards a consensus—choosing the winning project. The goal of the jury was to identify projects and positions that contribute to and help define the concept of Digital Humanism itself in its complexity. The term ‘Digital Humanism’ is a construction of two terms that lends itself to subjective interpretation. The attempt to pin down an unequivocal definition did not succeed, and the concept remains open to interpretation—which in no way detracts from the relevance of the award itself. On the contrary. The diversity of the submitted works that came from almost all parts of the world and all fields of art, the many different ways of looking at what Digital Humanism actually means, and the many issues arising from the complexity of social coexistence in which Digital Humanism is needed and required are evidence of the urgency of many of the problem areas revealed in the submitted artistic projects, but also of the tenor of the award itself, which reveals alternative and constructive approaches to solutions offered by the world of art and culture. What almost all the submitted works had in common was to emphasize in their individual narratives and perspectives on our society the importance of making the digital an immanent part of our cultural understanding, but also of our cultural identity. This approach was ultimately the basis for the intensive discussions between the jurors in order to select the winning project from the large number of projects submitted.

In the end, there were 22 works that we as a group of jurors had to discuss in order to present a first prize. 22 works that turned out to be extremely controversial in their artistic expressions, but also in their interpretation of what Digital Humanism might be. The jury was confronted with a high-quality diversity of works, which offer evidence of the intense penetration of the digital into all areas of society and at the same time point to the many different challenges that need to be met. However, the aspect of the ‘digital’ in particular has shown that the discussions surrounding the definition of the term have both deepened and broadened. From the always relevant classical consideration of what humanism should be to the question in which relationship status we are or want to be with technology and nature. The submissions have also shown that the digital is not only a tool but also a ‘space’ in itself. A space that is used by billions of people, is increasingly flattening into a commercial place, and is in danger of losing the hopeful, visionary shine of a virtual, democratic global space for global citizens. A space whose potential for universality needs a new order—in the sense of a Digital Humanism. It was also remarkable to see in the works and projects under discussion that, in addition to critically pointing out complex problems, there was a lot of constructive will and talent to bring about concrete solutions.

**Ars Electronica Award
for Digital Humanity
Jury Statement**

The complexity of the task ultimately turned the jury process into an intensive and interesting discussion process on the topic of Digital Humanism. This is also expressed quite well in the choice of the winning project that the jurors were ultimately able to agree on unanimously: *Branch Magazine: A Sustainable and Just Internet for All* by Climate Action Tech.

**Branch Magazine:
A Sustainable and Just Internet for All
Climate Action Tech**

At the very first glance, *Branch* magazine, with its large international team of authors and headed by the dedicated Managing Editor Michelle Thorne, seems predestined for the new Ars Electronica Award for Digital Humanity. This is a prize for which the jury was above all searching for cultural projects devoted to the unifying quality of culture and the necessity of placing the central issues of our time in the forefront. The online magazine *Branch* is a project that impresses in equal measure with its thematic focus, high information quality, and the inspiring commitment of an international and very diverse community of contributors. The project is also convincing for its unpretentious but effective graphic appearance, in which several jury members also detected a strong statement for a new design ecology of digital spaces. *Branch* was also seen as a valuable impetus for the development of new strategies for cultural diplomacy due

to its successful practice of gathering people from all over the world to dedicate themselves to a crucial issue of our present day.

The opportunity to choose from an enormous abundance of submissions—over 3,000—resulted in an extraordinarily high level of quality among the projects nominated for the final round, and each of the projects did, in fact, meet with great approval by all jurors. The generally very evident ‘activist turn’ of current media-art works was further reinforced by the specific call for submissions for this award, and it was thus important to the jury to award an Honorary Mention to yet another project.

Honorary Mention

In a Small Room

KyungJin Jeong

An Honorary Mention goes to the South Korean artist KyungJin Jeong for her multifaceted project *In a Small Room*, which won over the jury with its aesthetically stylish and intelligent approach of using artistic forms of design and communication to address sensitive socio-political problems.

Branch Magazine: A Sustainable and Just Internet for All

Climate Action Tech (EU/Global)

Branch is an online magazine written by and for people who dream of a sustainable and just internet for all.

The internet is the world's largest fossil fuel-powered machine. If we continue business-as-usual, the IT sector will be responsible for 14% of the world's carbon emissions by 2040. We believe that the internet must instead serve our collective liberation and ecological sustainability. That's why we created *Branch magazine*.

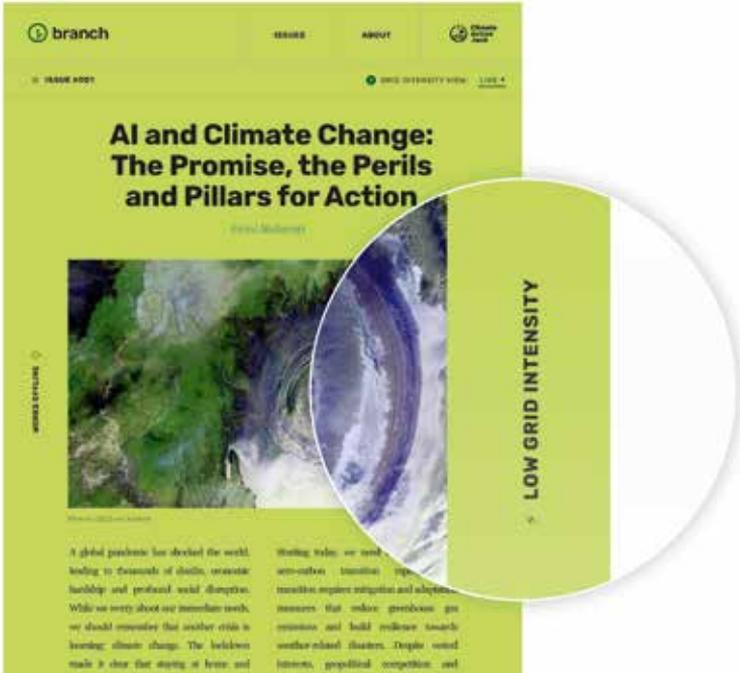
The magazine is a space for personal reflection, critical engagement with technology, and experimentation. This is our small attempt to uplift fresh thinking for how to green the web technically, aesthetically, and politically.

The articles strive to connect sustainability to root causes and to inequalities experienced at different intersections—gender, race, class, ability, and so

on. Creating change requires all kinds of practices, so our contributors include climate activists, open source technologists, indigenous leaders, artists, energy scientists, and degrowth experts.

We hope to not only articulate what these desirable futures are, but also to embody them with specific tools and art. That's why we made *Branch* a carbon-aware website. The site adapts to and reflects the physical infrastructure of the internet and the energy behind it. Utilizing data from a grid intensity API and the user's location, *Branch* has four different interface designs shown depending on the current energy demand and fossil fuels on the grid where the user is:

1. Lower grid demand, more renewables
2. Medium grid demand, fewer renewables
3. Higher grid demand, less renewables
4. Grid data unavailable

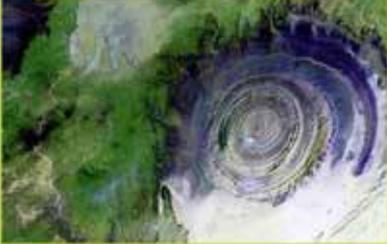


branch ISSUES ABOUT

ISSUE #001 GRID INTENSITY VIEW LIVE

AI and Climate Change: The Promise, the Perils and Pillars for Action

Erin Mulcahy



PHOTOS BY GIPPO/GETTY IMAGES

LOW GRID INTENSITY

A global pandemic has derailed the world, leading to thousands of deaths, economic hardship and profound social disruption. While we worry about our immediate needs, we should remember that another crisis is brewing: climate change. The lockdown made it clear that staying at home and

Starting today, we need to accelerate our anti-carbon transition rapidly. This transition requires mitigation and adaptation measures that reduce greenhouse gas emissions and build resilience towards weather-related disasters. Despite varied interests, geopolitical competition and

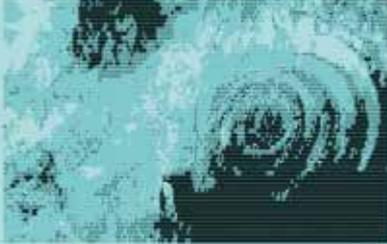
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MEDIUM GRID INTENSITY

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MEDIUM GRID INTENSITY

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Swirling green and purple view of Maur Adrar Desert from space

PHOTOS BY GIPPO/GETTY IMAGES

HIGH GRID INTENSITY

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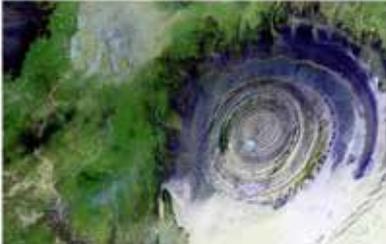
HIGH GRID INTENSITY

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PHOTOS BY GIPPO/GETTY IMAGES

GRID DATA UNAVAILABLE

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Starting today, we need to accelerate our anti-carbon transition rapidly. This transition requires mitigation and adaptation measures that reduce greenhouse gas emissions and build resilience towards weather-related disasters. Despite varied interests, geopolitical competition and

GRID DATA UNAVAILABLE

We collaborated with leading Wordpress developers to produce the demand-responsive code and openly licensed it so others can make carbon-aware websites without needing to be a specialist developer. We intentionally worked in Wordpress, the biggest open source blogging platform on the internet, so that more people could experiment with these kinds of carbon-aware digital tools on their own sites. The code is available on Github for anyone to use, repurpose, and contribute to: <https://github.com/climateaction-tech/branch-theme> Furthermore, the *Branch* site has been designed to be as low energy as possible. This includes using a limited number of fonts and utilizing system fonts, reducing image weight, and designing without a lot of Javascript. Another feature is that *Branch* is available offline, which caches the website so users can access it even without an internet connection. This often forgotten feature counters the idea of being constantly connected, and it could become increasingly necessary if the physical infrastructure of the internet becomes more unreliable due to environmental changes.

Branch is a global project anchored in Europe where we live and finds resonance with the European Union's 'twin transition' towards a sustainable and digital society. We see the EU's twin transition as an opportunity to advocate for a more sustainable society and use the internet to help dismantle the power structures that delay climate action.

We want the internet itself to become a positive force for climate justice. For us that meant demonstrating how to create a website that can adapt to energy grid intensity and makes transparent how digital services are resourced. Going forward, we want to continue experimenting with sustainable, open websites and equipping technologists to better understand underlying structural issues of the climate crisis. Ultimately, we need to go beyond tech solutionism and towards intersectional climate justice. This is part of larger research and advocacy work to green the internet.

The first issue in September 2020 featured work by 25 contributors, received 14,000 unique visitors, and was made possible by EIT Climate KIC, Mozilla Foundation, Climate Action Tech, and the Green Web Foundation. The second issue will be published in June 2021.

Managing Editor: Michelle Thorne

Editor: Chris Adams

Assistant Editors: Laurence Bascle, Carrie Hou

Design: Tom Jarrett

Development: Jack Lenox, Hannah Smith, Chris Adams

Cover illustrations: H el ene Baum, Gica Tam



<https://u.aec.at/2EAFE62F>



Climate Action Tech (EU/Global) is a community of practice of tech workers that provides support and guidance for systemic change in our organizations and industries for rapid, far-reaching, and unprecedented change. The climate crisis requires a serious and sustained response from across civil society, and that includes the tech sector and technology professionals. Climate Action Tech's purpose is to empower technology professionals to play our part—to meet, discuss, learn about, and take climate action. Our vision is that everyone is working on the climate crisis at all levels.

In a Small Room

KyungJin Jeong



In a Small Room: The Gap between Advertising and Reality focuses on two social issues, the first being the problem of poor living conditions in modern metropolitan areas, such as London and Seoul. The demand for housing in large cities, such as London, has greatly increased, but supply has not caught up with demand, a problem that has given rise to a cramped, prison-like residential environment. The second issue is the dazzling advertising designed to inspire in potential consumers the wish to buy a service. The advertising medium disguises poor living conditions by creating false images to bolster profits. I explore the gap between advertising and reality, producing work intended to have an impact in the real world.

This project uses artificial intelligence (AI), virtual reality (VR), films, a literature review, interviews, and experiments to study how existing images are transformed into visual advertising images. The work has four components: an interactive web application (CycleGAN), a VR installation, films, and a research paper.

The following is a brief explanation of each project. The AI program begins with the question, “Can AI distinguish between advertisements and

reality?” With enough pictures, machine learning can determine some attributes. I designed an interactive platform into which people could place room images that were subsequently changed into attractive advertisement images using CycleGAN. A VR installation provides an immersive experience, demonstrating the contrast between reality and the deceptive advertising image created to attract people. As regards films, they show in detail the differences between advertisements and real-life housing. The research paper studies the housing crisis in metropolitan areas and presents an analysis of the interviews and research on the subject.

Computer scientist: ChanHee Cho

Advisor: Dylan Yamada-Rice, Shelly James,

Kevin Walker, Oliver Smith

Special thanks to my father, DoHee Jeong, and mother, YongJa Kim, for all their support



<https://u.aec.at/7FE242DB>



KyungJin Jeong (KR) is a designer, artist, and researcher with an interest in the social concerns people face in daily life. She believes that artists, designers, and researchers can reveal such concerns to the public through their work and offer feasible solutions to them. KyungJin earned a master's degree with distinction in Information Experience Design from the Royal College of Art. She holds dual bachelor degrees in Media Interaction Design and Convergence Design from Ewha Womans University, Seoul.

**Ars Electronica Award
for Digital Humanity
Honorary Mention**

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u19–
create
world



PRIX

ARS ELECTRONICA 2021

u19–create your world

your

Gaps and Solutions

Of things that are missing and how one can deal with this

Sirikit Amann, Josef Dorninger, Conny Lee, Mira Lu Kovacs, Tori Reichel

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 one's life. 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 is about immediately 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. Obvious themes were homeschooling, quarantine, and being left to one's own devices to get through the isolation, but also the resulting yearning for intimacy and social interaction. The ways of dealing with these emotions are as diverse as people are themselves: they range from humorous resignation to struggles related to mental health, from rational solutions to creative acts of self-empowerment. That group work was very difficult this year was apparent from the submissions as well, but it is surprising that the number of video games submitted was lower than it has been for a long time, although young game developers can now tinker with their projects not only on their own but also while connected with each other online. We hope that in the future, more video games will again find their way to us. Another gap was related to subject matter: the topics of gender identity, queerness, and other LGBTIQ+-related concerns were conspicuously underrepresented this year. What there was an ample amount of was criticism:

criticism of society and politics, of the handling of the climate crisis and the treatment of young movements that were brought to an abrupt standstill by Covid. A critical look at another major issue of today—data protection—was present in some projects but alarmingly absent in others.

Particularly with mobile applications and technical solutions, it was often apparent how much energy went into these projects, but an important step at the beginning was skipped: the question of whether similar products already exist and what distinguishes this new application from the others. If someone has several projects for submission to the Prix Ars Electronica, they should consider in advance whether the projects should be entered individually or as a group. We, the jury, then evaluate them either separately or in context. Both methods are possible, but one should be aware of these different approaches.

What was important to us with all the projects was a creative approach and, particularly in the case of the Young Professionals, a societal perspective as well—that is, a criticism of circumstances or the attempt to find solutions to problems—and not least a certain degree of independence. It is understandable that here and there a helping hand from a parent is necessary. Nonetheless, the jury prefers something self-made—even if it is a bit wobbly—to a perfectly executed work that was created with a great deal of influence from parents or teachers. In order to give different age groups an equal chance, the projects are divided into two major categories: "Young Creatives" (up to age 14) and "Young Professionals" (age 14 to 19). This division not only helps make the competition fairer; it also helps to better showcase the enormous range of projects submitted in the u19—create your world category.

Young Professionals

(age 14–19)

This year's moving-image submissions were overall of a very high standard. An example is *Silence*, an animated short film by Felix Zorn-Pauli that interprets Paul Celan's poem "Today and Tomorrow." The depiction is limited to a moody and abstract staging in just a few scenes. With an atmospheric, procedurally generated desert, he demonstrates technical skill and creative stamina. The combination of high quality, artistic focus, and precise content in this film is extremely successful and for this the artist clearly deserves an Honorary Mention.

Other impressive, solution-oriented Young Professionals projects came from the school environment. With their app *dine.*, the young developers from HTL Dornbirn have created a delivery-service app aimed at promoting the sustainable and healthy eating habits of the students. The fact that the project is already operating in a test phase and regional restaurants have already signed on as partners is testimony to the motivation and effort that the team at HTL Dornbirn invested in this idea to make it a reality. A concept was developed here that could improve the everyday life not only of the creators but also of countless other students in a lasting way, and this deserves an Award of Distinction in the Young Professionals category.

Themes were also addressed in this category that were not related to day-to-day school life. The nearly six-minute audio work *Durch den Wind* (Totally Shaken) by Jasmin Schlögl deals with the role of the caregiver, which relatives of people suffering from Alzheimer's and dementia all too often have to assume themselves. Both the film editing and the background music contribute to the sensitive approach to the narrative—a moving,

awareness-raising work that the jury would like to recognize with an Honorary Mention.

Another audio work that was awarded an Honorary Mention is *Future / just a dream?* A "film soundtrack without the film" is how Leonhard Gaigg describes his musical work. It is divided into chapters and guides us through his worlds of sounds. He worked with various instruments, including alto, bass, and contrabass clarinet, zheng, and synthesizer. Characteristic of this work is the distortion and processing of the sounds. Here, Leonhard Gaigg has composed and conceptualized an immersive and genre-transcending musical work.

Another Honorary Mention goes to the refreshing short film *Liebe ist kein Spielfilm* (All is Fair in Love and Film), in which Sabine Wimmer examines the contradiction between staged romanticism in films and reality. Using talking film posters, she interweaves parodies of classic romantic films with her own narrative. In addition to the many skillfully utilized techniques, *Liebe ist kein Spielfilm* is also outstanding for its good acting and lovely statement at the end.

Touching works from the field of the visual arts were also submitted in the Young Professionals category: At the age of just 18, Fabian Ahammer / Wenzelhumer already has an expressive style that only few achieve in many years of work. Not only are his lines fascinating; his picture *Realitätsverlust* (Loss of Reality) also touches on many themes. It deals with the relationship between humans and technology, with surveillance, the pressure to perform, a feeling of alienation, and the loss of freedom. Fabian's work tells stories but also triggers associations on the part of the viewers, and thus is deserving an Honorary Mention.

Many of the Young Professionals also want to use their technical skills to solve environmental prob-

lems. Light pollution, for example, is an increasingly important issue. One solution for this is *smartLantern—die smarte Straßenlaterne*, a smart streetlight created by Christoph Steiner, Moritz Vögl, Simon Schmidmayr, and Jan Reinsperger. It makes sense ecologically to illuminate defined areas and to dim streetlights that have already been passed. According to the students at HTL Rennweg, these smart streetlights could also be used as charging stations for electric vehicles. Thinking ahead and protecting resources without giving up any convenience—this definitely deserves an Honorary Mention!

And while we are on the subject of technical skills: a Tesla coil is an impressive spectacle if only for its sparking bolts of electricity. But in his *Sprechende Teslaspule*, Nikolaus Juch also utilizes and refines the capability of his “talking Tesla coil” to reproduce music and language. Nikolaus Juch’s work combines a profound grasp of technology with the aim of getting more young people excited about electronics and STEM subjects. Here is a project that is as well-reasoned as it is spectacular, one that has justifiably attracted much attention and fully deserves our Honorary Mention.

The times we are currently living through are characterized not only by the pandemic but also by global protest movements. With impressive foresight, Johannes Rass, Julian Pixel Schmiederer, and Gregor Franz have created an entire documentary film on this subject. In *The 2020 Rise Up*, the filmmakers not only examine protest movements—from local offshoots of the worldwide climate protests to the mass anti-government protests in Hong Kong—but also were able to interview key figures in these movements. In 30 minutes, the young filmmakers capture what the onset of the

pandemic and the worldwide standstill meant for the work of the activists. From the use of archival material and the conducting of interviews to the linking of the individual storylines, their documentary-film work is highly professional and deserves a Honorary Mention.

Another film, but of a very different kind, is *The Click*. A woman uses an app to order a child but does not get what she ordered or wanted. The child also has completely different interests to its parent. What seemingly divides the mother and child, however, is ultimately the mother’s salvation—through a machine that the child builds itself. *The Click*, by Julia Scheiwein, Zara Dineva, Anna Zoglauer, and Caroline Bär, is cleverly constructed and appealingly animated. Many current debates, such as adoption ethics, parent-child relationships, gender roles, and racism, are treated here in a humorous but also critical manner.

The animated film *INCERT*, by Isa Mutevelic, Simon Effenberger, and David Stummer, is clearly deserving of an Award of Distinction. This animated film compresses the overwhelming emotions of a tumultuous period of crisis into less than two minutes. *INCERT* teems with references to the greatest crises of our time: from surveillance and an environmental and climate crisis to race-motivated police violence. The aesthetic inspiration for this was found in the depths of the Internet: here, sensory overload and hyperbole become skillfully used stylistic devices. While the young artists do not offer any direct solutions, they do seize on a crucial point: that there are no simple answers to complex questions.

The second Award of Distinction in the Young Professionals category goes to *Urban Green: Bamboo Bicycle*. While there have been bamboo bicycles

in the past, the connecting elements of the bicycle frames were not environmentally friendly. In collaboration with Smart Grass Bicycles, Angelina Djukic, Lukas Gabesam, Japleen Khurana, and Alina Schweighofer, from the Euregio HTBLVA Ferlach, reworked the bamboo bicycle. Biodegradable materials like organic resin were used to make connecting elements by means of a 3D printer. This novel bicycle is not only a product of the future but also very impressive in terms of its design. The high degree of relevance and innovation as well as the team's determination not to accept just an *almost* environmentally friendly product but to use solely biodegradable materials won over the jury. This year's Golden Nica goes to the project *re-wire* by Felix Senk, Emil Steixner, and Max-Jakob Beer. They built a modular synthesizer using electronic scrap and found material. They recorded the sounds for the synthesizer themselves, in part during the building of the object—for example, while sawing the boards. It is thus an instrument whose sounds derive from its own creation. The three artists edited the sounds, used free software for a microcontroller, and transformed the XLR cables to make an interface for the synthesizer. The result is an instrument that not only contains an unbelievable amount of work, research, and sound experimentation, but also one that can be used to produce an inimitable sound. It combines the ecological concept of upcycling with the desire to create something tangible. They have spent enough time in the virtual space and now want to again create something with their hands—this is clearly illustrated by *re-wire*. The Internet is merely an aid to finding the necessary software that enables one to put ideas into practice.

Young Creatives (up to age 14)

This year, even some of the youngest participants addressed the current situation and created innovative things like a remedy for loneliness. In her work *Little Dancing Stars: Alle im Takt* (All in Step), nine-year-old Sarah Hölzl programmed a LEGO robot to dance with her. In a time in which we are not able to dance with each other, the jury found this invention particularly touching and awards it an Honorary Mention in the u10 category.

For another solution-oriented approach, an Award of Distinction in the u10 category goes to Emilio Deutsch for *Der erste Plastikschluckler der Welt*. This “plastic swallower” is a spray that completely dissolves plastic in only five minutes. With a concept paper, sketch, prototype, and presentation of the plastic swallower, he won over the jury like a true entrepreneur on the path to a major investment.

The u10 Prize goes to Leopold Kastler, who at the age of seven submitted a *Kranfahrzeug auf vier Ketten* (Crane Vehicle on Four Tracks) constructed with LEGO Technic. He can explain his invention and construction with a professionalism that completely convinced the jury, making it clear that Leopold designed and built everything himself—without any guidance. He thought very carefully about the functionality of the vehicle, particularly where the construction did not allow for any simple solutions, such as in the securing of the load. In the jury's opinion, this kind of well-explained, technically masterful achievement from a seven-year-old deserves the u10 Prize.

The submissions in the u12 category also dealt the major problems of our time. The *Upcycling Stadt*

(Upcycling City) shows us a way out of the climate crisis. Imagine we were shrunk—then nature would have the space, time, and necessary resources to recover. Moreover, we would build our cities out of recycled materials in order to create a world that prioritizes sustainability. Lia Marits did precisely this, which is perfectly in keeping with the competition's motto: *create your world*.

The project by Benjamin Hölzl also deals with the environment. At *Benjamin's Recycling Centre*, various devices assist in disposing different materials in the appropriate boxes. The diverse apparatuses not only distinguish themselves through their technically refined performance; they also display playful qualities, like the little robot that “simply can do anything and takes care of jobs that no machine is capable of.” This could make it the prototype of a new generation of robots that think for themselves and one day will make our work easier for us—and this earns it an Award of Distinction in the u12 category.

With the support of the artists' group MuKaTo, seven students from class 1B at RG/ORG antonkriegergasse produced a stop-motion animation called *Das unmögliche Computerspiel* (The Impossible Computer Game). It is the story of a school trip to Mars that is interrupted by an alien attack. The story ends with the destruction of the earth, which “simply cannot be saved.” It is a convincing, pointed team production that also manages to approach problems of today with a great deal of humor and a wink—and it takes the u12 Prize!

The u14 projects also find impressive solutions for the large and small problems of modern life, for example, for the problem that we spend too much time sitting and too little time moving. The project *Juck uf* (Jump Up) by students at Bundesgymnasium Dornbirn, offers a solution with the help of a sensor that measures how high one jumps. And it isn't long before ambition takes over: “I can

do even better; I want to jump higher,” you think, and soon you are doing something for your health. Together, the group developed a great idea for getting people moving, an idea that earns an Honorary Mention in the u14 category.

Another group effort earned an Award of Distinction as one of the top projects in the u14 category: The project *Black Day* consists of three games that combine various media and themes and was developed by students at MS Lehen in cooperation with media artists and educators. The games are played on oversized playing fields, combined with recorded video clips and interaction by means of smartphone apps. The participants developed the games themselves, filmed the videos, and created a large number of accessories. This project reflects various facets of young people's attitudes toward life—on the one hand on the level of the game principle, which was inspired by video games, and on the other through the themes.

But it was not only the group works of this age group that delighted the jury: *Reunited* by Clara Weiss is a single drawing, made with a felt-tip pen, that reveals a great amount of detail. It deals with a battle between mankind and nature that ultimately ends in peaceful coexistence. At the age of only 14, she shows how art can be made with simple means and impresses with a great deal of passion, earning an Award of Distinction in the u14 category.

The u14 Prize also goes to a solo project. With *digital mirror*, 14-year-old Michael Zaminer designed an interactive LED wall. This work testifies to an impressive tinkerer spirit: in a year dominated by homeschooling and isolation, Michael used his technical skills to bring art, aesthetics, and thus also happiness into his own room. Almost in passing, he created a prime example of a fundamental idea of Ars Electronica: fusing technology, art, and people's everyday lives in an enriching manner.



re-wire

Felix Senk, Emil Steixner, Max-Jakob Beer,
Höhere Graphische Bundes-Lehr- und Versuchsanstalt



The idea for our project came to us fairly quickly. We asked ourselves: How can sustainability be combined with music? The solution was to build a MIDI controller from an Arduino and electronic scrap.

The MIDI controller is a kind of sculpture and more of an instrument than a controller. With it, one can play 16 different perfectly compatible loops independently of each other. The sounds also vary greatly. One should really be able to hear a distinct difference when something is changed. We recorded all the sounds ourselves with a field recorder, and they are taken from the components that we installed. They were heavily edited, of course, and were given a musical body. With this method, it is possible to create sounds that cannot be produced with conventional instruments.

For example, we used the sound of a circular saw, which we used to cut the casing, to build a synthesizer-like instrument.

How does this whole thing work? The inside of the MIDI controller contains an Arduino DUE and a PC running Ableton Live. The Arduino is the controller, which uses digital and analog pins to connect the XLR rack, the buttons, and the rotary controls with each other. We completely rebuilt the XLR rack and gave it a new function: it now works like a switch. When a cable is plugged in, a track is activated, and when it is unplugged, the track pauses again. The rotary controls can be used to regulate the intensity of the preset effects. We chose very impactful effects such as reverb, echo, and distortion. In addition, one can change the speed or volume and decide if the sound should come from



the left or right. Using the buttons, one can play preset sounds live to go with the loops. To be able to observe what one is currently doing, the controller has a monitor displaying Ableton Live. For the audio output, we installed loudspeakers taken from various radios and PC speakers. To enable the controller to be used even if there is a lot of ambient noise, we installed a headphone jack.

Support with the programming of Arduino and troubleshooting: Philipp Mold
 Content-related feedback: Manuel Steinböck, Bernhard Compoj
 Procurement of the electronic scrap: Klaus Karll

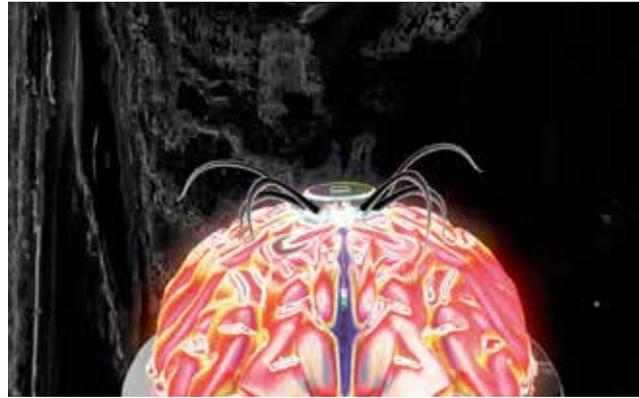
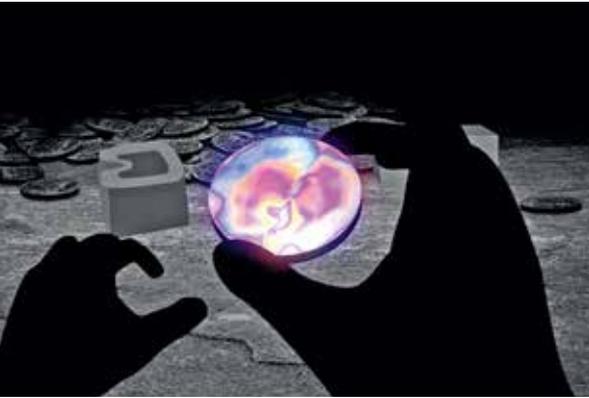
<https://u.aec.at/D0150BE7>



Felix Senk (*2002), **Emil Steixner** (*2002), and **Max-Jakob Beer** (*2002) are students at Höhere Graphische Bundes-Lehr- und Versuchsanstalt in Vienna. We are three good friends. What we most have in common are the fields of sustainability and music. We all have other interests, from film-making and music-making to taking stuff apart, handicrafts, and building things. But it was precisely this that worked so well with this project. It was the first project that we did together. But we will definitely continue working together.

INCERT

Isa Mutevelic, Simon Effenberger, David Stummer,
Höhere Graphische Bundes-Lehr- und Versuchsanstalt



INCERT is an experimental animated film that looks at current political and social developments and shows them in their extreme form. The film is intended to focus attention on the fact that presumably no future scenario can be perfect, and a certain turmoil will always remain. The outward appearance is merely a shell that conceals constantly recurring problems. The title *INCERT* consists of the words 'invert' and 'uncertain,' or 'certain.' The idea for the project came from Isa Mutevelic. He wanted to make an animated film that would bring together many artistic influences and critically examine social issues. To implement the idea, he brought Simon Effenberger and David Stummer on board. Our animated short was created over a period of four months.



<https://u.aec.at/2FB39E09>



Isa Mutevelic (*2002), Simon Effenberger (*2002), and David Stummer (*2003) are students at Höhere Graphische Bundes-Lehr- und Versuchsanstalt in Vienna. They conceived and produced the animated short *INCERT* together.

Urban Green: Bamboo Bicycle

Angelina Djukic, Lukas Gabesam, Japleen Khurana,
Alina Schweighofer, Euregio HTBLVA Ferlach



The project *Urban Green: Bamboo Bicycle* deals with the construction of biodegradable bamboo bicycles. But contrary to what one would initially expect, the bamboo-frame structure is simply concealed behind an environmentally friendly image, because synthetic resins and toxic varnishes are used in its construction. The production process itself is also very time-consuming and requires a great deal of manual labor.

In order to counteract these problems, our group developed a new manufacturing process. In this procedure, the bamboo joints are no longer glued and sanded by hand—these steps are replaced by quicker methods. This is achieved through the combination of 3D printing and injection molding. Environmentally friendly materials such as lignin and organic resins are used. The optimized joining technique creates a recognizability factor that is further enhanced by the redesigned frame geometry. The connecting elements are produced through a combination of 3D printing and injection-mold

technology and the casing of the joints with lignin filament in an additive production process. The connecting elements are fastened to the frame with organic resin, which is applied between the connection and the bamboo frame by means of injection molding. Lignin is a byproduct of paper production and is fully biodegradable. To ensure individual adaptability, the connecting elements are produced with the aid of CAD programs such as Fusion 360 and can thus be adapted to any user. Parallel to this, a configurator enables customers to select a frame style and the desired connecting elements. The required dimensions and angles are generated automatically through parametric calculations in the CAD program Fusion 360.



<https://u.aec.at/566E1CD7>



Angelina Djukic (*2001), Lukas Gabesam (*2002), Japleen Khurana (*2001), and Alina Schweighofer (*2002) are students at Euregio HTBLVA Ferlach. At the beginning of the project, all of us knew how to ride a bike, but none of us knew how to make a bike ourselves. Despite a number of ups and downs, we were able to complete the construction of our bamboo frame one step at a time and in the process create a group dynamic through which any goal can be achieved.

dine.

Tariel Immler, Alexander Fetz, Daniel Hiebeler, Jakob Defranceschi, Mathias Johannsen, David Graf, HTL Dornbirn

dine. is the delivery service of the future that enables the entire school to order lunch together. Regardless of what class or what grade you are in: with our platform, you will always find someone who wants to eat the same thing as you.

dine. is an app specifically designed for people at schools and businesses to order healthy food together, whether they know each other or not. We achieve this with our unique system of collective orders by which all orders from a school are collected virtually and sent to the respective food supplier. This way, the students save the delivery costs for their orders, and the minimum order value does not apply. And since everyone is served with a single delivery, it's good for the environment as well.

Additionally, these are not just any food suppliers but exclusive *dine.* suppliers—generally small restaurants or kitchens that are available only to us. They cook with healthy, regional products with students in mind and therefore can cater to young people's needs and desires. And in the app, everyone can adapt the food choices to his or her dietary preferences, whether it is vegan, protein-rich, or low-carb. *dine.* will soon begin operating at HTL Dornbirn and could be expanded to other schools and even businesses in the future.

Project supervision: Daniel Gmeiner, Markus Kornfehl

<https://u.aec.at/7BD1F8FE>



Tariel Immler (*2003), Alexander Fetz (*2002), Daniel Hiebeler (*2003), Jakob Defranceschi (*2003), Mathias Johannsen (*2003), and David Graf (*2003) are all students at HTL Dornbirn. Thanks to the inter-class collaboration between the Product Management and Computer Science branches, we are the perfect team for our e-commerce project *dine.* This partnership started about a year and a half ago, and we have been busy developing the app since then.

Durch den Wind

Jasmin Schlögl



The Corona pandemic hit the caregivers at nursing homes especially hard. But the task of caring for old people, particularly those suffering from dementia, has always been an enormously difficult one. The storytelling audio drama *Durch den Wind* (Totally Shaken) addresses this very issue. 70-year-old Maria Schlögl recalls how it was when, at the age of 36, she had to stay home and care for her demented father-in-law, without any outside support or help.

Everything was as it always was, until one evening something strange happened: in the middle of the night, Maria's father-in-law climbed out the window. Without any context, he claimed that he had been locked inside the neighbor's barn. From this point on, it was clear that something was not right. After he was diagnosed with dementia, everything was still fairly simple for a time. Maria's father-in-law developed a few idiosyncrasies—for example, he knocked the leaves from trees because he believed that this was his job, through which he

clung to his world. But then it became increasingly difficult. Absurd but harmless actions became aggressive and malicious. So on top of physical exhaustion there was also mental stress. One day, Maria's father-in-law suffered a stroke and from this point on was confined to a wheelchair. The physical strain gradually lessened. He died a half year later, but the demanding task of caring for him continued to burden Maria for a while, and the memories of this time lingered.

Spoken by: Maria Schlögl
Music: Sonoton Musik GmbH & Co. KG
With support from: David Reischl,
HTBLVA Graz-Ortweinschule



<https://u.aec.at/9103E7FF>



Jasmin Schlögl (*2003) grew up in a small town in southeastern Styria. She realized at an early age that she wanted to see more and try out new things. Her path led her to music and acting, which she was also interested in studying. Only at the age of 16 did she decide to go in a completely different direction, and she transferred to the HTBLVA Graz-Ortweinschule. Her primary career focus and her great passion is now the field of film and multimedia art.

Future / just a dream?

Leonhard Gaigg



Future / just a dream? is a piece of music I composed and produced myself, one that describes my ideal future in the form of a dream. It is more a kind of a wish, because I think that it can often be more effective to show how things could be ideally, instead of pointing out the problems.

Time (our modern world)

In order to be able to look into the future, one must first become conscious of the present. Our modern society is dominated by an oppressive feeling: pressure to perform, environmental pollution, and still no equal rights in many areas of life. Drums represent the monotone beat of life, while the zheng embodies the pandemic, which originated in China. Acoustic feedback depicts the virus's swift spread throughout in the entire world. The ticking of the clock grows increasingly urgent, and one flees into a dream about the future and how it could look.

Symbiosis (1:04)

My dream world could be described perfectly by the term 'symbiosis': a collaboration based on equality in seemingly contrary areas in which the individual can fully develop and realize his or her potential.

The City Awakens (2:13)

At the end of *Symbiosis*, one hears an airplane taking off, and the city comes to life. This is how I would picture the end of the pandemic: a spirit of optimism, music on every corner, and big concerts.

Life on the road (2:52)

My biggest dream for the future is to become a musician and travel the world with my music. In this part, a distorted alto-clarinet solo is heard, which is processed like a guitar.

The Concert (3:52)

The 'main concert' is ready to start, and the now-familiar melody hits like an explosion one final time.

The Nightmare (4:26)

A pedalboard-contrabass clarinet solo containing various effects, such as timbral trills and spectral multiphonics is heard. The synths adapt to the spectra and become increasingly abstract and atonal, until one is pulled out of the dream.



<https://u.aec.at/ECBF6FEE>

Leonhard Gaigg (*2005) currently attends the Musikgymnasium in Linz and is also enrolled in the Academy for the Support of Gifted Children at Anton Bruckner Private University. He plays the clarinet (and not only the 'normal' Bb clarinet) and keyboard instruments, and also composes and produces.

Liebe ist kein Spielfilm

Sabine Wimmer



Hollywood and Disney have set the bar high for love. In real life, however, love usually works out very differently. The short film *Liebe ist kein Spielfilm* (All is Fair in Love and Film) is about a young man who receives advice from his movie posters to help him win back his ex-girlfriend. But it quickly becomes clear that what works in the movies is doomed to failure in real life. The film parodies three classic romance films: *Notting Hill*, *Dirty Dancing*, and *Lady and the Tramp*. It shows all the things that can destroy the romantic moments of these love stories. And not only are familiar scenes provided with punch lines; the parodies are also woven into my own narrative framework. Costumes, posters, and music closely follow the originals. I recorded the instrumental soundtrack

myself, and the vocals were supplied by Sebastian Anton Maria Brummer. I used Adobe Premiere Pro and After Effects to realize the moving posters in post-production. I created this first-time project for my practice-oriented diploma thesis on the topic of parody. Due to the social distancing restrictions in effect at the time, the project was realized within the family household.

Actors: Thomas Wimmer, Barbara Wimmer
School: HBLA für künstlerische Gestaltung, Linz



<https://u.aec.at/E2E407AD>



Sabine Wimmer (*2002) is a graduate of HBLA für künstlerische Gestaltung in Linz. She is an actor at Theater Sellawie in Enns and a member of the Mini ME's improv group (2019 Amateur State Champion). She also studies keyboard and guitar at Landesmusikschule Enns.

Realitätsverlust

Fabian Ahammer / Wenzelhumer



This is a work of visual design that explores the nearly harmful dependence of humans on technology, but also ties in themes such as our changing times and their epochs and trends.

War, pandemic, people's steadily sinking trust ... The result: a loss of reality. One can scarcely manage the constant accumulation of problems. My work is intended to illustrate this. I have drawn immense inspiration from the media and from the events of the past months and created several

works. *Realitätsverlust* (Loss of Reality) is my main work. It is an A3 (29.7cm x 42cm) pencil drawing showing a despondent youth and the hopeless conditions in which he finds himself. (The works were not created in a school setting).



<https://u.aec.at/35166DF0>



Fabian Ahammer / Wenzelhumer (*2003) attends HBLA für künstlerische Gestaltung in Linz. I have been working intensively with multimedia art since my early youth and would like to live out this passion professionally as well. After I graduate, I plan to begin studying at an arts university in Vienna. At school and to some extent at home as well, I have access to woodworking, metalworking, textile, and silk-screening shops, as well as to photography and video equipment, which I also utilize regularly.

Silence

Felix Zorn-Pauli

This project evolved through the interpretation of a poem. The goal was to create a short film that could convey within one minute the emotions expressed in a poem by Paul Celan. The project was realized in the space of two months, although over half of this time was spent designing the desert and for rendering. From the interpretation of the poem and brainstorming to the storyboard design and technical implementation ('procedurally' generated desert, animation, texturizing, and rendering), this project was realized by one single person. It is important that I was not supplied with an interpretation in advance, and that I allowed my work with the poem to have its effect on me.

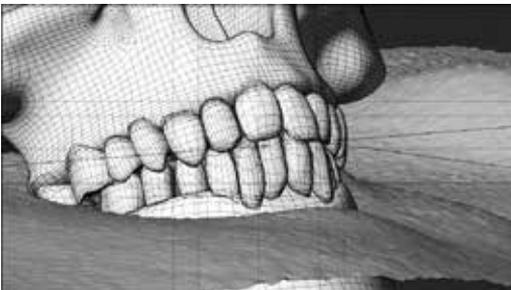
*So I stand stony, toward the distance to which I led you:
Washed out by quicksand the two caves at the brow's nether edge. An eye-gathered darkness within.
Pounded through by silently-swung hammers the place where the wing-eye brushed me.
Behind it, recessed in the wall, the stair on which the Remembered crouches.
To this place, poured out by nights, comes trickling a voice from which you draw your drink.*

'Today and Tomorrow,'
a poem by Paul Celan

With support from: Johannes Steger,
HTBLVA Graz-Ortweinschule



<https://u.aec.at/C2CE64F2>



Felix Zorn-Pauli (*2004) enjoys working with visual effects, post-production, and filmmaking. He currently attends the seventh grade at the HTBLVA Graz-Ortweinschule (2021). Since 2015/2016 he has enthusiastically produced videos and films and experiments with VFX. Today, his fields of expertise are editing, animation, VFX, social media, HTML/web, and graphic design.

smartLantern—die smarte Straßenlaterne

Christoph Steiner, Moritz Vögl, Simon Schmidmayr,
Jan Reinsperger, HTL Rennweg



Conventional streetlights are often on even when they are not needed, such as in the late afternoon when it is not yet dark, or in the morning when it is already sufficiently light outside. This not only leads to an increase in light pollution, which has a negative impact on animals and humans; it also wastes a great deal of energy.

As little has improved in the area of streetlights in recent decades, we developed the *smartLantern*. Utilizing built-in brightness and radar sensors, they turn on only when they are truly needed. Even at night, the *smartLantern* requires only a minimum of energy because it remains dimmed as long as no person is nearby. If someone approaches the *smartLantern*, it sends a signal on to the next streetlights, and the street is illuminated in advance. Because the *smartLantern* can adjust its brightness and uses LEDs, it consumes up to 80 percent less energy than the mercury high-pressure lights that were formerly used.

Moreover, environmental data such as temperature, humidity, atmospheric pressure, and particulate pollution are recorded and shown on an ePaper display built into the light pole. Information such as the current time and the energy savings is also displayed. Integrated electrical outlets on the *smartLantern* make it possible to charge e-bikes, for example, while securing them using one of the two locking mechanisms mounted on the pole. Charging a smartphone is also no problem, thanks to integrated USB outlets.

With support from:
DI Richard Drechsler



<https://u.aec.at/FE296EE2>



Christoph Steiner (*2002), **Moritz Vögl** (*2001), **Simon Schmidmayr** (*2001), and **Jan Reinsperger** (*2001) attended the ninth grade at HTL Rennweg this year, with a focus on mechatronics, and designed the *smartLantern—the smart streetlight* as their diploma project. As the team members had already completed four years of training at the technical secondary school, they were able to support each other in case of problems.

Sprechende Teslaspule

Nikolaus Juch



Lunghammer, TU Graz



The *Sprechende Teslaspule* (Talking Tesla Coil) is a power-electronics demonstrator that was especially conceived for special show segments, performances, and presentations. For example, it can be demonstrated during school visits to illustrate the possibilities of state-of-the-art power electronics. In this way, it can be used to get people, especially young students, excited about the fascinating world of electronics.

Unlike the other common demonstrators of power electronics, whose function can only be conveyed with the help of gauges and metrics, this demonstrator makes it possible to experience the performance in a sensory manner. One can see it in the form of bolts of electricity, hear the talking bolts, smell the ozone that is produced in small amounts, and in extreme cases even feel the bolts if one gets too close to them.

The *Talking Tesla Coil* is in principle a resonance transformer (a Tesla coil) that steps up the low voltage in the primary coil to several thousand volts. Due to the high voltage emitted from the secondary coil, the surrounding air is ionized, producing electrical arcs resembling bolts of light-

ning. The plasma produced in this way is very hot, causing the surrounding air to expand. Through the skilled, continuous modulation of the bolts and thus also the air expansion, soundwaves are created that can be perceived by the human ear.

Unlike most of the musical Tesla coils in widespread use, the *Talking Tesla Coil* can not only play simple melodies like those from MIDI files; it can also reproduce any audio sequence (including human speech) without any preprocessing, for example directly from a smartphone. For this, the audio source merely has to be connected via Bluetooth or a 3.5-mm audio jack to the specially-designed modulation stage, which modulates these audio signals in real time and transmits them by way of a galvanically insulated fiber-optic connection to the *Sprechende Teslaspule* to be played.

With support from: Bernd Deutschmann, Klaus Krischan, and Gunter Winkler



<https://u.aec.at/AC61607A>



Nikolaus Juch (*2002) is a graduate of Modellschule Graz, who already participated with his entire class in the 2014 Prix Ars Electronica u19–create your world competition. In the summer semester 2017, he audited classes in electrical engineering at the Graz University of Technology. In the course of his studies, he and the Head of the Department of Electrical Engineering, Professor Bernd Deutschmann, together developed an idea that resulted in the *Sprechende Teslaspule* project.

The 2020 Rise Up

Johannes Rass, Julian Pixel Schmiederer, Gregor Franz



In recent years, various activist groups have often used the slogan “By 2020 we rise up” as a warning to politicians and corporations. The documentary film *The 2020 Rise Up* addresses the substance of this slogan as well: it examines protest culture, which in 2020 was overshadowed by the coronavirus but not brought to a halt. Worldwide blockades of the Siemens corporation, protests staged to draw attention to the bushfires in Australia, as well as rallies denouncing the inhumane conditions in Greece’s refugee camps: in addition to numerous other protests, all of this occurred in the first two months of 2020. Then corona came, and with it the worldwide shutdown ...

The coronavirus stopped these large-scale protests in their tracks: since the outbreak of the pandemic, large public gatherings have been prohibited. Have protests really been brought to a standstill? How

does one reach people now if one cannot take to the streets in a way that is visible for all? What can we learn from this for later protest rallies? This film attempts to find answers to these questions.

The 2020 Rise Up is a film project that evolved as a result of the effects of the curfews and directly addresses them. The videos we made at protests at the beginning of 2020 are combined with Skype interviews conducted during the lockdown in spring 2020. It is a compelling before-and-after comparison or, put in a different way: from revolt to ‘resurrection.’

HTBLVA Ortweinschule-Graz,
Film and Multimedia Art

<https://u.aec.at/23A3699F>



Julian Pixel Schmiederer (*2002), **Johannes Rass** (*2002), and **Gregor Franz** (*2002) are the filmmakers behind the documentary *The 2020 Rise Up*. It combines a love of art and culture, which this trio discovered at an early age, with their training together at the HTBLVA Ortweinschule-Graz, Department of Film and Multimedia Art. They work together outside of school as well. This has resulted in a number of projects for prominent artists, such as music videos for the pianist Maki Namekawa.

The Click

Julia Scheiwein, Zara Dineva, Anna Zoglauer, Caroline Bär,
Höhere Graphische Bundes-Lehr- und Versuchsanstalt



The Click is a short animatic film that deals with an unusual mother-daughter relationship in the future. At the beginning, the mother tries to change the incorrectly delivered child. She gives the child ballet shoes and dolls in the hope that the child will play with them. But the child rejects these toys and continues experimenting with technical things. When the mother then becomes seriously ill, she is saved with the help of a self-built machine. Although the mother did not support the child's abilities, they ended up saving her life.



<https://u.aec.at/7DBFDD16>



Julia Scheiwein (*2002), Zara Dineva (*2002), Anna Zoglauer (*2002), and Caroline Bär (*2002) are all classmates in the eighth grade specializing in multimedia at Höhere Graphische Bundes-Lehr- und Versuchsanstalt in Vienna.

digital mirror

Michael Zaminer



My project for this year, *digital mirror*, is an LED wall consisting of 500 pixels. It measures 1 meter x 1.25 meters and is about 13 centimeters deep. Each pixel measures 5 x 5 centimeters. The wall is operated with a power adapter and an Arduino Uno. It is interactive, which means that I can change the patterns and the color on the wall with various influences. With a resolution of 20 x 25 pixels, it can be used to project pictures, patterns, and much more. The name of the project comes from the fact that one can control the 500 pixels with environmental influences, such as an audio sensor or with music playing on the computer.

I built the wall myself. It consists of 500 small LED lights, which can be individually controlled, and two wooden panels, four slats, and a plastic panel that is milky, so that the light from the LED lights is dispersed. The wall was programmed in two languages: Arduino (C++) and Processing (Java). Arduino is the language that directly controls the wall, and with Arduino, I can calculate a pattern so I know which LED has to be which color in order to create an animated pattern. Processing, on the other hand, runs directly on the computer, which is connected to the Arduino. Processing can convert the webcam, an image stored on the computer, or music into values that can then be sent to the Arduino. These values influence the pattern or produce an image on the wall. My project shows how 500 LEDs can be turned into a real picture screen, and how there are no limits to artistic creativity.



<https://u.aec.at/06C5DA46>



Michael Zaminer (*2006). I have been a student at Vienna's Gymnasium G19 since 2017. I became interested in technology at an early age. I really got into programming when I got my first Arduino at the age of twelve. Since then, I have learned other programming languages as well and have become increasingly skilled and experienced in areas like web development, Arduino, and other languages such as Processing. My goal is to someday work for SpaceX.

Black Day

Students at MS Lehen



Black Day is a series of three mixed-reality games: Enter a spooky house with us, escape from the treacherous traps of a lunatic school, or find your way around the jungle of dubious products as an influencer. We transport the player into a world that combines the elements of board games, adventure, media art, and comics. For this, the students developed—among other things—their very own game format, the ‘Game-Comic.’

Are the audience members spectators or players? The roles can be quickly reversed! To make *Black Day*, we developed various interaction formats: together with the audience, players’ guess, vote, and face challenges. This ‘Battle Royal with a difference’ was developed by students at MS Lehen in partnership with the media artists Sonja Prlić and Karl Zechenter and the media and culture educator Iwan Pasuchin. The creation of *Black Day* was a year-long process. The young people developed a number of mixed-reality game ideas and systems of rules, sought out exciting filming

locations, produced and edited video, photo, and audio material, created playing fields and game material, tested, and played. The students collaborated with the team consisting of artists and a media and culture educator under the motto ‘We are all game experts.’ They jointly discussed ideas, aesthetics, and production methods and designed the game as equals.

Project directors: Sonja Prlić, Karl Zechenter, Iwan Pasuchin

Design assistance: Reinhold Bidner, Martina Brandmayr
Software assistance and technical advice: Sebastian Frisch

Project support: gold extra, MediaLab of the Mozarteum University Salzburg

Performance partner: ARGEkultur Salzburg

Financial support from the City and Province of Salzburg



<https://u.aec.at/74661017>



Students from MS Lehen in Salzburg, (Abdullah Akyazi, Adelina Arifović, Aleksandar Vukić, Altina S., Blerina Aliu, David Djordjevic, Ilyas Kahveci, Marvin Arnold, Merisa Čajtinović, Obaid Baso, Scarlett Danninger, Şevval Duman) designed the game series *Black Day* in their Creative Media Design class in the 2019/2020 school year. The collaboration with the media artists and game designers Sonja Prlić and Karl Zechenter and the culture and media educator Iwan Pasuchin was part of the research project *schnitt # stellen*.

Reunited

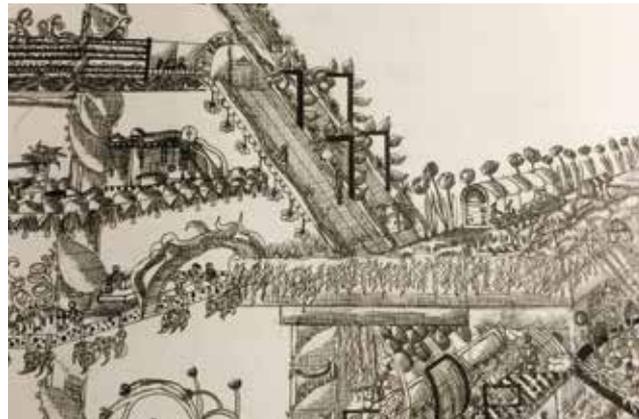
Clara Weiss

One can see my vision for the future in this picture. The background: For years, humans constructed so many buildings without any regard for nature that there were no longer any open spaces left on Earth. Green spaces were covered over and animals were driven from their natural habitat. For fear of not having sufficient room, people started stacking their houses on top of each other to take better advantage of the available space. As a result of the massive CO₂ emissions, the last small remnant of nature was obliterated once and for all.

But Mother Nature was not yet completely destroyed. Deep below the earth's surface, buried beneath tons of concrete, many plants were still alive. Nature knew that if the self-destruction brought about by humans did not stop, all forms of life would soon be extinguished. So the plants ultimately penetrated through the earth's surface, the animals found safe spaces, and little by little, the plants began to devour the buildings. No person or animal died, and the humans were given time to flee upwards.

Recognizing the error of their ways, the humans then began building lovely structures in harmony with nature. Each building was required to have a certain minimum number of plants. Thanks to this change in thinking—and with nature's help—humans realized that they had made a grave mistake, and they saw that a green city was much more livable.

This is what gives the picture its name, *Reunited*, because nature, animals, and humans live together again in a symbiosis. In my picture, one can see the habitat of humans. In the lower part of the picture, one can recognize the old city, which is gradually being dismantled by the plants. At the very edge of the city, the natural habitat begins; the animals prefer to live in nature a bit farther away from the city, where they can enjoy their own lives.



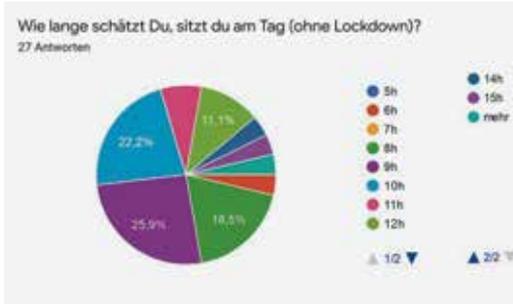
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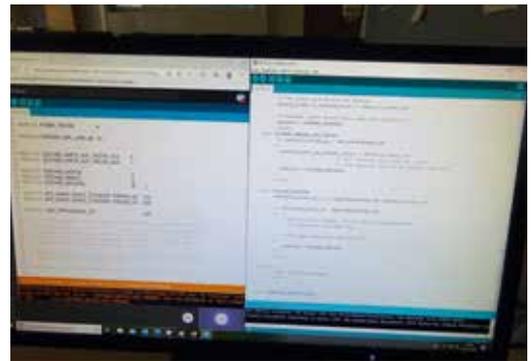
Clara Weiss (*2006) was born in Vienna. After kindergarten she attended the Protestant primary school at Karlsplatz, in Vienna. She presently attends Vienna's BGR III, with an arts focus. Currently she has six hours of art each week with her tremendous art teacher, Barbara Brandl. Her hobbies include drawing, arts and crafts, and parkour. She has a 12-year-old brother, Maximilian.

Juck uf

Students at Bundesgymnasium Dornbirn



Constant sitting in our everyday lives has become a problem of society. Due to the Corona pandemic and the resulting lockdowns, we are sitting for even longer periods of time, and the consequences of this, from muscle shortening to a higher mortality rate, will be with us for a long time to come. In order to reduce the time we spend sitting and to motivate us to move more, twelve students have developed a digital device for measuring jumping height. The project is called *Juck uf*, which in English means “jump up.” The most important components of the prototype are an ultrasound sensor, a display, and an Arduino Nano, which was programmed in the C language. As soon as a person steps under the ultrasound sensor mounted on the ceiling, his or her height is measured. When an audio signal sounds, the person can jump, and the highest point of the jump is recorded. The difference between the jumping height and body height is the result, which is shown on the display. In this way, short and tall people have an equal chance. The prototype has already been installed in our school in Dornbirn and is currently in the test phase. In the future, we plan to regularly program changing challenges into the device, as well as the storage of personal jumping data. But the solution is already simple but effective.



<https://u.aec.at/34D41236>



Aaron Waltl (*2007), Alexander Fitz (*2007), Claudia Thal (*2004), David Nesler (*2009), Katja Mitterbacher (*2004), Leo Mohr (*2007), Luca Malin (*2007), Magdalena Fitz (*2009), Noemi Christensen (*2008), Pius Verkleirer (*2009), Simon Metzler (*2006), and Valentina Schreyer (*2007) are students in the sixth to eleventh grades at Bundesgymnasium Dornbirn. As a team, they take on various problems every year and develop ideas and prototypes to solve them.

Das unmögliche Computerspiel

Students of class 1B at RG/ORG antonkriegergasse



The students of class 1B at Vienna's RG/ORG antonkriegergasse have made a film on the subject of "We Save the World," in which a much-anticipated school trip to Mars is interrupted by an alien attack. The students were fascinated by film as a medium and made great progress within only a few days. Here a few statements by the producers about their work:

"Pascal and I developed our spaceship. I played the character in the film who did the computer work as well as the background music. In any case, it was fun." (Ali Kaan)

"Making the figures was very interesting, but when I was taking pictures, I had to hold my hand still, and that was exhausting." (Milan)

"Well, I thought this project was really good because while we were working, I had the chance to get to know the other people on my team better. There was also a lot of variety in the work."

(Pascal)

"I took care of constructing the bodies. It was a lot of fun creating the costumes, because I really like drawing and doing handicrafts. My favorite part was when I was able to photograph all the scenes!"

(Yaara)

In collaboration with MuKaTo

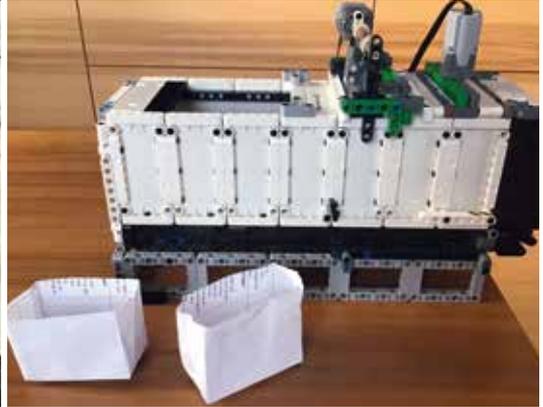
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As their creative project for the 2019/2020 school year, students of class 1B at RG/ORG antonkriegergasse chose to produce an animated film. A film by Yaara, Valentina, Milan, Finn, Ali Kaan, Raffaella, and Pascal.

Benjamin's Recycling Centre

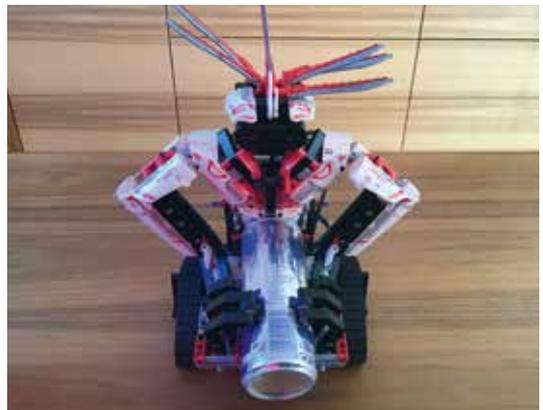
Benjamin Hölzl



Waste separation is a problem that everyone is faced with in everyday life. This is why I have developed machines for separating waste.

My hardworking employee, Robert the Robot, collects aluminum cans and carries the paper container away to be disposed of. This robot was built according to the construction plans of LEGO Mindstorms and is controlled by the system's remote control.

The waste compactor works like industrial trash compactors, pressing cardboard boxes so they don't take up so much space in the paper container. After the pressing, a flap in the back opens and the crushed boxes are discharged by means of a special mechanism. The stopper-sorter separates plastic and metal bottle and jar tops by means of a panel that can be folded down. The paper container disposes of paper that it first pulls into a box, using a mechanism that is furnished with wheels. Then Robert disposes of the full paper box. The PET bottle return machine takes back plastic bottles.



This machine was constructed with gear wheels and a conveyor belt driven by an M-Motor, while the 4-cylinder motor is only a fake motor. To build these machines and devices, I used LEGO technology with seven motors, a remote control, and the robot from LEGO Mindstorms.



<https://u.aec.at/272E5302>



Benjamin Hölzl (*2010) attended Kaltenberg primary school and is currently in the fifth grade at the secondary school in Unterweißenbach. In primary school, Benjamin was identified as being highly gifted. His hobbies are skiing, playing soccer, and bike riding. He plays the drums and enjoys climbing. But his great passion is building things with LEGO. The 11-year-old spends hours at a time developing new machines, vehicles, and various apparatuses.

Upcycling Stadt

Lisa Marits



My project is called *Upcycling Stadt* (Upcycling City). I am very interested in upcycling and believe that it will become increasingly important for our future. This is what gave me the idea that we humans could also live in upcycled buildings. The objects I built are an initial idea for a better future. The elements of my city were created largely from upcycled materials: a plastic-bottle house in which one can live, an Innocent bottle that was turned into a pool, and an Amazon box that I transformed into a supermarket. A park has been installed on the roof because in a city, green spaces are particularly important. Upcycled elements can be found here as well, such as a bench made out of bottle-caps and a tree swing fashioned from a plastic-bottle screw top. Many more buildings could be made in this manner.

Of course, we cannot really live in a mineral water bottle or go shopping in an Amazon box, but in the future, buildings can and should be created out of upcycled materials. My project is intended to serve as a vision and an inspiration for how we can design our habitat in the future. This will help people produce less waste, which in turn benefits the environment and ultimately all living things.



<https://u.aec.at/F1BE57ED>



Lisa Marits (*2010) is a student in the visual arts program at BRG Boerhaavegasse, 1030 Vienna. She is interested in animal and environmental protection.

Kranfahrzeug auf vier Ketten— LEGO Technic

Leopold Kastler

My *Crane Truck* consists of LEGO Technic parts. It runs on four track chains driven by four motors—all remote controlled. I installed not only motors in the vehicle but also batteries, wires, and receivers for the remote control. There are also three extra motors: one for the linear drive that moves the crane up and down, and two for the cable winch, which can be used to lift loads. I installed a few lights as well.

I learned about the Prix Ars Electronica competition from my mother. I am very interested in technology, and after we looked at the Ars Electronica homepage together, I thought: I'm going to enter! All the many different LEGO Technic parts in my LEGO box offer me numerous possibilities. I got a few additional LEGO motors and chains from my Papa, and then I went to work building this crane truck. I didn't have a precise idea about what I

wanted to do; I just knew I wanted a remote-controlled crane truck on four track chains! First, I built chassis 1 and then chassis 2, and then came the crane and the winch, and at the very end the driver's cab. I wanted to have four track chains because I think it looks cool. I have long been interested in cranes, so I wanted a crane truck. I knew how the chains, the linear drive, and the winch work because I used to play with LEGO with my Papa, and I watched how he used them. And now I'm happy that I succeeded in building such a great truck myself, one with so many functions and possibilities!



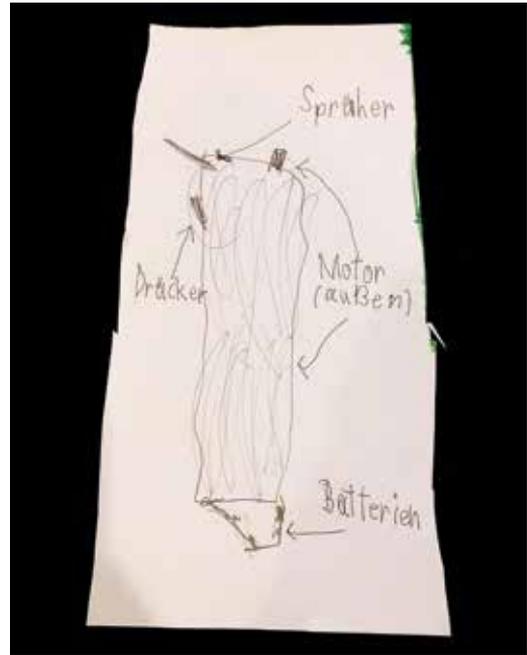
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Leopold Kastler (*2014) is seven years old and for the past two years has attended the Freie Schule Linz. Before that he was in the Forest Kindergarten. He is fascinated by technology and loves building things. His favorite tool is the hot glue gun, which he uses to assemble his creations out of wood and cardboard. When he is not in the workshop making and building things, he likes spending time with his friends in the woods, where they build forest houses and caves.

Erster Plastischluckler der Welt

Emilio Deutsch



I have seen all of the trashed beaches, and I didn't like what I saw. So I invented the *world's first plastic-swallower*. It can dissolve trash, especially plastic trash, within only a few minutes. And this could make our environment cleaner again. I am also very happy that I invented it. The *plastic-swallower* works with special acids and environmentally friendly chemicals. If the *plastic-swallower* could be sold in large amounts, nature would have more space again.

It utilizes acids and substances such as gas and hydrochloric acid. A stabilizing network is built in. With this network, the acids are heated and through a specific procedure become a spray. The motor is installed externally and is powered by batteries or sometimes air. The bottle containing the

spray has an oval shape. The pipe through which the spray is emitted usually measures between a few millimeters and one centimeter.

The process consists of substances and acids being shaken and then 'infected' in a container. The friction and heat turn this mixture into the spray. You merely have to press the lever, and the plastic disintegrates within five minutes. A stabilizing network controls the process. Zumulus is a mixture of chemicals that helps in the formation of the spray.



<https://u.aec.at/9516A5D8>



Emilio Deutsch (*2012) grew up in Mödling and now lives in the neighboring town of Gaaden. He likes reading very much and enjoys meeting friends, riding his scooter, and running. He also likes painting and writes funny stories. Emilio is fascinated by everything to do with nature and the forces of nature. This is his specialty. He currently attends LIBO Montessori School in Brunn am Gebirge.

Little Dancing Stars: Alle im Takt

Sarah Hölzl

Due to the COVID-19 pandemic restrictions, people were not able to attend dancing lessons or go to a disco. But because dancing is much more fun with a partner, the robot has become the dance partner. Why should robots only be used for work? Vernie, the LEGO BOOST ROBOT, was programmed to enable it to waltz.

I built Vernie the robot according to LEGO instructions. But when it comes to programming, creativity is required. Thanks to the ready-made programming components, this is child's play in a technical sense, and there are countless ways of programming. The robot plays music, can speak, and can move in all directions. The movements of the LEGO BOOST robot were combined with music, which means that both programs (music and movement)

are played simultaneously as the robot dances with Sarah: forward and back, a quarter turn to the left, a quarter turn to the right, a full turn, forward and back again, and then the turns again.

Sarah tried out various pieces of music, but the robot's movements worked best with classical waltz music. Vernie dressed up in his nicest clothes for the dance performance and put on a bow tie. Sarah just had to learn the same steps as the robot, and the dance was ready to perform.



<https://u.aec.at/26C01A8E>



Sarah Hölzl (*2011) started primary school in Kaltenberg in 2017; she is now in the third grade there. Sarah's hobbies are reading, handicrafts, and building things with LEGO. She plays guitar and clarinet and takes dancing classes. She enjoys skiing and gymnastics. The nine-year-old also regularly attends classes at Talente OÖ and at the Kinderuni.

Jury Prix Ars Electronica 2021

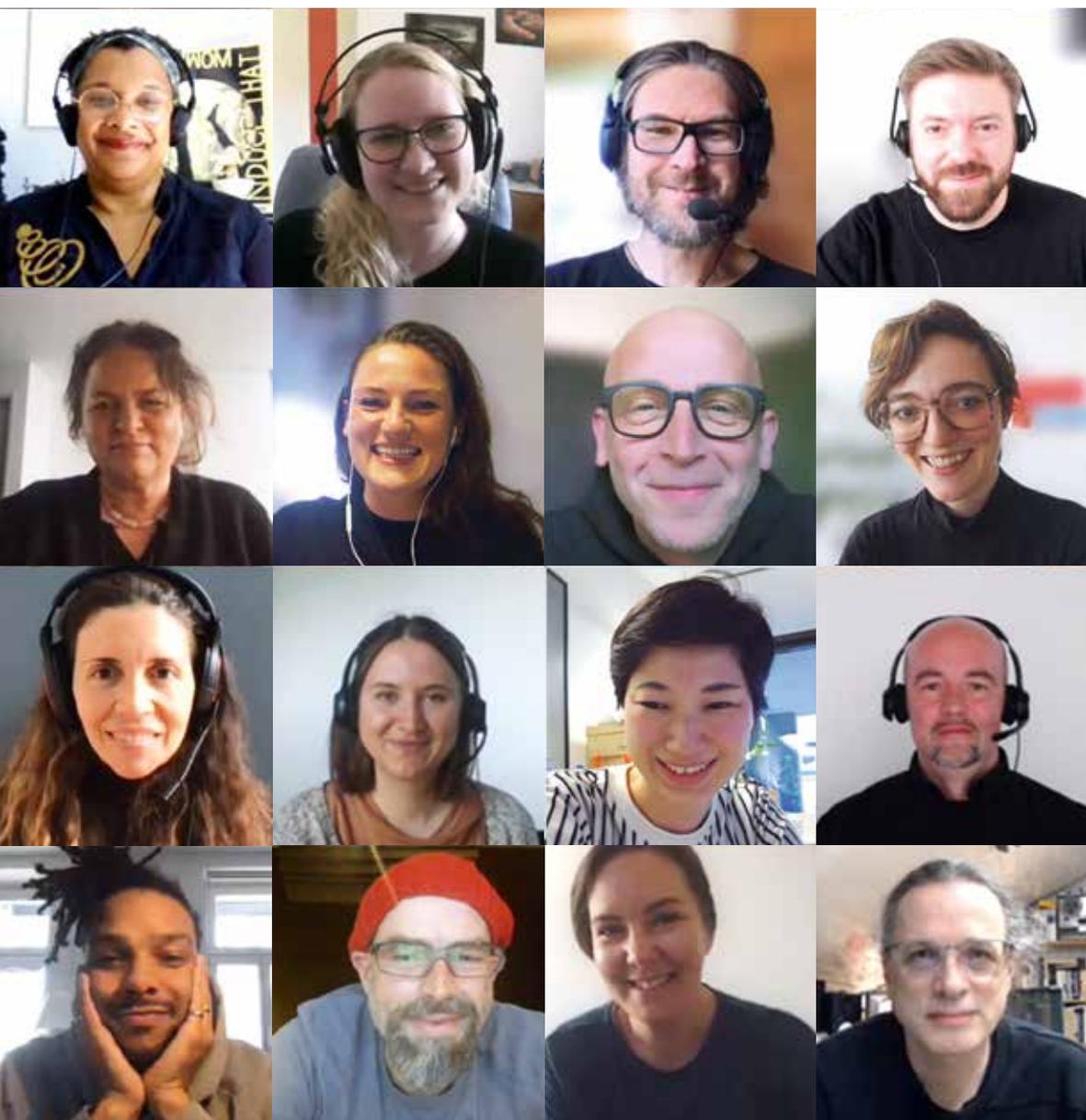


Computer Animation

Juliane Götz, Hsin-Chien Huang, Randa Maroufi, Casey Reas, Helen Starr, and Ars Electronica Team

Artificial Intelligence & Life Art

Jens Hauser, Kenric McDowell, Karen Palmer, Regine Rapp, Marleen Stikker, and Ars Electronica Team



Digital Musics & Sound Art

Ludger Brümmer, Cedrik Fermont, Rikke Frisk,
Daito Manabe, Christine McLeavey Payne, and
Ars Electronica Team

u19—create your world

Sirikit Amann, Josef Dorninger, Conny Lee,
Mira Lu Kovacs, Tori Reichel, and Ars
Electronica Team

Computer Animation



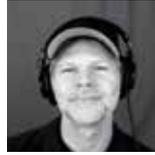
Juliane Götz (DE) is a Berlin-based artist, using various media such as time-based performance and installation as well as classical sculptural and two-dimensional works. Since 2013 she is part of the artist group Quadrature. With her partner Sebastian Neitsch, their artistic explorations gravitate towards data, physical experiments, and new technologies as a means to read and write today's realities. Their works have been shown internationally and they have been awarded several residencies and grants for their artistic practice.



Hsin-Chien Huang (TW) is an artist who specializes in mixed media. Science, technology, new media, programming, and algorithms are tools he uses to bring the universe of his imagination to life. He is especially enthusiastic about VR because it opens up a world of possibilities, free of any constraints. He collaborated with Laurie Anderson and their VR work *La Camera Insabbiata* won the best VR Experience Award at the 74th Venice Film Festival. His latest work *Bodyless* also won the Special Mention at 2019 Kaoshiung Film Festival, the Honorary Mention at Prix Ars Electronica 2020, and the Golden Mask Award at 2020 NewImages Festival.



Randa Maroufi (MR/FR), born in 1987 in Casablanca. She currently lives and works in Paris. Randa Maroufi is a graduate of the National Institute of Fine Arts, Tetouan, Morocco (2010) and the School of Fine Arts, Angers, France (2013). She also earned a diploma from Le Fresnoy—Studio National des Arts Contemporains, Tourcoing, France (2015). Randa Maroufi was Artist Member of Academy of France in Madrid at Casa de Velázquez in 2017–18. She has received many awards for her films *Le Park* (2015), and *Bab Sebta* (2019).



Casey Reas (US) is an artist and educator who lives in Los Angeles. His software, prints, and installations have been featured in numerous solo and group exhibitions at museums and galleries in the United States, Europe, and Asia. His work ranges from small works on paper to building-scale installations and he balances solo work in the studio with collaborations with architects and musicians. Reas' work is in a range of private and public collections at institutions including the Centre Georges Pompidou and the San Francisco Museum of Modern Art. Reas is a professor at the University of California, Los Angeles. He holds a Master's degree in Media Arts and Sciences from the Massachusetts Institute of Technology and a bachelor's degree from the College of Design, Architecture, Art, and Planning at the University of Cincinnati. With Ben Fry, Reas initiated Processing in 2001; Processing is an open-source programming language and environment for the visual arts.



Helen Starr (TT) is an Afro-Carib curator, producer, and cultural activist from Trinidad, WI. She began curating exhibitions with artists such as Susan Hillier, Cindy Sherman, and Marcel Duchamp in 1995. Helen founded The Mechatronik Library in 2010, to give marginalized artists access to technologies such as Game Engines, Virtual Reality (VR), and Augmented Reality (AR). Helen has worked with many public institutions such as Wysing Art Centre, FACT, Liverpool, and QUAD in Derby. Being Indigenous-American, Helen is interested in how digital artforms transform our understanding of reality by world-building narratives through storytelling and counter-storytelling and how, by "naming one's own reality," we can experience the Other. Helen is on the board of QUAD, Derby and in 2020 she co-founded DAAD Futurism with Amrita Dhallu and Salma Noor.

Artificial Intelligence & Life Art



Jens Hauser (DE/FR/DK) is a Paris and Copenhagen-based media studies scholar and art curator focusing on the interactions between art and technology, trans-genre and hybrid aesthetics.

He is a researcher at University of Copenhagen's Medical Museion, following a dual post-doctoral position at the Faculty of Humanities and the Faculty of Health and Medical Sciences, and coordinates the (OU)VERT network for Greenness Studies. He is a distinguished affiliated faculty member of the Department of Art, Art History and Design at Michigan State University, where he co-directs the BRIDGE Artist-in-Residency Program, and an affiliated faculty member at the Department for Image Science at Danube University Krems, He is also a guest lecturer at the University of Applied Arts Vienna, the University of Innsbruck, a guest professor at the Department of Arts and Sciences of Art at Université Paris I Panthéon-Sorbonne, and a researcher affiliated with École Polytechnique Paris-Saclay. Hauser has curated about thirty international exhibitions and festivals.



Karen Palmer (GB) is the Storyteller from the Future, an Award Winning International Artist, and a TED Speaker. She creates immersive film experiences that combine film, A.I. tech, Immersive Storytelling, Bias, Behavioral Psychology, and Parkour. Articles have been published in *Wired Magazine*, *Forbes*, *PC Mag*, Goethe Institute, *Fast Company*, *Engadget*, *The Guardian* "It leapfrogs over VR"... Exhibitions include V&A the PHI Centre, The Future of Storytelling, SXSW, The Museum of Modern Art Peru, Armory Arts Week NYC, and SIDF. Palmer has been described as a Thought Leader and has delivered keynotes all over the world, including AT&T Shape Conference, Wired for Wonder Festival Microsoft, IFA+Summit, and MIT to name a few. Recently she received an Honorary Mention for the STARTS Prize Ars Electronica for *Perception iO*, (*Input Output*), enabling participants to experience the future of law enforcement. Her current project, *Consensus Gentium* in R&D with the BFI, due to be released late 2021, enables participants to experience the future today and to understand their agency within it.

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Kenric McDowell (US) is a writer, speaker, and musician. They are the author, with GPT-3, of the book *Pharmako-AI*, and are co-editor, with Ben Vickers, of *The Atlas of Anomalous AI*. They record and release music under the name Qenric. Allado-McDowell established the Artists + Machine Intelligence program at Google AI. They are a conference speaker, educator, and consultant to think-tanks and institutions seeking to align their work with deeper traditions of human understanding.

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Regine Rapp (DE) is an art historian, curator, and director of Art Laboratory Berlin. Her research focuses on installation art, artist books, hybrid art, and art & science collaborations. She has taught Art History at Burg Giebichenstein Kunsthochschule Halle. As co-founder and director of Art Laboratory Berlin, she researches, curates, and publishes on 21st century art at the interface of science and technology. In this context she conceived the international conferences Synaesthesia. Discussing a Phenomenon in the Arts, Humanities and (Neuro)Science (2013), Nonhuman Agents (2017), and The Camille Diaries (2020). In the project *Mind the Fungi* she has worked at the interface between artistic and scientific research and recently co-edited the project publication at TU Berlin University Press (2020).

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Digital Musics & Sound Art



Marleen Stikker (NL) (1962) is founder of Waag Future Lab, a social enterprise that consists of a research institute for creative technologies and social innovation and Waag Products, that launched companies like Fairphone, the first fair smartphone in the world. She is also founder of De Digitale Stad (The Digital City) in 1993, the first virtual community introducing free public access to the Internet in Amsterdam. Marleen Stikker strongly adheres to the Maker's Bill of Rights motto: "If You Can't Open It, You Don't Own It." Marleen believes that society needs open technologies that meet societal challenges. 2020 she co-founded DAAD Futurism with Amrita Dhallu and Salma Noor.



Ludger Brümmer (DE) holds a Master's in Pedagogy from University Dortmund and a Master's in Composition from the Folkwang Hochschule Essen. He has worked with choreographer Susanne Linke and the Dutch contemporary dance company, NDT (Nederlands Dans Theater) as well as with Bernd Lintermann and also rosalie. He was commissioned and performed at GRM, Paris, IMEB Bourges at ICMC's in San Jose, Tokyo, Banff, Thessaloniki and other locations around the world. He was a visiting scholar at CCRMA Stanford University, teaching assistant at Folkwang Hochschule, TU Berlin, School of Design Karlsruhe, research fellow at Kingston University, and lecturer for Composition at the Sonic Arts Research Centre Belfast. Since 2003 he is head of the Institute for Music and Acoustics at ZKM|Karlsruhe, now Hertz-Labor, and guest professor at the School of Design. Since 2017 he is also professor of composition for digital media at the University of Music Trossingen and since 2009 member of the prestigious Academy of the Arts Berlin. His artistic work focusses on physical modeling of sound and visuals, video art, granular synthesis, sound synthesis techniques, spatial music, and databases. He developed the spatial audio system at ZKM. Awards: Folkwang Award Essen, WDR Award Cologne, Busoni Award Akademie der Künste Berlin, Golden Nica Ars Electronica 1994 and second prize at Ars Electronica 1997, Larry Austin Award, ICMA, Pierre d'Or Bourges 1997 and 2001, first prize at Rostrum for electroacoustic music by the UNESCO, Musica Sacrae 2001, Fribourg Switzerland, Menzioni D'Onore at the Luigi Russolo Award, Italy, and the Stockholm Electronic Music Award.



Cedrik Fermont (CD/BE/DE) is a Berlin-based Belgian-Congolese composer, musician, mastering engineer, author, radio host, and label manager (at Syrphe) who operates in the field of noise,

electronic, and electroacoustic and experimental music since 1989. He has toured extensively in Asia, the Middle East, Africa, Europe, and North America. His main research focuses on electronic, electroacoustic, experimental, and noise music from and in Asia and Africa. In 2017 he released together with Dimitri della Faille the book *Not Your World Music* about noise music in Southeast Asia, and was winner of the 2017 Golden Nica, Prix Ars Electronica, in the Digital Musics & Sound Art category.



Rikke Frisk (DK) is executive producer at Copenhagen Opera Festival—a festival that uses the city as the background and venue for opera in various formats. She is responsible for the strategic

development and elevation of the relevance of contemporary opera to a broader audience. A position she is familiar with from her time as manager and co-creator of Strøm—the leading festival for electronic music in Scandinavia, which she ran for several years. Rikke is also co-founder of the community-focused culture production company Indgreb, which is based in Copenhagen. Indgreb specializes in projects within participant-driven art and innovation events. Within their portfolio is the creation of the international innovation and art competition festival, Afsnit I, and Talk Town—a debate festival on gender, equality, and feminism. She is head of the board of Denmark’s leading venue for experimental contemporary music and global roots, ALICE. With a background in architecture and communication she is an experienced creative leader with renowned relational and strategic abilities to unfold people’s skills and ideas.



Daito Manabe (JP) is a Tokyo-based artist, interaction designer, programmer, and DJ. He launched Rhizomatiks in 2006 and since 2015 he has served alongside

Motoi Ishibashi as co-director of Rhizomatiks Research, the firm’s division dedicated to exploring new possibilities in the realms of technical and artistic expression with a focus on R&D-intensive projects. He is also specially-appointed professor at Keio University SFC. Manabe’s work in design, art, and entertainment takes a new approach to everyday materials and phenomenon. However, his end goal is not simply rich, high-definition realism by recognizing and recombining these familiar elemental building blocks. Rather, his practice is informed by careful observation to discover and elucidate the essential potentialities inherent to the human body, data, programming, computers, and other phenomena, thus probing the interrelationships and boundaries delineating the analog and digital, real and virtual.



Christine McLeavey Payne (US) is a research scientist at OpenAI where she created MuseNet and collaborated to create Jukebox. Groups such as the BBC Philharmonic and SF Symphony have

performed pieces co-composed using MuseNet. Also a Juilliard-trained pianist and avid chamber musician, she is particularly interested in Human/AI musical collaborations. She holds a Master’s degree in Neuroscience from Stanford, and a degree in Physics from Princeton.

u19—create your world



Sirikit Amann (AT) has been a juror since the very inception of the u19—create your world category for youngsters under 19 years of age in Austria. She was director of cultural education at KulturKontakt Austria. Since 2020 she is the head of the sector ‘Education and Society’ with a focus on digital education at the OeAD-GmbH. The OeAD is the Austrian Agency for Education and Internationalization. She had previously served as an expert advisor on artistic affairs at the Austrian Federal Ministry of Education, Art and Culture, and in the Office of the former Federal Chancellery Minister.



Josef Dorninger (AT) has been exploring new forms of digital artistic expression with the Viennese collective OMAi since 2007. His team presents the results worldwide in live performances, art installations, and workshops. The primary medium is digital light projections, implemented with the specially developed visual instrument Tagtool. This is used by an international community and was featured by Apple at the Worldwide Developers Conference in 2014 and 2016. As a trained social worker, Josef has also been involved in regional youth work in his hometown of Tulln since 2005. With this dual role, he incorporates state-of-the-art technologies into creative youth projects. Since 1996, Josef has also held a leading position in the non-profit cultural association Kunstwerkstatt, which he uses to implement regional art and youth projects.



Conny Lee (AT) Conny Lee is already part of the core team of u19—create your world. The host of Radio FM4 is known nationwide—she hosts the afternoon show *FM4 Connected*, produces and co-hosted the bilingual FM4 *Morning Show* and a show about video games in a socio-political context. In addition, Conny Lee is head of the ‘love department,’ which deals with current topics in the fields of sex, love, and dating. As an editor she reviews games, literature, and comics.



Mira Lu Kovacs (AT), lives and works in Vienna. With her numerous and diverse projects, MLK has a permanent place in the Austrian music landscape as a producer/composer of consistently high-quality pop music (and everything around it). As a singer, ‘head of’ and songwriter recently under her own name (formerly known as Schmieds Puls), with 5K HD (progressive cinematic electronic music), as well as side woman and guitarist with My Ugly Clementine (rock/pop). In addition to these 3 main projects, the musician regularly collaborates with artists of various genres. Nominated several times, she won the FM4 Amadeus Award in 2016, and in 2020 her band 5K HD was honored with the Music Moves Europe Talent Award.



Tori Reichel (AT) is a freelance journalist, moderator, and conceptionist based in Vienna. His work is almost always at the interface between social politics and pop or subculture. Growing up as the child of a Nigerian father and an Austrian-Swedish mother in Salzburg, he later studied journalism and communication science at the University of Vienna and worked as an editor and moderator at *VICE* Austria from 2014 to 2018. Tori writes for media such as *Die Zeit*, among others, and has been the host of *AUX*, a weekly music and pop culture magazine on A1Now, since February 2021.

STAR Prize

Grand Prize of the European Commission honoring
Innovation in Technology, Industry and Society
stimulated by the Arts

S+T+ARTS 
PRIZE'21

TS
'21

“STARTS demonstrates how innovation in Europe that is rooted in artistic creativity can emphasize the human dimension in technological innovation while ensuring that Europe takes full advantage of its excellence in culture and science and maintain its leadership to push world-wide for sustainable development.”

Member of the European Parliament Dr. Angelika Winzig



Horizon 2020
European Union funding
for Research & Innovation



S+T+ARTS

Bozar



INOVA+



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STARTS—Science, Technology, and the ARTS

The S+T+ARTS = STARTS program of the European Commission was launched in 2016 to encourage synergies between the arts and technology to support innovation in industry and society. STARTS promotes the inclusion of artists in research and innovation activities in Europe.

To encourage collaboration between engineers, scientists, and artists, STARTS is currently funding different pillars: STARTS Residencies to stimulate interdisciplinary collaborations in situ, STARTS thematic pilots to finance research with artists as active parts of projects that work on concrete challenges for industry and society, STARTS Academies uniting engineers and artists to teach digital skills to citizens and young adults in a playful way, STARTS regional centers to expand the initiative on a local level in a number of European regions, Digital Innovation Hubs that help new and starting companies improve production processes and services, STARTS in Motion as an accelerator for art-tech collaborations and last but not least the annual STARTS Prize to give visibility to outstanding examples of collaboration between art and technology. In 2021 for the first time, Nesta Italia presents a STARTS Prize for social good, a pilot

project to highlight a regional thematic focus on STARTS topics.

Innovation in and for Europe

Europe has historically focused its attention in engineering on R&D and standardization, and historically innovation is viewed to be the core of a competitive economy. Today, however, focusing only on technology has not proven sustainable. An increasing number of high-tech companies throughout the world assert that, in addition to scientific and technological skills, the critical skills needed for innovation to happen and to be of value for society are skills such as creativity rooted in artistic practices. In this context, the expertise and practice of artists can directly drive and influence innovation in technology. They offer new perspectives, inspire new directions, and act as a catalyst for a successful and socially responsible transformation of new technologies into new products and new economic, social, and business models. In recognition of this development the European Commission launched the STARTS initiative—Innovation at the nexus of Science, Technology, and the ARTS.

STARTS Prize '21

Grand Prize of the European Commission honoring Innovation in Technology, Industry and Society stimulated by the Arts

The European Commission's STARTS Prize highlights people and projects that have the potential to make a sustainable positive impact on Europe's economic, technological, social, and ecological future. The competition seeks innovative projects at the nexus of science, technology, and the arts. The STARTS Prize celebrates visions and achievements at the interface between innovation and creation. The winners receive the STARTS Trophy and €20,000 in prize money. Both winning projects as well as a selection of the Honorary Mentions and Nominations are showcased at the Ars Electronica Festival in Linz. Plus, projects singled out for STARTS Prize recognition are featured in exhibitions and events that Ars Electronica, BOZAR, Frankfurter Buchmesse, INOVA+, La French Tech Grande Provence, T6 Ecosystems, and Waag stage at partner institutions worldwide. The new continuation of the STARTS Prize is set to run until 2023 with an extended consortium of partners to widen the sphere of visibility and activities for the selected projects.

The STARTS Prize competition is staged annually in two categories:

Grand Prize – Artistic Exploration

Awarded for artistic exploration and art works where appropriation by the arts has a strong potential to influence or alter the use, deployment, or perception of technology.

Grand Prize – Innovative Collaboration

Awarded for innovative collaboration between industry or technology and the arts (and the cultural and creative sectors in general) that opens new pathways for innovation.

The current edition of the Prize also brings with it a thematic focus on cross-sectoral projects investigating the disruptive powers of creative data and

media innovation as well as on works exploring hybrid formats, groundbreaking technologies, or initiatives of storytelling in next generation media. This year the spotlight is on the novel creation, access, and distribution of media content, and development of new, qualitative approaches in the media.

In an elaborate process of open call and nominations by advisory experts, a total of 1,564 entries from 96 countries were submitted in the application period that ran from January 11 to March 15, 2021. 805 submissions were entered directly to STARTS and 759 submissions were received via the Prix Ars Electronica in the STARTS Prize database.

The STARTS Prize jury convened for a long weekend of intense conference calls to determine the two winning projects, 10 Honorary Mentions, and 18 Nominations for the STARTS Prize '21. Following extensive deliberations, the unanimous decision was taken to award *Remix el Barrio*, *Food Waste Biomaterial Makers* with the STARTS Prize for Innovative Collaboration and *Oceans in Transformation* by Territorial Agency with the STARTS Prize for Artistic Exploration. *Oceans in Transformation* makes visible the profound impact of humanity on the world's oceans, which are not observable by the naked eye. Territorial Agency use high resolution remote datasets that show these transformations and use this data in a space for learning about integrated actions to safeguard the oceans. *Remix el Barrio* examines the potential to democratize the access to innovation in a series of co-design projects using food leftovers in the Barcelona neighborhood Poble Nou. Anastasia Pistofidou, Marion Real and The Remixers at IaaC Fab Lab Barcelona worked together with local restaurants, markets, fashion designers, and citizens to find new models and techniques of innovating with waste.

Furthermore, 10 of the finalist projects were selected for an Honorary Mention.

Submission and evaluation process

On behalf of the European Commission, Ars Electronica in collaboration with BOZAR, Frankfurter Buchmesse, INOVA+, La French Tech Grande Provence, T6 Ecosystems, and Waag issued an open call for entries to the fifth annual competition for the STARTS Prize. Considering the interdisciplinary approach, the STARTS Prize '21 was once more launched with a dual approach for submissions:

Submission via open call

The STARTS Prize open call started on January 11 and ended on March 15, 2021. Submissions of projects could be made either by artists / creative professionals or the researchers / companies involved.

The competition was open to:

- ground-breaking collaborations and projects driven by both technology and the arts.
- all forms of artistic works and practices with a strong link to innovation in technology, business, and/or society.
- all types of technological and scientific research and development that have been inspired by art or involve artists as catalysts of novel thinking.
- artists and teams from all over the world.

Purely artistic or technologically driven projects were not the focus of this competition. The competition was not limited to any genres such as media art, digital art etc., and not limited to Information and Communication Technologies.

Recommendations by international advisors

To encourage a wider range of participants as well as a geographical and gender balance, seven international advisors who are experts in the field were engaged to recommend interesting projects and artists. These recommended participants were contacted by the Ars Electronica team and asked to submit their project via the submission platform, with the same process and deadlines as for the

open submissions. These international advisors served as facilitators to identify relevant works and projects during the submission process and helped reach a wider range of artists and quickly introduce them to the award.

Jury Process

The jury consisted of five international experts from the fields of industry, technology, governmental policies, and culture. For the second time, the jury was unable to travel to Linz. Restrictions imposed due to the COVID-19 crisis necessitated a different kind of jury process. All submissions were evaluated by a pre-selection committee on arrival, to determine whether they met all formal criteria of the call. For an individual pre-jury process, the five STARTS Prize jury members each received an individual pool of projects to assess in advance of the main jury weekend. Each project was assessed by two jury members.

Since the main categories of Prix Ars Electronica have a strong overlap with the criteria of the STARTS Prize, artists submitting for the Prix Ars Electronica could decide to also enter their submission for the STARTS Prize. Out of these submissions, a total of ten projects per category were nominated for prize consideration by the three Prix Ars Electronica Expert Juries (Computer Animation, Digital Musics & Sound Art, and AI & Life Art). The resulting list of top 55 projects was presented at the remotely held main jury event and reduced to 30 finalists before the last jury meeting. The STARTS Prize jury evaluated these 30 finalists in order to select two prize-winning projects and ten Honorary Mentions. The list of the 30 finalists represents a comprehensive overview of the international state of the art collaborations between art and technology. Therefore all 30 projects are published in the *CyberArts 2021* catalogue.

STARTS Prize '21, a joint project by Ars Electronica, Bozar, Frankfurter Buchmesse, INOVA+, La French Tech Grande Provence, T6 Ecosystems, and Waag.



The STARTS Trophy was designed by Nick Ervinck. The Belgian artist explores the boundaries between various media, fostering a cross-pollination between the digital and the physical. He applies tools and techniques from new media, in order to explore the aesthetic potential of sculpture, 3D prints, animation, installation, architecture, and design. Nick Ervinck, TAWSTAR, 2016

Making the Invisible Visible

Reflections on the Here-and-Now and the Soon-to-Be

Statement of the STARTS Prize '21 Jury (Francesca Bria, Alexandra Deschamps-Sonsino, Alexander Mankowsky, Nicola Triscott, Fumi Yamazaki)

From a staggering 1,564 entries, 805 projects were directly submitted to STARTS Prize '21.

As a 'new normal' required the jury to gather virtually for the second time in the history of the prize, a spirit of hope colored the discussions as vaccination schemes had begun around the world. Settled into a year of remote work, jury members from time zones spanning across the world were able to get to know each other, collaborate, argue, and make their way as a group to a final selection. This was, of course, without the ambiance of Linz and the pleasures of face-to-face meals and conversations but with the obvious and important environmental benefits of meeting virtually. If the crisis has taught us anything, it's that other crises will be coming along shortly, and we might as well learn to live with change.

This sense that everything is changing also permeated the projects submitted. Many of them addressed the important issues of today in Europe and around the world: social injustice and climate change. Some chose to approach our ever-changing present with hope while others took a more journalistic approach of documenting our present in creative ways. Technical ambitions were high and the interest in new materials, new techniques, and ways to instrument our world out of a crisis were omnipresent. For others, it was a question of using technology to amplify the cultural impact of shared public space. Applicants showed us the power of cross-disciplinary collaboration while still retaining a strong sense of purpose and identity as

artists. Over 96 countries were represented this year, proving that the interest in STARTS is continuing to expand across borders and into a wide range of creative and technical communities.

The natural systems that we are part of, our agricultural futures, the built environment and the fragile state of privacy online were some of the themes that emerged strongly. In that sense, the projects the jury chose to highlight in both their nominations and the prizes were about reflecting on the now and the soon-to-be. The COVID-19 crisis may have tampered the desire to predict a far-flung future when so much is possible now, today. The need to demonstrate the technical capabilities of today was an important dynamic. Perhaps the applicants were tired of speculating and wanted a little more action. The jury responded accordingly, choosing to award the prizes to projects that made the invisible systems that surround us a little more visible, understandable, beautiful, and something we can all act on today.

This 'can do' spirit was omnipresent this year as the COVID-19 crisis gives us a chance to reflect on how we might respond to more diffuse, complex, and multi-layered crisis. As the STARTS prizewinners announcement coincides with a surge of hope for our immediate future, artists, designers, scientists, and technologists everywhere were clear in their message: this is just the beginning of a journey that requires new tools and new skills. It's up to us to respond to their invitation not only across Europe but around the world.

STARTS Prize '21 Grand Prize— Artistic Exploration

Awarded for artistic exploration and art works where appropriation by the arts has a strong potential to influence or alter the use, deployment, or perception of technology.

Oceans in Transformation Territorial Agency—John Palmesino and Ann-Sofi Rönnskog

Oceans in Transformation is a strong call to collaborate across disciplines to deepen our knowledge of the oceans and to act together to safeguard the future of our living ecosystems. Housed inside the Church of San Lorenzo in Venice, in a place that can remind us of the wonderful and fragile balance between man and nature, the collaborative platform Ocean Space presents the multimedia exhibition conceived by the collaboration between the architects of Territorial Agency, TBA21–Academy, and e-flux Architecture. The work is the outcome of a three-year multidisciplinary investigation and research project on the state of the oceans in transformation, linking science, arts, and politics, by producing shared images of the oceans, earth science and remote sensing datasets with data from satellites, GPS, AI, sonar scans, and climate models produced by different actors and research disciplines, revealing the magnitude of the impact of human activities on the oceans. The project makes visible what is ultimately at stake in the Anthropocene, which is the health of our aqueous planet, presenting rapid sea level rise and marine degradation. Intensive fishing, deep-sea mining, and various other activities represent dangerous anthropogenic pollution factors of the oceans that can irreversibly modify our ecologies. The project is a large-scale collaboration involving interaction with hundreds of scientists, research institutions, NGOs, environmental activists, policy makers, and artists. It brings together a group of Ocean Fellows and a rich program of digital initiatives and activities to broaden and deepen our knowledge of the Anthropocene ocean that can be accessed on the digital platform ocean-archive.org.

STARTS Prize '21 Grand Prize— Innovative Collaboration

Awarded for innovative collaboration between industry or technology and the arts (and the cultural and creative sectors in general) that opens new pathways for innovation.

Remix el Barrio, Food Waste Biomaterial Makers

Anastasia Pistofidou, Marion Real and The Remixers at Fab Lab Barcelona, IaaC
Remember the 19th century Arts & Crafts Movement? *Remix el Barrio* can be seen as translation of Arts & Crafts into our times, confronting well-known contemporary issues with manufacturing and consumption in our daily life. *Remix El Barrio* is a collective of designers who propose projects with food leftovers using artisan techniques and digital manufacturing. They collaborate with agents from the Poblenou neighborhood to promote a more local and circular ecosystem. In their manifesto they want to “promote artisan-manufacturing sites and designer/craftsman cooperatives in the development of short-loop products, creating direct synergies with neighborhood actors, facilitate the access and the rehabilitation of abandoned sites, support logistics, and partnerships between local actors.” The jury was most impressed by the wide array of beautifully up-cycled products made from waste—ranging from dye colors made from avocado stones, bioplastics out of orange peel, soaps from used oil, or paper made of coffee peels. Their initiative, Organic Matters, explores the intersection between design, biology, chemistry, technology, material science, community, and self-sufficiency. It could be interpreted as a reformulation of the STARTS idea itself.

STARTS Prize '21 Honorary Mentions

A Lighter Delicacy Sorawut Kittibanthorn

Food waste is a major concern around the world and has a major impact on climate change. It also flies in the face of global poverty, which is also on the rise again for the first time in 20 years. Sorawut Kittibanthorn wants us to rethink a common food by-product, chicken feathers, and put them back in the center of a meal. Rich in protein, they could easily be turned into a foodstuff that would rival soya, tempeh, and other similar by-products. Kittibanthorn challenges us by putting on a Michelin-star looking meal with the processed feathers at the center, inviting us to change our minds about what is waste and what is food. The project fits very well in a food landscape that is diversifying and where even dried insects are starting to feature more prominently. The impact of turning a waste by-product into a foodstuff could save the feathers from landfill, keep them out of our rivers, and in turn help feed others. These are all important and critical ideas that should travel far and wide, especially in our foodie circles.

Cloud Studies Forensic Architecture

Cloud Studies propose a new and radical approach to investigate contemporary clouds, suggesting the need for an alternative cartography of critical zones. It is a video work that assembles eight recent investigations by Forensic Architecture under the common theme of toxic clouds in different geographical locations and local contexts—from chemical white phosphorus and glyphosate used in Gaza, tear gas used to disperse crowd protests in Hong Kong, methane in Argentina, or chlorine used in the Syrian town of Douma, and arson used to eradicate Indonesian forests for industrial plantations. In the turbulent and fragile year of the COVID-19 pandemic, where the relationship between nature, ourselves, and technology appears dangerously unbalanced, *Cloud Studies* reflects on the global atmosphere

dominated by toxic clouds that colonizes the air we breathe and shapes our environment and our perception, prompting collective resistance and protests. Clouds are also a metaphor for the fragility and porosity of borders, since we are all connected and close, breathing the same toxic air. It is clearly denouncing how state and corporate powers continuously mobilize new types of clouds to control and manipulate human behaviors and their environment. Toxic clouds colonize the air we breathe, leaving traces everywhere, and it is hard not to relate it to the infrastructural “clouds” that colonize our digital life today, amassing information and data that can be used and monopolized in various ways. Audio recordings and the audiovisual narrative, together with the essays and texts read by their authors are also made accessible in a virtual exhibition platform, providing more in-depth information for the audience: <https://critical-zones.zkm.de/#!/detail:cloud-studies>.

Data Garden Grow Your Own Cloud

Global energy consumption of data centers is a huge issue for the global environment. Data centers are emitting as much CO₂ as the aviation industry, and these numbers are growing exponentially. *Data Garden* is an organism-based data center, a carbon negative data infrastructure that can store and retrieve data from the DNA of plants, using organisms that create its own energy. Through this project, the *Grow Your Own Cloud* team aims to build an organic cloud that emits oxygen rather than CO₂. From speculative research working with local flower shops to be transformed as decentralized data centers, to working with researchers at the University of Washington, actually converting computational data such as JPGs and MP3s into DNA. *Data Garden* and its installation inspires the audience regarding how humans may be able to work with nature and data, creating regenerative data ecosystems.

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

What is real and what is virtual? As technology advances, some technologies are capable of making such borders invisible. *border 2021* is a project that challenges the audience with a highly immersive experience transforming the border of the virtual and the real world. With a combination of personal mobility device and VR-headset, the audience experiences an immersive performance art going back and forth between the fictional world of VR/AR and the real world brought back by the physical touches of dancers confusing various boundaries. Everything in this project moves, from physical objects, the audience on personal mobility devices, and dancers, all of which is programmed, choreographed, and performed extremely precisely. Coping with the post-COVID-19 era, the project also provides a unique online viewing experience enabling the viewers to select viewpoints of multiple perspectives such as a bird’s eye view of the entire venue, and the control screen of the controlling software. *border 2021* impresses the audience with the artistic and technical quality of the implementation, the multidisciplinary collaboration, and innovative nature of how the project is pushing the boundaries of what people could perceive in the future as ‘real’ and ‘virtual.’

mEat me
Theresa Schubert

Not since Lee Miller photographed a severed breast on a dinner plate in 1929 and Orlan’s performances of carnal art of the 1990s have we seen human flesh as food for thought. Veganism doesn’t seem too extreme compared to the impressive work of artist Theresa Schubert. Taking our obsession with meat, the realities of gene manipulation, and our food production realities, she really does make us eat hyper-locally. Her videos and photographs explain the process of turning a sample of her own blood cells into lab-grown meat. By treating the human body as just another food choice, her work puts us back into the animal kingdom and Nature where we belong. It’s bold and might even be shocking to some, but the reality is, if we

treat our own bodies the way we treat the bodies of the animals that help us both to nourish us and to overcome disease, we might find commonalities instead of differences.

On View
Ania Catherine, Dejha Ti

In modern society, users are constantly exposed online to various addictive interfaces, surveillance, and data privacy, often not knowing what is actually going on. *On View* (2019) is an installation that allows the audience to interact with those interfaces in the virtual world, with no virtual layer, being exposed directly to that awkwardness that is usually hidden behind the online interactions. Through the installation, the audience is forced to experience, learn, and feel the weight of what is actually going on when they sign the Terms & Conditions online that they may not read, unaware that they may be signing up for facial detection and facial recognition. *On View* raises awareness of the issues such as privacy, data protection, data ethics, and surveillance capitalism, which are concerns often addressed in Europe with the GDPR.

Project Habitate
Yuning Chan, Tom Hartley, Yishan Qin

When we are talking about the Anthropocene with its destruction of the biosphere, then we imagine large mammals, whales or the Amazon forest. What is missing in our cultural imagery of nature, is the barely visible, in case of trees the profane: mosses, lichen, and fungi. In *Project Habitate*, the artists have created scientifically proven wearables which are ready to be accepted by mosses, lichen, and fungi. The wearer would be enabled to replace a tree as host. The original host is the ash tree: the jewelry mimics the ash tree’s bark texture, light level, porosity, and pH and leverages human movement to support guest species’ spore dispersal. The living wearable can be seen as an indicator of ecological-social connectivity, as a reminder that no species is an island. From the STARTS perspective, *Project Habitate* provides scientifically sound ideas on how the destructive aspects of the Anthropocene can be countered through the creation and application of materials that can serve as habitats for neglected species.

The Growing Pavilion

Company New Heroes / Biobased Creations

Biobased or recycled materials are often evaluated solely as replicas of today's conventional one-way-ticket materials. Contemporary mainstream aesthetics reflect a production process in which the product itself can be endlessly replicated in sameness—but only until the resources are depleted. Nature shows a different approach, there is neither resource depletion, nor sameness. *The Growing Pavilion* communicates a future-proof approach to beauty, where everything is unique in texture and color. The walls are grown out of locally harvested plants and mycelium, forming a kind of organic skin instead of an evenly white wall. The creators have reinforced the new aesthetics of growing with the exhibition of unique pieces by Aniela Hoitink, Christien Meindertsma, Diana Scherer, Eric Klarenbeek, Martijn Straatman and HuisVeendam. The core idea of growing instead of manufacturing is seen as a very promising pathway into a sustainable future.

The Living Light

Nova Innova

Microbial Fuel Cell technology (MFC), the idea of using microbes to produce electricity, has been known since 1911, when Michael Cressé Potter made the subject public. In Pop Culture, the banana fed time machine was able to send mad scientists 'Back to the Future.' But *The Living Light* is different—it is a practical approach to literally illuminate the mutual dependence between nature and mankind. *The Living Light* is about to implement Plant Microbial Fuel Cell technology in our day-to-day lives—reaching from your indoor plant providing light at home to illumination in urban parks, powered by the organisms in the soil. *The Living Light* is a beautifully crafted beacon into a future, where life itself can contribute to our civilization, replacing endless numbers of batteries. Especially interesting for STARTS is *The Living*

Light as an eye opener for the engineers of the sensory based Internet of Things, where many small devices will need weak energy sources that cannot be maintained by a complicated energy network or batteries.

The Tides Within Us

Marshmallow Laser Feast, Fraunhofer MEVIS, Natan Sinigaglia

The Tides Within Us is a unique trip into the human body, following real blood flow heart data captured by an MR scanner that amplify our perception of the body and its boundaries. Where does the human body begin, and where does it end? What's the relationship between humans and nature? An immersive scientific exploration with interactive screens that allow the audience to explore the fluidity of the human ecosystem, mapping the flow of oxygen through the cardiovascular system, thus challenging the boundary between our bodies and our environment, beyond the limit of our perception. This arts–science partnership between the Marshmallow Laser Feast (MLF) and pioneers in medical image computing Fraunhofer Institute for Digital Medicine MEVIS, shows that everything is connected and that we share a similar structure to nature. The expertise of Fraunhofer Institute in digital medicine and the MR-Lab research made possible the artistic exploration of MLF using scientific medical data sets and advanced capturing techniques at scale, to create a human 600 feet tall. In a moment of strong evolution and transformation of digital medicine, this work opens up our imagination and perception: at this scale, lungs look like trees, arteries like river deltas, and neural pathways like thunderstorms, opening novel ways of experiencing our bodies, and changing the way people learn and think about the body in relation to the environment. *The Tides Within Us* is an ongoing science–arts collaboration that will continue to evolve and expand.

STARTS Prize '21 Nominations

An Olfactory Biopolitics Nairobi
Coltrane McDowell

Constructing Connectivity
Jessica Smarsch

Extendable Ears
Sheng-Wen Lo

Face Lab
Håkan Lidbo

Genetics Gym
Adam Peacock

Glacier's Lament
Jiabao Li

In a Small Room
KyungJin Jeong

In Event of Moon Disaster
Halsey Burgund, Francesca Panetta

Lovewear
Ivan Parati, Emanuela Corti, Witsense

MyComythologies
Saša Spačal

Para-optic-8
Anastasia Alekhina

**Shapes and Ladders: Battles of Bias
and Bureaucracy**
Ani Liu, Michelle Lim, John Ahloy, Andrea Li

Silencing The Virus
Lily Hunter Green

So far the Skies are silent
A Series of Audiovisual Performances for
Radio Telescopes and Artificial Intelligence
Quadrature

Symbiosia
Thijs Biersteker

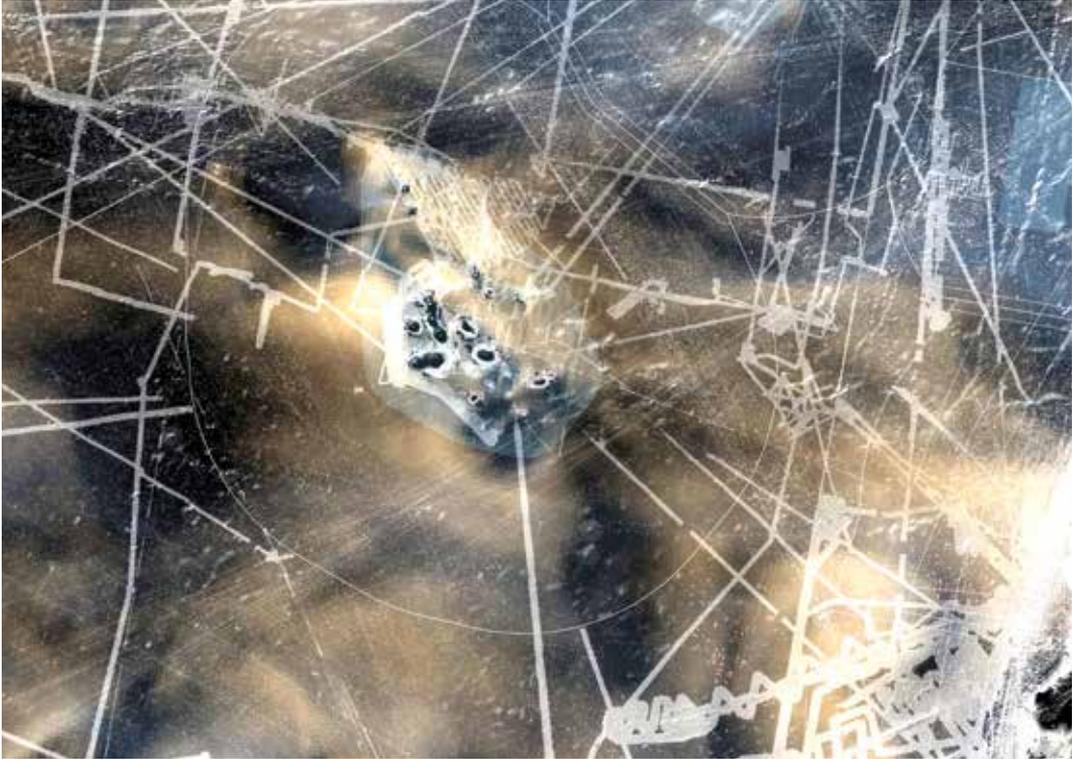
The [Uncertain] Four Seasons
AKQA, Jung von Matt

The Cleanroom Paradox
Felix Lenz, Angela Neubauer, Eszter Zwickl

TheirTube
Tomo Kihara

Oceans in Transformation

Territorial Agency—John Palmesino and Ann-Sofi Rönnskog



© Territorial Agency

Galapagos archipelago with high resolution bathymetry fishing and shipping data of Marine Protected Area EEZ.

Oceans in Transformation investigates the impact of human activity on the world ocean. The global ocean is changing its circulations, energies, interactions, and ecologies. It is the most dynamic and sensitive component of our living planet. The ocean is in a new phase of its dynamic history, shaped by intensifications of the impact of human activities on planetary systems—the Anthropocene.

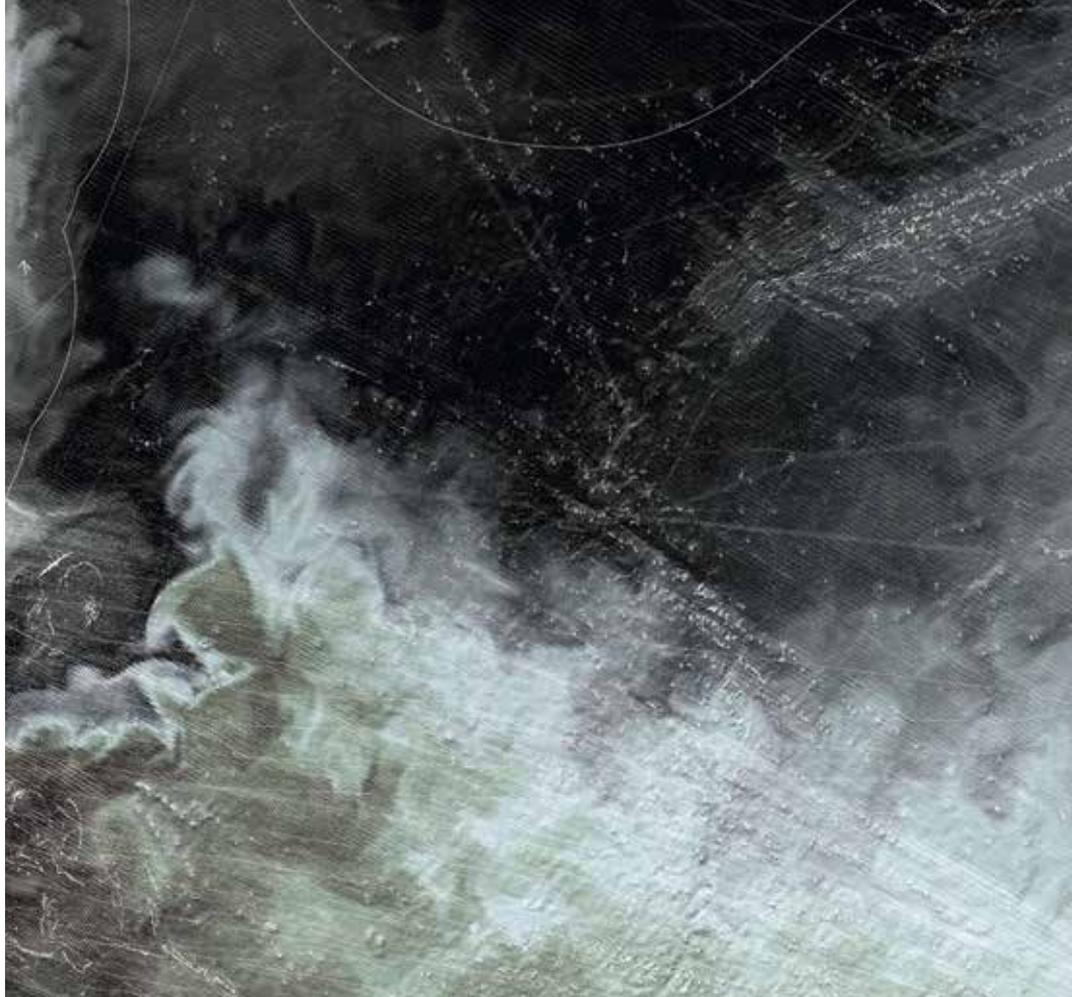
Territorial Agency uses extensively geospatial and remote sensing data to produce public settings—exhibitions, seminars, workshops and online—to guide discussions between multidisciplinary expert groups, scientists, policy makers, activists, conservationists, and to build capacity to act on complex environmental issues.

Oceans in Transformation is a project that addresses the challenges linked to multi-scalar data, multi-temporal data, and dynamic environmental data,

in direct connection with contemporary arts, architecture, and environmental settings.

The ocean is a sensorium, an aesthetic device: it records in its complex dynamics the transformations of the Earth, and it inscribes back its cycles in the dynamics of life-forms. *Oceans in Transformation* is an aesthetic and conceptual setting, where different ways of being sensitive to the complex events of climate change are brought into close proximity. It investigates two systems of knowledge developing alongside each other, often with little contacts between them.

On one side Earth System science is developing rapidly and widening our understanding of the Earth as a living entity. The ocean is a key element of the Earth System—yet one of the least known. *Oceans in Transformation* is organized by large dynamic compositions of remote sensing images



Gulf Current meeting the Labrador Current, with the Grand Banks off the coast of New Foundland.

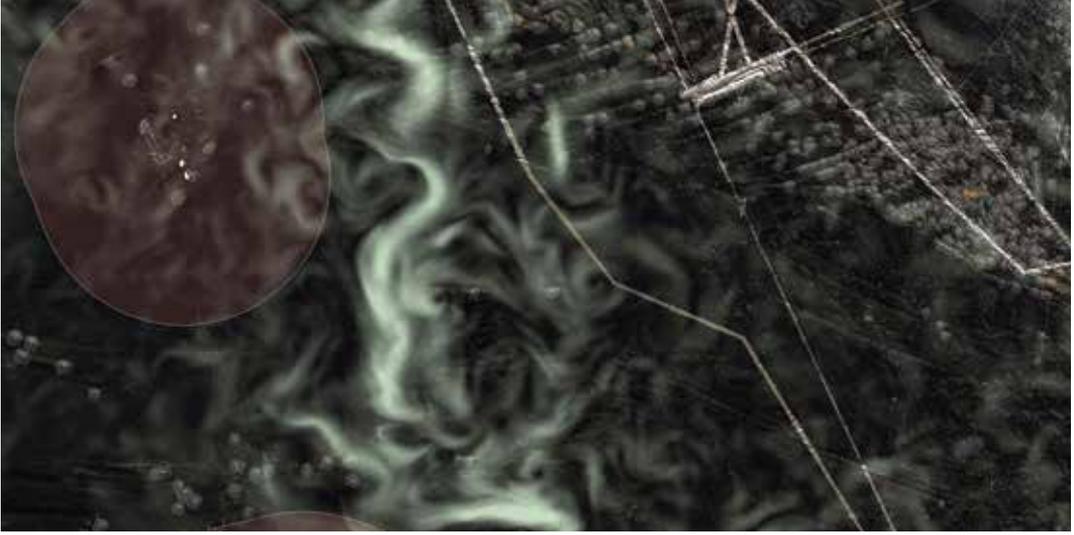
where the gaps between different knowledge components, areas with no data and areas with contradictory and ambiguous understanding are highlighted and brought to the forefront. The dynamic compositions of Earth System science data offer in this sense no overview, rather a multiplicity of areas of research, each one attempting to find more focus and calibration.

On the other side we have the complex unfolding of world-systems analysis, the long-term forms of coherence of human societies, with an emphasis on datasets and narratives that unfold the complex ways in which we are starting to exit the modern world-views of globalization and the long echo of imperialism and the subjugation of nature to extractivist practices.

Oceans in Transformation proposes an innovative viewpoint on the transformation processes that

are shaping contemporary societies and the territorial narratives that underpin them. By investigating through complex spatial and environmental images the material character of the spaces that specific polities inhabit, *Oceans in Transformation* indicates the magnitude of contemporary human activity. It indicates the coherence of long-term forms of inhabitation practices, as they unfold in time and across space, often shaping quasi-stable levels of coherence with dimensions that are interacting with the cycles of the Earth.

With *Oceans in Transformation*, Territorial Agency has developed an active way to engage and inquire into the knowledge systems of Earth System and world-system analysis, that rarely connect. There is a world beside each one of them, with interlocking elements of insight, and interwoven transformation processes that range from acidification of



Indian Gyre, with the Antarctic Circumpolar Current, marine protected areas, areas of deep-sea mining exploration, maritime traffic data.



Equatorial Pacific, with the Clarion-Clipperton areas for deep sea mining exploration, maritime shipping routes.

the seas to depletion of forests in native lands, from overfishing to ocean warming, from intensified use of natural resources in coastal areas to sea level rise, from the destruction of the cryosphere to loss of languages. As the world ocean is transforming, its vast, interconnected waters indicate that the ways of sensing them are plural. Over the last decades a wide range of new measurements and observations have increased the knowledge of the changing ocean and have also multiplied the number of different agents operating with them. *Oceans in Transformation* allows inquiry into both systems, and drawing up each one into the other's unfolding.

Territorial Agency's work focuses on the integration of science, architecture, and art in the challenges posed by climate change. The work of Territorial Agency is grounded in extensive spatial and territorial analysis through remote sensing technologies. Its focus is on complex representations of the transformations of the physical structures of contemporary inhabited territories. Through its work Territorial Agency engages different polities to re-evaluate the relations to the complex material, energy, and information fluxes that mark contemporary territories.



Territorial Agency: *Oceans in Transformation*, Ocean Space, Venice, Italy, 2021

Oceans in Transformation is a research project by Territorial Agency—John Palmesino and Ann-Sofi Rönnskog, commissioned by TBA21—Academy.

<https://u.aec.at/9A2534D0>



Territorial Agency—John Palmesino and Ann-Sofi Rönnskog (INT). Territorial Agency is a London-based independent organization that combines contemporary architecture, science, art, advocacy, and action, based on comprehensive spatial analysis and the formation of new settings for public diplomacy. Recent projects include *Oceans in Transformation* commissioned by TBA21—Academy, in collaboration with ZKM Critical Zones and Taipei Biennial 20; *Museum of Oil* with Greenpeace, ZKM Reset Modernity and Chicago Architecture Biennial; *Anthropocene Observatory* with Armin Linke and Anselm Franke at HKW Haus der Kulturen der Welt Berlin, BAK Utrecht and in the collection of Centraal Museum Utrecht;

Plan the Planet with AA Architectural Association supported by Graham Foundation; *North anon in Kiruna Forever* at ArkDes; the Museum of Infrastructural Unconscious; and the integrated plan for the Zuiderzee region, *Unfinishable Markermeer*. John Palmesino (ITA) and Ann-Sofi Rönnskog (FIN) teach at the AA Architectural Association School of Architecture, London.

Remix el Barrio, Food Waste Biomaterial Makers

Anastasia Pistofidou, Marion Real and The Remixers
at Fab Lab Barcelona, IaaC



Fab Lab Barcelona

KOFI: Making paper and packaging from coffee husks, by Dihue Miguens Ortiz

Over the last 30 years, plastic production has increased by 620%.

In Catalonia alone, every day, 720,000 kg of food is thrown away. This wasted food, totaling 260,000 tons per year, is equivalent to the food needs of 500,000 people for one year. *Remix el Barrio* was born with the ambition to propose a learning space to encourage and nurture new practices based on food-waste crafts. It is the result of a pilot program where various designers learn about biomaterial design and explore projects with food scraps using artisanal techniques and digital fabrication. *Remix El Barrio* was created in the regenerative district of Poble Nou, more specifically in the ecosystem of Fab Lab Barcelona, where designers united to co-produce new forms of crafts from their individual aspirations, benefitting from regular peer-learning sessions, access to machines and tools, and learning from the maker open source

culture present all over the place. Each designer has initiated a creative design driven material innovation approach where they identify a recurrent local food waste case, learn about its characteristics, investigate how to best collect and process it, and imagine future applications and material life-cycle narratives.

Guided and mentored by experts from the field at Fab Lab Barcelona, experimented with different recipes for making materials with appropriate flexibility, strength, and esthetics, and tested diverse fabrication techniques, from molding to extrusion, laser cutting, CNC milling, and 3D printing. Each project could have entered into an iterative loop of prototyping, fed by intrinsic people creativity and interactions with peers, lab gurus, external experts, local providers, and future users. This resulted in a strong diversity of projects with outstanding circular narratives, materials, products, and services:



EN(DES)USO: A poetic approach to materialities using eggshells and yerba mate for design artefacts, by Lara Campos

- **KOFI:** Making paper and packaging from coffee husks, by Dihue Miguens Ortiz
- **RE-OLIVAR:** Creating design objects such as lamps, chairs, and tiles from olive pits, by Silvana Catazine y Josean Vilar of Naifactory
- **EN(DES)USO:** A poetic approach to materialities using eggshells and yerba mate for design artefacts, by Lara Campos
- **SQUEEZE THE ORANGE:** A jacket made of vegan fruit leather based on orange peel, by Elisenda Jaquemot, Susana Jurado Gavino y Nuria Bonet Roca
- **COLORES,** Empowering natural dyes from avocado pits, by Giorgia Filippelli
- **DULCE DE PIEL,** Making Soaps from used oils, by Clara Davis
- **ORGANIC MATTER,** Designing a platform about regenerative circular design, by Laura Freixas
- **LOOK MA NO HANDS,** 3D printing cookies from fruit peel and skins, by Secil Asfar
- **CIRCULAR GOS,** Making snacks for pets from restaurant food leftovers with environmental awareness, by Arleny Medina of Leka Restaurant
- **BIOPANTONE,** a collaborative artwork of nature's color palette with natural dyes, by Anastasia Pistofidou and Fabricademy alumni 2019.

Beyond the pilot, *Remix* has transformed into a collective that experiences circularity, not only by creating materials with local food leftovers but also by exploring collaboration, inclusiveness, and self-management towards shared knowledge with local actors and global outreach.

The Remixers' leitmotiv:

“We are exploring new practices to stop wasting our time and our resources and act at a local scale to foster more social circular practices. We collaborate and involve local agents from the neighborhood such as restaurants, urban gardens, and neighborhood associations, to promote a local circular economy ecosystem. We affirm the potential of co-design, digital manufacturing, and crafts to reinvent our ways of producing, consuming, and living with awareness of the environmental ecosystem. We claim the need to imagine new models and techniques to innovate with what we com-

monly call ‘waste’. We value innovative and artistic practices as a motor for social change. We are convinced that living shared design experiences can facilitate the empowerment of territories to implement a circular economy.”

IaaC, Fab Lab Barcelona, Anastasia Pistofidou, Arleny Medina, Clara Davis, Dihue Miguens, Elisenda Jaquemot, Giorgia Filipellini, Joseán Vilar, Lara Campos, Laura Freixas, Marion Real, Milena Juarez Calvo, Nuria Bonet Roca, Secil Asfar, Silvana Catazine, Susana Jurado Gavino, Siscode partners, local agents from Poblenou and Barcelona.

Remix El Barrio is part of the *SISCODE* project that has received funding from the European Union’s Horizon 2020 Research and Innovation under grant agreement programme n°788217.



<https://u.aec.at/A0763D75>



SQUEEZE THE ORANGE: A jacket made of vegan fruit leather based on orange peel, by Elisenda Jaquemot, Susana Jurado Gavino y Nuria Bonet Roca



RE-OLIVAR: Creating design objects such as lamps, chairs, and tiles from olive pits, by Silvana Catazine y Josean Vilar of Naifactory



BIOPANTONE, a collaborative artwork of nature's color palette with natural dyes, by Anastasia Pistofidou and Fabricademy alumni 2019.



Fab Lab Barcelona
Betiana Pavon



COLORES, Empowering natural dyes from avocado pits, by Giorgia Filippelli



Giorgia Filippelli
Anastasia Pistofidou

Iaac Fab Lab Barcelona is an innovation center rethinking the way we live, work, and play in cities. It is part of the Institute for Advanced Architecture of Catalonia. The institution supports contemporary educational and research programs related to the multiple scales of the human habitat. Fab Lab Barcelona is also the headquarters of the global coordination of the Fab Academy program in collaboration with the Fab Foundation and the MIT's Center for Bits and Atoms. Anastasia Pistofidou is a digital fabrication expert, wearables and e-textile practitioner, biomaterial maker, and educator. She incubated the Remixers in the technical and conceptual development of their biomaterial projects. She is the cofounder of FabTextiles experimental open source research lab and the cofounder of Fabricademy, Textile and Technology Academy. She also works as a content curator for FabFoundation. Marion Real is a systemic design researcher exploring co-creation processes in the territorial transformations toward circular economies and cosmopolitan localism. She is currently working at Fab Lab Barcelona where she has coordinated the 10 pilots in the *SISCODE* project, including *Remix El Barrio*. She is also associate researcher at Estia, Chaire Bali and Centre for Circular Design. The Remixers collective has emerged as a group incubated in Iaac Fab Lab Barcelona within the *SISCODE* EU project pilot. They experience the value of co-creation and open knowledge and formed a group of like-minded individuals who defend sustainability, cooperativism, shared infrastructures, and circular glocalism. They wish to further collaborate in establishing a space to experiment with local food waste and biofabrication with a goal to connect with local services, activate circularity, and scale up by collaborating with open-minded and visionary industries.

A Lighter Delicacy

Sorawut Kittibanthorn



A project that seeks to highlight the inefficiencies of our current food system, from its production methods to the way ingredients are being consumed. Over 2.3 million tons of feather waste are produced annually from poultry production in the EU. Traditionally, this feather waste is disposed of either through landfill or incineration. Massive waste streams have affected the planet and food industry, which needs to be refined and improved so that supply chains are more sustainable.

This project proposes an alternative way to manage feather waste from slaughterhouses by converting its nutrient composition into a new edible product. Chemically, chicken feathers are composed of approximately 91% protein (keratin), which contains up to eight types of the essential amino acids that we require as part of a healthy diet. It has been proved that keratin protein from feathers is safe for general consumption in our daily diet.

Chicken feathers could therefore be turned into a new delicacy that replicates the quality and aesthetics of high-quality food and is also a tender texture creation with a unique structure in food. The structure was constructed with non-animal products similar to a vegan meat-making technique. Consequently, all the ingredients and selected food binders could finally form a structure that gives this feather meat both firmness and flexibility. Under these circumstances, the physical and chemical aspects of the making result in a melt-in-the-mouth texture for an alternative meat eating experience. This new eating experience will trick our sensory perception of food into enjoying this healthier meat cut more.

I believe that if we are to continue rearing and slaughtering millions of birds daily, then at the very least we have a responsibility to ensure that we safely and sustainably make use of every part of them.



Photography: Pichaya Sampanvejsobha,
Varinthorn Deprasertwong
Videography: Prod Bangkok Co.,Ltd.

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Kieren Jones, Course leader, MA Material Futures,
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Central Saint Martins
Dr. Keshavan Niranjana, Food scientist, Reading
University
Penpun Tasaso, Scientist, Mahidol University
Manida Jakrapong, Scientist, Mahidol University

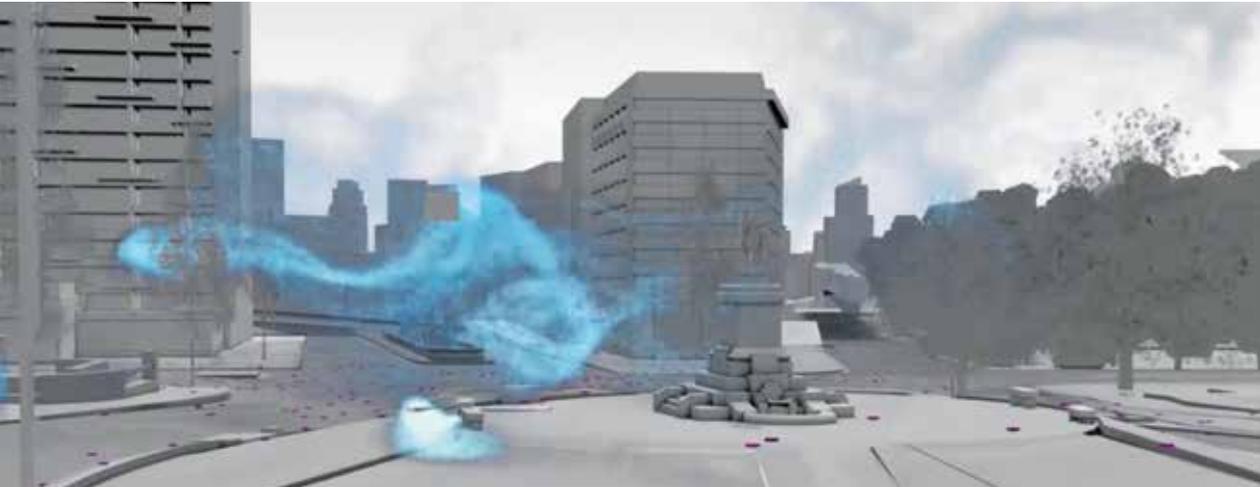
<https://u.aec.at/172CD4DA>



Sorawut Kittibanthorn (TH) is a material designer who is interested in applying science to investigate the physical and chemical transformation of materials that occur in food crafting processes. Exploring natural resources is a means of creating a closed-loop system with a zero-waste policy. Additionally, the bottom-up design approach with living materials is a key feature of the design work in order to enhance sustainable activities and encourage the potential usage of such designs in the real world.

Cloud Studies

Forensic Architecture



Still from *Tear Gas in Plaza de la Dignidad, 2020* (Cloud Studies, 2020)

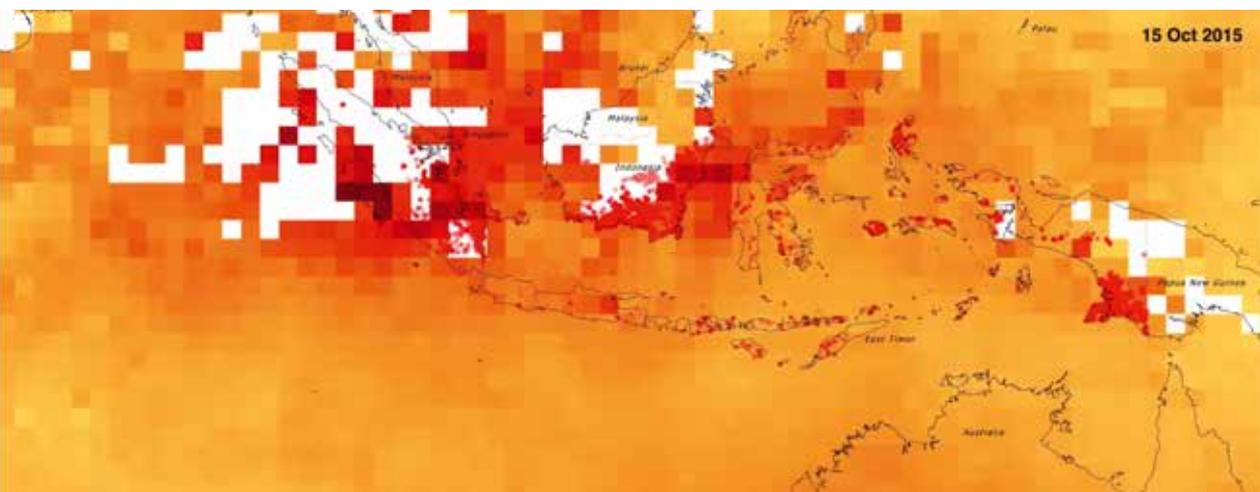
Forensic Architecture

Across the world, tear gas is deployed to disperse bodies gathering in democratic protest, white phosphorus and chlorine gas spread terror in cities under siege, aerial herbicides destroy arable land and ruin livelihoods, and large-scale arson eradicates forests for industrial plantations. Mobilized by state and corporate powers, toxic clouds colonize the air we breathe across different scales and durations, from city squares to continents, unique incidents to epochal latencies.

In the recent history of human rights, incidents of violence have been understood as momentary and kinetic: a gunshot or explosion, where “every contact leaves a trace.” But contemporary airborne violence requires a different approach: clouds are transformative entities—their dynamics elusive and nonlinear; causality is hard to demonstrate, the ‘contact’ and the ‘trace’ drift apart, carried away by winds or ocean currents. Around these toxic fogs, contemporary political conditions breed doubt and lethal skepticism, and physical clouds

become epistemological. When figures in power deny the realities of climate change or chemical attacks, those forced to inhabit the clouds must find new forms of resistance.

This work brings together eight recent investigations by Forensic Architecture, each examining different types of toxic clouds and the capacity of states and corporations to occupy airspace and create unliveable atmospheres. Combining digital modelling, machine learning, fluid dynamics, and mathematical simulation in the context of active casework, it serves as a platform for new human rights research practices directed at those increasingly prevalent modes of ‘cloud-based,’ airborne violence. Following a year marked by environmental catastrophe, a global pandemic, political protest, and an ongoing migrant crisis, *Cloud Studies* offers a new framework for considering the connectedness of global atmospheres, the porousness of state borders and what Achille Mbembe terms ‘the universal right to breathe.’



Still from *Ecocide in Indonesia*, 2017 (Cloud Studies, 2020)

Forensic Architecture

Forensic Architecture Team:

Principal Investigator: Eyal Weizman

Researcher in Charge: Samaneh Moafi

Team: Robert Trafford, Martyna Marciniak,

Lola Conte, Lachlan Kermode, Mark Nieto,

Leigh Brown, Sarah Nankivell, Christina Varvia,

Amy Cheung, Shourideh C. Molavi.

Originally commissioned by ZKM Center for Art and Media in Karlsruhe.

<https://u.aec.at/88E117EF>



Forensic Architecture (FA) (INT) is a research agency at Goldsmiths, University of London, investigating human rights violations by states and corporations using pioneering techniques in the fields of spatial analysis, open source investigation, modeling, and immersive technologies. FA works in partnership with institutions across civil society, from grassroots activists and legal teams to NGOs and media organizations, to carry out investigations with and on behalf of communities and individuals affected by conflict, police brutality, border regimes, and environmental violence.

Data Garden

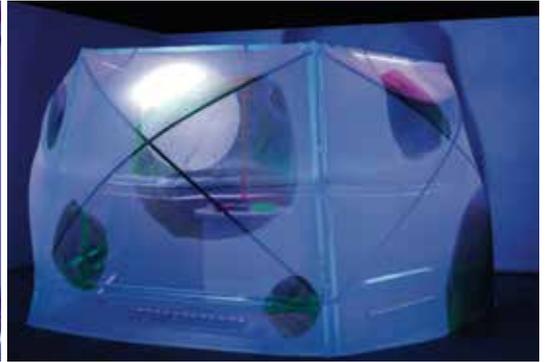
Grow Your Own Cloud



Data Garden is an organism-based data center. This functional carbon negative data infrastructure is capable of storing and retrieving data from the DNA of plants. In stark contrast to the carbon emitting data cloud, *Data Garden* works with data in nature's way, storing data in plant DNA, within organisms that create their own energy. It uses Nanopore sequencers to retrieve data from the plants' DNA in almost real-time.

The project offers a vision of a world in which design is a collaboration between species, ecosystems, and technologies. As an interactive piece, developed for SXSW, it brings the public into contact with advanced biotechnology as well as critical issues of 'Data Warming' (a term coined by GYOC to describe the link between carbon emissions and data storage), genetic modification, and synthetic biology. These are presented through visualizations and a series of posters that accompany the installation.

Developed by Grow Your Own Cloud and scientist Jeff Nivala, principal researcher at MISL, University of Washington, the installation features tobacco plants and Arabidopsis encoded with curated data related to Data Warming using in vivo DNA data storage techniques. The encoding process involved converting computational data such as JPEGs and MP3s into DNA, using ATCG rather than binary. In order to retrieve the data, samples from the plants are taken to obtain droplets of liquid DNA, which are decoded using a nanopore sequencer. Decoded read-outs are then fed into TouchDesigner via Python, revealing the data stored within the plants. Working with nature to respond to the threat of Data Warming, *Data Garden* invites visitors to experience a new materiality around data, and explore a world in which data storage is truly green. This type of organism-based data centre is designed to inspire new models that bring principles of working with nature to data, creating regenerative data ecosystems.



Created by: Cyrus Clarke, Monika Seyfried,
and Jeff Nivala
Architects: (ab)Normal
Graphic Design: Kuba Bogacki, Krzysztof Seyfried,
Olek Znosko
With support from: Unlisted Projects (US), The Museum
of Human Achievement (US), Statens Kunstfond (DK),
Roskilde Festival (DK), Catch (DK), and The Singer
Foundation (US).

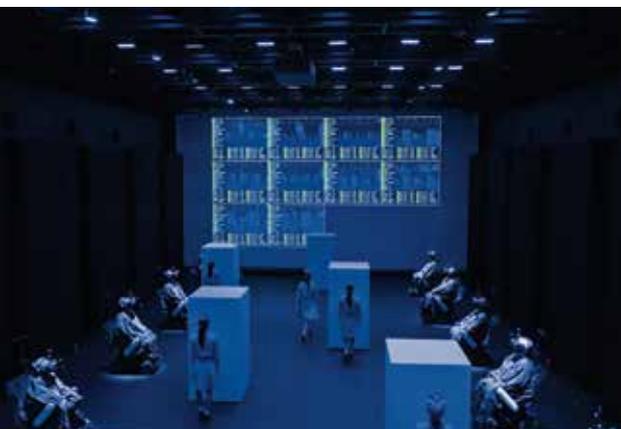
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Grow Your Own Cloud (GYOC) explores alternative relationships with nature and technology through collaboration between the arts and science. By storing data in nature's way, in the DNA of plants, GYOC creates carbon absorbing data storage. Initiated by **Monika Seyfried** (PL) and **Cyrus Clarke** (UK), the research investigates data, living systems, and planetary issues such as 'Data Warming.' GYOC works with scientist **Jeff Nivala** (US) to re-imagine the cloud as a space for symbiosis between humans and other organisms. GYOC has been exhibited at SXSW, Primer NYC, and BIO26. They contributed to the agenda of the UN Climate Summit, COP25, and WEF Davos. In 2020 they were awarded the Ginkgo Creative Residency.

ELEVENPLAY x Rhizomatiks “border 2021”

MIKIKO, ELEVENPLAY, Daito Manabe, Motoi Ishibashi,
Rhizomatiks, Takayuki Fujimoto, evala



The dance company, ELEVENPLAY, the director-choreographer, MIKIKO, and the collective led by Daito Manabe and Motoi Ishibashi, Rhizomatiks, presented a dance piece *border* in 2015. We developed and updated our experiment of 2015 to establish a new expression model for both online and on-site experience for the post-COVID-19 era. Five years after the premiere, with *border 2021* the latest version has been made. *border 2021* challenges the ‘evolution’ of experience and expression.

From *border* to *border 2021*

After the premiere of *border* at Spiral Hall in Tokyo in 2015, the updated version was presented at the Yamaguchi Center for Arts and Media [YCAM]. *border* is a work that transforms the border of the virtual and the real world. The audience sit in a WHILL (by WHILL Inc.) personal mobility device and their movements are completely controlled by the program. They also wear a Virtual Reality headset display to move back and forth between the fictional world of VR/AR and the real world brought back by the dancers to confuse various boundaries. In 2015, there were no products or services yet, and we had to make our own devices. However, in the past few years, VR devices with higher resolution have become available and it is getting more immersive and realistic. The quality of both visual and sound in the 2021 version has been improved by making the most of these innovations with newly added choreography and direction.

The emergence of online viewing models

In addition to the on-site experience, online streaming was available to establish a new expression model of post COVID-19 times. In the online viewing, viewers can select the viewpoint from multiple perspectives, which were specialized for online viewing that cannot be seen at the venue, such as a bird’s eye view of the entire venue and the control screen of the controlling software.

Agency for Cultural Affairs Visual Industry Promotion Organization (VIPO)

ELEVENPLAY: MIKIKO, SAYA, MARU, NANAKO, YU, MAI, KAORI, emmy, TOMO, MIKU, MAYU, Yoko Shiraiwa

Rhizomatiks: Daito Manabe, Motoi Ishibashi, Yuya Hanai, Satoshi Horii, Futa Kera, Katsuhiko Harada, Hideaki Tai, Toshitaka Mochizuki, Kyohei Mouri, Saki Ishikawa, Momoko Nishimoto, Naoki Ishizuka, Muryo Homma, Shintaro Kamijo, Hiroyasu Kimura, Kaori Fujii, Miku Maruno, Hirofumi Tsukamoto, Tatsuya Takemasa, Takahito Hosono, Momoko Aoyagi, Kahori Takemura, Takao Inoue

evala, Takayuki Fujimoto, mountposition, Kentaro Mito, So Ozaki, Kazuya Kushimoto, Ikumi Ijiri, Jiro Kubo, Kinya Takayanagi, 2bit, Kosaku Namikawa, Shino Higuchi, 1 inc, Crescent, Yae-pon, Gnzo, TOW

<https://u.aec.at/84E0EDC2>



Rhizomatiks (JP) is a Japanese artist group led by **Daito Manabe** (JP) and **Motoi Ishibashi**. Rhizomatiks mainly takes up projects focusing on the field of research and development and focuses on opening a new expression for the future. **ELEVENPLAY** (JP) is a dance company directed by choreographer & art director, **MIKIKO** (JP). ELEVENPLAY was founded by MIKIKO in 2009 and is composed of female dancers from a variety of genres. ELEVENPLAY’s methods of expression are diverse, including stages, video works, and still photos. **Takayuki Fujimoto** (JP) a.k.a. Kinsei is a director and lighting designer. Kinsei began participating in projects of the performance art group Dumb Type in 1987. He also founded his own company, Kinsei R&D, in 2015. **evala** (JP) is a musician and sound artist. Presents works of leading-edge electronic music and has concerts and installations in Japan and abroad.

mEat me

Theresa Schubert

Many thinkers of posthumanism stress a non-human-centered perspective on the world, that we should assume a more modest role in our dealings with nature and stop hierarchizing species. Theresa Schubert draws a radical consequence: if we treat humans the same as we treat animals, we should also be material and food. In her artistic research project and performance *mEat me*, Schubert demonstrates this provocative scenario as an alternative reality. With consequent fearless exploitation of her body, she creates aesthetic experiences beyond human exceptionalism. Making the human vulnerable can also be understood as a strategy for raising awareness of biopolitical issues and a more conscious dealing with nature and its living beings at large. It's also a critique of the ethical image presented by the cultured meat industry and how this idea per se is not solving environmental problems.

In the context of an atmospheric-intense performance consisting of video projections and spatial sound, *mEat me* shows the human meat-growing process and the consumption of her own flesh. The artificially developed corporeality of her own flesh engages in a dialogue with a voice generated by machine learning models. The exchanged information defines a level of abstraction which mirrors our disconnection regarding food supply. Schubert

turns herself into a material and resource, breaking the societal taboo of cannibalism by misusing technology that was invented with the intention of capitalizing on it.

As an artistic research project, *mEat me* applies innovative biotechnological advancement beyond a scientific purpose or monetary intent. For the lab process, a serum, gained out of her own blood, was used to reproduce her muscle cells that had previously been extracted. The resulting cultured human meat shifts normative borders and dissolves the consumerist hierarchy between humans and animals. It engages with the urgent topic of food supply in times of meat mass production and its relevance not only for our consciousness but our planet.

Text: Theresa Schubert / Helene Bosecker

Production: Kapelica Gallery / Kersnikova Institute

Sound design and AI: Moisés Horta Valenzuela

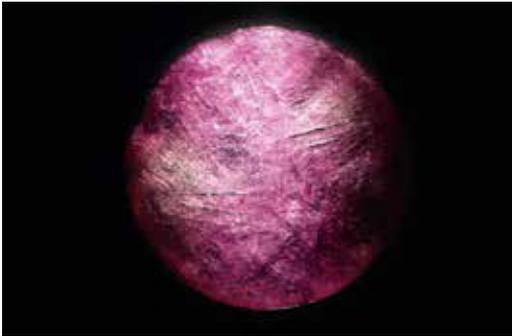
Scientific Partners: EDUCELL laboratories (Dr. Ariana Barlic), BioTehna (Dr. Kristian Talec), Jožef Stefan Institute (Department for Nanostructured Materials Slovenia)

Supported by: Bauhaus-Universität Weimar, Kapelica Gallery



<https://u.aec.at/0F1FAF5F>





Tina Lagler, Kapelica Gallery Archive



Margherita Pevere

Theresa Schubert (DE) is a Berlin-based artist exploring unconventional visions of nature, technology, and the self. Her work combines audiovisual and biomedicine with conceptual and immersive installations or performances. By means of interdisciplinary methods such as biohacking, theoretical analysis, performative interpretation, and material experimentation, her works question the relation of humans to their environment and the evolution of matter and meaning beyond the Anthropos. More recently, she has worked with UHD video environments and 3D Laser Scanning to challenge modes of perception and question the human-machine-nature relationship in hypertechnical societies.

On View

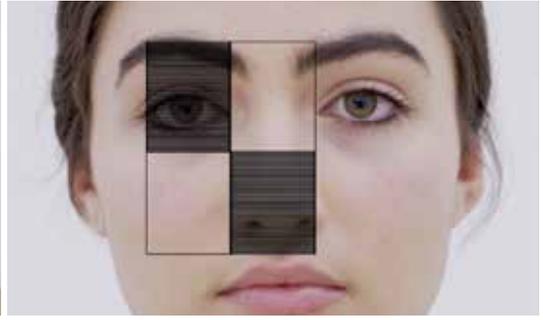
Ania Catherine, Dejha Ti



Djeneba Aduayom

Ania Catherine and Dejha Ti's seminal interactive performance installation *On View* (2019), commissioned by the SCAD Museum of Art, examines the generational desire to be the subject of an art experience and that phenomenon's relationship to addictive interfaces, surveillance capitalism, and data privacy in modern society. Equally a socio-political critique and an experiment in art and technology, *On View* offers audience-participants a way into the critical conversation on the digital architectures we inhabit, illuminating the underlying forces shaping our everyday realities through experiential art. Tech literacy is imperative—especially as technology becomes increasingly invisible. The artists harness their fleshy approach to human-computer interaction and immersive art to create a world that speaks to feeling states—

eliciting dimensions of knowing that imprints a physical memory. *On View* manifests as mixed reality, allowing audience-participants to interact with a virtual world with no virtual layer as they move through the installation's three spaces: Terms & Condition, Stages Gallery, Golden Gallery. While the installation appears to be non-digital, it relies on a ubiquitous network of technology, using TouchDesigner as a mainbrain integrating real-time facial recognition (AI subsets: computer vision & machine learning), voice commands, micro-processor devices/objects, environment-embedded sensors, kinetics, and guest profile generation. The technology is embedded both conceptually and technically into the backdrop of the experience—a critical nod to the misuse of pervasive computing and IoT. Using hyperbole, the piece demonstrates



Holden-Ramage

how small and frequent choices in our daily lives make us extremely vulnerable—like unknowingly training facial recognition systems or clicking ‘I agree’ to a T&C we never read. *On View* won an ADC Award 2020 for Experiential Design (Digital Experiences/Responsive Environments) and was shortlisted for Lumen Prize 2020 for 3D/interactive.

Artists and technologists: Ania Catherine and Dejha Ti
 Curator: Storm Janse van Rensburg
 Commissioned by SCAD Museum of Art



<https://u.aec.at/A319EBC8>

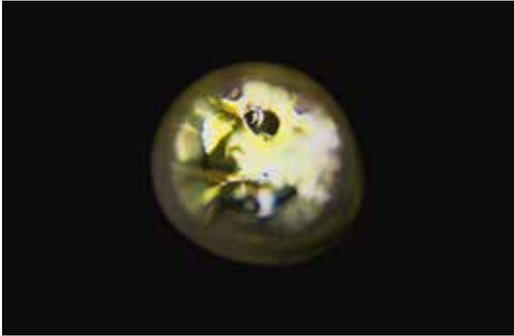


Ania Catherine and Dejha Ti (US) are an LA-based experiential artist duo whose practice merges environments, technology, and performance art. Rooted in the understanding that immersion is not only a physical state but also an emotional one, their approach employs nuance in scale, producing a feeling instead of a spectacle. Their expertise collide—Ti’s extensive background in immersive art and human-computer interaction, and Catherine an established choreographer, performance artist, and gender scholar—in large-scale conceptual works recognizable for their signature poetic approach to technology.

Project Habitate

Yuning Chan, Tom Hartley, Yishan Qin





What if humans can be the medium of nature? What if humans can also provide ecological services? *Project Habitate* is a provocation that challenges the anthropocentric perspective of ecological values and cultivates kinship between human and nonhuman organisms.

We designed a living wearable that enables people to become the hosts for endangered organisms, which in return gives them a sense of companionship and belonging, advocating a new concept of participatory conservation.

The background of the project is ash dieback, a disease that is eradicating the majority of the ash tree population in Europe. Fortunately, the ash won't be gone forever, but the new population will take decades to grow. In the intervening years, hundreds of species of moss, lichen, and fungi that depend on the ash are losing their habitat and risk secondary extinction.

Traditional conservation methods for these unassuming species can't cope with this scale of habitat loss. To thrive and reproduce, the species need a

specialised habitat and access to a diverse population, normally provided by a forest.

Our material mimics the ash tree's bark texture, light level, porosity, and pH and leverages human movement to support guest species' spore dispersal. The wearable provides a temporary home for these tiny species and allows us to play an active role in maintaining biodiversity and breaking the cycle of conservation and destruction by creating a pattern of human-nature coexistence.

In an era of social distancing, this living wearable can be a vibrant indicator of ecological-social connectivity, reminding us that no species is an island.

Artists: Yuning Chan, Yishan Qin, Tom Hartley
With support from: Royal College of Art, Imperial College London, The James Hutton Institute, Robert Koch Institute, The Millennium Wood



<https://u.aec.at/9B0B8BA2>



Yuning Chan (CN) comes from an environmental science background and has always been driven by working with nature. She sees design as a powerful tool to influence how people perceive and interact with their environment. She is very much inspired by kin-centric ecology and flat ontology. Her main interest lies in using design fiction to expand imaginations of human-nature coexistences. **Tom Hartley** (GB) is an innovation designer with a drive to tackle complex issues in meaningful and creative ways. His background in Electronic and Information Engineering has lent

him deep understanding of the technologies that underpin our lives. This is complemented by a keen familiarity with the design process, gained during his masters degree at the Royal College of Art. **Yishan Qin** (CN). Starting with product design in her bachelor's degree, Yishan then dived into Innovation Design Engineering at the Royal College of Art and Imperial College London. At the same time, she has been pursuing her exploration of UX design and fine art. Yishan really enjoys merging insights from scientific contexts into creative solutions with a can-do mind and curiosity.

The Growing Pavilion

Company New Heroes / Biobased Creations



The Growing Pavilion is an ode to biobased materials. It stands as a necessary and viable solution for reducing the rising impacts of climate change and the use of fossil resources. We show the possibilities and the new aesthetic of biobased materials to trigger a turnaround in thinking and acting. By combining research and art, we brought our vision to life.

The pavilion is made up of five grown core raw materials: wood, residual flows from the agricultural sector, mycelium, bulrush, and cotton. With every material we use, we show the natural raw material as much as possible. We use them in a way to emphasize their own, distinctive identity. In this way, the pavilion acquires a unique, organic texture, color, and experience. Besides showing the beauty and strength in the construction of the pavilion itself, we fill the interior of the pavilion with grown design objects to show how beautiful biobased furniture, lamps, cabinets, and other objects are.

The Growing Pavilion was built on many years of research. We have documented and showcased our research process in different ways, aiming for full transparency. For example, in the *Materials Atlas*, we share the collection of all materials found

and used. Through this, we want to show how far we can currently go, with the ambition to reach fully biobased creations. But also what the near future will bring. However, it takes more than good materials to make large-scale applications possible. Think of sufficient raw materials, appropriate regulations, innovative designers, and open minded consumers. With *The Growing Pavilion* we also put this conversation on the agenda and facilitate this conversation, because this is essential to achieve the desired change in thinking and doing. *The Growing Pavilion* could be visited in the beating heart of Dutch Design Week 2019. More than 75,000 people—professionals and daily visitors—visited the pavilion there already.

Design: Pascal Leboucq, Biobased Creations / Company New Heroes

Concept: Pascal Leboucq, Lucas De Man, Biobased Creations / Company New Heroes; Eric Klarenbeek, Klarenbeek & Dros



<https://u.aec.at/3F1140F9>



Company New Heroes / Biobased Creations. In 2019 Creative Company New Heroes started Biobased Creations to inspire and activate both professionals and the general public through imagination and storytelling about the possibilities, benefits, and beauty of biobased materials. With our installations and stories we want to contribute to the transition to a biobased economy. We stimulate the demand for materials by making people more aware of the quality of biobased materials. We offer designers a platform and stimulate further development to improve the range of biobased materials. *The Growing Pavilion* was our first major project.

The Living Light

Nova Innova



There is a ground-breaking technology, called Microbial Fuel Cell (MFC) technology. This technology enables us to generate energy from organic waste: from compost to mud, from urine to plants. All organic waste streams are turned into sustainable energy sources thanks to this innovative technology.

MFC technology was included in the European Commission's '100 radical innovation breakthroughs for the future' report in 2019, acknowledging the importance of the development of this sustainable technology. The *Living Light* project is there to give this promising technology the attention it deserves and is the living proof that this technology can already provide us with enough energy to design practical applications.

Up until now MFC technology has been investigated in laboratories all over the world but attempts to implement this promising technology in the real world have been limited. The *Living Light* indoor design lamp and the outdoor park modules are the first light applications making use of this technology to provide you with energy. Microbial Fuel Cells for the *Living Light* collaborate with the naturally occurring microbes in the soil to generate energy. MFC technology is comparable with the solar cell of twenty years ago, standing on the brink of becoming a welcome contribution to the renewable energy mix. *The Living Light* is there to inspire others to develop this technology to the fullest and to tell the story of MFC technology in a magical way.

Before the *Living Light* project, people were skeptical about the use of this sustainable energy source for practical applications. Now our 'Park of Tomorrow'—the *Living Light* Park—and our indoor *Living Light* lamps are the first global example that we can already use this promising technology to light up houses and parks. We want to make sure that the *Living Light* project is just the beginning of this impactful technology to change our energy systems and the way we think about and take care of nature.

With the *Living Light* project we collaborate across industries: design, science, and biology are being combined in order to create the *Living Light*. Credits go to our scientific partner Plant-e, who developed the microbial fuel cell over the past ten years. Credits go to the Nova Innova team who turned the *Living Light* lamp into a practical and powerful storytelling object: softly stroking the leaves transforms this ordinary plant into a *Living Light*. If you provide the plant of the *Living Light* design lamp with love, you receive love from the plant in terms of light. Credits go to our early adopters who are there to advise, guide and support us, even when working on an innovation that combines design, nature, and science becomes quite challenging. Credits go to all the professionals and individuals who believe as much in this circular way of creating energy as we do.



<https://u.aec.at/B8EB3907>

Nova Innova (NL) is a creative start-up based in Rotterdam that combines nature, science, and design to generate crucial, sustainable breakthroughs. There are many interesting things happening in laboratories all over the world, which remain invisible to the general public. The team of Nova Innova aims to bridge the gap between science and everyday life, by developing sustainable applications in the shape of a powerful design. Nova Innova's aim is to inspire others by their collaboration with nature, and to develop important technologies that contribute to clean and sustainable water, air and energy systems with their practical applications.

The Tides Within Us

Marshmallow Laser Feast, Fraunhofer MEVIS , Natan Sinigaglia



A cross-sectoral project centered on utilizing high-end MR research results, *The Tides Within Us* is an ongoing exploration into the world beyond the limits of our senses at the intersection of art, science, and technology. To create this project, Marshmallow Laser Feast (MLF)—one of the world’s leading immersive art collectives—partnered with Fraunhofer Institute for Digital Medicine MEVIS—pioneers in digital transformation of health care. Scientific data sets that peer deep into the human

body formed the starting point of this unique and ambitious collaboration. The Institute’s expertise in digital medicine and the MR-Lab research has enabled MLF to work with medical data acquired from a modern clinical MR-scanner.

The result is a series of stunning interactive screens that allow the audience to explore the human ecosystem, investigating the flow of oxygen through the cardiovascular system, with cutting edge tracking technology—painting a picture of a



human body as a fluid event. This collaboration has opened new ways of seeing and experiencing our bodies. As immersive technology continues to evolve, offering new platforms for experiential and embodied learning, the potential for this collaboration grows too. The ultimate goal of the project is to change the way people learn and think about themselves in relation to the environment. Where does the human body end, and where does it begin?

The work was first presented as part of the new media art exhibition, *Human Nature*, which opened at York Art Gallery in October 2020. In the summer of 2021, *The Tides Within Us* will be presented as part of *Observations on Being*—a series of awe-inspiring immersive audio-visual artworks across Coventry's Charterhouse Heritage Park for the UK's Coventry City of Culture 2021, featuring high-profile collaborations with international experts in the fields of music, nature, science, and technology.

Concept: Marshmallow Laser Feast

Directed by: Barnaby Steel, Ersin Han Ersin, Robin McNicholas

In collaboration with Natan Sinigaglia

Scientific partner: Fraunhofer Institute for Digital Medicine MEVIS

Co-Commissioned by York Mediale, York Museums Trust and Coventry City of Culture 2021



<https://u.aec.at/FF7DFE9D>

Marshmallow Laser Feast (MLF) create immersive experiences, expanding perception and exploring our connection with the natural world. Fusing architectural tools, contemporary imaging techniques, and performance with tactile forms, MLF sculpt spaces that lay dormant until animated by curiosity and exploration. Informed as much by playfulness as research, MLF break the boundaries to worlds beyond our senses. Fraunhofer MEVIS Embedded in a worldwide network of clinical and academic partners, Fraunhofer MEVIS develops real-world software solutions for image and data-supported early detection, diagnosis, and therapy. **Natan Sinigaglia** (IT) is a sound and visual artist based in Varese, Italy. With a strong background in music, contemporary dance, and real-time graphics, he creates canvases where languages lose their boundaries and share forms and meanings.

An Olfactory Biopolitics Nairobi

Coltrane McDowell



An Olfactory Biopolitics Nairobi spans the Netherlands to Kenya, linking these geopolitical locations through the thread of scent. The interaction of scent in public space became a means to examine hidden power structures of inequality, using the case study of my home country, Kenya.

The project gained meaning from numerous collaborations. Interactions with chemists enabled a series of gas chromatograph tests of the atmosphere of Nairobi. Through this experiment I became aware of the illicit industry of alcohol distillation, which acts as a major driver of the informal economy in Kenya. I collaborated with distillers in the community of Mathare to distil essential oils. This culminated in the production of a contraband perfume company that required a steady supply of aromatic materials.

Kenya is a major supplier of flowers to Europe, in

particular to the Netherlands. 2020 was the year the global flower industry was hit hard by the economic impacts of COVID-19. I collaborated with the Tambuzi luxury scented rose farm and set up a distillation site. Over several months I was able to salvage some of the economic losses accrued by the pandemic in the form of valuable rose oil that amounted to 70,000 roses distilled, this was the total amount of roses that would be bound for the Netherlands from the farm in a single day.

Social Design Advisor: Henriette Waal
Chromafrica
Tambuzi Farm
Ghetto Foundation
Mathare Social Justice Centre

<https://u.aec.at/4985405C>



Coltrane McDowell (CA). Designer, artist, and writer, Coltrane McDowell has lived an international life that has informed his ways of seeing places, people, and culture. McDowell's work is preoccupied with context and how the designer's point-of-view can be deconstructed. His projects often take the form of poetic visual stories and are the results of sensitive community engagement. McDowell graduated cum laude from the Social Design course at the Design Academy Eindhoven. McDowell was featured in the Design Indaba Antenna Best Design Graduates of 2020 and nominated for the Gjis Bakker award in Eindhoven. He is currently based in Basel.

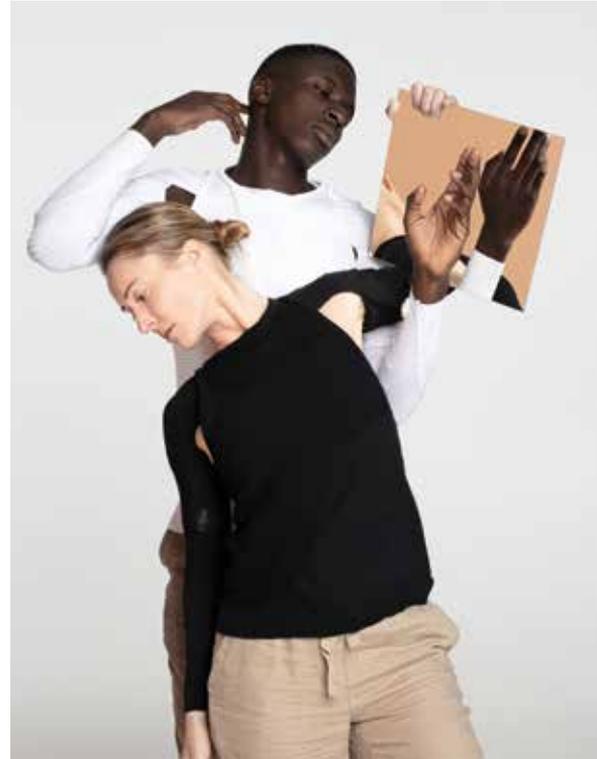
Constructing Connectivity

Jessica Smarsch

Gabriele Mariotti



Constructing Connectivity is a person-centered stroke rehabilitation method that addresses the need to quicken and improve recovery, motivate the patient, and provide connection to support systems. It combines 1) a comfortable shirt that captures body movement and 2) an app that inspires creativity, interprets data into visual patterns and written reports, quantifies and tracks progress, and connects the patient to the community. The system incorporates environmental and economic sustainability. It recycles and reuses the technological components of the garment and provides a stylish accompanying shirt that can be worn long past rehabilitation. Healthcare costs are reduced when patients return home sooner. The patient's experience is the most important part of *Constructing Connectivity* and this is reflected in the design sensitivity of all its components. The aim is to improve the rehabilitation experience, and therefore improve therapy adherence. The system blends creativity with goal setting and uses rhythmic multi-sensory stimulation to help create more synaptic connections in the brain (Raymond van Ee, et al. *The Journal of Neuroscience*, September 16, 2009 • 29(37):11641–11649).



Lisa Klappe

Concept, design, and direction: Jessica Smarsch
Advisors: Raymond van Ee, PhD, Christel Verboven, PhD
Product development collaborators: Vention Technologies, Metafas, ItoM-Medical, Fraunhofer IZM, Knitwear Lab, POL Studio
Film and sound: Gabriele Mariotti & Salatore Sapienza
Photography: Lisa Klappe
With support from: Re-Fream, Worth Partnership Project, and Wear-Sustain EU grants and MIT Feasibility Study Dutch grant



<https://u.aec.at/9A89640F>



Jessica Smarsch (US) is an internationally recognized designer who collaborates cross-sector to bring beauty, creativity and enhanced user experience to technological, scientific and industrial innovations. She is passionate about systemic and disruptive innovation design that enhances well-being, quality of life, user experience, community connection, and circularity. She is inspired by subject-behavior relationships that create mindful experiences in connection with whole-body health and well-being, and she is motivated by the unique outcomes that unexpected collaborations produce.

Extendable Ears

Sheng-Wen Lo

Audio visual installation, documents

While living with friends, I realized ‘noise’ is subjective: what’s music for me may torture others. Likewise, noise is species-dependent: animals including dogs, cats, bats, and insects can hear ultrasound (> 20 KHz) beyond our hearing perception. However, the fact that we cannot hear ultrasound does not prevent us from producing it: we use appliances, tools, and vehicles—the manufactures of which only measure operation noises in ‘audible’ frequency range.

I wondered—Am I unintentionally producing ultrasound noises that annoy other species?¹ Am I living in ultrasound-rich societies? To find out, I made a wearable device which transforms ultrasound (20~70 KHz) to audible ranges, allowing my ears to register sound frequencies similar to cats.² I

decided to wear this device for one month (24/7),³ feeding ultrasound noise to my ears to see if I would go crazy. Surprisingly, I found myself starting to have bizarre dreams; I recorded them in a diary.

- 1 Sales, G. D., et al. *Laboratory Animals* 22.4 (1988): 369–375.
- 2 Cats can hear higher-pitched sounds than humans (55Hz–79kHz).
- 3 In the Netherlands and Taiwan.

Thanks to Dr. HHF (Bert) Derkx and Dr. Hans Hamburger (consultant physicians), Kees Reedijk (programming and electronics), Mondriaan Fund (NL), Rijksakademie (NL), National Culture and Arts Foundation (TW)



<https://u.aec.at/8FE21A09>



Sheng-Wen Lo



Sheng-Wen Lo (TW) has been investigating the relationships between non-humans and contemporary society, often taking daily experiences as points of departure and playfully engaging with them. As a maker, his practice comprises installations, video games, and escape rooms, as well as still and moving images. He received an MA in Photography from AKV|St.Joost in the Netherlands, and an MSc in Computer Science from the Computer Music Lab at National Taiwan University. Sheng is currently an Artist in Residence at the Rijksakademie (2019-2021) in Amsterdam.

Face Lab

Håkan Lidbo



A series of projects exploring the outer limits of how we use our face as an interpreter of our environment—or for the surroundings to find out what is going on in our minds.

A face analyzing a person's emotions, pixelating your real face in real life, bringing your digital avatar into the physical world, becoming a musical instrument, a hat that helps you keep 1,5 meter distance to others—or faces that block human senses and replace them with non-human super senses.

Face projects by Håkan Lidbo, assisted by Simone Giertz, Farzaneh Farkish, Tiziano Leonardi, Sven Olsson, Magnus Frenning, and Mikael Sjosten.



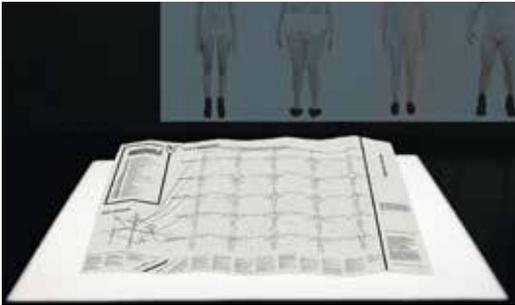
<https://u.aec.at/EC25F207>



Håkan Lidbo (SE) Following a career in electronic music with more than 350 records released, Hakan Lidbo explores new ideas within interactive art, music, robotics, games, urban planning, and design fiction. He is also the founder of Rumtiden Idea Lab in Stockholm Sweden.

Genetics Gym

Adam Peacock



The *Genetics Gym* is an ongoing research project, depicting a calculated fiction of modified bodies, edited with hypothetical new and emerging genetic technologies, allowing in-depth exploration to question how the internet is affecting human behavior. The project, spanning 5 years, is built upon the Darwinian construct that what an evolutionary biologist might term perception of genetic strength, we might term appeal, attraction, or 'sexiness,' now playing out in a vastly complex new media age. The ongoing project is designed to engage varied audiences and perspectives into a multi-layered conversation on the effects of new media today, with emphasis upon queer and marginalized identities, homogenization, and non-binary, observing the link between cognitive perception of genes and visual appeal. The project is built upon Marshall McLuhan's theories on electric circuitry as an extension of the central nervous system, Norbert Wiener's Cybernetic theories, and evolutionary psychology. The initial project outcome was an installation that went on to be toured, exhibited, and published internationally, and has led to Phase II that will take place in Oslo, Norway in summer 2021.

Creative & strategic direction: Adam Peacock
Project management: Fashion Space Gallery Team
Applied psychology consultant: Prof. Carolyn Mair
Genetic technology consultant: Dr. Helen C. O'Neill UCL
Genetic research: Prof. Joyce Harper UCL, Liane Stein, Ashley Campbell
Project assistants: Isabella Branca Gygax, Dian-Jen Lin, Lara Gill, Celia Tang
Makeup artist: Tamara Dickson-Jones
Sound artist: Timothy Wang aka TWANG



<https://u.aec.at/4E3905DC>

John Duff



Adam Peacock (UK) is a London-based artist and designer. Adam's practice exists between architecture, consumer psychology, computer science, fine art and body design and seeks to interrogate the reality of human behaviors today. His work has been recognized with awards including the 2018 Robert Garland Treseder Fellowship at Melbourne School of Design, The University of Melbourne (2018), 2016 Designer in Residence at the Fashion Space Gallery at London College of Fashion (2016–17), and Artist in Residence at the Visible Futures Lab at the School of Visual Arts in NYC (2015–16).

Glacier's Lament

Jiabao Li

Jiabao Li



Glaciers are sentinels of climate change. They are the most visible evidence of global warming today. This series of works embodies the stunning beauty, rapid change, fragility, and magnificence of glaciers. In *Glacier's Lament*, we used data from glacier melting in the past 60 years to compose music and dance with local musicians who have witnessed the recession of the Mendenhall glacier over their lifetimes. We filmed the artists performing the piece on the glacier, in collaboration with the glacier's own sounds. As glaciers are disappearing, the unique blue is also disappearing. The color in the hanging tube was sampled with melted glacier rivers by the artist from glaciers in Alaska. When one glacier calving happens in the world, one tube falls. At the end of the exhibition, all 60 tubes fell, forming a painting on the can-

vas beneath. In *Reflect on Glaciers*, we created a one-day-long installation with mirrors reflecting the glaciers from the river that they disappeared into. As if they were saying: "This was me." Placing the mirror on the glacier, facing the lake: "This is my future." They challenge the audience with the dramatic, irreversible ecological damages from climate change.

Glacier's Lament by Jiabao Li

Dance video: Artist and director: Jiabao Li

Team: Cooper Galvin, Ryan Cortes Perez, Anouk Otsea, Lindsay Clark, James Cheng



<https://u.aec.at/F7AFC96D>



Jiabao Li (CN) works across nature, humans' designed environment, and belief structures and creates works addressing climate change, humane technology, and a just, sustainable future. Her mediums include wearable, robot, AR/VR, projection, performance, and installation. Jiabao's TED Talk reveals how technology frames reality. She is the recipient of numerous awards, including IF, NEA, Fast Company, Core77, and AACYP 30 Under 30. Her work has been exhibited in Ars Electronica, SIGGRAPH, Milan and Dubai Design Week, ISEA, and Donghu Shan Museum. She graduated from Harvard University with Distinction.

In a Small Room

KyungJin Jeong



In a Small Room focuses on two social issues, the first being the problem of poor living conditions in modern metropolitan areas, such as London and Seoul. The demand for housing in large cities, such as London, has greatly increased, but supply has not caught up with demand, a problem that has given rise to a cramped, prison-like residential environment.

The second issue is the dazzling advertising designed to inspire in potential consumers the wish to buy a service. The advertising medium disguises poor living conditions by creating false images to bolster profits. I explore the gap between advertising and reality, producing work intended to have an impact in the real world.

This project uses artificial intelligence, virtual reality, film, a literature review, interviews, and experiments to study how existing images are transformed into visual advertising images. The work has four components: an interactive web application (CycleGAN), films, a VR installation, and a research paper.



Computer scientist: ChanHee Cho
Advisors: Dylan Yamada-Rice, Shelly James, Kevin Walker, Oliver Smith
Special thanks to my father, DoHee Jeong, and mother, YongJa Kim, for all their support



<https://u.aec.at/E02A01DE>



KyungJin Jeong (KR) is a designer, artist, and researcher with an interest in the social concerns people face in daily life. She believes that artists, designers, and researchers can reveal such concerns to the public through their work and offer feasible solutions to them. KyungJin earned a master's degree with distinction in Information Experience Design from the Royal College of Art. She holds dual Bachelor degrees in Media Interaction Design and Convergence Design from Ewha Womans University.

In Event of Moon Disaster

Halsey Burgund, Francesca Panetta



In July 1969, much of the world celebrated the ‘giant leap for mankind’ of the successful moon landing. Fifty years later, nothing is quite so straightforward. *In Event of Moon Disaster* illustrates the possibilities of deepfake technologies by reimagining this seminal event. What if the Apollo 11 mission had gone wrong and the astronauts had not been able to return home? A contingency speech for this possibility was prepared, but never delivered, by President Nixon—until now.

In Event of Moon Disaster invites you into this alternative history and asks us all to consider how new technologies can bend, redirect, and obfuscate the truth around us. The project has a physical installation as well as an online component. The installation version consists of a 1960s American living room set allowing viewers to step back in time to watch the coverage of the Apollo 11 mission live on a vintage TV. The film journeys from blast off all the way to the moon where something goes terribly wrong and Neil Armstrong and Buzz Aldrin are stranded, prompting President Nixon to deliver the elegiac contingency speech to a mourning world.



The website contains both the film and accompanying educational materials as well as a quiz used to evaluate the effectiveness of the awareness campaign.

Directors: Francesca Panetta,
Halsey Burgund
An MIT Center for Advanced
Virtuality production

<https://u.aec.at/FDD20529>



Halsey Burgund (US) is a sound artist and technologist whose work focuses on the combination of modern technologies—from mobile phones to artificial intelligence—with fundamentally human ‘technologies,’ primarily language, music, and the spoken voice. He is the creator of Roundware, the open source contributory audio AR platform, which has been used to create art and educational installations for cultural organizations internationally. Halsey is currently a fellow in the MIT Open Documentary Lab and has formerly held artist research positions in the MIT Media Lab as well as the Smithsonian Institution. **Francesca Panetta** (GB) is an independent artist and storyteller. Formerly,

she was a Creative Director in the MIT Center for Advanced Virtuality. As an immersive artist and journalist, she uses emerging technologies to innovate new forms of storytelling that have social impact. Previous to MIT, she worked at *The Guardian* for over a decade where she pioneered new forms of journalism including interactive features, location-based augmented reality, and most recently virtual reality, where she led *The Guardian*’s in-house VR studio. Her works have won critical acclaim—receiving awards around the world.

Lovewear

Ivan Parati, Emanuela Corti, Witsense

Lovewear is smart underwear that helps people of all abilities to self-explore and enhance their own intimacy and sexuality. *Lovewear* wants to empower the wearer through a tactile experience achieved by soft robotics, through the interaction with a connected 'console' pillow. The wearer can hug, cuddle, caress, press this interface as a surrogate for human contact, or just explore its surface as they would explore their own body, facilitating gestures.

One of the main features of *Lovewear* is the integration of soft robotics, inflatable pockets embedded into the garment. A variety of professionals have been involved at different levels.

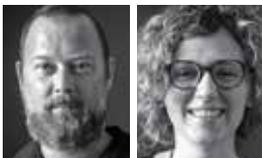
The co-design phase was supported by a psychologist. A questionnaire was prepared, translated into several languages and distributed. Feedback was collected, and some of the participants joined focus groups. The main objective of the collaboration was to understand how people with disabilities perceive and experience sex toys, their view on the use of new technologies in relation to intimacy, pleasure, and sex, and especially to understand the user needs and scenarios.



Thanks to: Thomas Gnahm, Ioana Puscasu, Christian Dils, Max Marwede, Robin Hoske, Valeria Serra, Aesun Kim, Paola Tomasello, Agneszka Psikuta
The project was developed within Re-Fream, a collaborative research project funded by the European Union within the Horizon 2020 program, with the support of Hub Wear It Berlin and Fraunhofer IZM.



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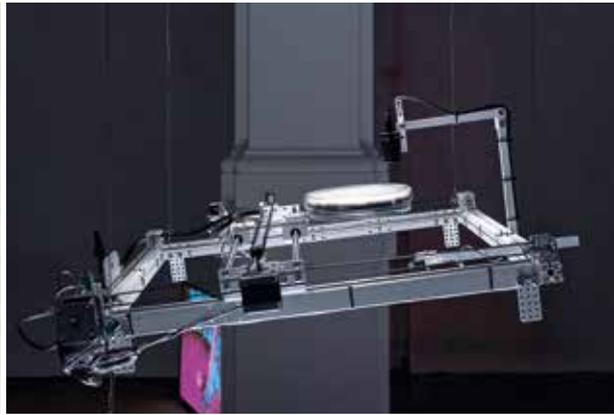
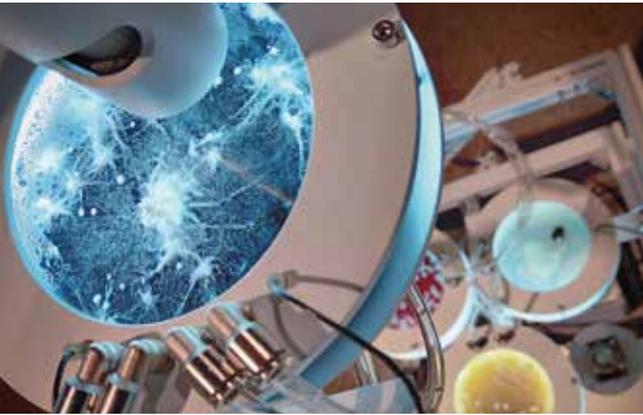


Ivan Parati (IT) is an industrial designer and educator; his research focus on modularity, geometric tessellation, and digital fabrication. His vision on design and innovation is to offer everyone better living conditions, aiming at a cohesive and integrated multicultural society. **Emanuela Corti** (IT) is a researcher, product designer, and educator; her research encourages exploration at the intersection of product design and fashion. She believes in a user-centered approach and sees design as a problem-solving process that has the power to improve lives. In 2017 Emanuela and Ivan co-founded Witsense with Alessia Moltani. They design and manufacture sensible innovative products and

services with high technological content such as sensory objects and tools, design elements to improve the lives of people with or without disabilities and promote social inclusion through the application of developmental, behavioral, and learning methodologies.

MycoMythologies

Saša Spačal



KIBLA Janez Klenovsek

MycoMythologies is a series researching how fungal ontologies could help humans think, learn, and practice multispecies survival through practices of inclusion and caring. As a series of ontogenetic mythological stories and machines it researches the multilayered question of how mushrooms can help humans think about the possibilities of entangled life in capitalist ruins. As a speculative artistic research, *MycoMythologies* thinks not only about how fungal underground networks can inform humans, but also about how technologies define the teachings that humans receive.

The series includes two biotechnological installations: *MycoMythologies: Rupture* and *MycoMythologies: Patterning*, which mark two nodes in the mythological planetary institution of the World Networks Entanglement. The biotechnological installations, together with the accompanying myths, function as storytelling objects, nodes in the World Networks Entanglement, that experience disruptions.

MycoMythologies: Rupture is uttering the need for change erupting in mycocentric networks, a need for different stories and tools that disturb existing looping mythologies.

MycoMythologies: Patterning is an infrastructural node for acceptance of change which braids artist's blood, sweat, and tears into fungal ecology and draws sonified cartographies for the Atlas of Collaborative Contamination.

MycoMythologies: Rupture and Patterning [2020, 2021]

Artist: Saša Spačal

Programming, computer vision: Matic Potočnik

Sound, software design: Pim Boreel

Microbiology: Mirjan Svagelj

Construction: Scenart

Video footage: Tilen Sepič

Mycelium micrographs: Toby Kiers Laboratory [Vrije Universiteit Amsterdam]

Production and support: Projekt Atol, PIF Camp, ACE Kibla, Zone2Source, Ministry of Culture of Republic of Slovenia, Municipality of Ljubljana, Municipality of Maribor, Amsterdams Fonds voor de Kunst [AFK].

MycoMythologies series expresses admiration for the work of Lion's Mane *Hericium erinaceus*, Octavia E. Butler, Oyster mushroom *Pleurotus ostreatus*, and Ursula K. Le Guin.



<https://u.aec.at/68718E72>

Tadey Causevic



Saša Spačal (SI) researches living systems at the intersection of contemporary and sound art. Her work focuses on entanglements of environment-culture continuum and planetary metabolisms by developing interfaces and relations with soil critters. She addresses the posthuman condition which involves mechanical, digital and organic logic within biopolitics and necropolitics. Her works have been exhibited at venues such as Ars Electronica, National Art Museum of China, Perm Museum of Contemporary Art, and Transmediale. Her works have received awards and nominations at Prix Ars Electronica, Japan Media Art Award, Prix Cube, New Technology Art Award, and New Aesthetica Prize.

Para-optic-8

Anastasia Alekhina



In the functional sense, the fingertips of a person are in numerous ways similar to that of the retina. For example, if the visual perception is impaired, a human being begins to develop a sense of vision with their fingers. Thus, based on skin-kinesthetic sensations, compensation for impaired vision is possible. Intuitively, humanity often linked these two perceptual mechanisms together.

In this sense, an interesting example would be the 'Skin-optical perception'—an alternative (kind of?) vision with the aid of the skin of the hands. In the second half of the 20th century in the USSR, a number of works were published in which researchers tried to detect the existence of special light—or heat—sensitive skin receptors. During the Cold War, interest in the parapsychic capabilities of the human mind mainly came from the military. However, no reliable data has been found that would favor these hypotheses. It is interesting to

take this further and use technology to forcefully assign a physiological relationship between the retina and the fingertips.

The *Para-optic 8* project offers a visual experience that literally reproduces the idea of vision through fingers. First, you need to go through fingerprinting, scan a fingerprint and, in accordance with the scan, visual abilities will be assigned. Then you need to put a special device on your eyes and hands.

The work was created especially for the I.P. Pavlov Institute of Physiology of the Russian Academy of Sciences, within the framework of the art&science project *New Anthropology*.

<https://u.aec.at/E6217F4B>



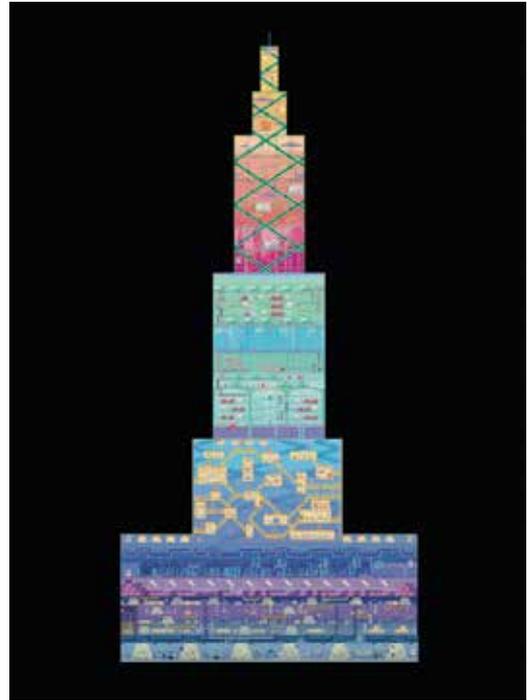
Anastasia Alekhina (RU), born 1989, is an interdisciplinary artist and teacher, working in the technological genres of art. Graduated from The Rodchenko Art School (Moscow) in photography and multimedia (Faculty of Interactive, Communicative and Mixed Media, 2015). Participant in Russian and international exhibitions and festivals. Based in Moscow. Through artistic practices Alekhina explores the aesthetic and existential issues of contemporaneity, human identity, the future of wearable devices, and corporeality. She works with sound in experimental directions, using self-made analog instruments, computer algorithms, and 'found sounds.'

Shapes and Ladders: Battles of Bias and Bureaucracy

Ani Liu, Michelle Lim, John Ahloy, Andrea Li



Shapes and Ladders is a video game that shows how systemic racism and sexism can exist through the metaphor of climbing a career ladder. Players can play as a circle, square, or triangle, for which game mechanics have been designed to reflect real life inequalities different populations face. For example, a circle is more likely to encounter workplace sexual assault, has access to fewer coins, and performs a second shift in childcare. Some shapes are more likely to contract COVID or have a deadly encounter with the police. All the while, players must find health insurance, earn enough coins to maintain quality of life, and pay off student loans. Players do not choose their shape—they are born into it. The video game is designed to allow players to cultivate empathy through a first person simulation of structural inequality. It is my hope that these insights can inspire players to spark change in real life.



Creator: Ani Liu
Art director: Andrea Li
Art director: Michelle Lim
Technical director: John Ahloy
Intern: Anoushka Mariwala



<https://u.aec.at/4CDE7888>



Ani Liu (US) is a research-based artist working at the intersection of art & science. Her work examines the reciprocal relationships between science, technology, and their influence on human subjectivity, culture, and identity. In her project-oriented practice, each work involves a deep dive into a new body of research, resulting in new modalities of thinking and making. Recurring themes in her work include gender politics, biopolitics, labor, nostalgia, and sexuality. **Michelle Lim** (MY) is an experiential designer based in London that co-founded liim studio with Andrea Li. Together, they design engaging online and offline experiences that bring people together in the present. **John Ahloy** (TT) is a student at Princeton studying mathematics and computer science. He is a hobbyist game developer that has worked on personal projects for over 4 years. **Andrea Li** (HK) is an experiential designer based in London that co-founded liim studio with Michelle Lim. Together, they design engaging online and offline experiences that bring people together in the present.

Silencing The Virus

Lily Hunter Green



Zoe Goldham

Silencing The Virus is an immersive Sci Art installation that mixes a virtual virus environment with performance, science, ecology, and digital arts. It has two key objectives. One, to raise awareness of the decline in global honeybee populations and the impact on human societies. Two, to examine the intricate social systems of the honeybee; how the hive works as a collective to repel aggressors, specifically viruses, and what can be learnt from their social immunity mechanisms. One of the major causes of the decline in honeybee populations is disease. This includes the Israeli Acute Paralysis Virus (IAPV): an RNA virus that leaves honeybees paralyzed and that can result in the death of entire colonies. Drawing on research by molecular scientist Dr Maori (Cambridge University), *Silencing*

The Virus mimics the spread of IAPV via an interactive sound installation or collective listening experience: an LED visualization of a digital honeycomb and music composition both infected with a converted sample of the virus' genome. As participants orbit and infect the virtual hive, it becomes apparent that only by working as a collective, akin to the honeybees, will they be able to *Silence The Virus*.

Artist: Lily Hunter Green
Collaborators: Karun Matharu,
Dr Eyal Maori, and Tom Moore
With support from Arts Council
England

<https://u.aec.at/BE42B35A>



Lily Hunter Green (GB) is an interactive design artist. She has extensive experience making multi-component immersive works based on the science of the hive under the banner of *BEE COMPOSED*: an interdisciplinary more-than-human 'hive' project that uses digital media, coding, and performance to communicate rapidly changing ecologies, and humans' role in that process. An Associate Research Fellow at Birkbeck College (London) and an Artist-in-Residence at the Maori Lab, Cambridge University, Lily's work has been exhibited nationally and internationally.

So far the Skies are silent.

Quadrature



A series of audiovisual performances for radio telescopes and artificial intelligence

What happens if artificial intelligences try to find an answer to one of the oldest mysteries of mankind? Combining data from (self-built) radio telescopes with various A.I. trained on human communication and aesthetics, a series of audiovisual performances and installations emerged, revolving around the ultimate question: Are we alone in the universe?

Using electromagnetic radio waves from the universe as input data for audio-based neural networks, the works create the utmost alien—a fusion of artificial intelligence and outer space. The various formats, with and without human performer, investigate different aspects of the same notions: How do contemporary methods of data handling respond to these extraterrestrial frequencies?

Will neural networks recognize familiar elements in these archaic, foreign frequencies?

Can they find meaning within the noise of the universe?

The process of searching for significance, for patterns, and for rhythms is at the core of the works, in all its original uncensored A.I. beauty, with all its potential promises and flaws. Unfortunately the only reliable training data for intelligent communication systems stems from human civilizations...



In collaboration with Christian Losert

With Sebastian Müllauer

Coproduced by ZKM | Hertz-Lab

Thanks to Klaus Holzapfel, Ensemble Resonanz,

Marco Pasini, and Daniel Boubet

Developed within the framework of the #beethoven scholarship program, a project of the PODIUM Esslingen on the occasion of the Beethoven Jubilee 2020, funded by the Federal Cultural Foundation.

Partially supported by a NEUSTART KULTUR scholarship for visual artists with children under the age of 7 from Stiftung Kunstfonds.



<https://u.aec.at/85967DD0>

Quadrature (DE), a Berlin-based duo, understands technology as a means to read and write realities, with data as their main material. Various art and science collaborations have led the two members Juliane Götz and Sebastian Neitsch further and further into outer space, fusing the objective views of science with their very own subjective truth as artists. Their latest series of artworks was realized with Christian Losert, sound artist, composer, and creative technologist, and Sebastian Müllauer, a creator working at the intersection of design, art, technology, and nature.

Symbiosia

Thijs Biersteker



Plant Neurobiologist Stefano Mancuso and artist Thijs Biersteker created an artwork that uncovers the invisible tree-to-tree communication in real time to start a conversation about the effects of climate change. With a series of sensors attached to two living trees, *Symbiosia* creates a generative animation of the growth patterns of the two trees. The volatile organic compound measurements indicate the increase of warning signals in the communication between the trees as their surroundings change. When watching the trees grow and ‘talk’ to each other, the work hopes to start a conversation about the real-time impact of environmental changes, like climate change and pollution, on nature. Next to this, sensors capture the light spectrum, soil moist, rain, dendrometer, and

other weather data. This is combined in an algorithm that uses 12,000 data points to create one single tree growth-ring every second, instead of every year. The distance between the rings, every bending curve, every sprouting knot, reveals how the tree was reacting in real time to the changes in its environment—uncovering the hidden liveliness of trees and the environmental impact we have on nature on a daily basis.

Symbiosia, 2019, by Thijs Biersteker in collaboration with Professor Stefano Mancuso



<https://u.aec.at/9055E68E>



Ecological artist **Thijs Biersteker** (NL) creates interactive awareness installations about the world's most pressing environmental issues. In his work he fluidly merges scientific research with esthetics to deliver an empowering experience on topics like climate change, ecosystems, air pollution, ocean plastics, and biodiversity loss. His collaborations with top scientists and universities around the world lead to a fluid mixture of data, sensors, living trees, kinetic motion, big data visualization, and recycled plastics that make people feel the facts again. Next to creating art in his Woven Studio, Biersteker holds a teaching position at Delft University of Technology (NL) and a Fellowship at VU University Amsterdam. His work can be found in museums around the world and in documentaries. In his TED talk he speaks about the urgent need for science and art to come together in times of climate crisis.

The [Uncertain] Four Seasons

Tim Devine

In 2019 we set about reflecting the effects of global warming to date in Vivaldi's *Four Seasons*, using historical data to inform a musical system that transposed climate changes upon the original score. The result was the *Four Seasons*, which was performed by the NDR Elbphilharmonie Orchestra, led by conductor Alan Gilbert.

In 2020, working with the Monash Climate Change Communications Research Hub, we developed a series of new variations of the composition. This time, we situated Vivaldi's score in the future, using Shared Socioeconomic Pathways (SSPs) data from the UN's latest Intergovernmental Panel on Climate Change report to project future climate outcomes in a worst-case climate future.

Using geospatial data, we created unique and wildly different variations for every orchestra on the planet. The result is nearly 1,000 new versions of *The Four Seasons*, which form a collection that we call *The [Uncertain] Four Seasons*.

The Sydney variation of *The [Uncertain] Four Seasons* was performed in January 2021 by the Sydney Symphony Orchestra, led by concertmaster Andrew Haveron. It was a great success and featured in the scientific journal *Nature*.

The [Uncertain] Four Seasons by: Tim Devine, Joachim Kortlepel, Adam Grant, Gerard Mason, Melanie Huang, Dr. Jaehyun Shin, Dr. James Goldie, and Assoc. Professor David Holmes

With support from: AKQA, Sydney Symphony Orchestra, Jung von Matt, NDR Elbphilharmonie Orchestra, Kling Klang Klong, Monash Climate Change Communications Research Hub



<https://u.aec.at/C91EF4C2>



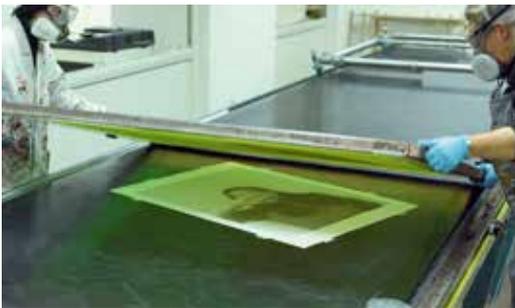
Yaya Stempler



Tim Devine (AU), Adam Grant (AU), Gerard Mason (AU), Mel Huang (AU), Hugh Crosthwaite (AU), Dr. Jaehyun Shin (KR), Joachim Kortlepel (DE), Assoc. Professor David Holmes (AU) collaborated to bring this work to the world. They are a collective of designers, developers, scientists, and composers.

The Cleanroom Paradox

Felix Lenz, Angela Neubauer, Eszter Zwickl



Dismantling the deceptively pristine image of the high-tech industry, *The Cleanroom Paradox* unveils the systemic suppression of information on occupational and toxic hazards at semiconductor production sites. A gradually disintegrating, screen-printed photograph of former Samsung factory worker Jin and a video documenting its creation are being superimposed with her and other industry experts' stories of inadequate health measures at work. Jin was diagnosed with kidney cancer. Interweaving stories and fibers, the used ink is corrosive and made of chemically dissolved smartphones. Analogous to the industry's etching processes, the ink will disintegrate the print over time, skinning a surface to reveal Jin's story, which is

already inscribed in the lower layers. The toxicity hidden behind the many steps in semiconductor manufacturing and the effect of the labor necessary to shape our high-tech products shifts focus towards the middle-west.

Jin's fate is not an isolated case but one of many that can be traced far across the industry.

A project by: Felix Lenz, Angela Neubauer, Eszter Zwickl
Produced at and supported by: Design Investigations (ID2) University of Applied Arts Vienna

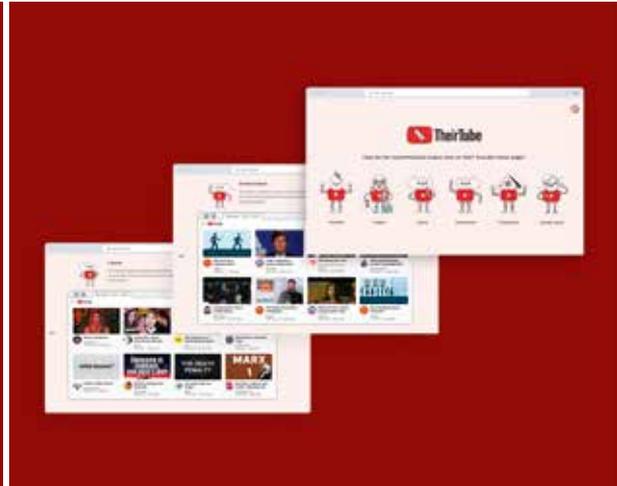
<https://u.aec.at/DD5AA933>



Felix Lenz (AT) is a research-led artist, designer, and filmmaker based in Vienna. His work analytically explores geopolitical, ecological, and technological matters and can be found at <https://felixlenz.at>. **Angela Neubauer** (AT) is a young Viennese creative, exploring her interests in social and natural sciences through her artistic work. She is currently studying at the University of Applied Arts Vienna. **Eszter Noémi Zwickl** (HU) mostly focuses on social and cultural issues through art and design. Her writings, drawings, and designs have been exhibited in Labor Galerie (Budapest).

TheirTube

Tomo Kihara



TheirTube is an open-source web service that provides a look into how videos are recommended on other people's YouTube. Users can experience how the YouTube starting page would look for six different personas: Conspiracist, Climate Denier, Conservative, Liberal, Prepper, and Fruitarian.

On an average day, people around the world watch one billion hours of video on YouTube. 70% of these videos are recommended by an AI, making every YouTube experience unique. By offering a tool to understand what the other recommendation bubbles look like, *TheirTube* shows how YouTube's recommendations can drastically shape someone's experience on the platform and, as a result, shape their worldview.

Each of these *TheirTube* personas is informed by interviews with real YouTube users who experienced similar recommendation bubbles. Six YouTube accounts were created in order to simulate the interviewees' experiences. These accounts subscribe to the channels that the interviewees followed and watches videos from these channels to reproduce a similar viewing history and a recommendation bubble. The code is open source meaning, anyone can make their own version of *TheirTube*.

Concept, design, development: Tomo Kihara
Character illustration: Polina Alexeenko
With support from Mozilla Foundation



<https://u.aec.at/EE4DB156>



Tomo Kihara (JP/NL) works at the intersection of play, technology, and society, as a researcher, designer, and developer. He uses code as a medium to create playful interventions that provide a new perspective on complex socio-technical problems. Tomo holds an MSc in Interaction Design from TU Delft (NL). He has collaborated with organizations like Waag and Mozilla Foundation on several design projects that have been exhibited at places like the Red Dot Design Museum in Xiamen and the Victoria & Albert Museum in London.

S+T+ARTS PRIZE '21 July 2021

All nominations are judged by a jury to decide on the two prize-winning projects and up to ten Honorary Mentions.



Alexandra Deschamps-Sonsino (GB) is an Internet of things author, consultant, public speaker, and entrepreneur with a background in industrial and interaction design. She wrote *Smarter*

Homes: how technology will change your home life and *Creating a Culture of Innovation* (Apress, 2018-2020), was the first UK distributor of the Arduino and is the founder of the Good Night Lamp, which is in the permanent collection of the London Design Museum. She was named 1st in a list of 100 Internet of Things Influencers (Postscapes, 2016) and 2nd in Top 100 Internet of Things Thought Leaders (Onalytica, 2014).



Nicola Triscott (GB) PhD is a curator, researcher and writer, specializing in the intersections between art, science, technology and society. Since 2019, Nicola has been Director/CEO of FACT (Centre for Film, Art & Creative Technology) in Liverpool, UK, where she curated the exhibition *And Say the Animal Responded?* in 2020. Previously, she was the founding Artistic Director/CEO of Arts Catalyst (from 1994 to 2019) and Principal Research Fellow at University of Westminster (2017-19). Over 25 years Nicola has built Arts Catalyst into one of the UK's most distinctive and respected art and research organizations, distinguished by ambitious artists' commissions, including notable projects by Tomás Saraceno, Otolith Group, Ashok Sukumaran, Marko Peljhan, Ariel Guzik, and Critical Art Ensemble. Nicola lectures and publishes internationally.



Alexander Mankowsky (DE), born 1957 in Berlin, studied Social Science, Philosophy and Psychology at Freie Universität Berlin. In 1989 he started working in the Daimler research institute in

Berlin. The multidisciplinary approach in the institute integrated a wide array of disciplines, from social sciences to artificial intelligence. His current working topics are Futures Studies, focusing on the ever-changing culture of mobility, the interdependency of social and technological innovation, and other aspects of envisioning paths into the future.



Francesca Bria (IT) is the President of the Italian National Innovation Fund and Honorary Professor at the UCL Institute for Innovation and Public Purpose in London. She is Senior Adviser

to the United Nations Human Settlements Programme (UN-Habitat) on digital cities and digital rights. Francesca Bria is leading the *DECODE* project on data sovereignty in Europe and is a member of the European Commission high level expert group, Economic and Societal Impact of Research and Innovation (ESIR). Francesca has a PhD in Innovation and Entrepreneurship from Imperial College London and an MSc in Digital Economy from Birbeck, University of London. She has been teaching in several universities in the UK and Italy and she has advised governments and public and private organizations on technology and innovation policy and its socio-economic and environmental impact.



Fumi Yamazaki (JP), Senior Marketing Manager, APAC, Niantic Japan. Fumi joined Niantic in February 2018, working on marketing for Ingress, Pokémon GO, and Harry Potter: Wizards Unite, and

Niantic Developer Platform in the APAC market. In 2010 she joined Google as Developer Relations country lead for Japan, then joined Google Social Impact team working on Google Crisis Response helping the community hit by natural disasters, and Civic Innovation working with the citizens to make society a better place using technology, then moved to Google Advanced Technology and Projects team working on Project Soli creating radar-based gesture sensors and Project Jacquard developing interactive textile using conductive yarn, as program manager and developer relations manager. Prior to joining Google, she worked on corporate sales at Nippon Telegraph and Telephone Corporation (NTT), Internet marketing research at Interscope, marketing, event management, new business development and investment at Digital Garage, DG Incubation, and Technorati Japan.

S+T+ARTS PRIZE '21 International Advisors

The advisors are renowned international consultants with expertise in this field. They recommend projects and encourage a wide range of potential participants to submit proposals. In addition, they ensure a balance in terms of gender and geographical origin of the participants.



Amanda Masha Caminals (ES) is co-director and curator of the Mutant Institute of Environmental Narratives (IMNA), the laboratory of Matadero Madrid that fosters artistic practices in connection with journalism, science, and technology as a response to the challenges of the climate crisis. Previous to that she directed the CITY STATION of the Environmental Health Clinic by artist Natalie Jeremijenko at the Centre for Contemporary Culture of Barcelona (CCCB). She is founder of the organization Translocalia, a network of artists, curators, and designers to plan for the future through art. She holds a BA in Humanities, a degree in History of Art and an MA Hons in Curating Contemporary Art from the Royal College of Art in London.



Andy Cotgreave (UK) is co-author of *The Big Book of Dashboards*, and Technical Evangelist at Tableau. He is the host of *If Data Could Talk*, co-host of *Chart Chat* and columnist for *Information Age*. He is also on the 2021 DataIQ 100 most influential people in data. With over 15 years' experience in the industry, he has inspired thousands of people with technical advice and ideas on how to identify trends in visual analytics and develop their own data-discovery skills. Keep in touch with Andy by subscribing to his Sweet Spot newsletter with curated stories of how data intersects with the world, or follow him on Twitter and LinkedIn.



Jennifer Heier (DE) is an Industrial Designer at heart who specializes in User and Customer Research. She studied Industrial Design in Darmstadt (Diploma), did her Bachelor of Arts in San Francisco and her Master of Science in User Research in Edinburgh. She loves to work in a diverse and cross-disciplinary team close to new technology topics, contributing her passion for human-centric-innovation and continuously questioning the status quo. She is currently working at Siemens Digital Industries data lab as Head of UX driven AI, bringing the human factor into the B2B context. Besides, she is working on her PhD at Bauhaus University in Weimar, investigating how the creative community should and could positively influence AI development. She believes in the power of her profession to contribute and add value to the challenges, as well as opportunities, of the digital age.



Nana Radenković (RS) is one of the co-founders of Nova Iskra, where she focuses on creating mentoring programs, trainings and workshops for individuals, organizations and companies interested in taking an active role in the processes of transformation—not only of their projects and businesses but also through the creation of new ways in which we could learn, live, and work in the future. She holds an MA in Management in Culture, Interculturalism and Mediation in the Balkans from the University of the Arts Belgrade, and has extensive experience in working in the private, public, and civil sectors. She is a professor at the Faculty of Media and Communications in Belgrade, and a mentor within the Nelt Educational Program and Creative Mentorship.



Lining Yao (CN) Lining Yao is an Assistant Professor of Human-Computer Interaction Institute (HCII) at Carnegie Mellon University, School of Computer Science, directing the Morphing Matter Lab

(<https://morphingmatter.cs.cmu.edu>). Morphing Matter Lab develops materials, tools, and applications of adaptive, dynamic, and intelligent morphing matter from nano to macro scales. Research often combines material science, computational fabrication, and creative art and design practices. Lining and her lab work anti-disciplinarily, publishing and exhibiting across science, engineering, design and art. Lining gained her PhD at MIT Media Lab in 2017.



Fiona Zisch (AT), architect and experimental psychologist with experience in film production design and designing for extreme environments. Fiona Zisch

researches the cognition, experience, and reciprocity of architectural space, bodies, and movement. She works between the Institute of Behavioural Neuroscience at UCL and the Bartlett School of Architecture. She also teaches undergraduate Experimental Psychology at UCL. Fiona speaks at and organizes international architecture and neuroscience conferences and festivals, has collaborated on a number of multidisciplinary research projects, and acts as a consultant for architecture and technology companies. She has published papers and book chapters in an array of research fields.



Patrick van der Smagt (NL) is director of AI research at Volkswagen Group, and leads its Machine Learning Research Lab in Munich (*argmax.ai*). The lab

focuses on probabilistic deep learning for time series modeling, optimal control, robotics, and quantum machine learning. He is also a faculty member of the LMU Graduate School of Systemic Neurosciences and research professor at Eötvös Loránd University Budapest. He is the founding head of a European industry initiative on certification of ethics in AI applications (etami). Patrick previously directed a lab as professor for machine learning and biomimetic robotics at the Technical University of Munich, while leading the machine learning group at the research institute fortiss. He founded and headed the Assistive Robotics and Bionics Lab at the DLR Oberpfaffenhofen. Ages ago he did his PhD and MSc at Amsterdam's universities on neural networks in robotics and vision. Besides publishing numerous papers and patents on machine learning, robotics, and motor control, he has won a number of awards, including the 2013 Helmholtz-Association Erwin Schrödinger Award, the 2014 King-Sun Fu Memorial Award, the 2013 Harvard Medical School/MGH Martin Research Prize, and best-paper awards at machine learning and robotics conferences and journals. He was founding chairman of a non-for-profit organization for Assistive Robotics for tetraplegics and co-founder of various tech companies.



ARS ELECTRONICA 2021

Festival for Art, Technology & Society

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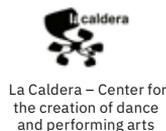
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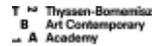


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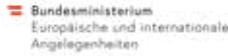
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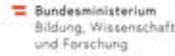
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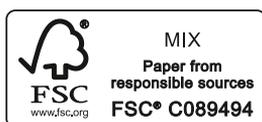
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Documentation of the Prix Ars Electronica 2021

Lavishly illustrated and containing texts by the prize-winning artists and statements by the juries that singled them out for recognition, this catalog showcases the works honored by the Prix Ars Electronica 2021. The Prix Ars Electronica is the world's most time-honored media arts competition. Winners are awarded the coveted Golden Nica statuette. Ever since its inception in 1987, the Prix Ars Electronica has been honoring creativity and innovativeness in the use of digital media. This year, experts from all over the world evaluated 3,158 submissions from 86 countries in four categories: Computer Animation, Artificial Intelligence & Life Art, Digital Musics & Sound Art, and the u19–create your world competition for young people. The volume also provides insights into the achievements of the winners of the Isao Tomita Special Prize and the Ars Electronica Award for Digital Humanity.

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STARTS (= Science + Technology + Arts) is an initiative of the European Commission to foster alliances of technology and artistic practice. As part of this initiative, the STARTS Prize awards the most pioneering collaborations and results in the field of creativity and innovation at the intersection of science and technology with the arts. The STARTS Prize '21 of the European Commission was launched by Ars Electronica, BOZAR, Waag, INOVA+, T6 Ecosystems, French Tech Grande Provence, and the Frankfurt Book Fair. This catalog presents the winners of the European Commission's two Grand Prizes, which honor Innovation in Technology, Industry and Society stimulated by the Arts, and more of the STARTS Prize '21 highlights.

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