

CyberArts 2019

Prix Ars Electronica

S+T+ARTS
Prize'19



ARS ELECTRONICA
Art, Technology & Society

**HATJE
CANTZ**

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Hannes Leopoldseder · Christine Schöpf · Gerfried Stocker

CyberArts 2019

Prix Ars Electronica 2019

Computer Animation · Artificial Intelligence & Life Art
Digital Musics & Sound Art · u19–create your world

STARTS Prize'19

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

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PRIX

ARS ELECTRONICA

2019



Prix Ars Electronica 2019

Christine Schöpf, Gerfried Stocker

These are the facts and figures of the 33rd edition of Prix Ars Electronica: 3,256 entries from 82 countries in the categories Computer Animation, Digital Musics & Sound Art, u19—create your world for young people throughout Austria, and in the new category Artificial Intelligence & Life Art, introduced for the first time in 2019.

Established in 1987 and based on an idea by Hannes Leopoldseder from the Austrian Broadcasting Corporation (ORF), Prix Ars Electronica has become the world's largest continuously held competition for digital art.

The year 2019 saw a number of innovations in Prix Ars Electronica, including the splitting of the youth category u19—create your world into two independent categories: Young Creatives (up to age 14) and Young Professionals (age 14 to 19). This change reflects the significant increase in professionalism in the work of the young people as well as underscoring the importance of creativity for the successful shaping of the future.

Furthermore, with the introduction of the category Artificial Intelligence & Life Art we recognized that artists are increasingly exploring the game-changing element of artificial intelligence in their artistic work. The new category is dedicated to artistic practice and thinking related to all areas of artificial intelligence and life sciences, such as art-work engaging with fields like biotech, genetic engineering, and synthetic biology as well as with machine learning, deep learning, and any other form of artificial intelligence research. The new category is also aimed at artists who explore the intersections of these fields, such as robotics, androids, and prosthetics, or projects that address environmental issues, our biosphere, and biodiversity. Art-science collaborations are of partic-

ular interest, as are projects that critically reflect the cultural and social significance of AI and life sciences, their ethical and philosophical dimension as well as the role of policy makers, governments, and industry.

While in the early years the Prix Ars Electronica was largely a search for a place within the fledgling area of media/computer art, it has now evolved into an annual international trend barometer for a wide variety of artistic approaches. It brings together artists and scientists from various countries and cultures as well as creative people from diverse fields: developers of new interfaces and artist-scientists exploring the area of life art and artificial intelligence are joined by activists experimenting with social networks and sound artists whose designs provide us with new auditory experiences.

Prix Ars Electronica has always been a meeting place for artists who demonstrate in and with digital media how nearly every facet of our lives—communication, politics, business, finance, ecology, and sociology—changes virtually on a daily basis. And it has become secondary against what political and cultural backdrops these changes occur and leave their mark. These are the developments that form the reservoir that Prix Ars Electronica can draw on in its annual position analysis. It is not about making judgements here, but rather about exploring the current media culture.

In each category, the main prize is a Golden Nica plus €10,000 prize money and there are also two Awards of Distinction and twelve Honorary Mentions. In 2019, in the u19—create your world youth category, a Golden Nica plus €3,000 prize money goes to the winner of the Young Professionals category (age 14 to 19) as well as two Awards of

Distinction and twelve Honorary Mentions with prize money totaling over €2,000. In the Young Creatives category (up to age 14), there are main prizes, Awards of Distinction, and Honorary Mentions to the value of more than €2,000.

The selection of the winning works in the different categories was carried out by a group of twenty 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 thanks and appreciation to them.

This is the fourth year in succession that Ars Electronica, in cooperation with BOZAR and Waag, has staged the competition to select the recipients of the STARTS prizes awarded by the European Commission. 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.

Prix Ars Electronica is being staged for the 33rd time in 2019. 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 the State of Upper Austria, the OK “Offenes Kulturhaus” in the Upper Austrian Culture Quarter, the University of Applied Sciences Upper Austria, Campus Hagenberg, netidee/IPA – Internet Privatstiftung, KulturKontakt Austria, Cubus, MAXON Computer GmbH, and CONRAD Electronic GmbH & Co KG.



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. **Gerfried Stocker** (AT) is a media artist and engineer for communication technology. In 1995 he became artistic and managing director of Ars Electronica and has since been responsible, together with an ambitious team, artists, and technicians, for the many new activities and the successful growth of Ars Electronica. Stocker is a guest speaker at numerous international conferences and universities, consults international companies on creativity and innovation management, and was awarded a Doctor Honoris Causa from Aalto University, Finland, in 2019.

Turning Point: At the Dawn of a New World

Hannes Leopoldseder

“[... we] wish [Ars Electronica] continued boundary-pushing endeavours that cumulatively bring us all one step closer to a better tomorrow.”

Statement of the STARTS Prize'19 Jury

April 2019. Once again scientists, artists, cyborg activists, curators, filmmakers, founders of agencies for new media and art, and experts for games and artificial intelligence meet in Linz for the multi-day jury deliberations for the Prix Ars Electronica and the STARTS Prize of the European Commission.

The task of the juries and the preliminary juries for all categories is to select the prizewinners from the 3,256 entries. On the evening of April 15, the jury members for the STARTS Prize gather at a Linz restaurant. At the same time, at 6:50 p.m., the news agencies release the first reports on a catastrophe for France and the world: Notre-Dame, the world-famous Paris cathedral, is in flames. Spellbound, I follow the events in Paris over the following hours on CNN. One journalist compares the tragedy to that of 9/11, only to immediately qualify this assessment. But the images of the burning cathedral will remain etched in the memories of millions of people.

This is followed only a few days later by another phenomenon that captures the attention of the media and the general public: sixteen-year-old climate activist Greta Thunberg and her call to “Follow Greta! Strike for Climate! Fridays For Future!” The young activist speaks regularly to forums around the world: in Davos, at TEDxStockholm, and in a very emotional address to the EU Parliament in Strasbourg. She is also able to speak briefly with the Pope during a general audience in St. Peter's Square. In front of thousands of people at “Fridays For Future” on Vienna's Heldenplatz, her message is loud and clear: “We are not begging decision-makers for their participation,”

declares young Greta Thunberg. “They have ignored us in the past, and they will continue to do so. But things will change, whether they like it or not.”¹

Friday, May 17, 2019, 6 p.m.: Austria experiences the maelstrom of the “IbizaGate” scandal involving a secretly filmed video of Deputy Chancellor Heinz-Christian Strache, leader of the far-right Austrian Freedom Party (FPÖ), discussing trading government contracts for campaign support with a woman posing as the niece of a Russian oligarch. Within only a few days, the coalition government is voted out of office. Austria faces a political situation unprecedented in the country's history.

Are these events, which occurred within only a few weeks of each other—Notre-Dame, Greta Thunberg, “IbizaGate,” and the removal of the entire government—to characterize the year 2019? Will this year, like 1979, be a year of the historic “turning point?” This is the view put forth by Frank Bösch, professor of Twentieth-Century European History at the University of Potsdam, in his book *Zeitenwende 1979. Als die Welt von heute begann* (Turning point 1979: when the world of today began).²

Bösch is not the only scholar to attach special significance to the year 1979. He quotes the German philosopher Peter Sloterdijk, who calls 1979 the “key year of the twentieth century.” Bösch also refers to the “bipolarity” that divided the world into a Western and Eastern Hemisphere during the Cold War. Even if the Cold War is over, a certain bipolarity still separates the poor from the rich, and the analog world from the digital sphere. Those who remain in the analog world are shut out from many communication opportunities, which impacts their day-to-day life and most importantly deepens the divide between the generations: grandchildren can communicate with their grandparents only with great difficulty.

But before I turn my attention to the future, I would like to return to the 1970s, in particular to 1979—that is, to the period forty years ago. At the very time that California was becoming the Eldorado of the computer industry, the Austrian city of Linz, an industrial center with a population of 190,000, launched a new festival: Ars Electronica. Why Linz of all places? This is a question that is still being asked forty years later. The crucial factors were ideas, constellations, coincidences, and a willingness to take risks. The point of departure for me was this conviction: the computer, the fundamental technology of microtechnology—as it was called back then—will change our work, our culture, and ultimately our way of thinking like virtually no other technology before it.

Linz, 1979: The Upper Austrian capital has experienced a rapid economic upswing following World War II. With its International Brucknerfest, the city between Vienna and Salzburg is gaining its own distinct profile. The field of tension between technology and art that is characteristic for Linz is highlighted by Helmuth Gsöllpointner's *Forum Metall*, an exhibition with international artists.

A year later, the Linz pop group Eela Craig, featuring Hubert Bognermayr, delivers another highlight at the International Brucknerfest with its rock mass *Missa Universalis*. This success would be continued the following year with the symposium "Electronic Music & Video Art." Bognermayr is also responsible for the collaboration between the Linzer Veranstaltungsgesellschaft (LIVA) and ORF Upper Austria, of which I was Regional Director beginning in 1974. This new partnership between the City of Linz and the ORF makes it possible to go beyond the symposium level. In my journalistic research in the area of art and technology, I stumble upon the publications of Herbert W. Franke, an artist and scientist living in Munich. I contact Herbert Franke, and he accepts

my invitation to join our team as a scientific-artistic advisor. Another new addition to our team is the Hamburg-based producer Uli A. Rützel, the publisher of Bognermayr's *Missa Universalis*, who makes crucial contributions to Ars Electronica in the area of marketing.

For our partner, the Brucknerhaus, I outline the goals of Ars Electronica with the following points:

- Manifestation and consequences of new technologies for art, culture, and society
- Application of new technologies in all artistic fields
- Integration of the electronic media of radio and television into the festival in order to make the specific subject matter accessible to a wider audience
- Exemplary large-scale projects as open-air events in the context of the cultural-political demand for "culture for all"
- Openness for the future, for experiments, and for discourse

After extensive discussions in our group, we agree on my proposal: *Ars Electronica: Art. Technology. Society*. And the programmatic objectives of this triad remain unchanged even after forty years. Within these four decades, the focal points have, however, undergone a shift. While the 1980s were more oriented toward technology, today its societal impacts are at the forefront of technology. Of crucial importance is the opening project of the first Ars Electronica: the *Linz Klangwolke* (Linz Cloud of Sound), a symphonic open-air event featuring Anton Bruckner's *Symphony No. 8*. This idea comes to me from the cultural-political objective of the time: "culture for all," a demand formulated by Frankfurt's Social Democratic Councilor for Cultural Affairs, Hilmar Hoffmann. What is still missing is an opening speaker for the first Ars Electronica. By coincidence, I discover in a student magazine a reference to a robot that opened an

exhibition in New Jersey. I am able to contact the company that owns the robot and find a sponsor for its air transport to Linz.

Linz mayor Franz Hillinger welcomes the robot at Linz-Hörsching Airport like a guest of state, greeting it on a red carpet with the words: “Welcome, Herr SPA 12.”

Tuesday, September 18, 1979, the day of the *Klangwolke*. A cloudless sky heralds the evening event. People stream across the Donaubrücke (Danube bridge) into the city center by the thousands. The opening speaker is the robot SPA 12. At the opening ceremony, the mayor proclaims: “The Brucknerfest has given birth to a daughter—her name: Ars Electronica.”

ORF Upper Austria exhorts its radio listeners: “Please place your portable radios in your window for the broadcast of Anton Bruckner’s *Symphony No. 8*. Bring the music into the city—you are part of the event!” The “Sound Center” in Linz’s Donaupark is marked by a balloon encased in silver hearts. Due to the crush of visitors, the retainers for the balloon floating above the crowd are ripped off during the final part of the music. After the *Klangwolke*, Brucknerhaus Linz announces that some 100,000 people attended the first *Linz Klangwolke*. The media response is correspondingly immense, exceeding our highest expectations. The event is not only reported on by local media: under the title “Swinging Toni” (referring to Anton Bruckner), the German magazine *DER SPIEGEL* writes: “In its anticipation of the Bruckner open-air spectacle, this gray industrial town was gripped by ‘Tuesday Night Fever.’” The *Süddeutsche Zeitung* stressed the inclusion of the entire city in the musical event—and the whole city did, indeed, participate. That was the opening of Ars Electronica 1979.

In 1980, Ars Electronica again opened with the *Klangwolke*, visualized by a helium sculpture by Otto Piene. Piene called it *Blue Star Linz*. The event again attracted some 100,000 visitors.

In the following years I was able to contribute two other ideas to Ars Electronica. The first was the idea of the Prix Ars Electronica in 1987. The organization and execution of the project, and above all the selection of the international jury members, was managed in the following seventeen years by Christine Schöpf, who was responsible for culture and science at ORF Upper Austria during that time. My second idea was the construction of the Ars Electronica Center in 1991. This initiative was very decisive, for otherwise there would probably be no Ars Electronica today, but perhaps a different festival instead. The Ars Electronica team is today headed up by Gerfried Stocker and Diethard Schwarzmaier as Artistic Director and Financial Director, respectively. Since the opening of the Ars Electronica Center in 1996, they and the entire staff share the credit for the overwhelming success of the Ars Electronica brand.

I would like to take this opportunity to thank not only the entire team but also the municipal and state politicians. All mayors of the City of Linz—Franz Hillinger, Hugo Schanovsky, Franz Dobusch, and now Klaus Luger—have always championed Ars Electronica, thus ensuring its sound financial base. For forty years. My thanks go to all the parties represented in the Linz City Council.

Just as I turned back time by forty years, we will now take a great leap ahead forty years, to the year 2059. All those born this year, in 2019, could thus celebrate their fortieth birthday in 2059. What kind of world will it be then? What could the path to this future date look like?

The 2019 Ars Electronica Festival strives to be a forum for the discourse on the current midlife

crisis of the Digital Revolution, a situation that we must take advantage of in order to reformulate our questions regarding the future: What elements of technology are useful for human beings? What pitfalls do we wish to avoid?

As Gerfried Stocker, Artistic Director of Ars Electronica, remarked at the press conference on this year's festival on April 8, 2019: "In keeping with the title *Out of the Box—The Midlife Crisis of the Digital Revolution*, the festival embarks on an expedition to artistically and scientifically survey our modern world and its techno-economic influences, asking questions about our future prospects and options for action."³

Today, computer systems are everywhere: in our homes, in cars, in the massive data processing centers of banks, in the stock exchanges, in airplanes, arms systems, robots, games, and traffic systems. Algorithms determine our lives. As the economist Joseph E. Stiglitz writes: "We are now in a vicious cycle: Greater economic inequality is leading, in our money-driven political system, to more political inequality, with weaker rules and deregulation causing still more economic inequality. If we don't change course, matters will likely grow worse, as machines (artificial intelligence and robots) replace an increasing fraction of routine labor, including many jobs of the several million Americans making their living by driving."⁴ How can we utilize the possibilities of digitalization and artificial intelligence to make our lives better? A good life is, after all, the entire point. One thing cannot be denied: we are at the dawn of a new world.

In spring 2019, Sarah Spiekermann, Professor of Business Informatics at the Vienna University of Economics and Business, published a book with the title *Digitale Ethik. Ein Wertesystem für das 21. Jahrhundert* (Digital ethics: a value system for the

twenty-first century), in which she describes her concept for the "individual, economic, and technical conditions for humane progress in the digital age. [The book] contains a vision of how we can use the powers of digitalization to make us stronger and not weaker ... The function I am aiming for is a good life, the *eudaimonia*, in which money is merely a boundary condition."⁵

To attain this, says Spiekermann, three steps are required:

- Creating a system of values in a process of self-reflection
- Learning to understand values; for example, asking yourself what friendship means to you
- Implementing your value priorities in your personal habits (Do I have to be reachable 24 hours a day? Can I rethink my behavior and not check my emails every minute?)

Sarah Spiekermann underscores the political necessity of "ethics by design" in order to understand the digital world. The much sought-after keynote speaker places particular importance on the reduction of speed in the networks, on moving away from the push model that dominates our present communication, and on forsaking human-like robots and artificial intelligences. Spiekermann considers digital ethics to be essential because we humans must decide how we wish to live, as what we presently know about artificial intelligence is only the beginning: "I am certain," she writes, "that we are at a point in the history of our civilization where we have to rethink things." "We have a gigantic reorientation in front of us in terms of our action if we wish to follow the path of digital ethics," Spiekermann continues, "indeed, if we wish to live ethically in general. We then break away from a purely economic rationality and turn toward a values-oriented way of thinking."⁶

I deliberately use this quote because in a special way it fits with the question posed by this year's Ars Electronica festival. Let's go one step further—robots everywhere: in media, publications, startups, world-wide businesses.

The predecessors of these robots were automatic or semi-automatic machines. We find them in literature, for example, in the works of E. T. A. Hoffmann. The Czech word “robota” means “forced labor.” The term was used for the first time in 1920 by Josef Capek. His brother Karel Capek then made the word popular in a science fiction play *R.U.R.—Rossum's Universal Robots*—“Robots of the world! The power of man has fallen! A new world has arisen: the Rule of the Robots! March!”⁷

But how will robots, androids, and machines evolve by our reference year of 2059?

Michio Kaku, Professor of Theoretical Physics at the City College of New York and author of numerous publications on future scenarios, titled his latest book, published in spring 2018, *The Future of Humanity: Terraforming Mars, Interstellar Travel, Immortality, and Our Destiny Beyond Earth*.⁸

For Michio Kaku, space is the answer for our future. And the race to Mars has already begun. The planet is to be investigated geologically and tested for possible living conditions. For the futurologist, our Moon could become a second Earth. In this regard he speaks of “terraforming.” This term refers to the reformation of a planet into a celestial body similar to the Earth and is also used in reference to the Moon.

Whether or not life on Mars is possible is a point of contention among scientists; NASA's Mars rover Curiosity has in any case found potential traces of organisms there.

By 2050 the world will be faced with an unprecedented disruption, with disruptive events in a wide variety of fields. Among them are China's possible

ascent to the top of the global economy, the explosive rise of Asia and Africa, the increase of inequality, or a “black swan,” some type of unforeseen occurrence that alters the course of global development. Intelligent machines have spread out like an invisible spiderweb not only across the globe but also via interacting networks all around the globe.

These scenarios concerning developments up through the 2050s lead me to the publications of the scientist and futurist Amy Webb, Assistant Professor for Strategic Foresight at the New York University Stern School of Business as well as a former lecturer at Harvard University. In March 2019, Amy Webb published the provocative book *The Big Nine: How the Tech Titans and Their Thinking Machines Could Warp Humanity*.⁹

By “Big Nine,” Amy Webb means the nine world-dominating corporations in the area of artificial intelligence: Google, Amazon, Apple, Microsoft, IBM, and Facebook in the US as well as Baidu, Alibaba, and Tencent in China. From Amy Webb's American perspective, European businesses are not among the major players. She predicts that China will dominate the world in terms of the development of AI and use this position of power politically as well. It is thus crucial that the West, first and foremost the US and the EU, arrive at a common solution in the coming years. The common goal must be to utilize the manifold possibilities of AI to create a better, more humane life for all people.

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 turn-

ing 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 Nomination Committee” 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.”¹⁰

- 1 [https:// orf.at](https://orf.at), May 5, 2019.
- 2 Frank Bösch, *Zeitenwende 1979. Als die Welt von heute begann*, Munich, 2019.
- 3 Gerfried Stocker, press conference for the 2019 Ars Electronica Festival, April, 2019.
- 4 Joseph E. Stiglitz, “Progressive Capitalism is Not an Oxymoron,” *New York Times*, April 19, 2019.
- 5 Sarah Spiekermann, *Digitale Ethik. Ein Wertesystem für das 21. Jahrhundert*, Munich, 2019, p. 9 ff.
- 6 *Ibid.*, p. 278.
- 7 Karel Capek, Karel Capek’s *R.U.R. – Rossum’s Universal Robots*, Norderstedt, 2016.
- 8 Michio Kaku, *The Future of Humanity: Terraforming Mars, Interstellar Travel, Immortality, and Our Destiny Beyond Earth*, New York, 2019.
- 9 Amy Webb, *The Big Nine: How the Tech Titans and Their Thinking Machines Could Warp Humanity*, New York, 2019.
- 10 Joint Statement of the STARTS Prize’19 Jury, CyberArts 2019, p. 182.



Hannes Leopoldseder (AT), PhD, has worked as a television journalist for ORF Vienna, as the managing director of ORF Upper Austria (1974–1998), and the information director of ORF Vienna (1998–2002). In 2009 he was appointed honorary professor at the University of Art and Design Linz. He co-founded Ars Electronica and the Linzer Klangwolke in 1979 and initiated the Prix Ars Electronica (1987) and the Ars Electronica Center (1996). He is also the co-editor of Ars Electronica’s catalogues.

 **PRIX
ARS ELECTRONICA**

COMPUTER ANIMATION

Extending Screens: Extending Vision

Ferdi Alici, Ina Conradi, Nobuaki Doi, Birgitta Hosea, Alex Verhaest

At a time when all animated images, however handcrafted, necessarily become digital at some stage of the production or distribution process, the concept of ‘computer animation’ as a distinct category becomes harder and harder to define. Isn’t all animation now computer animation? If so, how could the jury make choices that honor the distinctive identity of Prix Ars Electronica’s computer animation category? Shouldn’t Ars Electronica stand for something distinctive? We were very concerned with how to make our judging process fair and transparent. Wrestling with these issues and the wider context of the 40th anniversary of Ars Electronica, the jury reflected at length on the idea of computer animation itself: what it is and what it might mean as a tool for communication and for the creation of experiences. This became very important as a guiding principle to help the jury to choose between so many strong submissions that encompassed a wide variety of different forms—from abstract works, music videos, essay films, story-led or surreal character animations, data visualizations, physically situated installations, VR, AR, and MR. Ultimately, however, we had to make difficult choices and we regretfully rejected a number of works that we thought were good and knew that they either would be or already had been successful at other animation festivals. This was because we did not think they fitted the category of computer animation as we had decided to define it this year.

As a jury we felt honored to be able to witness this selection of works submitted to Ars Electronica that actually represents a snapshot of the state-of-the-art in computer animation in 2019. Technical trends that emerged from the works included processes such as algorithmic generation, point clouds that index a machine view of the world, artful photographic manipulation with Touch Designer, impossible Octane objects that use irrational and plasmatic cartoon principles rather than the known laws of the physical universe, stylish graphic combinations of 3D mo-cap and 2D rendering, machinima animations that use existing game engines, and various inventive methods to render live data. Common themes that emerged

from the works included personal issues—such as gender, sexuality, relationships, social inclusion, body image, and mental health—as well as wider social and geo-political issues such as migration, mass communication networks, ecological devastation, and impending extinction. We mainly watched the entries on screen, but also spent time experiencing works from inside VR headsets. The VR entries become more sophisticated year after year. We noted how they play with point of view, misdirection, voyeurism, and empathy to enhance storytelling and emotional affect. In addition, some entries paid particular attention to the world outside the headset and sensory experiences were created in the physical environments in which they were encountered that complemented the effect of the work. Although we were able to get a sense of VR and single screen work in the manner in which the works were designed to be encountered, this was not the same for the installations which we received in the form of proposals. Since they were not directly experienced in the physical space in which they were intended to be located in, installation proposals were at times hard to imagine. Clear information about the set-up and video documentation of what it would be like were essential for us to understand how these works were intended.

The process of selection takes several stages. After the initial preselection, there are three full days of further discussion and voting by the jury to first narrow down the entries under consideration and then to select the final fifteen. Sometimes there was a consensus of opinions and we were in total agreement and at other times we had quite heated disagreements. When this happened, decisions were taken by majority vote. At all times, the jury was mindful that winning an award can have a major impact on the recipient’s reputation and future career. Consequently, we tried to recognize independent artists and small studios over major industry players. In our selection it was important for us to represent a spread of the different expanded forms that animation can take, but above all we selected works that demonstrated individual authorship, independence of vision, and

thoughtfulness. Even more than technical prowess, we valued meaning, daring, and emotional risk. As animators we can conjure powerful visions through our fingertips and we must take responsibility for the messages we portray. We should be careful to avoid becoming totally absorbed by the technology and to remember that we are communicating ideas. As a jury, we hope to continue to see animation that does more than technically innovate, but has the vision and bravery to engage with the complexity of topical issues in contemporary society and the sensitivity to portray intimate, personal, human experience.

Golden Nica

ManicVR · Kalina Bertin, Sandra Rodriguez, Nicolas S. Roy, Fred Casia

Mental illness is too often a shameful and misunderstood topic that people do not want to talk about in public. It can be hard to understand if you have not personally experienced it. Although we were not without cynicism for the cliché of VR as an empathy machine, as several jury members had personal knowledge of friends or family with a bipolar disorder, we found it moving to be taken through the experiences of the filmmaker's brother and sister and to hear them talk about it through first-hand accounts left as messages on her voicemail. Scenarios such as being trapped in a small room and then flying through the ceiling to touch the stars served as a metaphor for the rush of mania after a depressive episode. Above all, we applauded the work's ambition to use expanded animation technology to seek understanding for a debilitating condition.

Awards of Distinction

Strings · Ruini Shi

With a clever script that mixes chat messaging with programming language in a nostalgic retro gaming aesthetic, *Strings* addresses online gaming and the loneliness of remote communication. Chasing ghostly algorithms within a discarded game, the narrator searches through data banks

for traces of a lost cyber femme fatale who once caressed him pixel by pixel, but can no longer be found. The jury was enamored with the highly poetic treatment of this story of lost love and the loneliness of social media. They also found the idea of a lost world of forgotten games to be moving and thought provoking.

Undershoot, sensitive data: Cristiano
Cindy Coutant

Inspired by her love for the famous soccer player Ronaldo, in this installation the artist Cindy Coutant has created a virtual character with whom she can have a deep personal relationship. *Undershoot, sensitive data: Cristiano* pays tribute to the deeply personal need to connect through all of the senses—sound, touch, and smell—with the image on the screen and real person. The animation is emotionally charged and enhanced by the physical installation. The jury was moved by the honesty of the piece. *Undershoot, sensitive data: Cristiano* provokes the social, cultural, and ethical standards of the current technology, screen-based and social media infatuation. We are in constant communication with everything around us through machines. As such, it is a tribute to lost emotional connection, intimacy, and materiality.

Honorary Mentions

A Double Life · Studio Job, Joris & Marieke

Who's the husband, who's the wife? This film was chosen by the jury for its daring and humorous exploration of male privilege in heterosexual relationships and the hidden desires beneath the performance of conventional gender roles. Over and above the technical accomplishment of being a well-made CGI character animation that pays attention to detail in modelling and animation, it has a clever twist that reflects power dynamics in sexual relationships and how they are impacted by social stereotypes of gender. The film reminds us that our own thoughtless, bad habits towards those who are close to us can go very wrong in the end.

ACID RAIN · Tomek Popakul

In this bizarrely colored film, Tomek Popakul combines the animation of 2D drawings and 3D models in an unusual way. This combination of the two techniques was already achieved in his previous films like *Ziegenort* and *Black*, but here he takes one step further by depicting a strange act of inner reality like the transformation of the consciousness (and its accompanying involuntary movements of a body) and ontologically unstable perception. The effect of these visions is enhanced by digital techniques: strange mutation of the things, sudden appearances of one of the layers, awkward movements or seemingly infinite multiplication of human figures... By depicting various human conditions in this way, the film also tells something sinister happened to our existence: It already has been deeply mutated or deteriorated and it will never be the same. The ugly beauty of acid rain or a puddle with soaking oil shows it with the mesmerizing and terrifying metamorphosis of its color.

Egg · Martina Scarpelli

Animation is uniquely placed to convey very intimate thoughts and private, subjective feelings. *Egg* uses a striking visual style with a stark black and white color palette, to convey one woman's story of her unhealthy relationship with food and body image. In these digital drawings, the body of the character is trapped within a box, limited by her own beliefs and poor self-image. Body parts multiply and mutate as she contemplates whether to eat, kill, or nurture an egg. The jury admired the illustrative style and the bravery of the animator to explore a personal battle with anorexia.

Emergence · Universal Everything

What drives human behavior? What is the universal language between us? *Emergence* is a large-scale animated performance in an open, infinite virtual game world. Using cutting-edge VR technologies and studies of human behavior, it builds on deep evolutionary and emotional characteristics in humans that are triggered by crowds. It immerses the viewer in a massive hyper-real and intelligent crowd of some 5,000 people. After the initial experience of panic and fear of losing control, the viewer becomes leader and follower, while navigating and flying through and with thousands of people in and out of sync.

Facing It · Sam Gainsborough

Facing It is a technically sophisticated film with faces that are animated through stop motion combined with pixelated live action through painstaking motion tracking and compositing. Through this challenging process, a range of Claymation facial expressions were precisely matched on to the body movements of actors. The result brings animation into everyday locations. The style is tactile, messy, and not afraid to show the fingerprints left behind. This technique enables the interior, subjective worlds of the characters to show through the mask that they wear in public. The jury found it not only technically clever, but also a sensitive metaphor for the way that people protect themselves from revealing their inner feelings and desires to others in public.

Huskies · Lilli Carré, David Sprecher

With a stylish and hallucinatory quality, this film draws you into a dream-like environment of unquestioning obedience where everyone follows the orders of a water aerobics instructor—ultimately to achieve the personal fulfilment of individual pleasure and narcissistic desires. However, the surprising ending draws attention to the environmental consequences of our obsession with ourselves and the legacy this will leave behind. The jury admired the unusual aesthetic and the thoughtful messages behind the film.

KIDS · Michael Frei, Mario von Rickenbach / Playables

KIDS is remarkable, not only in the manner with which it is critical towards human behavior in contemporary society, but also as an example of how digital technology enables animators to try new forms of production. Michael Frei teamed up with coder Mario von Rickenbach and utilized Unity as a production engine, making this project happen in multi-platforms: installation, short film, and indie game, while using the same animation materials. This film version has acute and witty storytelling, using anonymous figures of kids in the black and white space. The film keeps generating faceless children like forever. They think they have a will but, in fact, they just behave like puppets. They just follow the order of something they cannot recognize. This is the reason why the film not only makes us laugh but also feel scared.

Nike · Theo Triantafyllidis

Nike uses an imaginative combination of techniques to critique the pretensions of academic sculpture and fixed conceptions of gender. In this installation, a physical sculpture can be viewed through AR to reveal the artist in the form of a mighty s/hero building an effigy of the goddess Nike out of scrap materials. A commentary can be heard on the progress of the work. This tongue-in-cheek parody of the monumentalization of the ideal female form, is made all the more complex since the artist himself is represented through a grotesque female avatar.

City Rhythm · Siyeon Kim / ARTLab

Of all the entries this year that were based around the visualization of data or the use of point clouds, the jury found this animation to be the most poetic and visually beautiful. The flow of data in Seoul is connected to dreamlike views of a haunted city, bereft of inhabitants. A virtual camera moves through this uncanny landscape of deserted streets with an accompanying soundtrack that tells of being lost, disorientated, and alone as time moves on relentlessly.

Solar Walk · Réka Bucsí

Originally created for live score performance by a jazz orchestra, this short film becomes a symphony between humans, animals, creatures, inanimate and unknown objects, driven by technologies in various eras, set somewhere in the universe. In this film, curiosity about the unknown brings joy to the audience, as do strange situations and characters and the wide variety of the techniques. Here, CGI generates hi-dimensional (or fundamental) objects and makes them move, swim, and dance. It also makes us feel like witnessing the principle of nature just in front of us. With all these combinations that are only possible in animation, the film celebrates wonders this universe may hide as a secret.

Swatted · Ismaël Joffroy Chandoutis / Fresnoy

A number of the entries this year dealt with the negative side of social media: issues of loneliness, miscommunication, and abuse. *Swatted* is an animated documentary that deals with cyber bullying in online gaming. Combining first hand audio recordings of actual events, found and rendered in game footage, it documents the worrying phenomenon of “swatting,” in which gamers are hacked and targeted by pranksters. Their personal identity is then impersonated in order to make hoax calls to emergency services to fool them into visiting an address unnecessarily. This can range from fake deaths, kidnappings, or bomb threats, and result in an armed SWAT team coming to the affected person’s house with fatal consequences.

The Great Indecision Council · Romain Tardy

This installation was thought by the jury to be a good example of using data to create a physically immersive experience through light, sound, and the display of the most commonly searched terms on Google. With a structure resembling an ancient stone circle, the viewer is surrounded with the collective thoughts of society: a physical manifestation of intangible ideas. All too often what is called an installation is simply a screen installed in a gallery to create an essentially cinematic experience, but this installation considered the spatial and sensual elements of perception in three dimensions.

ManicVR

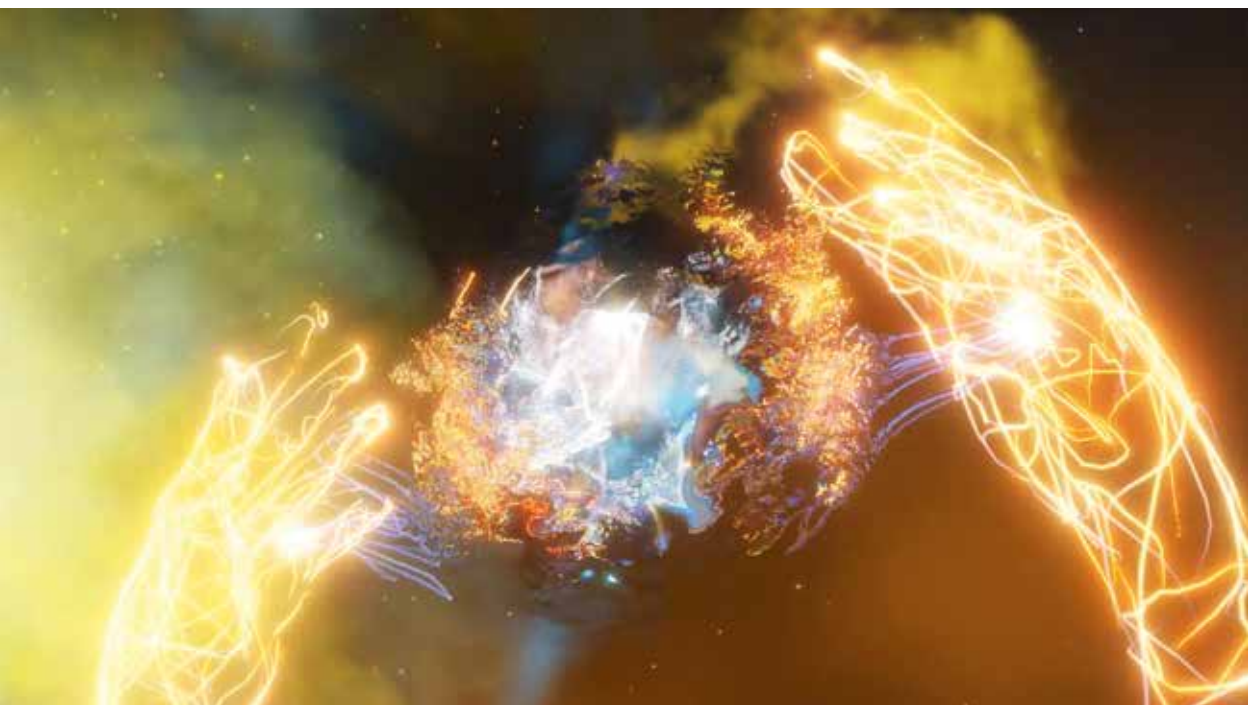
Kalina Bertin, Sandra Rodriguez, Nicolas S. Roy, Fred Casia





ManicVR is a virtual reality documentary that introduces users to the complex world of bipolar disorder. Guided by the voices of Felicia and François Bertin who, for the past 3 years, have used their sister Kalina Bertin's voicemail as their personal diary, the user embarks on a journey to decipher the cycling whirlwind of mania, psychosis, and depression. Through room-scale, real-time interaction and 3D worlds, we discover the destabilizing effects of bipolarity—the heightening of senses and the untamed imagination that accompanies this complex and mysterious condition. Bipolarity is a serious mood disorder characterized by manic and depressive mood swings. Those affected by this disorder can go for years before realizing and accepting they have this mental illness. Generally,

it is not just the people with this disorder whose lives are affected, but also their families and their social environment. Many relatives, friends, and colleagues do not comprehend the experiential world of a person living with bipolar disorder and don't know how best to deal with it. And yet it is this very knowledge that helps maintain the relationship throughout all of the disorder's phases. *ManicVR* humbly seeks to bridge this gap by offering a journey into the destabilizing and mesmerizing world of bipolarity, by enabling visitors to see and experience the highs and lows which characterize manic depression. This immersive experience aims to raise awareness and build empathy around the real, lived conditions of bipolar disorder.



In collaboration with Kalina's siblings, psychiatrists, and scientists from the Douglas Mental University Institute, the MIT McGovern Institute for Brain Research in Cambridge, and the Stanley Center for Psychiatric Research at Broad Institute, Kalina Bertin, Sandra Rodriguez, Fred Casia and Nicolas Roy have created a virtual reality experience that enables viewers to experience the unique world of manic depression from within.

The whole architecture of *ManicVR* is inspired by the natural, built in narrative arc of bipolar disorder type 1 (the type that Felicia and François have been diagnosed with). Six immersive environments were created to act as milestones of the experience. These environments were all based on the same fundamental blueprint—the structure of Felicia and François's bedroom—anchoring them in a reality that builds, transforms, and collapses around the user.

ManicVR had its world premiere at the prestigious Sheffield Doc/Fest in England in June 2018 before heading to the World VR Forum in Switzerland. It won the Dok Neuland Award at Dok Leipzig and was nominated for a Canadian Screen Award for Best Immersive Experience. *ManicVR* has been exhibited at the visionary Phi Center in Montreal, at the Schering Stiftung in Berlin, and in June 2019 at Kleisthaus in Berlin.

ManicVR was produced by EyeSteelFilm_CreativeReality and Dpt.co, both based in Montreal.

Director: Kalina Bertin

Creative direction: Kalina Bertin, Sandra Rodriguez, Fred Casia, Nicolas S. Roy

Producer: Sandra Rodriguez,

EyeSteelFilm_CreativeReality, Nicolas S. Roy, Dpt.co.

Creative coders: Josquin Zabka, Alexandre Bordereau, Paul Georges

3D artist: Hugo Forget

Original music and sound design: David Drury

Production manager: Stéphanie Emond



Kalina Bertin (CA) is an award-winning filmmaker based in Montreal, Canada. She is best known for her award-winning documentary film *Manic* and her virtual reality experience *ManicVR* which explores the world of bipolar disorder from within. **Sandra Rodriguez** (CA) is a creative director, UX consultant and producer of interactive content. A leading voice in emergent media and storytelling, she was founder of EyeSteelFilm—CreativeReality, and currently explores work in VR, AR, and AI. **Nicolas S. Roy** (CA) is the founder and creative director at Dpt.co, an award-winning Montreal studio specializing in interactive storytelling. He has been producing and directing award winning interactive projects for over 15 years. **Fred Casia** (CA) is a graphic designer, animator, and visual artist from Montréal. He is a founding member of the free-form collective Astroplastique and has exhibited art installations for Montreal Museum of Fine Arts and Osheaga Music and Arts festival.

<https://vimeo.com/273215708>

Strings

Ruini Shi





Strings depicts a story in a near future, in which the only player of an obsolete online game wanders around by himself day and night, and seamlessly replaces himself with another personality. However, his isolated emotions begin to open up when one day another “player” arrives in this “Cyber Chernobyl.” This film tells a story about mediated intimacy by depicting a range of virtualized spaces or realms in a game, aiming to open up new opportunities for thinking through digitally mediated relationships.

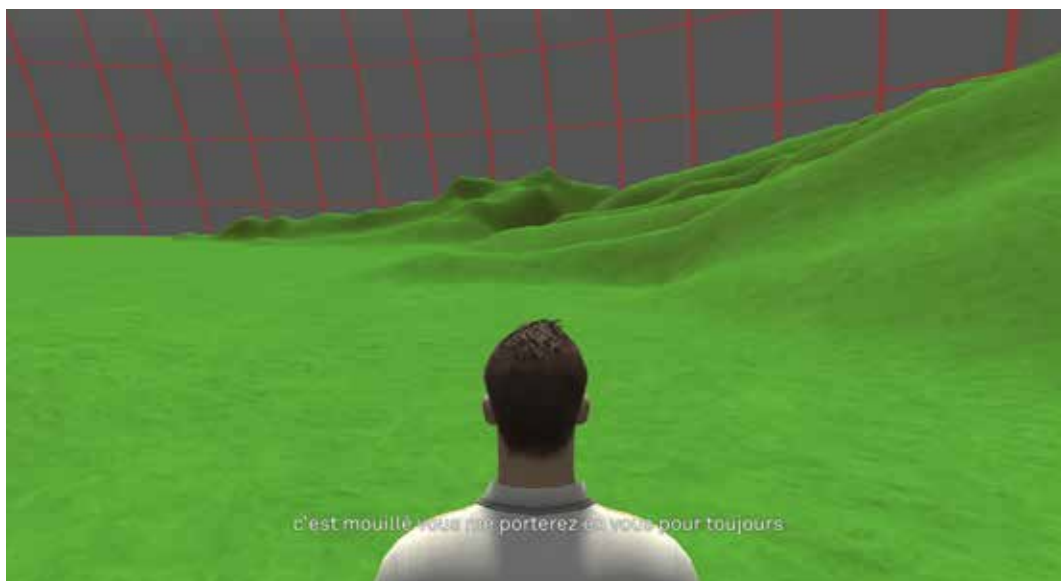
Strings raises questions about the tools and methods which can be employed to refactor the interactions between humans and machines in order to enable new, diverse kinds of intimacy in the digital age. This film combines 3D animation from game engineering software with 2D pixel art.

Director: Ruini Shi,
Voice-actor: Gary Pillai
Sound designer: Ankar Arken
Sound mixer: Sean McGarrity



Ruini Shi (CN) is an artist and designer currently based in London. She explores virtual intimacy by combining film language and technological aesthetics, creating narratives that interrogate the compatibility between humanity and emerging technologies. She holds a BA in Interaction and Moving Images from London College of Communication and an MA in Animation from the Royal College of Art in 2018. *Strings* is the first in a series of stories exploring digitally mediated sites and events as a locus to develop relationship diversity. Her previous film, *Desire Line*, was her MA project and took a different perspective on human-AI relationships through a murder mystery. Recently, she has investigated queering blockchain as an emotional-interactional autonomous region.

<https://vimeo.com/218539975> · <https://shiruini.com>



Undershoot, sensitive data: Cristiano

Cindy Coutant

Undershoot, sensitive data: Cristiano is a video game. The character, Cristiano Ronaldo, generates random existential monologues about its condition of media interface & digital pet and a few actions through a data bank supplied by the author. In 1996, the Japanese company Bandai launched a game called Tamagotchi. This name refers to virtual animals one takes care of by using an interface that resembles the screen of a colorful watch, in the shape of a key chain. They can be washed, fed, and raised with the help of basic commands located around the screen to ensure that they live as long as possible (even though many users entertain themselves by letting them die). For the second part of the series *Undershoot, sensitive data*, Cindy Coutant's installation echoes back to the principle of this game. She describes it as a "textual Tamagotchi." With the help of technological developments, the pet animal looks more precise: here, he takes on the features of Cristiano Ronaldo, and the space in which he moves is a vast soccer field.

How does the artist interact with CR7? Starting from three databases, she "feeds" him with texts—according to her own expression. The first one contains simple instructions (run, throw oneself to the ground, observe the landscape, dawdle, cry, cry hard enough to trigger a tsunami of tears—and there we can well recognize CR7...). The second one consists of simple sentences. The third one includes elements of these sentences, tagged according to their nature and grammatical function.

"Thus, the artist remotely feeds the character (input), who then acts and transforms the submitted text (output). The instructions are visible on the screen, along with the link between the actions and the commands that set them off."

Jill Gasparina for *Le Confort Moderne*

3D: Robin Maulet
 Unity development: Léon Denise
 Produced by *Le Confort Moderne* (Poitiers), Zebra3 (Bordeaux), and LAC&S Lavitrine (Limoges)
 Special thanks to Jérémie Nuel



Cindy Coutant (FR) is an artist and researcher, currently resident at Le Fresnoy. Her work mainly questions the desire of the living to connect with beings and things, coevolution between species or techno-species, and the human need to manage and attach a meaning to the incoming information of the world. Her installations and augmented readings are close to science-fiction and unfold into writing processes that explore different issues such as love in the time of technological espionage, affective economics, grammar of anxiety, or an alternative Genesis creation narrative.

<https://vimeo.com/334298440> · <http://cindycoutant.net>





A Double Life

Studio Job, Joris & Marieke

A Double Life is a deliciously dark comedy about a husband and wife whose different ideas of gender conformity lead to an unexpected confrontation. The inspiration for the film came from the various television programmes on gender in the Netherlands. Programmes named *Gender Bender* and *Love me Gender* and *Geslacht!*, all dealing with the boundaries or non-boundaries of gender. At the same time the papers and magazines were filled with stories about gender confusion at the workplace; should a woman wear suits to be able to become one of the boys, and is lumber-jacking a good hobby to show you are still a man? With the

changing ratio of men and women in the workplace, people were getting confused. With *A Double Life* we wanted to show this confusion without giving our opinion. Whatever the viewer thinks is the message of the film, conveys something about their own opinion on gender.

Written, directed, animated by: Studio Job, Joris & Marieke
 Producer: Studio Job, Joris & Marieke
 Music and sound design Studio Job, Joris & Marieke
 Mix and mastering: Martijn Groeneveld, Mailmen Studios
 5.1 and stereo mix: Jeroen Nadorp, Bob Kommer Studios



Studio Job, Joris & Marieke (NL) is a Dutch animation studio. Their work can be described as both cute and absurd. They've made the short films *Mute*, *Otto*, *A Single Life*, *Heads Together*, and *A Double Life*. In 2015 *A Single Life* was nominated for an Oscar and in 2019 *Heads Together* won an International Emmy Kids Award.

<https://vimeo.com/288164287> · <https://www.jobjorisenmarieke.nl/a-double-life>



ACID RAIN

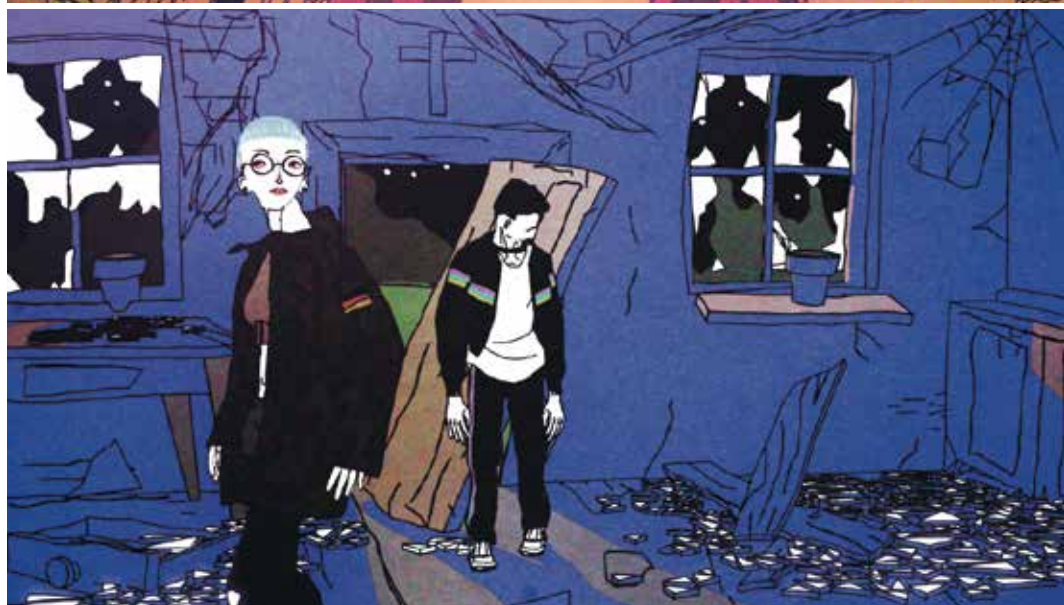
Tomek Popakul

Somewhere in Eastern Europe. Young runs away from her depressing hometown. Her early enthusiasm about hitchhiking fades when she finds herself on the city outskirts in the middle of the night. At the bridge she meets a figure balancing unsafely on the guardrail. That's how she meets Skinny—a kind of unstable weirdo. Skinny lives in a camper van, which he uses to run his not-so-legal job errands. Together with him, she sets out on a journey with no destination. As the ride continues, a particular affection grows between the two of them.

Acid Rain developed as a result of my fascination with rave subculture and its iconography—especially the early years of that scene. I wanted to depict mixed feelings: fascination and repulsion, community and alienation in the crowd, naive spirituality and “human dirt”, nature and civilization, the crave for colors and grey everyday reality in a post-communist landscape of Eastern Europe. The film is a patchwork of my own observations, free-

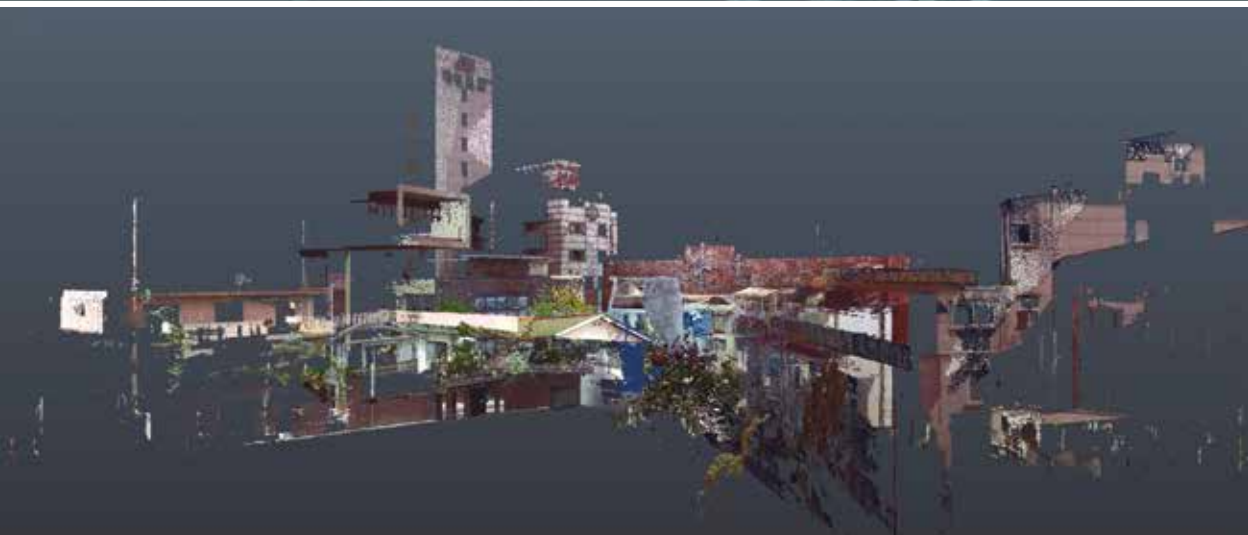
tekno parties on former military compounds, goa trance parties in forests, research about the acid house scene in the UK, stories heard from people that started the rave movement in Poland, and also pure imagination, all making one colorful mix. The soundtrack is made by artists that I respect very much: Escape From Warsaw, Chino, Ceephax, Reptant/Lou Karsh, and Jerome Hill.

Writer, director, and designer: Tomek Popakul
 Cast: Daria Butka, Piotr Butka, Maciej Miszczak
 Sound: Michał Fojcik
 Music: Escape from Warsaw, Lou Karsh/Reptant, Chino, Ceephax, Jerome Hill
 3D animation: Krzysztof Rakaszewski, Shibabrata Chakraborty, Jacek Mazur, Oleksandra Zakrevska,
 2D animation: Adrian Fijałek, Damian Krakowiak, Maria Kulpa, Kasia Melnyk
 Production: Animoon, National Archive – Audiovisual Institute
 Producers: Piotr Szczepanowicz, Grzegorz Wacławek (Animoon)
 Co-financing: Polish Film Institute



Tomek Popakul (PL), born in 1986, graduated in animation from the Łódź Film School. He also studied scriptwriting for a year. He made a couple of short films—among them his graduation, multi-awarded film *Ziegenort*, which screened at dozens of festivals around the world. He participated in the Animation Artist in Residence Tokyo 2014 residency program organized by Japan Image Council (JAPIC), where he made a film *Black*.

<https://vimeo.com/304086902> · <http://animoon.pl/en/projects/acid-rain-happy-hardcore>
https://www.facebook.com/AcidRainShort/?epa=SEARCH_BOX



City Rhythm

Siyeon Kim / ARTLab

Seoul is alive, a city bustling with eager people in their twenties. But where are the old people? Hardly any people in their sixties are ever seen. Even more, the long-term foreign residents rarely show any movement, as if they are anchored to a specific location. As you can see on the screen, the numbers, the movements, and the dots are all of us. They represent ourselves. A myriad of data embodies the movements within the city.

Based on raw data, we visualized the flow of big data related to the population of Seoul city. The three-dimensional images of the dots seem to take on the form of particles drifting across outer space. Let's assume that these dots indicate the movements of the people living in Seoul.

This world of numbers before us has the immense power to draw us into the world of data in a moment, and so transfixed by it, we are left looking at it for quite some time. Is this because data is the product of a very real phenomenon?

The *City Rhythm* project includes a section with the subtitle *LOST*, which shows the image of the city depicted as a point cloud, rendered by scanning the city with a 3D scanner. It seems to be packed with particles of dust—an ethereal halluci-

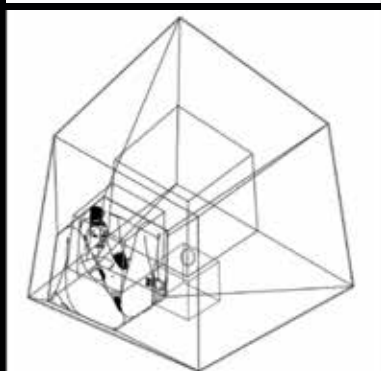
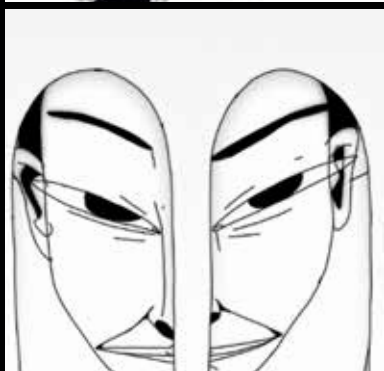
nation in a virtual world. Departing from the boundless universe of data, we set our feet on one narrow street of Seoul. It felt even smaller than a dot. The entity you come across may be a joyful rhythm beating inside your heart, a lonely rhythm standing unaccompanied, or a hectic and restless rhythm that always has to be somewhere, anywhere but here. *LOST* embodies such rhythms.

We may seem to be lonely beings that stand in the middle of the city, lost, without any indication of where to go or how to get to another place. We are the people who reside in the same space, yet we never meet each other. Aren't we all just a little dot?

Director: Kim Siyeon
Producer and writer: Park Seoeun
Graphics: Kim Siyeon, Park Jiyeon, Woo Hyeunjoon
Composer: Kim Siyeon
Editor: Kim Siyeon
Voice: Ariane Carmignac
Sound design, mixing: Kim Siyeon
Data: Kim Wooil, Park Hoontae
Engineering help: Kim Hojoong, Shin Joongho, Jeong Sangchul, Lee Sanghoon
Production: ARTLab
Coordinator: Suh Heesun / K'occa
With the support of Korea Creative Content Agency



Siyeon Kim (KR) is a multimedia artist, film director, and photographer who graduated from National School of Photography (FR) and studied philosophy at Paris-Sorbonne University. *Tremblement* has received several awards, including the grand prix of 16th LVMH Young Artists' Awards(2009), and was shown in France at the Galeries Nationales du Grand Palais. *Winter* was selected as a collection by the National Museum of Contemporary Art (KR) in 2015. The surrounding environment, the city, and people's emotions are central to her work, which focuses on hierarchical structures and how people who have compromised hierarchical order change society, and on the actual events that awaken the mechanical repetition of life.



Egg

Martina Scarpelli

At first glance *Egg* looks like a dark erotic fantasy about a woman's obsession. An intimate voice-over tells the story of a woman locked at home, who is both attracted to and scared of an egg. As the story unfolds it becomes clear that the woman is describing her struggle with anorexia. She eats the egg, she repents, she kills it. She lets the egg die of hunger. *Egg* is a poetic short film based on a small yet significant moment of my own life. Despite its topic, it is a symbolic film that many people will be able to identify with. It is a story about taking control over something you are afraid of, and then failing. It portrays a moment of shame, defeat, and yet of victory. I wrote the story in 2013 and felt uncomfortable reading it to others, so the first draft of the film was very abstract. I always wanted the film to be extremely clean and slightly disgusting. I sort of cleaned it. It is still uncanny and quite disturbing, but it became more personal, less serious, and a bit silly. *Egg* is poetic, metaphorical, and not overtly factual; it uses space, geometry, and volume as active elements of narration to depict a journey within the mind of the character rather than a description of symptoms.

The *ancients* believed that food-related pleasure came through touch rather than taste, because pleasure is derived through the contact of the food

with the lining of the throat. This was one of the main sources of inspiration for the staging of the story. Animation is constructed. It is distanced from reality, which allows the audience to picture what is not visible: the pressure of the moment, the tense relationship with the egg, the feeling of drowning in my own mental illness. I mean the walls of my house obviously never really moved, I didn't swallow the egg in one piece, and I didn't sink in the apartment. But the lack of realism does not seem to detract from the enjoyment people experience when engaging with the film. By the way, there is nothing untrue in *Egg*.

The production of *Egg*, from the writing through to post-production, took around 3 years. It was mainly animated frame by frame using a digital tablet, and the cube is animated in computer graphics by Lars Hemmingsen. From the very beginning there was a strong focus on sound. I started working with artist and sound designer Amos Cappuccio from the first draft of the storyboard, discussing voice-over, sound, and later music.

Director: Martina Scarpelli

Producers: Miyu Productions and Late Love Production

Sound design & music: Amos Cappuccio, Andrea

Martignoni, Sofie Birch



Martina Scarpelli (IT), born in 1988, is an Italian filmmaker with a Bachelor in Fine Art from the Academy of Brera in Milan, and a Bachelor in Animation from the Experimental Cinematography Center in Turin. She participated at the European workshops ASF—Animation sans frontières and ANIDOX. She was an artist in residency at Open Workshop in Denmark, and board member of Viborg-based Art Collective, PLASTIC. Martina's short film *Egg* was awarded with a Crystal for First Film at Annecy, a Golden Dove at Dok Leipzig, a Golden Horseman at Filmfest Dresden, a Grand Jury Award at AFI Fest, and was nominated for best short film at the European Animation Awards 2018.

<https://vimeo.com/138638735> · <https://martinascarpelli.com/egg-2>



Emergence

Universal Everything

Emergence is a first-person open-world environment and crowd performance by Universal Everything, a collective of video artists, experience designers, and future thinkers. The audio-visual, 360-degree artwork expresses the primal human desire to maintain individual identity whilst being part of a crowd. As the user navigates a crowd of thousands, shafts of light beckon them closer. As they touch the light, the environment responds in realtime. Its atmosphere, its gravity and the choreography of the crowd transform in powerful ways, continually challenging the user's perception. Showing 5000+ intelligent human behaviors, *Emergence* offers a powerful, unique experience of a crowd that is only possible with the latest graphics technology. Universal Everything encodes *Emergence's* figures with a form of human intelligence, programming each crowd member with behaviours such as avoidance, following, or mimicry. In this way, it allows a collective intelligence to emerge and elaborate patterns of behavior to be revealed on a huge scale.

The project expands Universal Everything's interest in abstracted human forms and movements. It also builds on their past experiments with software-based improvisation and custom-coded crowd simulations, such as the interactive installation *Disciples*, which humanized users' Twitter followers.

The first version of *Emergence* was an interactive audio-visual experience, in which the user controls their avatar with an X-Box controller or similar. It was released in 2018 at Universal Everything's solo exhibition *Fluid Bodies*, at Borusan Contemporary, Istanbul. In 2019, the project was updated as a VR experience, immersing the user in the crowd.

Creative director: Matt Pyke

Developer: Chris Mullany

Sound design: Simon Pyke

Senior producer: Greg Povey

The VR version is presented in collaboration with Within and premiered at Sundance Film Festival's New Frontier showcase. *Emergence* has featured in *Colossal*, *Cool Hunting*, *Wallpaper* magazine, and *Flaunt*.



Universal Everything (UK) is a global collective of digital artists, designers, animators, musicians, and developers. UE's work explores the future of human expression and collaboration, brought to life using emerging display technologies. The studio invents immersive multi-sensory experiences for pioneering brands, illuminates iconic architecture with video artwork, and directs new forms of moving image that are exhibited at leading cultural institutions worldwide. Past collaborators include Apple, Audi, The Barbican, Chanel, Coldplay, Deutsche Bank, Dolby, Google, Hyundai, Intel, La Gaité Lyrique Paris, Microsoft, MOMA NYC, MTV, Nike, Nokia, Radiohead, Science Museum London, Sydney Opera House, V&A Museum London, Vice Media, and Warp Records.

<https://universaleverything.com/projects/emergence>

Facing It

Sam Gainsborough

Shaun doesn't fit in. It's not that he wants to be alone but, somehow, he always feels separate and isolated from the confident, happy world around him. Whilst waiting for his parents in a busy pub, Shaun struggles valiantly to join in with the admirably happy people in the crowd, but the more he tries, the more it goes awry. As everything in the pub goes from bad to worse, Shaun finds himself confronted by the painful memories that made him who he is. His feelings, memories, and desires overwhelm him and by the end of the evening he is ready to explode...

Facing It is a short narrative film about anxiety, repression, and how we are made of the different relationships we have experienced throughout our lives. Sam Gainsborough and his creative team wanted to create a unique visual language that felt like something they hadn't seen before. It was

important from the first day of production that the visual technique would be the only way to tell this particular story. Using a combination of live-action, pixilation, and stop-motion animation, the team spent two years creating this bizarre little film. It was a leap into the unknown for everyone involved, creating a production process which was at times stressful but always exciting.

Writer and director: Sam Gainsborough
Producer: Jimmy Campbell Smith
Co-Writer: Louisa Wood
Cinematographer: Bruno Grilo
Production designer: Fiona Guest
Editor: Mdhamiri a Nkemi
Composer: Jack Newton
Sound designer: Adam Woodhams
Compositing producer: Joe Morris
Colourist: Vlad Barin
Production manager: Garry Frost





Sam Gainsborough (UK) began his career as a screenwriter, determined to tell unique stories with his particular sense of humor. He soon became fascinated with a variation of animation techniques, through which he could create his bizarre and wonderful worlds. Sam's work mixes physical animation with digital techniques to create a tactile and hand-made look. He loves physical textures, frame-by-frame handcrafted animation and strives to create visuals that feel like something we've never seen before. Aesthetically, Sam is obsessed by fingerprints, rough textures, and wet paint, however the most important thing for him is that his stories communicate a clear message with humor and pathos.

Sam has created a number of mixed media music videos and commercials, and his recent short film *Facing It* has picked up a number of animation awards all over the world.

<https://vimeo.com/260072282> · <https://vimeo.com/290238733> · <https://vimeo.com/samgainsborough>



Huskies

Lilli Carré, David Sprecher

Enjoy the resistance. Follow the leader.

In our film, we pulled language from our current political climate and from the imperative voice of water aerobics instruction. At times the film's subjects enact a trance-like obedience to the film's guide, performing the instruction with military coherence. At other times the subjects are passively disobedient like distracted animals at a training. Huskies emerged from our shared attraction to the aesthetics of indoor pools and a mutual unease with the inclination shared by Americans across the political spectrum to blindly recapitulate ideological bullet points sanctioned by their peers.

The pool can be thought of as a Petri dish seen through an out of focus lens, with the pool noodles resembling magnified microorganisms. Like bacteria near a sugar source, the swimmers' actions reflect a glitchy collective will that lacks conscious intentionality. The destination of this guided tour is clear and cold. The drama of humanity is memorialized by pool noodles.

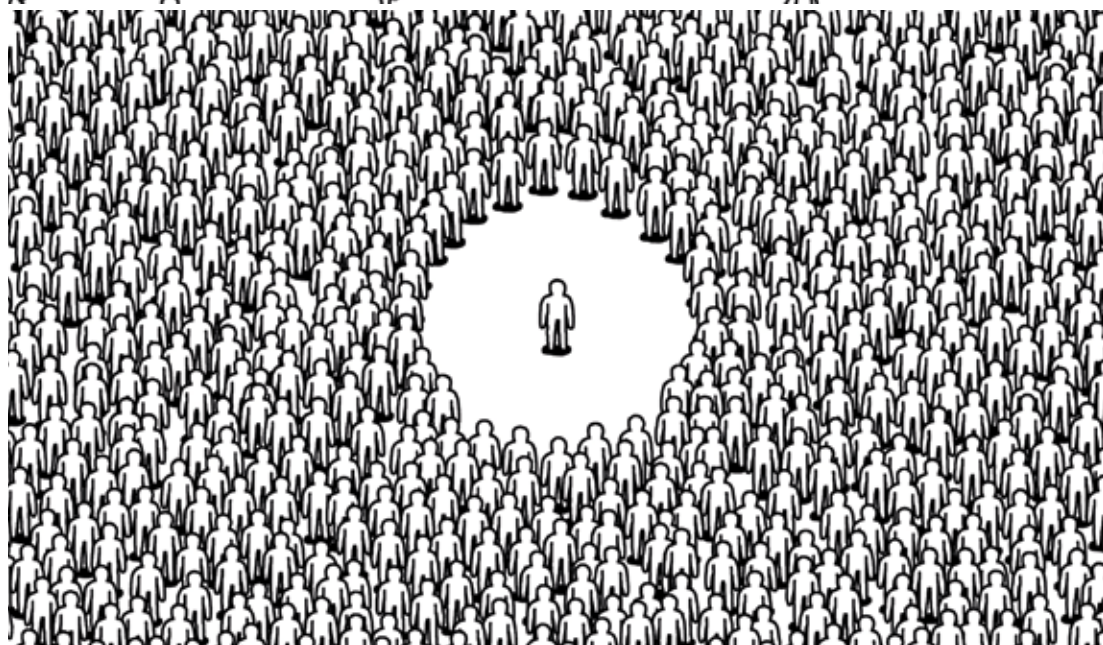
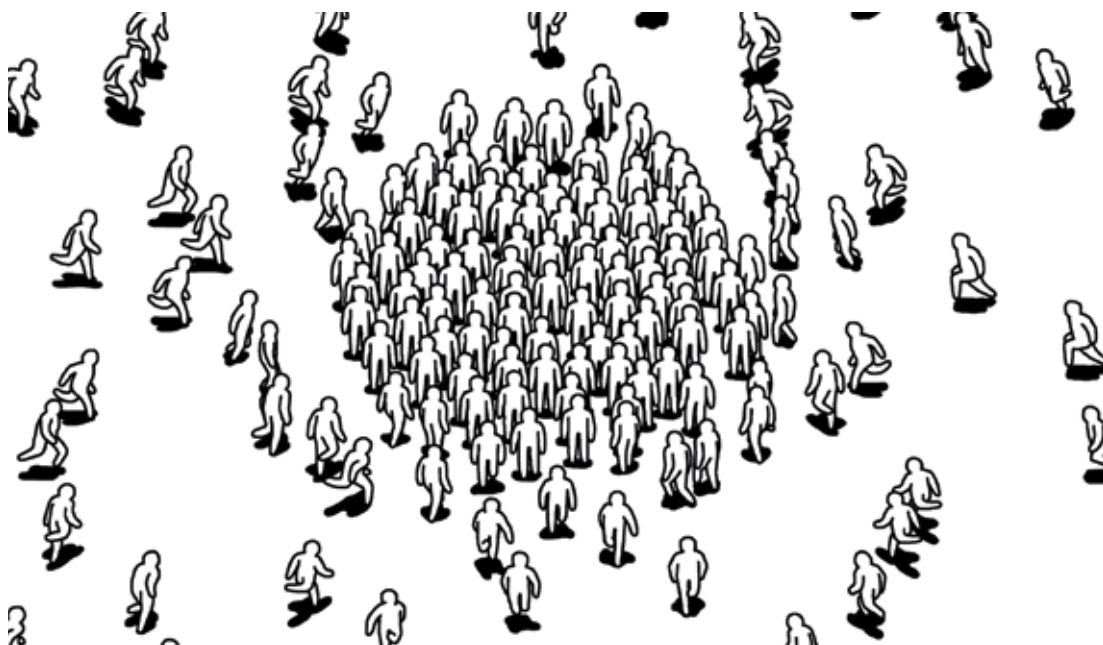
Animation: Lilli Carré
Writing + Sound: David Sprecher and Lilli Carré
Voice: Mary Emmerick



Lilli Carré (US) is a visual artist and filmmaker. In 2010 she co-founded the Eyeworks Festival of Experimental Animation, which is held annually in Chicago, LA, and NYC. Exhibitions of her drawing, animation, and sculpture have shown internationally and throughout the US, and her films have shown in festivals including the Sundance Film Festival, the Edinburgh International Film Festival, the Ann Arbor Film Festival, 25FPS, and the International Film Festival Rotterdam. She has an MFA in Art Theory & Practice from Northwestern University. **David Sprecher** (US) is an artist based in Chicago. As a

sculptor and writer, he makes augmented realities that conflate architectural and literary interiors. He has published writing in *The Brooklyn Rail* and has shown installations in New York, Chicago, Baltimore, and Berlin.

<https://vimeo.com/276565551>





KIDS

Michael Frei, Mario von Rickenbach / Playables

KIDS is a game of crowds. The project consists of a short film, an interactive animation, and an art installation.

How do we define ourselves when we are all equal? Who is steering the crowd? What if it is heading in the wrong direction? Where does the individual end and the group begin? What is done by choice, and what under duress? *KIDS* was made using traditional 2D hand-drawn line animation in black and white. The animation was assembled, composited, and choreographed using a game engine with a custom-made animation system in conjunction with physics simulations. The characters in a crowd behave much like matter: They attract and repel, lead and follow, grow and shrink, align and separate. They are purely defined by

how they relate to one other—without giving them distinguishable features. *KIDS* is the second collaboration of filmmaker Michael Frei and game designer Mario von Rickenbach after their project *PLUG & PLAY*. The project is co-produced by Playables, SRG SSR, and Arte. The app is published by Double Fine Presents for mobile devices and computers.

Written by: Michael Frei, Mario von Rickenbach
 Director: Michael Frei
 Animation: Michael Frei, Martine Ulmer, Anaïs Voirol
 Code: Mario von Rickenbach, Raphaël Munoz
 Music: Olav Lervik, Riga Cathedral Boys Choir
 Sound design: Masumi Takino
 Sound mix: Thomas Gassmann
 Production: Playables
 Co-Production: SRF / SRG SSR, ARTE



Michael Frei (CH), born in Switzerland in 1987, is a filmmaker and artist based in Zurich. He studied animation at the Lucerne University of Applied Sciences and Arts and at the Estonian Academy of Art in Tallinn. His films *Not About Us* and *Plug & Play* received numerous awards all over the world. He was invited as 'Animation Artist in Residence Tokyo' in 2014. His interactive project *Plug & Play* became an internet phenomenon. Funny. He recently co-founded Playables, a production company for peculiar projects based in Zurich. **Mario von Rickenbach** (CH) is a designer and creative technologist based in an obscure country called Switzerland. He's a generalist with experience in game design, programming, graphic design, and animation, and is interested in working at the intersection of design, art and technology.

<https://playkids.ch> · <https://vimeo.com/331766057>



Nike

Theo Triantafyllidis

In this body of work, the *Ork Series*, Theo Triantafyllidis re-imagines the exhibition space as his own virtual studio. He embodies an Ork avatar, who uses digital tools to create 3D forms, which are then manifested physically as large-scale wood sculptures. This process is recorded through DIY Motion Capture and displayed on a mobile screen in the exhibition space. By moving the screen structure throughout the space, the audience is able to view the sculpture while simultaneously experiencing the artist's digital performance of creating it. *Nike* can be seen as a re-interpretation of the *Winged Victory of Samothrace*, prominently displayed at the Louvre. Using scrap material available at the studio, the muscular character tries to recreate the sculpture from memory. The sense of awe, struggle, destiny, and divine grace of the Hellenistic sculpture are playfully misunderstood and intertwined with the synonymous sports company's

ad campaigns. The original's interplay between the statue and the space around it is expanded to the virtual space. In creating the Ork character, Triantafyllidis pairs prevalent video game tropes with the performative persona of The Artist. Ork Aesthetics are inspired by medieval contraptions, engineering tools, brutalism, and gaming culture. The artist's performance considers the concept of virtual labor and production in today's hybrid-reality work environments, as the Ork experiences the frustrations and complications of artistic labor in his virtual studio. After digital creation, his works are rendered physically flat in a purposeful misuse of 3D modeling, coming to occupy an alternative mass and materiality in this augmented and mixed world. Like chasing Pokemon on their phones, viewers are invited to enter the process and performance that created these odd objects.

Special Thanks to Meredith Rosen Gallery, NY and the Breeder Gallery, Athens GR



Theo Triantafyllidis (GR), born in 1988, Athens, is an artist who builds virtual spaces and the interfaces for the human body to inhabit them. He creates complex worlds and systems where the virtual and the physical merge in uncanny, absurd, and poetic ways. These are manifested as performances, mixed reality experiences, games, and interactive installations. He holds an MFA from UCLA, Design Media Arts, and a Diploma of Architecture from the National Technical University of Athens. He is based in LA.

<http://slimetechnology.org>



Solar Walk

Réka Bucsi

Solar Walk shows the journey of individuals and their creations on through time and space. Any meaning of action is only existent from the perspective of the individual, but never mandatory when looking at it from the perspective of a solar system. It's about the melancholy of accepting chaos as beautiful and cosmic. Passion for creation is projected through the unique and playful texture of the animation craft itself.

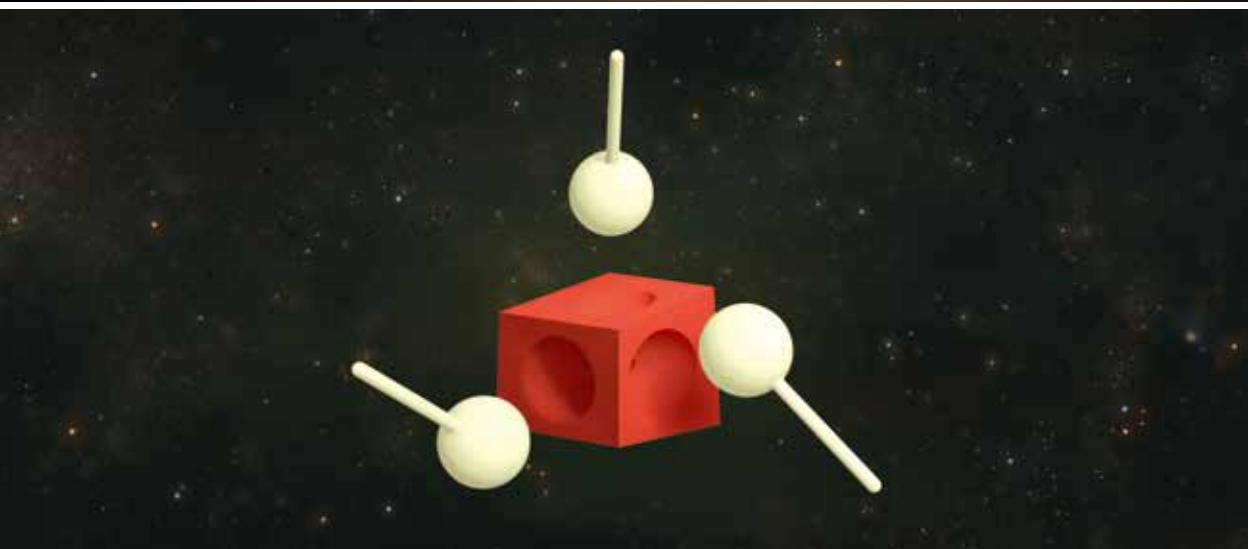
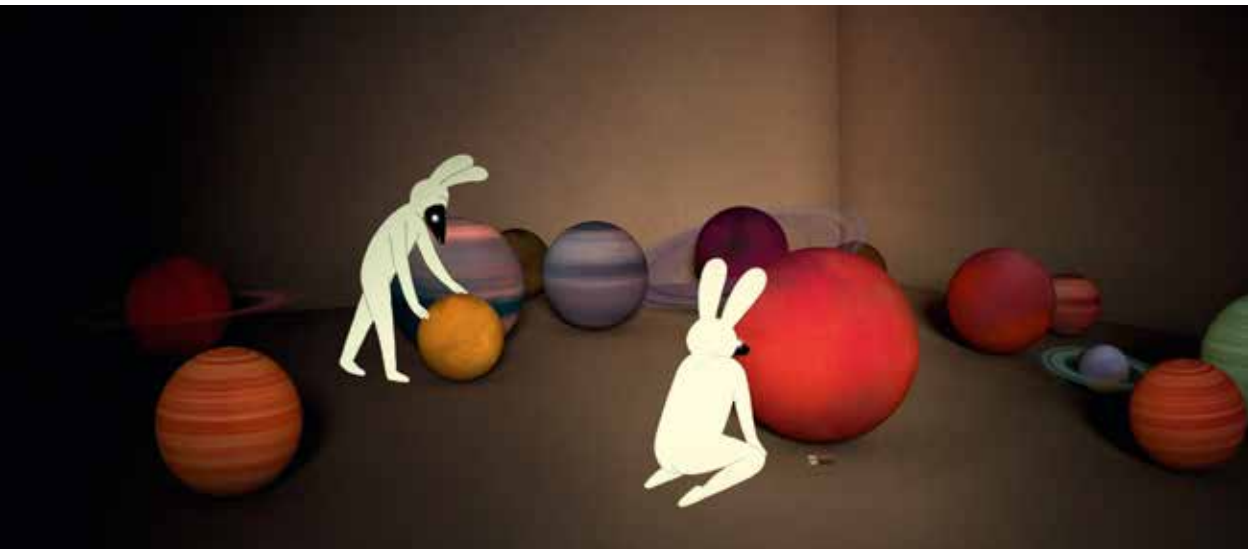
That balance between familiar and unknown is always one of my main focuses when I'm starting a movie. The alien part is also something I like to keep alien, and don't discover entirely. I prefer not to know my characters very intimately. The original version of *Solar Walk* is a 47 minute long piece for a live performance, with the Danish Radio Jazz Orchestra. It's a sort of modern *Fantasia*, where the film is linked to the music. The short film is the

spine of the long version, it's the core of the story. The film builds up from classic 2D cell animation, mixed with some 3D CGI. The focus relies on discovering what we could potentially take away from traveling through space or understanding something like infinity. I wanted to focus on kindness as the main characteristic for the creatures.

Director: Réka Bucsi
Storyboard: Réka Bucsi
Layout: Jason Reicher, Réka Bucsi
Background artist: Réka Bucsi
Animation: Nicole Stafford, Jason Reicher, Cyrille Chauvin, Pernille Kjaer
Generalist: Lars Hemmingsen
Compositing: Lars Hemmingsen, Asger Kjaerholm
Sound and mixing: Péter Benjámin Lukács
Music: Mads Vadsholt
Production manager: Loréne Lescanne
Producer: Morten Thorning (The Animation Workshop/
VIA University College), Claus Toksvig (Norlum)

Réka Bucsi (HU), born in 1988, is a Hungarian independent animation filmmaker. She received her BFA and MFA at the animation department of Moholy-Nagy University of Art and Design Budapest. Her graduation film *Symphony no. 42*, got shortlisted for the 87th Academy Awards. Her films have been screened at official shorts competitions such as Berlinale, SXSW, Sundance, Annecy, and have won over 50 international awards. 2013/2014 she attended Animation Sans Frontières (ASF), the European Animation Production Workshop. She was an artist in residence at the Open Workshop in Viborg, Denmark, and at Q21 in Vienna. Her French co-produced short film *LOVE* was nominated for the European Film Awards 2017, and shortlisted for the César Award 2018. Réka is represented as a director by Passion Pictures.

<https://vimeo.com/ondemand/solarwalk>







Swatted

Ismaël Joffroy Chandoutis / Fresnoy

Online players describe their struggles with “swatting,” a life-threatening cyber-harassment phenomenon that looms over them whenever they play. The events take shape through YouTube videos and wireframe images from a video game.

To make a film where action takes shape in the flow of the Internet, is to be open to all possible staging. It is the advantage of being able to create without camera and without shooting. The story was thus constructed directly in the editing, from different image regimes: interviews, videos found on the web, different game streams video... etc.

I also used a video game to generate an abstract space that is both a mental landscape and the narrative epicenter of the film.

Director: Ismaël Joffroy Chandoutis
Screenplay: Ismaël Joffroy Chandoutis
Producer: Le Fresnoy: Luc-Jérôme Bailleul
Cinematographer: Ismaël Joffroy Chandoutis
Animation: Ismaël Joffroy Chandoutis
Sound design & editing: Alban Cayrol
Sound mix: Martin Delzescaux
Editor: Maël Delorme, Céline Perreard, Ismaël Joffroy Chandoutis
Composer: Disasterpeace



Ismaël Joffroy Chandoutis (FR). Born in France in 1988. Graduated from INSAS (Belgium) in editing, from Sint-Lukas Art School (Belgium) in filmmaking, and from Fresnoy (France). Ismaël Joffroy Chandoutis explores a cinema beyond the boundaries of genres. His films question memory, virtual technology, and the intermediate spaces between the worlds and between the words. He was known as a filmmaker with his film *Ondes noires*, which has been shown at many international festivals, such as IDFA, Clermont-Ferrand Short Film Festival, Regensburg Short Film Festival etc. The film has also received numerous awards, including the Prix Festivals Connexion Auvergne Rhône Alpes in Clermont-Ferrand, the Grand Prix, and the Youth Jury Prize at Regensburg Festival. Ismaël is also a film editor. He currently lives and works in Paris.





The Great Indecision Council

Romain Tardy

Who are we really? Who do we want to be? What do we tell Google, from the apparent intimacy of our smartphone, that we would rather not share with the rest of the world?

The Great Indecision Council has been conceived as an unsolicited self-portrait of our current society by translating in real time the search terms most frequently used on Google and Google News into visual and audio signals in the public space; they become pulses that are visible and audible both inside and outside the circle. *The Great Indecision Council* is a reflection for us all. An image that shows humanity as it really is, not how it wants to be seen.

The work takes the shape of a mesmerizing and hypnotic large-scale light and sound installation, in which visitors are surrounded by a circle of light, 12-channel sound, words and computer-generated, mystical chants. *The Great Indecision Council* invites visitors into the middle of this enchanting work while being watched by spectators close-by, and maybe even far above us.

Concept, visual design: Romain Tardy
 Music: Loran Delforge
 Software development: Hand Coded
 Production: Into The Great Wide Open festival in association with MU art space

Romain Tardy (FR) is a visual artist. His works establish a direct connection with everything digital. However, Tardy doesn't necessarily use the term "digital art" to describe them. His installations are mostly IRL, offline because to him "the screen is not the limit." They are designed as sensory experiences using both digital tools (such as video mapping, sound, and light) but also objects or analog devices. They question technological progress and its repercussions on society. His work has been shown physically in more than 15 countries worldwide. Currently he lives and works in Brussels. As well as his personal creations, he does creative and art direction, and art consulting.

<https://romaintardy.com/The-Great-Indecision-Council-2018> · <https://vimeo.com/288438943>

 **PRIX
ARS ELECTRONICA**

ARTIFICIAL INTELLIGENCE & LIFE ART

Life's Intelligence, beyond Human Cognition

Memo Akten, Jens Hauser, Vladan Joler, Irini Papadimitriou, Moon Ribas

Establishing such a new category is a challenging task that requires an etymological and epistemological contextualization of the central key terms 'Artificial Intelligence' and 'Life Art.' But above all, it asks for a sensibility of how the oscillation between these two notions may correspond to criteria of artistic quality and criticality vis-à-vis currently much hyped notions that trigger unconventional responses with regards to their highly relevant impact on societies, ecologies, and relationships that humankind has with other living beings and planetary systems. While this new category replaces and, at least at first sight, seems to narrow down the scope of the highly successful 'Hybrid Art' category in place since 2007, it received 840 entries—a quantity comparable with the Prix Ars competition's most established categories. It indeed 'hybridizes' fields of artistic inquiry into practices that technically combine hardware, software, and wetware, and conceptually span from areas such as synthetic biology, the life sciences, artificial life and artificial intelligence, robotics and kinetics, to performative practices from the microscopic molecular to the

macroscopic environmental and cosmological level.

The new category sparks discussions about the links between the largely ambiguous notions of 'intelligence' and 'aliveness' as such, addressing, on the one hand, machinic practices of the animation of the technological and, on the other, biological practices of the technologization of what is naturally animate. It also encourages artistic thought about whether the problematic notion of 'artificiality' is reserved to human action—hence expressing an anthropocentric position per se—and about how far innate technical capacities of non-human agents play a crucial role within a larger bio-semiotic web of trans-species relationships that are often at the core of art projects proposing more humble attitudes, instead of the glorification of human prowess and progress.

Historically, then, the scope of the 'Artificial Intelligence & Life Art' category also embodies dichotomic developments within the fields of Artificial Intelligence and Artificial Life research since the 1960s—life versus mind, biological versus psychological—thus oscillating between cybernetic

interest in self-organization, autonomy, adaptation and regulation, and symbolic and computational approaches with their focus on intelligence—understood as information-processing capacities, programming languages, machine learning, the modelling of human-like capacities and consciousness, or artificial neural networks. If such different approaches have partially merged into areas such as soft or situated robotics, distributed cognition and technological hybrids composed of analogue-digital and hard-soft-wet systems, the advent of the new category becomes plausible. While such techno-philosophical debates set the back of the stage, the jury process, however, clearly foregrounded the search for critical artistic excellence, without any desire to cover as many aspects as possible within the wide range of the category. Clusters began to emerge quickly, and these were overall less concerned with technical perfection than with critical reflection of hyperbolic and affirmative mainstream discourses surrounding the fields of Artificial Intelligence and the Life Sciences. It may seem surprising that the jury detected generally less epistemological

awareness, poetry, and humor in art projects or devices mimicking human intelligence (such as in GAN/Generative Adversarial Networks or chats), than in unconventional and very personal artistic inquiries into eco-systemic forms or ‘intelligence.’ The jury also witnessed a trend toward more complex and longer-lasting work cycles instead of one-off projects dealing with isolated issues such as surveillance, privacy, facial profiling, or the debates around GMOs.

Among the awarded projects, many demonstrate a high level of both critical and humorous systems thinking, the quest for other than human intelligence, socially sustainable and peaceful use of AI technologies beyond militarizing fantasies, alternative sensory and perceptual modalities such as smell or taste, bio-semiotic reflections on alternative agencies such as plants or bacteria, thoughts about the limits of technological bioremediation, material practices in the context of ecological and climate crisis, or hybrid installations combining software, hardware, and wetware.

Golden Nica

Labor · Paul Vanouse

The jury has awarded the Golden Nica to the bio-cybernetic and olfactive installation *Labor* by Buffalo-based artist Paul Vanouse, which elegantly combines reflections about the automation of labor and the obsession with optimization in the name of capital, current challenges posed by today's microbiome research to the notion of human individuality, and the progressive disappearance of work and workers as we knew them. In times of algorithmic finance and high frequency trading this fully functioning live *laboratory* produces the sweaty smell of labor not as a by-product but as its end-product, involving three bioreactors containing different strains of bacteria that 'collaborate' to create scents typically associated with human exertion. The nostalgic link between physical human effort and economic value is disrupted, while stressing the disintegration of personhood. The instrumentalization of sequential micro-gestures on the industrial production line is continued here in a dynamic self-regulating art installation to embody our society's shift from human and machine labor to increasingly pervasive forms of microbial manufacturing and computerized bio-optimization. At the same time 'the smell of labor' produced by microbes populating human host bodies, and vastly outnumbering human cells, accentuates bio-philosophical questions regarding what defines and determines humanness, in times where research into the gut-brain axis reveals cognitive and emotional dependencies from our microbial co-actors.

Awards of Distinction

Confronting Vegetal Otherness

Skotopoiesis, Phytoteratology, Strange

Encounters · Špela Petrič

With her triptych *Confronting Vegetal Otherness*, Špela Petrič demonstrates continued and conceptually multi-faceted work to address bio-semiotic relationships with the plant world, and to call for the enlarging of the human sensorium via planta-

morphization. Translating her long-term involvement with the plant kingdom at different scales both in time and space, Petrič poetically stages human-plant kinship and co-performativity from the molecular to the ecological realm, via different vectors of communication from hormones to light. Her work systematically challenges the idea that sign processes carried out symbolically by humans are *per se* superior to other processes that play a crucial role in information and interpretation processes among living entities at large. In the quest of a process of 'intercognition,' Petrič explores material rather than language-based ways of physico-chemical exchange, while viscerally engaging audiences in the exploration of vegetal qualities crucial for human survival, and advertising a philosophical attitude of 'becoming plant' as eco-systemic intelligence.

VFRAME: Visual Forensics and Metadata

Extraction · Adam Harvey

VFRAME combines art-as-activism, open-source and DIY / DIWO philosophies, community and citizen science to subvert what was initially developed as surveillance technologies, and deploy them for the greater good. Against the grain of the bulk of today's Artificial Intelligence technologies—primarily surveillance technology fueled by business models of internet tech-advertising companies and the military industrial complex—*VFRAME* is a collection of open-source tools, workshops, documentation, and other resources that reclaim these technologies, and make them available for the benefit of human rights researchers and activists. Specifically, this includes training state-of-the-art object detection models to recognize illegal munitions in images and videos. To overcome one of the toughest challenges involved with such a task—being able to cope with the vast amount of possibilities that the system might encounter—Adam Harvey works with the Syrian and Yemeni Archives in order to produce synthetic data on which object recognition models can be trained.

Honorary Mentions

Biocomputer Rhythms

Eduardo Reck Miranda

In *Biocomputer Rhythms*, Eduardo Reck Miranda is bridging the gap between traditional silicon-based computing and biology. The result is a duet between a human pianist-composer, and a bio-computer. As the pianist plays the piano, audio signals feed into an electrical circuit with biological components consisting of *Physarum polycephalum*, slime mold. The biocomputer responds with signals that activate electromagnets to vibrate the piano strings. This enables the biocomputer to both sense its environment and take actions in it. *Biocomputer Rhythms* simultaneously questions and investigates new modes of musical performance, as well as new modes of computation.

Carbon Black · Anaïs Tondeur

in collaboration with Rita van Dingenen
and Jean-Philippe Putaud, JRC, European
Commission

Carbon Black presents us with a series of photographic prints of dramatic, and literally black skies, since its black carbon particles materially stem from burned fossil in the air we breathe. Anaïs Tondeur's expedition leads her from the northernmost point of Scotland, where—despite the lack of industry—carbon black particulates are detected in the heart of a young girl and inhabitants suffer from suffocation, all the way to Folkestone in South East England. Equipped with a respiratory mask, the artist follows the path of this invisible, but ever-present agent, breathing the polluted air and trapping black carbon particles she encounters in her mask, and turning them into photographic ink for her black skies prints, matching them to the locations they were breathed in, like a material index.

Fossil Futures

Nora Al-Badri, Jan Nikolai Nelles

Fossil Futures revolves around a dinosaur skeleton that is on display in the Natural History Museum in Berlin. The skeleton—or at least parts of it—was excavated in Tendaguru Formation in Tanzania, also known as German East Africa, the former German colony. While Tendaguru Formation was a site of dinosaur bone excavations during the colonial era, Nora Al-Badri and Nikolai Nelles were refused access to data from the museum. Using leaked data, they created an artificial intelligence generated 3D-printed dinosaur bone. This digital copy stands as a form of provocation, asking uncomfortable questions about looted artefacts in European museums. At a time of debates around museum collections and restitution, and while the threat of land grabbing and commodification of nature is ever present, *Fossil Futures* invites us to rethink Europe's colonial past, present, and future.

Human Study #4, La Classe · Patrick Tresset

Patrick Tresset's performative installation uses embodied computational agents—twenty-one robots as teachers and pupils, re-creating a classroom situation. The robots consist of a camera head and robotic arm holding a pen, trained to follow the headmaster's instructions so they learn to count by drawing lines and tallying marks, and also expressing human-like behaviors. Some of them look bored or shy, some might be slow and find it hard to follow, while others comply and dutifully complete their tasks. *Human Study #4, La Classe* is less a commentary on technology itself than an observation on society, human nature, behavioral standardization, and the limitations of machine learning processes.

[ir]reverent: Miracles on Demand

Adam Brown

In Adam Brown's long-term bio media research project *[ir]reverent: Miracles on Demand*, the inquiry into how non-human agents impact on human fate via the occurrence of 'miracles,' the investigation into the natural sciences' role to fill knowledge gaps, and in-depth microbial research into the mystery of 'bleeding hosts' and their role in belief systems converge. The project researches the historical context in which accounts of blood flowing from bread provoked religiously justified admiration or crime, and pursues extensive material inquiry to replicate and optimize the conditions under which certain bacteria express blood-like red pigment, that humans (mis)interpret. Combining historical and field research, interventions on Catholic churches and informed biotechnological practice to challenge the humans' claim to be the only intelligent species to symbolically make sense of cultural patterns, Brown's work condenses the bloody sides of human ignorance with regards to naturally occurring 'miracles.'

Mosaic Virus · Anna Ridler

An algorithm conjures up an endless stream of imaginary tulips, controlled by the price of bitcoin. The piece references the 17th century financial bubble called "tulip mania," caused by a rare mosaic virus that made tulips express streaks and become highly sought after, leading to extraordinarily high prices, only to collapse shortly after. Anna Ridler compares tulip mania to the highly speculative and hype-driven nature of cryptocurrencies, and of emerging technologies in general, including Artificial Intelligence. In the piece, AI algorithms generate an endless stream of imaginary tulips, paralleling 17th century Dutch still life painters who also often painted not what they saw but fictional scenes they fantasized. The artist reflects on the role of Big Data, data collection, data ownership, and data bias in off-the-shelf third-party datasets. She painstakingly photographs, collects, and catalogues thousands of images to create her own dataset as an integral part of the artwork.

Mother's Hand Taste (Son-mat) · Jiwon Woo

Jiwon Woo takes the emotional attachment to their mother's cooking most people have, as well as associative memories from dishes familiar from their childhood, as a starting point for her project *Mother's Hand Taste*. She explores in a deeply poetic way what makes a mother's dish "hand taste" (Son-mat) genuinely different from others, examining the inheritance of culinary culture and transmission of *Son-mat* among family members across four global locations. Jiwon Woo biologically experiments with yeast and fungi sampled from hand palms to reveal their effects on the taste of fermented food. This project brings together science and cultural heritage in a particularly tangible way and materializes the feeling of belonging, by connecting cultural identity, family ties, and taste.

One Tree ID

How To Become A Tree For Another Tree

Agnes Meyer-Brandis

Like any human, trees and plants have their individual odor, their own essence. *One Tree ID* condenses the identity of a specific tree into a complex perfume that can then be experienced by human visitors in order to apprehend the tree's communication system at a biochemical level. Agnes Meyer-Brandis has created a poetic piece to suggest an exploration of how to question the way we use our senses to generate new connections and interactions between species. *One Tree ID*'s perfumes offer alternative ways of information exchange with the plant kingdom upon which humankind depends.

Resurrecting the Sublime

Christina Agapakis of Ginkgo Bioworks, Inc., Alexandra Daisy Ginsberg, and Sissel Tolaas, with support from IFF Inc.

This installation comprises olfactive simulations of flowers that have become extinct as a result of human activity. The team behind *Resurrecting the Sublime* recovered DNA fragments from these extinct plants and, using methods of synthetic biology, synthesized what might have been the original extinct flowers' smell. While huge numbers of plant and animal species are irrevocably lost, the recreation of fragments of such lost species is experienced less as a celebration of de-extinction fantasies than as a terrifying sign of our compromised relationship with other species. *Resurrecting the Sublime* confronts us with the dilemma that even our most sophisticated technologies will not compensate for the lack of conservation strategies.

Solar Powered Website

Kris De Decker, Marie Otsuka, Roel Roscam Abbing, Lauren Traugott-Campbell

The *Solar Powered Website* addresses issues of growing energy use by the internet infrastructure, sustainable interface design, and content production. The project was created for *Low-tech Magazine*, an online and print publication that questions society's belief in technological progress and highlights the potential of past knowledge and technologies for designing a sustainable society. This simple, minimalist, and sustainable design and DIY technology solution based on the off-the-grid renewable power system is a wonderful example of the decentralization and re-appropriation of the internet infrastructure. The design and architecture behind this website allow us to understand how the growing energy use of the internet infrastructure is a consequence of actual decisions made by software developers, web designers, and publishers on the one hand, and internet users on the other.

The Normalizing Machine · Mushon Zer-Aviv, Dan Stavy, Eran Weissenstern

The Normalizing Machine is an interactive installation presented as experimental research in machine learning, created with the aim to identify and analyze the image of social normalcy, while precisely pointing out some of the main issues related to the use of contemporary machine learning applications. It references historical applications for categorizing and stereotyping human faces, as rooted in the eugenics movement and in the work of forensics' pioneer Alphonse Bertillon, who invented an identification system for criminals based on facial and bodily measurements. *The Normalizing Machine* visualizes how machine learning automates Bertillon's speaking portraits and amplifies systemic bias—something that can be identified in today's systematic discrimination, aggregated and hidden within face recognition systems.

Wastelands · Tagny Duff

Wastelands is a biological art project that speculates on a future in which humans will be fueling the world with their own waste—excrement, methanogens, and viruses. Small wearable and functional prototypes of methane biogas generators present a prospective scenario of how human-animal excrement might be recycled to produce sustainable biogas fuel for humans to live on the planet in an unforeseeable future with limited energy production resources. *Wastelands* subtly contrasts the usual promises of high-tech “innovative” or “green” technologies with a low-tech DIY alternative that takes advantage of human-microbial relationships and the potential of our own waste as a future resource, while at the same time addressing the issue of large-scale of human pollution.

Labor

Paul Vanouse



Francesca Bond

What does exploitation smell like? *Labor* is a dynamic, self-regulating art installation that re-creates the scent of people exerting themselves under stressful conditions. There are, however, no people involved in making the smell—it is created by bacteria propagating in the three bioreactors in the artwork. Each bioreactor incubates a unique species of human skin bacteria responsible for the primary scent of sweating bodies:

Staphylococcus epidermidis, *Corynebacterium xerosis*, and *Propionibacterium avidum*. As these bacteria metabolize sugars and fats, they create the distinct smells of human exertion, stress, and anxiety. Their scents combine in the central chamber in which a sweatshop icon, a wearer-less white T-shirt, is infused as the scents disseminate out, intensifying throughout the exhibition.



Process

I initiated this project at the Biofilia laboratory in Helsinki. There I isolated *Staph epidermidis*, which produces a mild scent, and *Propioni bacteria*, which produces funky, acrid odors. I isolated them by covering my armpits in sterile pads in a day that included mild exercise, white-collar labor writing proposals, and scheduling meetings. Cultivating skin bacteria in vitro is difficult as

these strains best survive in the complex ecosystem of the human epidermis. At the Coalesce Center for Biological Art in Buffalo, I've built incubation equipment to investigate at which metabolic stages, and under which conditions these organisms are the most fragrant.

In *Labor*, I have not engineered genes into microbial production strains (as a synthetic biology approach would entail), but rather adjusted incu-



bation conditions to fit these organisms of the human skin to maximize their particular scents. The three custom bioreactors in the installation are monitored by a Raspberry Pi-based automation system that incorporates stirrers, biosensors, pumps, heaters, and valves to automate these conditions in a continuous production model. It is important to me that this “labor” is performed live, it is a living process, and its product is produced in excess of that which could be created by human toil. The installation also includes several sweat-stain-transfer prints—visual evidence of exertion captured by a novel production method. Moist, freshly soiled shirts are dusted with charcoal and pressed between paper at high pressures, which infuses the paper surface with an embossed pattern of intimate sweat. In the first installation, each T-shirt was worn by a university student paid at the prevailing wage. The sweat-stain-transfer technique produces evidential traces of individual excretion.

Concept

The idea of what exactly makes up a person is again under the microscope, not just for scientists, but for culture at large. For centuries, we have been debating who gets to be considered a person and when: it is a question that dominates political discourse of the last few centuries because of the connection to labor and liberation in the post-renaissance world. *Labor* reflects upon our changing understanding of what we are. Microbes in and on the human body vastly outnumber human cells and they help regulate many of our bodily processes, from digestive and immune systems to emotional and physiological responses like sweat-

ing. Our microbiota is integral to who and what we are, and complicates any simplistic sense of self. Likewise, the smell of the perspiring body is not just a human scent, unless we are willing to redefine what we mean by “human.” The *Labor* project also reflects upon an industrial shift from human and machine labor to increasingly pervasive forms of microbial manufacturing. Today, microbes produce a wide range of products, including enzymes, foods, feedstocks, fuels, and pharmaceuticals. They literally live to work. These new industrial activities point to a deepening of the exploitation of life and living processes: the design, engineering, management, and commodification of life itself. In *Labor*, the microorganisms ironically produce the scent of sweat, not as a vulgar “bi-product” of production, like in factories of the 19th and 20th centuries, but as a nostalgic “end-product.”

As audiences contemplate clues within the installation, they will hopefully ponder perverse aspects of contemporary production like: life inseparable from labor, product and produce conflated, biology a subfield of technology, and “man” omitted from manufacturing.

Scientific collaborator: Solon Morse

Scientific advisor: Gerald Koudelka, University at Buffalo

Fabrication: Tom Gruenauer, University at Buffalo

Support received from:

The New York State Council on the Arts Electronic Media and Film Program

Burchfield-Penny Art Gallery, Buffalo, NY

Biofilia, Aalto University, Helsinki

Coalesce Center for Biological Art, Humanities Institute, and Genome Environment and Microbiome Community of Excellence at the University at Buffalo



Liz Linder

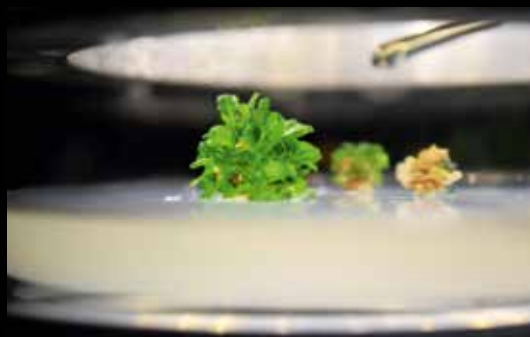
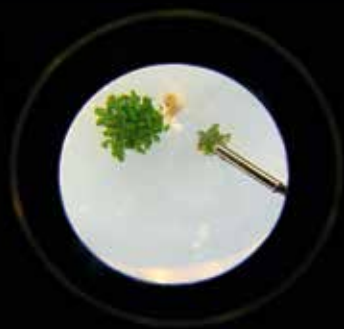
Paul Vanouse (US) is an artist and professor of Art at the University at Buffalo, NY, where he is the founding director of the Coalesce Center for Biological Art. Interdisciplinarity and impassioned amateurism guide his art practice. His bio-media and interactive cinema projects have been exhibited in over 25 countries and widely across the US. Recent solo exhibitions include: Burchfield-Penny Gallery in Buffalo (2019), Esther Klein Gallery in Philadelphia (2016), Beall Center at UC Irvine (2013), Muffathalle in Munich (2012), Schering Foundation in Berlin (2011), and Kapelica Gallery in Ljubljana (2011). Other venues have included Walker Art Center in Minneapolis, New Museum in New York, Museo Nacional in Buenos Aires, Haus der Kulturen der Welt in Berlin, ZKM in Karlsruhe, and Albright-Knox in Buffalo. Vanouse’s work has been funded by Renew Media/Rockefeller Foundation, Creative Capital Foundation, National Endowment for the Arts, New York State Council on the Arts, New York Foundation for the Arts, Pennsylvania Council on the Arts, Sun Microsystems, and the National Science Foundation. He has received awards at festivals including Prix Ars Electronica in Linz, Austria (2010, 2017) and Vida, Art and Artificial Life competition in Madrid, Spain (2002, 2011). He has an MFA from Carnegie Mellon University.

<http://www.paulvanouse.com/labor.html> · <https://vimeo.com/320605747>

Confronting Vegetal Otherness

Skotopoiesis, Strange Encounters, Phytoteratology

Špela Petrič



To investigate the consequences of a biotechnological and computational framing of life, the triptych *Confronting Vegetal Otherness* grounds the heteronomous human condition through risky relations with organisms traditionally thought to already exist in a state of environmental dependency, without an interiority or essence. Its three parts: *Skotopoiesis*, *Strange Encounters*, and *Phytoteratology* follow the implications of intimate encounters with plants at three different scales. Through the guidance of plants, the artist considers what it means to have and to be a body, and how the vegetal can bring into question representation, identity, and ethics. *Skotopoiesis* is a 20-hour durational performance, during which the artist faces a field of cress, illuminated from behind by a strong artificial light. The continuous shadow signals the plants to respond with changes in shape and color, their bodies producing a living imprint of her silhouette. However, the action also reveals an unsettled ethics towards plants and a fear of paralysis signified by the vegetative state. *Strange Encounters* is a micro-performance, which unfolds under the microscope when algae and human cancer cells are introduced to each other on equal terms—as machines of biochemical labor.

Surprisingly, the human cells absorb the algae, performing the first precarious step that once already led to symbiogenesis.

Phytoteratology concludes the opus addressing the molecular scale. The artist conceives plant-human embryos—*phytopolutans*. In lieu of seeds, artificial wombs—which contain hormones extracted from her urine—nurture, nourish, and imprint upon the baby plants. The plant-human monsters are thus beings of technological excess that fertilise the soil to breed cyborgian kinship and cultivate the vegetariat as a condition of dependencies and a matter of care.

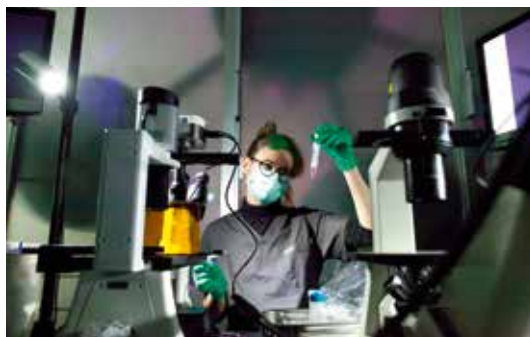
Confronting Vegetal Otherness: Skotopoiesis, Strange Encounters, Phytoteratology (2015–17)

Produced by: Kapelica Gallery / Kersnikova Institute (SI), Zone2Source (NL); Collaborators: Miha Turšič, Roland van Dierendonck, Federico Muffatto
Mentors: Jurij Krpan, Lucas Evers, Dr. Omid Karami
Thanks to: Dr. Mateja Erdani Kreft (University of Ljubljana, Faculty of Medicine, Institute of Cell Biology), Dr. Remko Offringa (Leiden University, Institute Biology Leiden), Alice Smits, Waag
Supported by: EU – Creative Europe (Trust Me, I'm an Artist), Leonardo da Vinci LLP, Ministry of Culture of the Republic of Slovenia, Municipality of Ljubljana, Amsterdams Fonds voor de Kunst, Stimuleringsfonds Creatieve Industrie



Špela Petrič (SI) BSc, MA, PhD, is a Slovenian new media artist and former scientific researcher currently based between Ljubljana and Amsterdam. Her practice is a multi-species endeavor, a composite of natural sciences, wet media, and performance. She envisions artistic experiments that enact strange relationalities to reveal the ontological and epistemological underpinnings of our (bio)technological societies and challenge the scope of the adjacent possible. Much of her recent work has focused on plant life. Her work has been shown at many festivals, exhibitions, and educational events. For her work she also received several awards including the White Aphroid for outstanding artistic achievement, the Bioart and Design Award, and an Honorary Mention at Prix Ars Electronica.

<https://www.spelapetric.org/>





VFRAME

Visual Forensics and Metadata Extraction

Adam Harvey

VFRAME is a research project exploring how computer vision can be applied to human rights research. *VFRAME* started in 2017 as a prototype demonstrating how object detection can be used to locate illegal munitions in the Syrian conflict. During 2018, *VFRAME* worked with the Syrian Archive (syrianarchive.org) to develop a large-scale visual search engine and custom algorithms for processing million-scale video datasets. Then, a new problem emerged: it was only possible to create object detection models for objects with thousands of examples, yet most objects in conflict zones only appear in a limited number of videos, often under extreme circumstances and with low-resolution cameras. To train new object detection models relevant for human rights researchers working with footage from conflict zones, a new approach was needed. During 2019 *VFRAME* is developing synthetic data modeling techniques that can be used to create specialized datasets. Synthetic training data is 3D-modeled photorealistic imagery based on a set of real, verified images. Often only a few real images are needed to recreate the object as a 3D model. The

3D model can then be textured and placed into a 3D environment to match the real images. This 3D environment can then be customized to generate lighting, weather, camera, and scene variations that are exported to still frames and used as image training data. The first prototype shows how this method can be applied to an illegal cluster munition, the AO-2.5RT. Although 3D modeling of the objects and scenes is still a labor-intensive process, it has the potential to be scalable and provide training data for objects that would otherwise not exist in the quantity and quality needed to train object detection models. This new approach has the potential to vastly increase the potential applications of computer vision for human rights researchers and will be carried out through a collaboration with the Syrian and Yemeni Archive projects based in Berlin.

Founder: Adam Harvey
 Co-developer: Jules LaPlace
 3D designer: Josh Laboue
 Researchers: Hadi Al-Khatib and Jeff Deutch at Syrian Archive
 Support received from: PrototypeFund.de



ICCMR, University of Plymouth

Biocomputer Rhythms

Eduardo Reck Miranda

Biocomputer Rhythms is a piece of music composed with PhyBox: an innovative biocomputer built using electronic components grown out of biological material. My research is aimed at harnessing biological organisms to become components of computing architectures for new kinds of creative Artificial Intelligence. My team and I invented a biological processor made with living tissue from an organism known as *Physarum polycephalum*. We baptized this processor the ‘biomemristor.’ *Physarum polycephalum* is found in cool, moist, and dark environments, e.g. decaying leaves and tree bark. Its intracellular activity produces fluctuating levels of electricity, which can be relayed through its body, and this prompts

it to behave like a memristor. The memristor is the relatively unknown fourth fundamental electronic component: it is a resistor with memory. The others are the resistor, the capacitor, and the inductor. The memristor is exciting because its behavior is comparable to the behavior of biological neurons. We built prototypes using Petri dishes retrofitted with electrodes. The process of building these prototypes highlighted a number of problems that had to be solved in order to develop a practical component. This work resulted in a very much improved design, which enabled the development of biomemristors cased in small 3D-printed barrels. In 2018 we built PhyBox: our first stand-alone biocomputer using biomem-



rists. In July 2018 I completed the final version of the piece *Biocomputer Rhythms*, for piano with electromagnets and percussion. Electromagnets are positioned inside the piano to vibrate its strings. Some electromagnets vibrate percussion instruments. The motivation for preparing the piano with the electromagnets stems from my

desire to give the piano a dual identity: one characterized by the standard piano sounds, produced by the hammers striking the strings, and the other characterized by the somewhat other-worldly sounds, which are produced by the biocomputer.

Composer: Eduardo Reck Miranda
Assistant engineer: Edward Braund



Eduardo Reck Miranda (BR/UK). Eduardo's distinctive music is informed by his unique background as a classically trained composer and Artificial Intelligence (AI) scientist. He studied music and computer science in his native Brazil and at the University of York in England. He subsequently received a PhD in sound design with Artificial Intelligence from the University of Edinburgh, Scotland. He worked at Sony Computer Science Laboratory in Paris as a research scientist in the fields of AI, speech, and evolution of language. Currently he is Professor in Computer Music at the University of Plymouth, where he founded the Interdisciplinary Centre for Computer Music Research (ICCMR).

<http://neuromusic.soc.plymouth.ac.uk>

Carbon Black

Anaïs Tondeur in collaboration with Rita van Dingenen and Jean-Philippe Putaud
JRC, European Commission



Anaïs Tondeur

Despite the absence of industry, the inhabitants of Fair Isle suffer from suffocation. When Anaïs Tondeur reached the island, she sent her geographic coordinates to climate modelers Rita van Dingenen and Jean-Philippe Putaud (JRC, European Commission), who retraced the itinerary of the particulate matters she encountered.

By means of atmospheric backward trajectory models and the analyses of anthropogenic emission of air pollutants, they could define the site of emission of the particles. This abstract trajectory line led the artist to an 837-mile expedition on foot and by ferry, fishing boat and car, unraveling the journey of anthropic meteors.

She crystallized each day in a photograph of the sky as well as filtering black carbon particles she encountered through breathing masks. The particles were later extracted by scientist J.P Putaud

and turned into ink. In fact, black carbon is a collateral form of soot, used for centuries as the primary component of Indian ink. The photographs are thus printed with some ink composed from the particles captured in the sky where they were shot.

In the words of art historian Estelle Zhong Mengual, Anaïs Tondeur restores the sky as an agent, carrying a power of action, whose new ontological consistency is translated by their sensitive materiality. The sky is no longer an element of decoration in our lives, it is the new given of our new environment. Some would no doubt see it as a new incarnation of the sublime proper to our time—except that these skies are not foreign to us. They no longer stand in this exteriority, in this distance, in this indifference which made it possible to feel a sense of comfortably mingled fascination



and terror. These skies, created by humans, incorporated by them, and actors of their destiny, can no longer be sublime—the sublime no longer holds. With these images of a new kind, this project forces us out of indifference and rushes us into a world where air is rarefied: our world.

A collaboration with mathematicians and climate modelers: Rita van Dingenen, Jean-Philippe Putaud, Joint Research Center, European Commission, Ispra, Italy

Support received from: The project was funded and developed as part of *Resonance II*, a project by Joint Research Center, European Commission.



Anaïs Tondeur (FR) is a visual artist. She works and lives in Paris. Her artistic practice forms at the point where disciplines meet. Crossing natural sciences and anthropology, myth making and new media processes, she creates speculative narratives and engages in investigations through which she experiments with other conditions of being to the world. A graduate from the Royal College of Art (2010) and Central Saint Martin (2008), she has presented her work in institutions such as Centre Pompidou (Paris), Serpentine Galleries, GV Art Gallery (London), Bozar (Brussels), and Spencer Museum of Modern Art (USA).

<http://www.anais-tondeur.com/main/black-carbon>



Fossil Futures

Nora Al-Badri, Jan Nikolai Nelles

Fossil Futures is an art project that traces the entangled histories and practices of museology, cultural heritage, public ownership, and digital reproduction. The artists Nikolai Nelles and Nora Al-Badri are known for using the tools of natural history museums, as well as leaked data, artificial intelligence (AI), and 3D scanning, to reimagine fossils and relics in the absence of access to real artefacts. The project asks viewers to question the authenticity of a nation's cultural narrative and seeks to build alternative emancipatory visions using today's easy-to-access data-driven technologies. The latest iteration of *Fossil Futures* is a complete reproduction of Tanzania's Tendaguru Hill environment in VR, which acts as a stage set for an immersive theater play written and directed by one of the artists.

Throughout the 20th century, Western institutions have been given the role of building and safeguarding our nation's histories and cultural identities. Interested in the role these institutions played in colonising the heritage of other nations, Nelles and Badri decided to find out more about the Natural History Museum of Berlin and their dinosaur collection. To shed light on the acquisi-

tion history of the dinosaur bones, the artists followed the routes of fossils housed in the museum's collection and found themselves in the African bush of southern Tanzania at Tendaguru. The Tendaguru Formation are amongst the richest sites of Jurassic fossils to have ever been found. A former German colony, the beds were also spaces of systematic excavations of dinosaur bones during the colonial era. Today, 230 tons of these dinosaur bones are now stored and partly exhibited in the Natural History Museum in Berlin. During their visits, the artists spent extended periods of time with the local community and were commissioned by them to build a museum for the site. In recognition of the complexity and responsibility of this request, the artists have realized the museum through various forms and approaches.

Text: Dani Admiss, curator and researcher

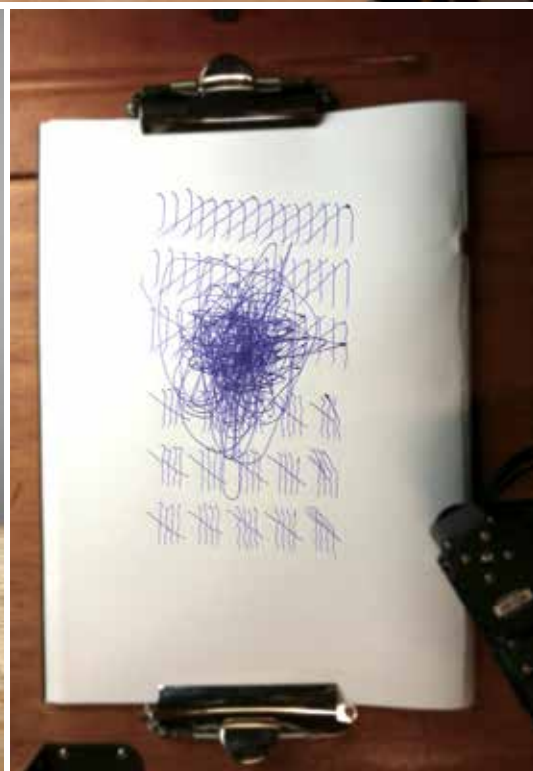
Made by the artists as an impression of the research/ contextualisation, with a short video with the Southern Tanzanian community, Prof. WJT Mitchell, University of Chicago, Denny Gayton from Standing Rock, and Ciraj Rassool from University of the Western Cape, Cape Town.

Support received from: Haus der Kulturen der Welt (HKW) Berlin, Gorki Theater Berlin



Nora Al-Badri (IR/DE) is a multi-disciplinary media artist with a German-Iraqi background. She lives and works in Berlin. She graduated in political sciences from Goethe University Frankfurt. Since 2019 she is a PhD candidate at the Ecole polytechnique fédérale de Lausanne (EPFL) in Switzerland. **Jan Nikolai Nelles** (DE) is a multi-disciplinary artist based in Berlin. He graduated from Offenbach University of Art and Design in 2011. His artistic practice oscillates between media art, documentary filmmaking, and cultural activism. Both artists are represented by Nome Gallery, Berlin. They have collaborated on several projects since 2009. They are also co-curating Chaos Communication Congress (Arts & Culture Track).

<https://www.alloversky.com/Fossil-Futures> · <https://www.nora-al-badri.de/works-index#fossil-future>



Human Study #4, La Classe

Patrick Tresset

Human Study #4, La Classe, is a performative installation that uses embodied computational agents as stylized actors. Set as a classroom, twenty-one robots of the RNP type act as pupils and teacher. The set also includes a large desk and a blackboard. A series of computational plotted drawings based on a math coursebook are hanging on the walls.¹

La Classe is a play that takes its inspiration from childhood memories, Jacques Tati, Theodor W. Adorno, and Michel Foucault. The actors express themselves in distorted Morse code,² learn to pass and record time with tally marks in order to alleviate boredom. They are trained to conform and comply. The fifteen-minute performance begins with the intense noise of the pupils chatting. They fall silent when the teacher says an unintelligible sentence. The registering process commences, he calls each pupil one by one, tracing a red line in his notebook, occasionally one needs to be called again, as if it was distracted. The lesson itself has three parts: practicing tracing vertical lines and diagonals, and the last part of the lesson is to draw tally marks. At some point, they revolt for a minute or two then get back in line

by tracing tally marks. During the performance, the sounds of the motors, the friction of the pens on paper, and the robots' voices produce a distinctive soundtrack. *La Classe* is the fourth of the six instalments of Tresset's *Human Study* series. As with the other installations, drawing is an essential component. Here mark-making is reduced to a minimal aesthetic playing with the strong symbolic and visual contrast between the tally mark and the gestural scribble. The performance is not a direct commentary on technology, but it is an observation of society, human nature, and behavioral standardization.

1 *Mathematique des petits*, H. and J. Denise and R. Polle, Pub. Delagrave, 1970

2 Tresset was taught to sing Morse code as a child by his grandfather, who was a radio operator during the Second World War.

Artist: Patrick Tresset, Ateliers Tresset SPRL-S

Assistants: Sabina Tupan, Sam Moon, Sandra Mondon, Steph Horak

Illuminate Productions: Caroline Jones, Angie Dixon

Video footage: Nassr Adris for BBC click, Tommo for Merge Festival.

Commissioned and co-produced by Illuminate Productions for Merge Festival in partnership with Better Bankside and Tate Modern.



Patrick Tresset (FR) is a Brussels based artist who develops installations with robotic agents as actors. These works are influenced by research into human behavior, how we make marks, perceive artworks, and relate to machines. Tresset also uses robots and autonomous computational systems to explore the drawing and painting practices. Tresset's work has been exhibited in association with major museums such as The Grand Palais, The Pompidou Center, Prada Foundation, Tate Modern, Museum of Israel, Victoria & Albert Museum, Seoul's MMCA, Brussels' BOZAR, and at events such as Ars Electronica and Montreal's BIAN.

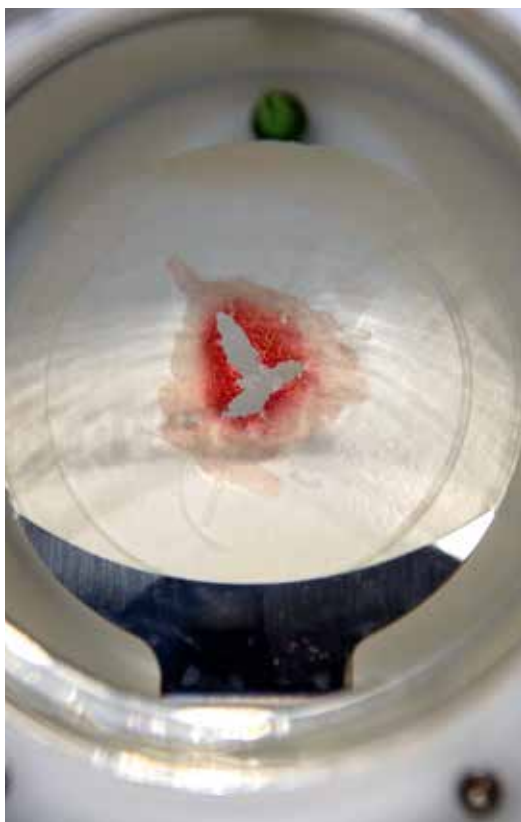
[ir]reverent: Miracles on Demand

Adam Brown



For centuries, the great monotheistic religions such as Catholicism proliferated stories about autonomous human mastery over all other organisms. Touting that man was made in God's image has blinded us to the fact that we are indeed interconnected to nature and that our histories have been influenced by non-human species. *[ir]reverent* is an artwork that examines the impact of invisible microbial agents on the course of human history and belief systems. Specifically, this artwork creates a "miracle" employing *Serratia marcescens*, a microorganism that grows on bread and creates a viscous fluid that has an uncanny resemblance to blood.

Countless historical accounts of blood flowing from bread were recorded during the classical period of antiquity, the Middle Ages as well as modern times. Blood miracles were used as a complex anthropogenic currency to justify everything from corrupt human conquests and evidence of divine agency, to anti-Semitic persecution. Physically, the installation consists of a bio-incubator inspired by medieval Roman Catholic monstrosities. A Eucharistic host is placed in the oculus; then micro-droplets of media containing a strain of *S. marcescens* are delivered to the bio-incubator. Over the course of two days the inoculated host will incubate the microorganism, caus-



ing the bread wafer to “bleed,” thus producing a blood “miracle on demand,” similar to those seen in churches centuries ago. The installation intends to destabilize human exceptionalism by questioning how human entanglement with other species shapes our histories, stories, and myths, and therefore redefine our ontological status.

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Humanities and Arts Research Program, Michigan State University
The College of Arts and Letters Summer Fellowship, Michigan State University



Adam Brown (US) is an internationally recognized artist, scholar, and educator, whose work incorporates art and science hybrids including living and biological systems. Brown has exhibited in international venues including Kapelica Gallery, Ljubljana; ZKM, Center for Art and Media, Karlsruhe; Ars Electronica, Linz; Synthetic, Vienna; ZeroOne, San Francisco; and Brazilian Biennial Emoção Artificial 5.0, Sao Paulo. His work has been written about widely in publications such as the *New York Times*, *Wired*, *Nature*, *Sculpture Magazine*, *Washington Post*, *Forbes*, *PNAS*, and *Discover*. Brown is currently an Associate Professor at Michigan State University, where he directs the BRIDGE Artist in Residency.

<http://adamwbrown.net/projects-2/irreverent/>



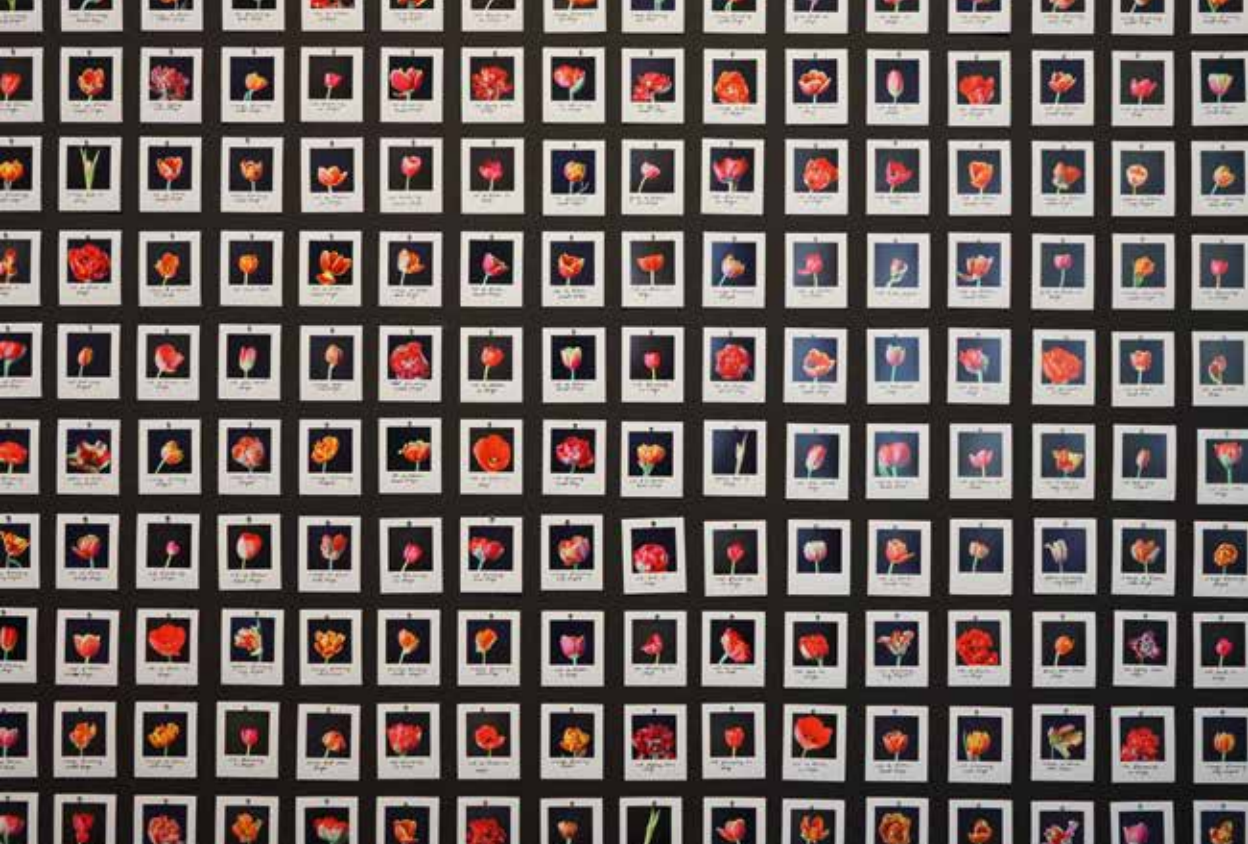
Mosaic Virus

Anna Ridler

Mosaic Virus is a moving image piece, each frame generated by AI, that responds to the price of bitcoin. Bitcoin has been described as “worse than the tulip mania,” the Dutch craze for buying tulip bulbs in the 1630s. Now, crypto currencies are still seen as a potential speculative bubble with prices fluctuating wildly. Drawing together ideas around capitalism, value, and the tangible and intangible nature of speculation and collapse, my work brings together these two very different, yet surprisingly similar moments in history. This is accentuated by the use of AI as a material, which is going through its own cycle of hype and speculation. As the tulips bloom, some reveal a striped appearance. In nature, the mosaic virus causes

stripes in a tulip petal, which increased their desirability and helped cause the speculative prices during the period of “tulip mania.” However, in this piece, the stripes seen on each tulip are dependent on the value of bitcoin—changing over time to show how the market fluctuates.

In order to create it, I had to construct my own training set. I took ten thousand photos and categorized them by hand—a counterbalance to the way most datasets are constructed. In the careful process of selection, arrangement, and repetition, I tried to mirror both horticultural craftsmanship and the process of still-life painting so characteristic of the Dutch Golden Age. Using AI to “imagine” or “dream” tulips, echoes the way that the



painters would not paint from life, but rather from all of the fragments of flowers that they have ever seen; similarly, the model is not just repeating flowers that are in its dataset, but creating new flowers from the knowledge that it has.

The result is a video work that shows some flowers appearing deceptively realistic, whilst others split and overproduce, morphing into unrecogniz-

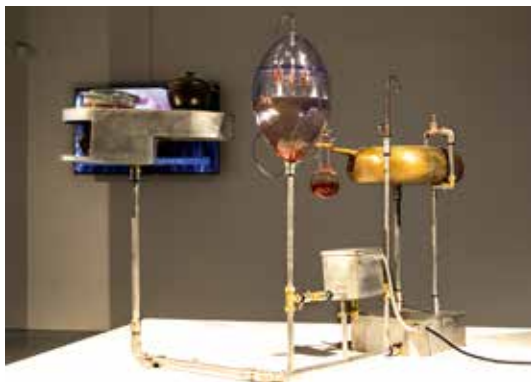
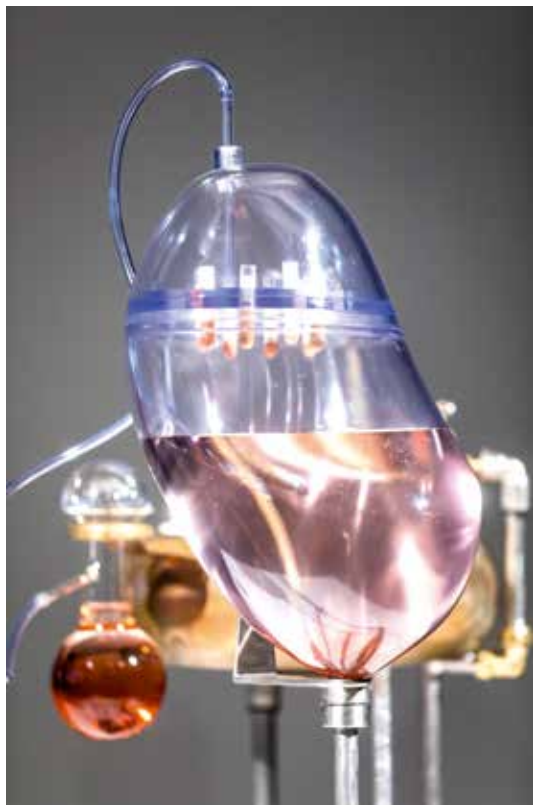
able floral forms. The result is a critique of value, human control, and the tenuous line between nature and artifice.

This project was commissioned by IMPAKT within the framework of the EMAP/EMARE program with support of the Creative Europe Programme of the European Union.



Anna Ridler (UK) (b. 1985) is an artist and researcher. She has exhibited at institutions such as the V&A Museum, Ars Electronica, HeK Basel, Impakt, and the Barbican Centre, and has degrees from the Royal College of Art, Oxford University, and University of the Arts London. She was a 2018 EMAP fellow and was listed by Artnet as one of nine “pioneering artists” exploring AI’s creative potential. She is interested in working with self-generated data sets to create new and unusual narratives in a variety of mediums, and what happens when things cannot fit into discrete categories.

<http://annaridler.com/mosaic-virus>



Mother's Hand Taste (Son-mat)

Jiwon Woo

Mother's Hand Taste (Son-mat) explores the complex relationships between the inheritance of culinary culture, genealogical heritage, microbiology, immigration, and notions of a “transient self.” Through *Mother's Hand Taste* (Son-mat), Woo questions whether various yeasts living on our hand skin influence the process of fermentation and the taste of food. The project emphasizes the notion of inheritance, not only to psychological and cultural core, but also to the microbes that inhabit our bodies. *Mother's Hand Taste* (Son-mat) involved social research, laboratory work, computational design, and additive manufacturing technology. Its main outcome is the creation of a conceptual and mechanical object aimed at capturing, storing, and growing one's own Son-mat—specifically, to be used in the brewing of the traditional Korean fermented rice wine, *makgeolli*.

The Korean term Son-mat, literally translates into “hand taste” and it is often used in relation to our “mother's” dish. Son-mat complements mother's dish, implies that the dish has a genealogy and

that mothers have a special, invisible power on their hands that makes the dish so tasty. Woo asks “What is really on our mother's hands that makes her dish so tasty and unforgettable?”

Woo experiments with the control and development of generational inheritance by visualizing and then bio-fabricating the hand yeast of multi-generational Korean family members across 4 historically related locations (Korea, Japan, United States, and the Netherlands), living in 8 different households, a total of 12 participants, whose hand yeast was expressed on more than 300 Petri dishes. By investigating “hand taste” through artistic and scientific means, the project reflects critically on the origins, authenticity, and preservation of cultural heritage. The project not only points to the significance of cultural identity, heritage, and the passing down of experiences, but also emphasizes the importance of science in the context of sociology and culture.

Copyright of whole project: Jiwon Woo
Support received from: Utrecht University, Department of Microbiology, Professor Han Wösten



Jiwon Woo (KR) is a multidisciplinary artist, designer, and researcher. Woo investigates new biologically designed materials and fabrication methods derived from nature and the human body. Woo holds an MFA from the University of Pennsylvania with a focus on Bio Art and Design and an MBA from Yonsei University (Seoul, Korea) with a focus on International Management. She earned her BA from Wellesley College in Media Arts and Computer Sciences. Woo's work has been exhibited at the Victoria and Albert Museum, the London Design Festival 2018, and more. She is the winner of the 2017 Bio Art and Design Award in the Netherlands. In 2018 she worked as a biodesigner at the MIT Design Lab.

<https://www.woojiwon.com/mht-bad>



One Tree ID—How To Become A Tree For Another Tree, Agnes Meyer-Brandis, 2019 © Agnes Meyer-Brandis, VG-Bild Kunst 2019

One Tree ID

How To Become A Tree For Another Tree

Agnes Meyer-Brandis

A Biochemical and Biopoetic Odour Communication Experiment

The project *One Tree ID* transforms the ID of a specific tree into a perfume that can then be applied to the human body. By applying it, a person can invisibly wear not just characteristics of the tree he/she is standing next to, but also use parts of its communication system and potentially have a conversation that—although invisible and inaudible by nature—might still take place on the biochemical level plants use for information exchange.

VOCs—Trees-Communication

All Plants emit Volatile Organic Compounds (VOCs). These are gases and molecules that contribute to cloud formation. It is also what we recognize as the fragrance of a forest. Plants communicate with the help of VOCs. Furthermore, these emissions are very specific for each individual plant; so each tree generates its own cloud. With the help of chamber measurements, we can detect these molecule clouds and most of its components.

A Tree Specific Perfume Producing the One Tree ID

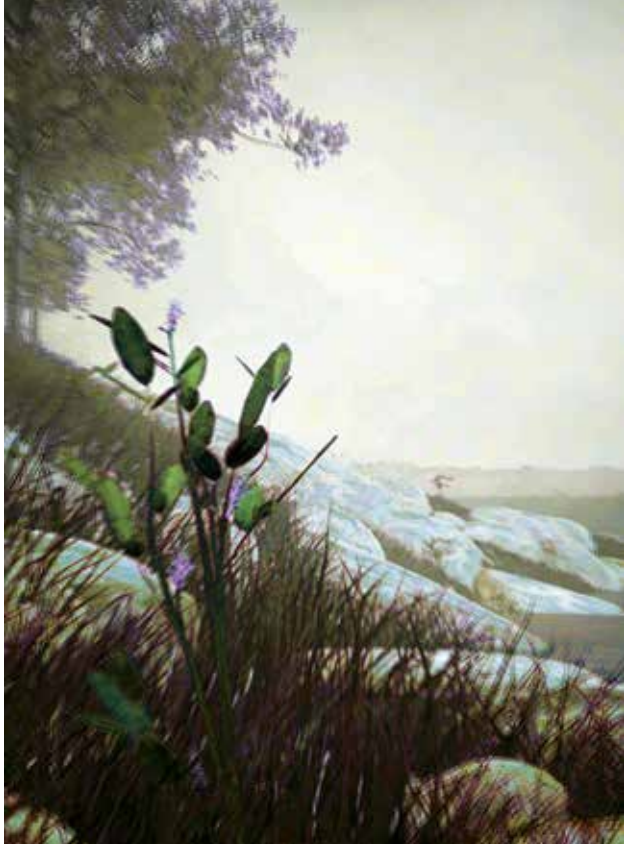
For its first realization, we selected a Himalayan cedar. The roots and its bacteria, the tree stem and needles emit different VOCs. So we measured the cloud of the roots, the cloud of the tree stem, and the cloud of the needles separately. It was possible to define more than 100 different compounds. Despite tremendous advancements in technology, it is not possible to determine the VOCs 100 per cent, as they are so small and short-lived. It could be that the 1 per cent we cannot measure is the part that gives the cloud its fragrance. The human nose and its 10 million receptors is still the only tool that can detect certain aspects of it. Therefore, we also invited a perfumer to smell the tree. The collected machine data and nose data were fused to create the perfumes “Cloud of the Roots,” “Cloud of the Tree Stem,” and “Cloud of the Tree Crown,” which then—in a final step—lead to the synthesis of the *One Tree ID* perfume.

In collaboration with Dr. Birgit Piechulla and Dr. Uta Effmert, Biochemistry, Institute of Biosciences, University of Rostock, and Marc vom Ende, Senior Perfumer, Symrise
With kind support by the Stiftung Kunstfonds, Symrise AG and Universität Rostock.



Agnes Meyer-Brandis (DE) lives and works in Berlin. She comes from a background of both sculpture and new media art. Her work, exhibited worldwide and awarded, explores the zone between fact and fiction—artistic research on the quest for a degree of reality within constructions. Selected Exhibitions: *Hors Pistes*, Centre Pompidou, Paris, FR, 2019 / *Strata-Rock-Dust-Stars*, York Art Gallery, UK, 2018 / *Cloud Cores, Moon Geese and Wandering Trees*, House of Electronic Arts HeK, Basel, CH, 2017 / *No Such Thing as Gravity*, National Taiwan Museum of Fine Arts, 2017 / *Setting Out*, apexart, New York City, 2016 / *COSMOS*, Daejeon Museum of Art, KOR, 2016 / *Globale / Exo-Evolution* ZKM, Center for Art and Media Karlsruhe, 2015 / *Republic of the Moon*, Oxo Tower London, 2014 / *Hamburger Bahnhof, Museum for Contemporary Art*, Berlin, 2014.

www.ffur.de/OneTreeID · <https://vimeo.com/328989340>



Resurrecting the Sublime

Christina Agapakis of Ginkgo Bioworks, Inc., Alexandra Daisy Ginsberg & Sissel Tolaas, with support from IFF Inc.

Could we ever again smell flowers driven to extinction by humans? *Resurrecting the Sublime* is a collaboration between a team from biotechnology company Ginkgo Bioworks, led by Dr. Christina Agapakis, artist Dr. Alexandra Daisy Ginsberg, and smell researcher and artist Sissel Tolaas, with support from IFF Inc.

Immersive installations allow the visitor to smell extinct flowers, lost due to colonial activity: the *Hibiscadelphus wilderianus* or *Maui hau kuahiwi*, a flowering plant in the Malvaceae family, was indigenous to the southern slopes of Mount Haleakalā, Maui, Hawaii. Its forest habitat was decimated by colonial cattle ranching and the last specimen of the tree was found dying in 1912. The *Orbexilum stipulatum* or Falls-of-the-Ohio Scurfpea, was last seen in 1881 on Rock Island in the Ohio River, before US Dam No. 41 erased the island in the 1920s. The *Leucadendron grandiflorum* (Salisb.) R. Br. was last seen in a collector's garden in London in 1806. Its original habitat on Wynberg Hill, behind Table Mountain, South Africa, had already been lost to colonial vineyards. Using DNA from flower specimens at Harvard University's Herbaria, the Ginkgo team used synthetic biology to predict gene sequences that encode for fragrance-producing enzymes. Tolaas then reconstructed the flowers' smells, using identical or comparative smell molecules. We know which

molecules the flowers may have produced, but the amounts are also lost. In Ginsberg's installation designs, the fragments of each flower's smell mix: there is no "exact" smell. The lost landscape is reduced to its geology and the flower's smell. Entering the installation, the human connects the two and, contrary to a natural history museum, becomes the specimen on view.

Resurrecting the smell of extinct flowers so that humans may again experience something we destroyed is awesome and terrifying—it evokes the "sublime." But this is not de-extinction. Instead, smell and reconstructed landscapes reveal the complex interplay of species and places that no longer exist. *Resurrecting the Sublime* asks us to contemplate our actions, and potentially change them for the future.

Ginkgo Bioworks: Natsai Audrey Chieza, Grace Chuang, Jason Kakoyiannis, Dr. Jason Kelly, Scott Marr, Krishna Patel, Kit McDonnell, Dr. Christian Ridley, Dr. Dayal Saran, Atsele Siba, Dr. Dawn Thompson, Dr. Jue Wang.
DNA Synthesis: Twist Bioscience.
Paleogenomics: Dr. Joshua Kapp and Dr. Beth Shapiro, Paleogenomics Lab, University of California, Santa Cruz.
Alexandra Daisy Ginsberg: Dr. Alexandra Daisy Ginsberg, Ana Maria Nicolaescu, Johanna Just, Ness Lafoy, Ioana Mann, Stacie Woolsey, Nicholas Zembashi.
Film Editing: Inferstudio
Sound design: Sam Conran.
With thanks to: Dr. Michaela Schmul, Harvard University Herbaria, Cambridge.



Dr. Christina Agapakis (US) is a synthetic biologist, artist, and writer who has been involved in the synthetic biology community for over a decade. She is Creative Director of Ginkgo Bioworks, a synthetic biology company based in Boston, designing made-to-order microbes for applications in industrial technology, agriculture, food, and health. **Dr. Alexandra Daisy Ginsberg** (UK) is an artist working across disciplines and media to explore the human values that shape design, science, technology, and nature.

Through installations, writing and curatorial projects, Daisy examines why we make things, what those things are, and their relationship with us and the world. **Sissel Tolaas** (NO) has been working, researching, and experimenting intensively with the topic of smell since 1990. Sissel is a pioneer and unique in her approach to smells. She has developed a wide range of revolutionary projects worldwide and established the SMELL RE_searchLab Berlin in January 2004, supported by IFF Inc.

<https://resurrectingthesublime.com>



Solar Powered Website

Kris De Decker, Marie Otsuka, Roel Roscam Abbing, Lauren Traugott-Campbell

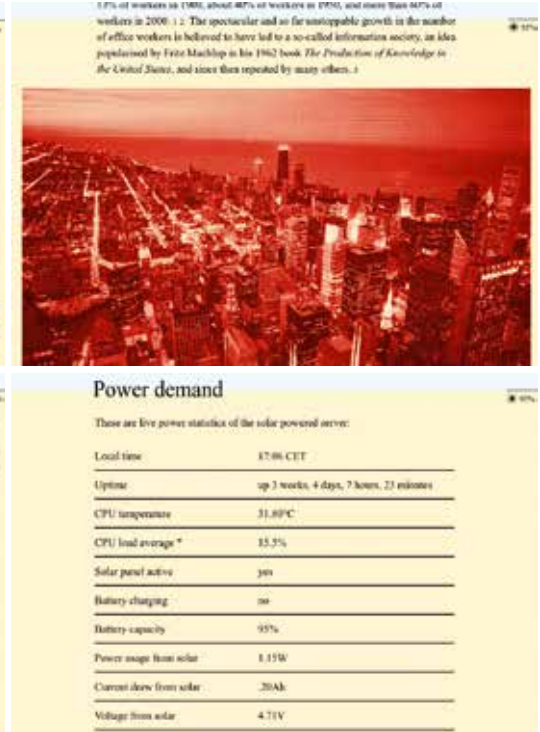
Low-tech Magazine questions the belief in technological progress, and highlights the potential of past knowledge and technologies for designing a sustainable society. Because a web redesign was long overdue—and because we try to practice what we preach—we decided to build a low-tech website that meets our needs and abides by our principles. To reduce energy use, we opted for a back-to-basics web design, using a static site instead of a database driven content management system. We further apply default typefaces, dithered images, off-line reading options, and other tricks to lower energy use far below that of the average website. In addition, the low resource requirements and open design help to keep the blog accessible for visitors with older computers and/or less reliable Internet connections.

Because it uses so little energy, the website can be run on a mini-computer which needs only 1-2 watts of power, which is supplied by a small solar installation on the balcony of the author's home in Barcelona. Typical for off-the-grid renewable

power systems, energy storage is limited. This means that the website will go off-line during longer periods of cloudy weather. To help visitors “plan” their visits to the solar powered website, we provide them with several clues, such as a battery meter, current sky conditions, and weather forecast.

We were told that the Internet would dematerialize society and decrease energy use. Contrary to these predictions, it has become a large and rapidly growing consumer of energy itself. The solar powered website addresses the two main causes of the growing energy use of the Internet: ever-increasing page sizes on the one hand, and the evolution towards 24/7 access on the other hand.

The Internet is not an autonomous being. Its growing energy use is the consequence of actual decisions made by software developers, web designers, publishers, and internet users. The solar-powered website shows that other decisions can be made.



Kris De Decker (BE) is the creator and author of *Low-tech Magazine*, an online publication that highlights the potential of past knowledge and technologies for designing a sustainable society. **Marie Otsuka** (JP) is a designer, developer, and educator exploring systems of use. Her research focuses on tools and methods for making work. She is currently drawing typefaces and programming scripts at Occupant Fonts. **Roel Roscam Abbing** (NL) is an artist and researcher whose work engages with the issues and cultures surrounding networked computation. Currently he also works as a teacher in Digital Media at the department of Graphic Design in Artez, Arnhem. **Lauren Traugott-Campbell** (US) is a graphic designer and artist working in exhibition and print design at MGMT Design in New York City. Her work investigates the materiality of digital systems and the labor involved in making them run.

<https://solar.lowtechmagazine.com>



The Normalizing Machine

Mushon Zer-Aviv, Dan Stavy, Eran Weissenstern

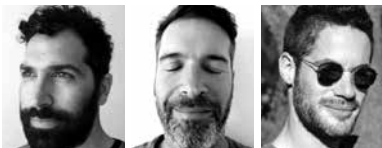
The Normalizing Machine is an interactive installation presented as an experimental research in machine-learning. It aims to identify and analyze the image of social normalcy. Each participant is asked to point out who looks most normal from a line-up of previously recorded participants. The machine analyzes the participants' decisions and adds them to its aggregated algorithmic image of normalcy.

Two scientists whose fingerprints are plastered all over contemporary culture inform the work. In the late 1800s the French forensics pioneer Alphonse Bertillon, the father of the mugshot, developed "Le Portrait Parle" (the speaking portrait), a system for standardizing, indexing, and classifying the human face. His statistical system was never meant to criminalize the face but it was later widely adopted by both the Eugenics movement and by the Nazis to do exactly that.

Half a century later, British Mathematician Alan Turing laid the foundation to computing and artificial intelligence. Turing was concerned about the fate of a child-machine, singled out among the other normal children. Turing was one of the unsung heroes of WW2 who cracked the Nazi Enigma code. Nevertheless, in the early 50s he was convicted of homosexuality, was chemically castrated, and later took his own life. Turing hoped AI would transcend the kind of systemic bias that criminalized his own deviation from the norms.

The installation visualizes how machine learning automates Bertillon's speaking portraits and paradoxically amplifies systemic biases. As today's systematic discrimination is aggregated and conveniently hidden behind a seemingly objective black box.

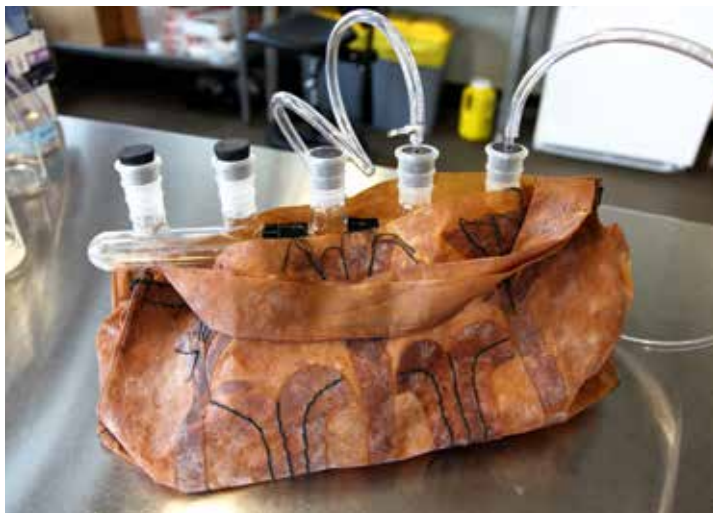
Mushon Zer-Aviv in cooperation with Dan Stavy and Eran Weissenstern
Support received from: Shenkar College,
Print Screen Festival



Mushon Zer-Aviv (IL) is a designer, educator, and media activist. He is an alumnus of Eyebeam Art+Technology Center in NY whose work and writings have been featured internationally. Mushon is a senior faculty member at Shenkar College, the VP of Design at LOCALIZE.city and a civic design lead at the Public Knowledge Workshop. **Dan Stavy** (IL) is a media artist and a creative coder. He specializes in interactive installation, projection mapping, and mobile apps. Dan's work has been presented in festivals, exhibitions, museums, and live performance in Israel and abroad.

Eran Weissenstern (IL) is a software engineer based in Tel Aviv. He designed and developed interactive installations for museums, proof-of-concept demos for startup companies, and gesture-based control paradigms for user interfaces. His work seeks the boundaries between the imaginary and real; trying to bridge between human and machine.

<http://www.mushon.com/tnm>



Wastelands

Tagny Duff

Wastelands is a playful, yet serious biological art project that explores speculative fiction scenarios and current bioengineering practices applying methanogenic bacteria, archaea, and bacteriophage to regulate methane production through anaerobic degradation. This biological art project speculates on a future 500 hundred years from now, when humans are using the biotechnology to create biogas, fueling the world with only our waste—excrement, methanogens, and viruses—the key ingredients for the production of methane biogas. Methane is one of the largest causes of climate change but used on a small scale, methane can be applied as a sustainable and ‘clean’ biogas.

The project explores how methane fermentation offers an effective means of pollution reduction, superior to that achieved via conventional aerobic processes. Although practiced for decades, interest in anaerobic fermentation has only recently focused on its use in the economic recovery of fuel gas from industrial and agricultural surpluses. This creation of “green” renewable biogas via anaerobic fermentation processes is quickly becoming the focus of biotech innovation. If it can be “scaled up” the technology will potentially reduce fuel

emissions derived from the agriculture industry. However, this technological drive does not challenge or change the deeper issues around the industrialization of animal agriculture, but rather it re-enforces the same vision of utilitarianism where large-scale efficient monoculture production is manifested through the labor of living beings. What if this “green” tech considered alternative relations between human-animal-microbial interactions that are not based on utilitarian and capital driven results? What if this new/old tech was scaled down and diversified to slow the pace of tech development?

Artist, project concept, design, photography, sculpture, and biotechnological engineering: Tagny Duff
Time Traveler and *Cosmos* bioplastic sculptures, collaboration by Tagny Duff with WhiteFeather Hunter, co-designer and sole sculptor.

Researched and co-produced in collaboration with Bridge Artist Residency Program, Dr. Dana Kirk and ADREC at Michigan State University, Sylvain Moineau Labs at University de Laval and Speculative Life Labs at Concordia University. Tagny Duff also acknowledges the work and intellectual property of WhiteFeather Hunter and Courtney Books in independently conducting the research, development, and protocol for the bioplastic material, which remains the sole intellectual property of WhiteFeather Hunter and Courtney Books.



Tagny Duff (CA) is an interdisciplinary media artist, scholar, and educator working across media art and microbiology with a keen interest in viruses, microbial interaction, and scientific practices from a cultural point of view. Duff’s earlier biological art works *Living Viral Tattoos* (2006–ongoing) and *Cryobook Archives* (2010–ongoing) explore the scientific manipulation and potential of human-microbial relations with retroviruses. Duff has exhibited biological art works nationally and internationally in venues, most recently in the Broad Art Museum where she showcased the *Wastelands* installation (2018-2019) produced during the Bridge Artist Residency Program at Michigan State University.

<https://tagnyduff.blog>

 **PRIX
ARS ELECTRONICA**

DIGITAL MUSICS & SOUND ART

Immersive Experiences and (Political) Silence

What are the Sound Realities now?

Rikke Frisk, Christina Kubisch, Soichiro Mihara, François Pachet, Shilla Strelka

The artistic field reflected in the category “Digital Musics & Sound Art” seems more diverse than ever before. Including sonic fields as varied as composition and installation, live performance and spatialization, projects involving AI and other highly advanced technologies, it was a challenge for the jury to establish a valuing system that would reflect and compare those disparate approaches. The search for new ways of creating sound, leads artists to engage with translation-processes, trying to find synchronicities in different disciplines. Often the result resembled event-like set-ups or introduced a complex concept, while not paying too much attention to the actual musical qualities of a work.

Aiming mostly for singular objects, a return to the traditional idea of sound art being finalized in a piece that is easily presented, was noticeable. Can the lack of site-specific pieces be traced back to less open spaces or hidden natural places? One of the basic topics artists are dealing with nowadays is the relationship of digital and analog, man and machine, often leading to the question whether digital sonification and transformation is more significant than the original phenomenon and whether sound that is not manipulated digitally has lost its relevance. Our awarded projects all deal with this tendency in a different way, confusing our views of what is true and false, irritating our perception or addressing the topic in a critical way.

On the other hand, the tendency to automatize conventional sound production was graspable in

advanced arrangements. Animating e.g. flutes or pianos proved that also sound art is shifting its focus, entering the world of objecthood and animism. Instruments would now run by themselves, with a similar sonic result, but guided by the fascination of a machine or an algorithm being the creator of sound. As expected, Artificial Intelligence seems to be slowly entering the field of music production. Still we are only at the beginning now and the works involving an AI were often lacking sophistication. Other than expected, there was a remarkable lack of socio-political artworks. Even though many projects were focusing on ecology, engaging in the sonification of information taken from environmental tests or live data, often the rules applied were arbitrary, and the result unconvincing. While interactive approaches were missing, instead we experienced a tendency towards immersive listening situations and compositions that let the listener delve deep into imaginary landscapes.

The winning project succeeds in combining this immersive approach with a confrontational conduct—challenging our senses and perception of reality, focusing on corporeal effects and lived experience, while being poetic at its core. It refers back to the history of sound art, while delving deep into the field of psycho-acoustics.

As an additional remark, the jury wants to actively invite more female artists and artists coming from various backgrounds and countries to submit their projects.

Golden Nica

TORSO #1 · Peter Kutin

The set-up is minimalist: four 100V speakers have been installed on four rotors on a more than 2m long axis, spinning around in slightly changing speed. Static microphones have been set up to take up the sound emitted by the rotating speakers to create a phasing of feedback tones that are sent back to a quadrophonic system surrounding the audience. The otoacoustic composition that is diffused via speakers is subtle, yet uncanny. Every once in a while, you hear abstract voices that are woven in so delicately, that the impression of EVP arises. Haunted voices are travelling through space, making it hard to differentiate between synthetic and human sound. The psycho-acoustic effects strongly irritate our senses, while installed strobe lights intensify a trance like state. The kinetic sound-light sculpture *TORSO #1* transgresses borders. The highly powerful, at times even threateningly aggressive movement of the huge rotors and flickering light pulses are juxtaposed with the calm repetitive feedback pulses and steady sine waves included in the composition. Highly referential at its core, *TORSO #1* evokes associations ranging from Brion Gysin's *Dreamachine*, to Steve Reich's *Pendulum*, from EVP-affiliated pieces to Alvin Lucier or even the operating mode of a Leslie speaker. The jury acknowledges that it doesn't always need the most advanced technologies to come to a result that is irritating our perception on a profound

level, while still convincing in its poetic, reduced, and elegant realization. *TORSO #1* is highly confrontational in its corporeality, offering an intense and original experience—a persuading example of contemporary sound art that delves into the still quite unexplored field of psychoacoustics. A Golden Nica in this category has previously only been awarded to an international project that included Austrian artists (Günter Geiger and Martin Kaltenbrunner, Music Technology Group/Universität Pompeu Fabra, *Reactable*, 2008) but Peter Kutin is the first Austrian solo artist in the history of Ars Electronica to win a Golden Nica in the Digital Music and Sound Art category.

Awards of Distinction

Muted Situation #22: Muted Tchaikovsky's 5th · Samson Young

The installation, consisting of a film and special speakers distributed between the audience, shows an orchestra playing Tchaikovsky's 5th. We see a conductor, musicians playing their instruments, but we hear nothing but the noise like sounds of the instruments being played without emitting any definite musical pitch. Young muted all the instruments by special techniques. The performative energy seems to be even stronger in this almost silent performance, the hard work and the concentration of the performers and the conductor is more impressive and clearer than by listening to a "normal" concert version. The 12-channel set-up gives the public the feeling to be seated inside the

orchestra and the musicians seem to play next to the listener. Tchaikovsky's *5th Symphony* has an iconic status in the orchestral repertoire and embodies the aesthetics of musical romanticism almost to a point of excess. The "double reality" of known and unknown orchestral performance creates a surprising special tension and concentration on listening which makes us question our usual way of consuming (orchestral) music and our usual cultural behavior. Is the concept more important than the result? Should we applaud? Do we still need romantic music, or can we renounce orchestras in times of digital creation of instrumental sounds? Young does not send a message but raises questions on which we start to reflect while listening to this unusual, beautiful performance of classical music.

Voices from AI in Experimental Improvisation · Tomomi Adachi, Andreas Dzialocha, Marcello Lussana

Tomomi Adachi is an experienced composer and performer influenced by the Fluxus movement, who in this piece works in the tradition of man-machine dialogue. The performance involves a singing Tomomi Adachi interacting with the software, *Tomomibot*. This software extends the long tradition of musical interactive systems, and uses state-of-the-art deep learning techniques to capture elements of the improvisation style of the singer in real-time. The result is not really a dialogue—there are overlapping streams of sound—but a new form of duet in which the software attempts both to mimic the style of the singer and produce novel phrases. The central question at stake here is the nature of style: such a performance shows how interactive technology and AI can push the boundaries of a style—here a singer—by challenging the musician with music material

that is strictly generated from his own productions. Tomomi also uses humor in his critical attitude towards AI. The human performer confuses the AI Tomomibot by behaving differently from how he taught it. The central question is: can machine learning be enough to act as a creative dialogue partner? In the dialogue he creates with the AI, it becomes clear that the AI is not able to follow him and that he is more creative and unpredictable than his machine counterpart.

Honorary Mentions

Anastrophe · Patrik Lechner

Patrik Lechner's *Anastrophe* offers a 3-dimensional sonic journey through space, bringing together digital club music, futuristic sound-design, and algorithm-based procedures, all created with custom made software. The audio-visual artist and programmer Patrik Lechner delves deep into complex structures, composing with densities and textures, stochastic processes and beat structures that evolve from contemporary club music. *Anastrophe* leaves us stunned, lost in space, free of gravity. The artist succeeds in building up short narratives that might, just a second later, dissolve into molecular arrangements. He confuses our perception of time and space while not aiming for complete immersion, but constantly grabbing our attention. Instead of following a linear movement, perspectives are thus on a permanent shift. Lechner is uniting digital processed-based real time sound-design that is controlled by self-designed algorithms, a convincing spatialization concept, and dance music in this acousmatic composition, helping to emancipate the instrument from its academic context of electro-acoustic music and transferring it into the context of live procession.

ÆTER · Christian Skjødt (DK)

The jury experienced the installation at the 2017 Ars Electronica festival exhibition and was already then drawn to the huge *Æter* installation and its majestic yet subtle presence that goes into dialogue with and offers an auditive insight into the invisible electromagnetic surroundings. *Æter* “listens” to the surroundings, even the audiences themselves, and transmits these signals as a deep low frequency undertow, the auditive part and thus the artwork constantly changing. The jury found it aesthetically moving, appealing, and somehow repulsive at the same time. It doesn’t come on to you, it’s almost ignorant of the audiences except for their electromagnetic signals.

APPARATUM · panGenerator

APPARATUM has been inspired by the heritage of the Polish Radio Experimental Studio—one of the first studios in the world producing electroacoustic music. It looks like an oversized tape machine with a lower part in the form of a cassette tape. The highly original installation reboots work from the early experiments of the early fifties and sixties, bringing visual, optical, and magnetic concepts into a contemporary synthesizer concept. Magnetic tape was the primary medium used in the Polish Radio Experimental Studio. The basic idea of the creators is that a digital interface produces purely analogue sound. The mix of digital means in order to trigger analogue sound material shows that the radical experiments of electronic music have the power to become an inspiration for future music production if used as creative material instead of being seen as only a historical background. *APPARATUM* demonstrates in a convincing way how digital and analogue procedures can be integrated to generate new soundscapes for the future.

fake synthetic music · Stine Janvin

Stine Janvin is an experimental vocalist and electronic musician who creates highly abstracted, uncanny sound pieces. Applying psycho-acoustic strategies, the Norwegian artist is taking advantage of the extensive spectrum of her voice to irritate our perception of what is real and what is an illusion, what is synthetic and what is human sound. Applying difference tones and otoacoustics, connecting both vocal and digital experimentation, Janvin is offering a radical new perspective. The result is a reflection on the interrelatedness of our digital surroundings and our mutating body-images, of actual and virtual sounds—creating a cyborg-like corpus that is ephemeral yet utterly present.

MANTRACKS and Sonic Fields:

A VirtuAural Duology · Francisco López

The originally independent sound pieces *MANTRACKS and Sonic Fields* are long durational sonic explorations which combine field recordings of industrial and natural origin. While many field recordings are just meant to share the experience of site-specific audio adventures, López uses his sounds to achieve what he calls a sonigenic composition: a process where the ontological properties of the material take over the representational ones. The work of López is based on time: time for the artist to listen to the environment before using his microphones, time to combine and layer the different sounds, and the time which the listener needs to take part in the listening process. The sound work of Francisco López has a kind of timeless nature. The public, mostly seated in darkness, takes part in a collective listening process which seems almost an anachronism in a society where everything is focused on acceleration and speed. López enables a new deep way of listening and convinces us without any dogmatism to open up our ears. His work wakes up our acoustic senses due to the musical quality of his sonic creations realized as a researcher and composer.

“Play Back” Curing tapes · SHOJIKI

From the serious performance by the young Japanese duo SHOJIKI, you will only feel playful irony—they really do play as honestly (正直/Syojiki) as possible, using non-magnetic packing tape to play rhythms, textures, and by varying the tension of the tape so that it sounds like a new instrument. Their straight play back performance seems a humorous way of proposing alternative possibilities of non-traditional tape performance. There is no doubt that they are the best tape players in this sense.

Polar Force · Speak Percussion, Philip Samartzis, Eugene Ughetti

Please come in: you are invited to enter the white tube-like structure. Shelter from the storm and dive into an hour-long performance of intertwining nature and machine sounds, mixed and played live in this portable venue resembling a research station of Antarctica. The jury wants to honor this true collaborative work. We fell for its ability to merge remote research and field recordings with investigations into new instruments, sampled in a live performance and a choreographed artistic “lecture” on geo politics and climate crisis. There was something curious about this project, we weren’t able to grasp it all at once, which made us come back several times, digging further into the various aspects. We see it as a comment on geo-political issues and the climate crisis, and the immersive live performance merges the art-science-tech. The design of the presentation in itself has a potential to be used to communicate to and engage a larger number of audiences in the climate crisis, in a tactile experience without words, leaving you to reflect for yourself.

The SINE WAVE ORCHESTRA stay The SINE WAVE ORCHESTRA

Stay is experience art using Fourier transform that, with the attraction of a participatory installation using sine waves, is packed into space. The composition of sine waves, which increased with the number of visitors, was delicately extracted. The relationship between the individual’s intention that determines a single frequency and directivity and inoperable leaps of the entire sound occur as gradations in various places in space. The experience is neither random nor noise, but the realization of stunning acoustic art of multiple phase.

Sky Brought Down · Åsa Stjerna

Åsa Stjerna’s site-specific *Sky Brought Down* managed to touch the jury in its gentle vertical manifestation of connections between inside and outside by sonifying weather data. Set in a hospital atrium, connecting different crowded spaces of the buildings, the site was chosen by the artist allowing for a more interventional approach than the mere “atmospheric” artwork for the waiting room that was originally asked for. By increasing the corporeal as well as conceptual experience of the site, she manages to establish an immersive relation between visitor and site. Even though it doesn’t demand any high attention of its audience, it generously soothes and helps balance the hospital sounds, without disturbing the fragile balance of an everyday work space. Åsa Stjerna has followed a long-term practice and dialogue with public spaces rather than gallery art. Her theoretical and philosophical reflections on sound art and her own practice is as thorough as her methodological process of exploring, sensing, testing, and reworking as a practitioner. In this case she had to patiently develop new methods as she worked alongside architects, engineers, builders, hospital employees etc., developing the piece as the new building emerged.

Smart.ing Bodies · Evelina Rajca

This installation consists of two “glass instruments.” Each instrument is itself made from a glass shape that rotates and resonates, emitting specific frequencies, characteristic of the shape. The composition contains a built-in constraint that avoids catastrophic feedback loops and resonance. What can be heard is the sound of sand, which is pure yet complex and ever changing. The composition consists of a smart exploration of these sounds that always seems on the verge of exploding through resonance yet stays under control. Are all music instruments inherently potentially explosive?

Wind from Nowhere · Haein Kang

Sound art sometimes handles and art-izes the pre-musical sounds and also the pre-sound air vibrations. The sense device of the wind is aesthetically and perceptually decoded, commensurate with the sound art that dealt with air in a data-driven era. Based on the wind data blowing somewhere in the world, this work is passively reminiscent of the wind by changing the way the paper is shaken. When the machine synthetically gets consciousness, can this phenomenon be regarded as the beauty of the wind for them? This work presents human and machine questions that are different from the future shown in the novel *Erewhon* by Samuel Butler, which is the source of artwork. The artwork realizes the most poetic transformation of the data process art submissions this year.

Wiki-Piano.Net · Alexander Schubert

This piano piece is composed in real-time by a community of users, and performed live by a pianist. The collective dimension of the piece makes it singular in an unusual way. It is composed by a collection of people who do not interact between themselves, but the resulting piece does sound structured in an intriguing way. Listening to the piece, one can feel a sense of direction, a musical intention that is not always consistent but clearly human. Interactive AI technologies are now increasingly used in artistic works, sometimes raising fears about the role of the artist in tomorrow's techno centric world. The jury has selected *wiki.piano.net* because this work shows how humans and machines can collaborate productively and open new exciting doors for collaborative creation. The piece questions the very nature of musical agency and demonstrates that new forms of collective musical creation can arise through the use of technology.



TORSO #1

Peter Kutin

With his kinetic sound-sculpture *TORSO*, Peter Kutin explores how the movement and acceleration of sound-sources can be used from a musical or compositional perspective. With this project, Kutin is referring to the philosopher Paul Virilio's concept of dromology (the science of speed): "[Speed] ostensibly perverts the illusory order of normal perception, the order of the arrival of information. What could have seemed simultaneous is diversified and decomposes."

Paul Virilio, *The Aesthetics of Disappearance*

For this first version of *TORSO (#1)*, Kutin created a quadrophonic system consisting of four old 100-volt speakers, which he rotates at varying speeds on a 2.5m long horizontal axis. The speakers' movements are visible, affecting the audience in unusual and confounding ways. Observing the speakers' circular movements while perceiving the ever-changing composition and how it develops over time combines to create a wholly unorthodox listening experience. For the structure of the object, Kutin drew inspiration from a klopotec—a variety of bird-scaring windmill found in central Europe.

For sound-sources, Kutin on one hand provokes simple feedback patterns via static microphones that are positioned on pre-determined spots in front of the speakers' circular path. The sonic-characteristics of the emitted feedback is directly changed and modulated by the speed of rotation. Kutin additionally created and designed original sounds especially for this unique setup, in order to maximize its psychoacoustic effects. The composed sonic-material is based on abstractions of the human voice—as performed by the soprano singer, Johanna Baader—as a reference to the human-made environment behind, as well as a counterpoint towards, the technical facade.

With these main ingredients, Kutin either performs live or pre-composes for an installation-setup—in both cases he develops site-specific compositions for which the speed of rotation, the acceleration, and the amount of feedback become the key parameters to work with. Partially the sounds emitted by the *TORSO* are picked up with microphones and sent into a PA system that is set up around the audience in order to translate, or seemingly magnify, the sonic movements to reach heightened dramaturgic variations and phases of increased density. Sounds and feedback travel within the space in an unfamiliar, and yet strange and multidimensional manner. It seems as if the

sonic movements can be perceived both horizontally and vertically at once. Flanked by meticulously arranged LED lights that flicker, pulsate, and spin, *TORSO* reaches lucid and hallucinatory heights. Visitors have described the concert experience as like exposure to an expanded Dream-machine—referring to the influential stroboscopic flicker device first developed by artist Brion Gysin and William S. Burroughs. With *TORSO#1*, Kutin takes this concept to a different level as he explores how rotating sound can influence and manipulate our way of listening, and enhance the acoustics of the performance space.

Realizing this first version of *TORSO* was a starting point for an on-going compositional cycle. A new version is actually in creation as part of the Society for Arts and Technology's (SAT Montreal) immersive works residency program. A fulldome version for which Kutin will cooperate with the video-artist Patrik Lechner will be premiered in the Sato-sphere, a unique concert space in Montréal, in 2020.

Text: Tristan Bath

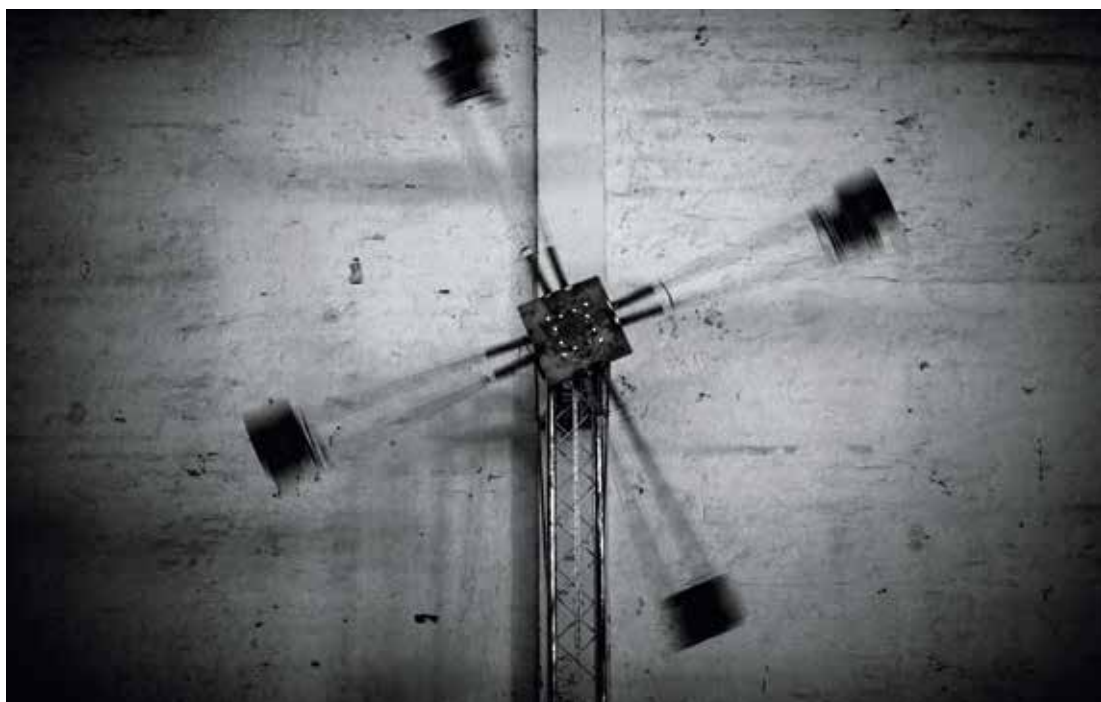
Concept, composition, realization: Peter Kutin
 Technical support and realization: Mathias Lenz
 Soprano singer: Johanna Sophia Baader
 Further technical support: Oskar Kutin, Johannes Fritzer, Gratis Kaiserin
 Supported by SKE Fonds and BKA



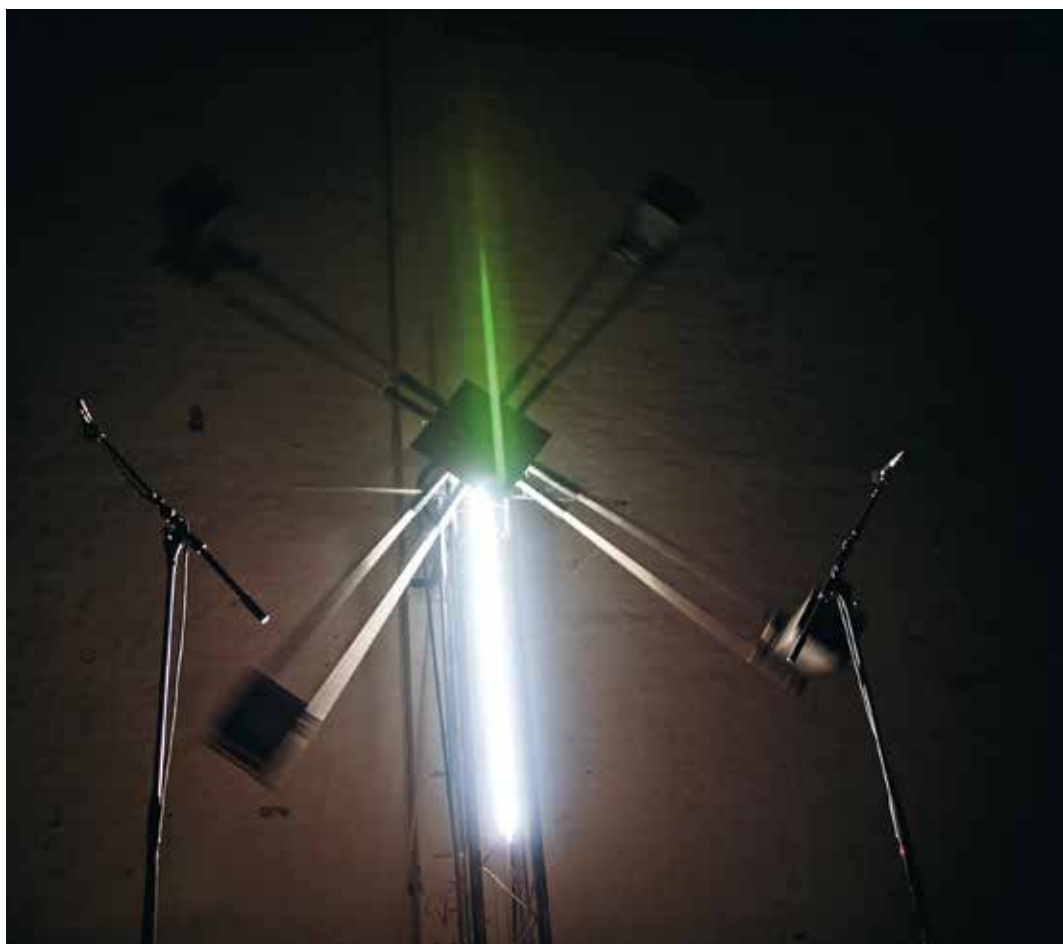
David Višnjić



Igor Ripak



David Višnjić



Peter Mayr

Peter Kutin (AT) is a Vienna based producer/composer. He works with sound. Kutin's live-performances or installations hold a physical and psychological impact that throws you as much off balance as they embrace you. They have been exhibited, commissioned, performed or screened at various music- / film-festivals and venues across the globe. He has written and developed music / sound for film, theater, performance, contemporary dance and radio plays. Besides that he directed experimental short-films and wrote / composed works for radio. He has received several awards of which some are considered more and some less important. Kutin is a founding member of the label Ventil-Records, Velak (platform for experimental music), and is a co-organizer of the RealDeal Festival.

<https://kutinkindlinger.com/torso>



Muted Situation #22: Muted Tchaikovsky's 5th

Samson Young

The artist produced a video and 12-channel sound installation as part of his ongoing series *Muted Situations*, 2014–ongoing. The series foregrounds the masked moments that take place in our everyday sonic experiences. By consciously ‘muting’ the sonic foreground, the less-commonly noticed layers are revealed. The artist has written a series of short instructional texts describing hypothetical situations, a few of which he has already staged, to draw attention to unnoticed sounds. Numbered from 1 to 22, this expanding set of scenarios range from *Muted Dance Party*, *Muted Non-Violent Protest* to *Muted Taoist Funeral Ritual of Hell-breaking*. In the latest iteration of the ongoing project, *Muted Situation #22: Muted Tchaikovsky's 5th*, 2018, the artist invites the Flora Sinfonie Orchester in

Cologne to perform Tchaikovsky's *5th Symphony* in its entirety. The orchestra, however, has been asked to ‘mute’ the musical notes, suppressing the pitched foreground layer of the composition, and bringing forth the sounds produced by physical actions in a performance—the musicians' focused breath, the turning of pages, or the clicking noises of the instruments' keys.

On the process of muting, the artist writes: “... muting is not the same as doing nothing. Rather, the act of muting is an intensely focused re-imagination and re-construction of the auditory. It involves the conscious suppression of dominant voices, as a way to uncover the unheard and the marginalized, or to make apparent certain assumptions about hearing and sounding.” The



process has the effect of disrupting the viewer's expectations; when the piercing shriek of a violin fails to come forth, it feels anticlimactic, ridiculous even. The artist's situational experiments reveal what is suppressed, enabling us to become aware of another layer of reality underneath the noise.

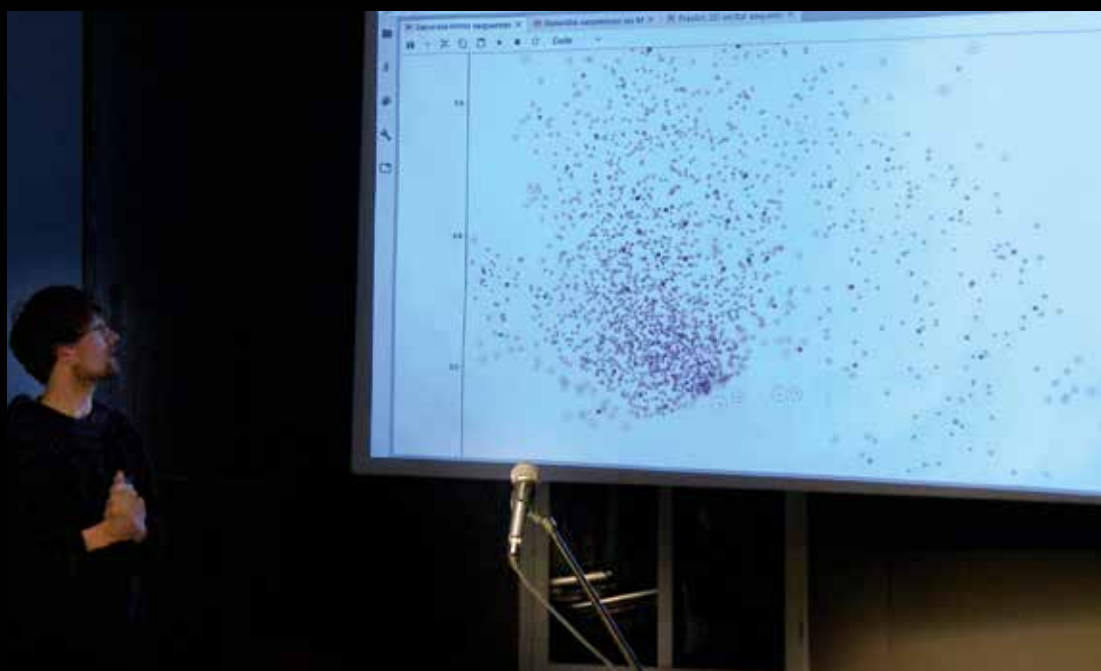
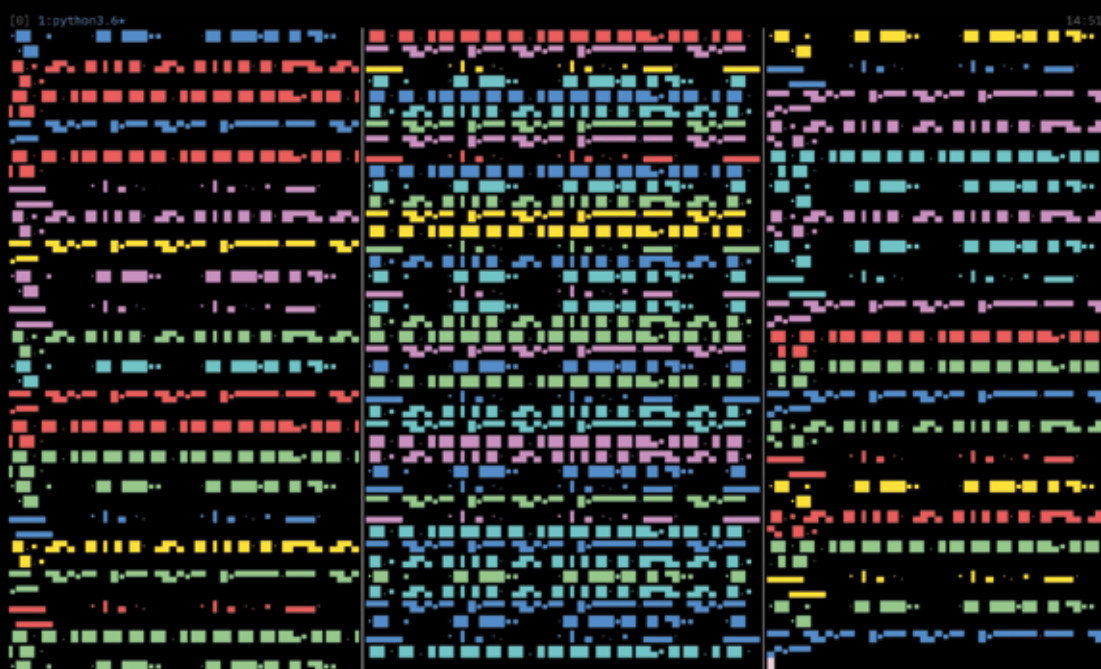
Description excerpted from Sydney Biennale's website.

Performed by the Flora Sinfonie Orchester, conducted by Thomas Jung
Commissioned by the 21st Biennale of Sydney, the Hong Kong Visual Arts Centre, and the Hong Kong Art Promotion Office



Samson Young (HK). Multi-disciplinary artist, composer, Ph.D. in Music Composition (Princeton, 2013). In 2017 he represented Hong Kong in a solo project at the Hong Kong Pavilion of the 57th Venice Biennale. Solo projects and exhibitions include Kunsthalle Düsseldorf; Talbot Rice Gallery, Edinburgh; SMART Museum, Chicago; Centre for Contemporary Chinese Art, Manchester; M+ Pavilion, Hong Kong; and Hiroshima City Museum of Contemporary Art. International group exhibitions in New York, Sydney, Shanghai, Osaka, and Seoul, among others. Recipient of various awards. His works are held in the Solomon R. Guggenheim Museum, New York; M+ Museum, Hong Kong; Mori Art Museum, Japan; and Israel Museum, Jerusalem.

<https://www.thismusicisfalse.com/muted-tchaikovsky>



Voices from AI in Experimental Improvisation

Tomomi Adachi, Andreas Dzialocha, Marcello Lussana

Voices from AI in Experimental Improvisation is the attempt to improvise and interact with a computer software which “learns” about the performers voice and musical behavior. The program behind it, named “tomomibot,” is based on Artificial Intelligence (AI) algorithms and enables the voice-performer and artist Tomomi Adachi (human) to perform with his AI-self-learning over time from Tomomi’s past concerts.

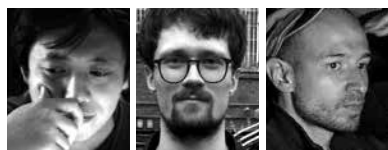
The project is not only a musical experiment with a non-human performer but also an undertaking to make computer culture “audible.” In giving “tomomibot” full agency in a human-machine interaction, the performance raises the question about the logic and politics of computers in relationship to human culture. What we hear is the result of human software design and computational logic, carving out the limited space of these machines while listening, interacting, and learning from them.

Tomomi Adachi is a sound artist known for his intense, fragmented, and sound-based improvisation style which makes “tomomibot” more of a sound and noise machine than a “singing” soft-

ware. This enables the program to learn from every sound source and type: What is the musical dramaturgy of orchestra music or war videos from YouTube? Through machine learning one can try to find and learn patterns in these sound documents and improvise musically with it, from the perspective of “tomomibot.”

“Tomomibot” is a software based on LSTM (Long short-term Memory) algorithms, a form of sequential neural networks, deciding on which sound to play next, based on which live sounds it heard before. The software was designed and developed by Andreas Dzialocha. Experimenting with AI sound synthesis algorithms (WaveNet, WaverNN, FFTNet) the developer Marcello Lussana generated a large database of sounds which sound like Tomomi. These sounds serve as the sound vocabulary “tomomibot” uses to improvise with human Tomomi.

Artistic direction, performance: Tomomi Adachi
AI programming, concept: Andreas Dzialocha
Programming, concept: Marcello Lussana
Funding: Initiative Neue Musik Berlin e. V. (2018) and Musikfonds e. V. (2019)



Tomomi Adachi (JP) is a performer/composer, sound poet, instrument builder and visual artist. Known for his versatile style, he performs his voice and electronics pieces, sound poetry, improvised music and contemporary music in site-specific compositions, classical ensembles or untrained musician groups. **Andreas Dzialocha** (DE) is an artist and developer. His work consists of digital and physical environments, spaces, festivals, or software for participants and listeners. The computer itself serves as an artistic, political, social, or philosophical medium. **Marcello Lussana** (IT) combines music, philosophy, and technology, particularly the interaction between music and human movement, where body and computer are connected through a complex understanding of body perception and interfaces.

<https://soundcloud.com/tomomibot> · <https://github.com/adzialocha/tomomibot>



Anastrophe

Patrik Lechner

The project *Anastrophe* is a piece specially written for being played on an acousmonium and was premiered in the Nordbahnhof Vienna 2018. Pre-Socratic literature (Porphyrios about Pythagoras) tells us that “Those who came to him [Pythagoras] were divided between “mathematicians”[“scholars”] and “acousmaticians”[“listeners”], whereby mathematicians were those who were granted deep insight in his teachings and acousmaticians were only allowed to hear insights, without exact explanations or reasoning.”

Acousmatic music typically is stuck in pre or post club culture, often displaying a surprising avoidance of beats. The work *Anastrophe* takes a clear step towards beat driven music, without losing focus on sound design, space, and progressiveness in structure and novel sound textures alike. The complete work is entirely synthetic/procedural, made with custom-made software. Thus, it

also breaks with the tradition of *Musique concrète*, which historically has a deep connection to acousmonium pieces.

The ‘hearing insights without reasoning’ is a beautiful way to understand both the state of current acousmatic music in its positive and negative consequences. Praising the surface of sound is integral to this work. The old discourse about education in art, academic art etc. is explored by centering artistic decisions around the ‘hearer’, the acousmaticians, the audience, and the creator.

These thoughts are reflected in the piece’s title, *Anastrophe*. Being the antonym of catastrophe, the term literally means an overturn towards a thing instead of against it. Since the word is also in use in the field of rhetoric, where it means the technique of interchanging word order, it also resembles compositional structures of the piece, where common compositional orders are questioned.



Patrik Lechner (AT) is an artist creating experimental audio/video content since the mid 2000s. Developing custom software for these purposes, original content in abstract sound works and real-time 3D graphics arose through the exploration of technology without losing focus on artistic expression. Patrik Lechner held audio/visual performances in Austria, Belgium, Italy, Bulgaria, Germany, Canada, Dubai and MUTEK Mexico and regularly played at the Austrian Pavilion at the world exhibition in Shanghai 2010.

<https://soundcloud.com/titled/acousmoniumset> · <http://www.patriklechner.com>





ÆTER

Christian Skjødt

ÆTER can be seen as a study of electromagnetism, translating the phenomena into an immersive sonic environment. Consisting of 16 large copper antennas and analogue electronic circuitry, the autonomous systems directly capture and transform the ever-present electromagnetic waves in the air around us into low frequency audio material. *ÆTER* thus “listens” to its surroundings—nature, technology and the visitor—as well as itself. The piece is therefore constantly changing and invites us to expand not only our perception of the world and its dimensions, but also our own perception apparatus. The intention is not to create a

performative instrument enabling visitors to play, but rather to create a complex interconnected network.

ÆTER takes its inspiration from the Russian scientist and musician Léon Theremin’s (1896–1993) most iconic invention—the theremin—a musical instrument which derived from an attempt to create a surveillance device.

Realized with support from The Danish Arts Foundation, The European Network for Contemporary Audiovisual Creation (ENCAC), Avatar Quebec, and KODA Culture



Christian Skjødt (DK) is an artist living and working in Copenhagen. Operating in the intersection between sound, visual art, and science, Skjødt’s work aim is to challenge our sensory perception and point towards its limitations. Often working site-specific, exploring natural and scientific phenomena, Skjødt creates large scale installations and immersive environments consisting of autonomous systems. His works can be seen as manifestations or witnesses of what we as human beings are unable to perceive, and of the boundaries between our sensory apparatus and the materiality of the world. Skjødt holds a Master’s degree from the Royal Academy of Music in Denmark.

<http://skjodt.net/aeter> · <https://vimeo.com/268404845> · <https://vimeo.com/246475495>



APPARATUM

panGenerator

Digital interface meets purely analogue sound. Analog sound generators, based on magnetic tape and optical components controlled via graphic score composed with digital interface.

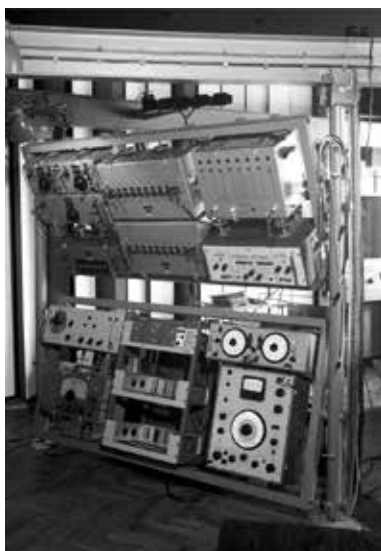
The *APPARATUM* was inspired by the heritage of the Polish Radio Experimental Studio—one of the first studios in the world producing electro-acoustic music. The installation draws inspirations musically and graphically from the *Symphony—Electronic Music* by Bogusław Schaeffer. Bogusław Schaeffer conceived his own visual language of symbols that conveyed the cues for the sound engineer responsible for the production of the piece. The physical form is inspired by the general aesthetics of the Studio's famous "Black Room" designed by Oskar Hansen. The electroacoustic generators and filters were arranged in a modular

fashion inside two steel frames—the construction element that we've referred to in our design. Magnetic tape was the primary medium used in the Polish Radio Experimental Studio. We're also using two types of "tape samplers"—two 2-track loops and three one-shot linear tape samplers. To obtain noise and basic tones we're utilizing purely analog optical generators based on spinning discs with graphical patterns.

panGenerator: Krzysztof Cybulski, Krzysztof Goliński, Jakub Koźniewski

The installation was commissioned by the Adam Mickiewicz Institute as part of POLSKA 100, the international cultural program accompanying the centenary of Poland regaining independence. Co-financed by the Ministry of Culture and National heritage of the Republic of Poland.

Andrzej Zborski, 1962–1972, Courtesy of the Museum of Modern Art in Warsaw



Andrzej Zborski, 1962–1972, Courtesy of the Museum of Modern Art in Warsaw



PanGenerator (PL) is a new media art & design collective based in Warsaw, founded by Piotr Barszczewski, Krzysztof Cybulski, Krzysztof Goliński, and Jakub Koźniewski. Since 2010 the group has created unique projects exploring new means of creative expression and interaction with the audience. Their works are characterized by blending ephemeral digital realm with the physical world. PanGenerator mixes bits & atoms to create audience-engaging, dynamic, and tangible experiences in opposition to typically static, hermetic, and unapproachable conventions prevalent to traditional, mainstream “modern art” practice. PanGenerator blurs the common divisions between art, design, and engineering, creating large-scale interactive installations commissioned by cultural institutions and commercial brands as well as purely experimental musical interfaces or speculative and critical pieces of art.

<https://pangenerator.com/projects/apparatum>



Udo Siegfried

fake synthetic music

Stine Janvin

“Tones ‘dance’ in the immediate space of their body, around them like a sonic wrap, cascade inside ears, and out to space in front of their eyes ... “

Maryanne Amacher

Inspired by architectural music pioneers and rave de-constructors, my live work is an ongoing exploration of the *Fake Synthetic Music* concept, currently a stage piece for voice, echo, and lights, recently materialized as a double LP on PAN and a number of live presentations around the world. Aiming to present physical full-body audio visual experiences, *Fake Synthetic* has become a method for creation and a sort of stage language for me, where the dualities between the digital/organic, minimal/dramatic and natural/artificial are always at play. The curiosity for psycho- and oto acoustics occurred through experiments with a digital echo effect and using this as a simple voice extension, enabling doubling of tones to create melodic patterns with the bi-product of imaginary and actual

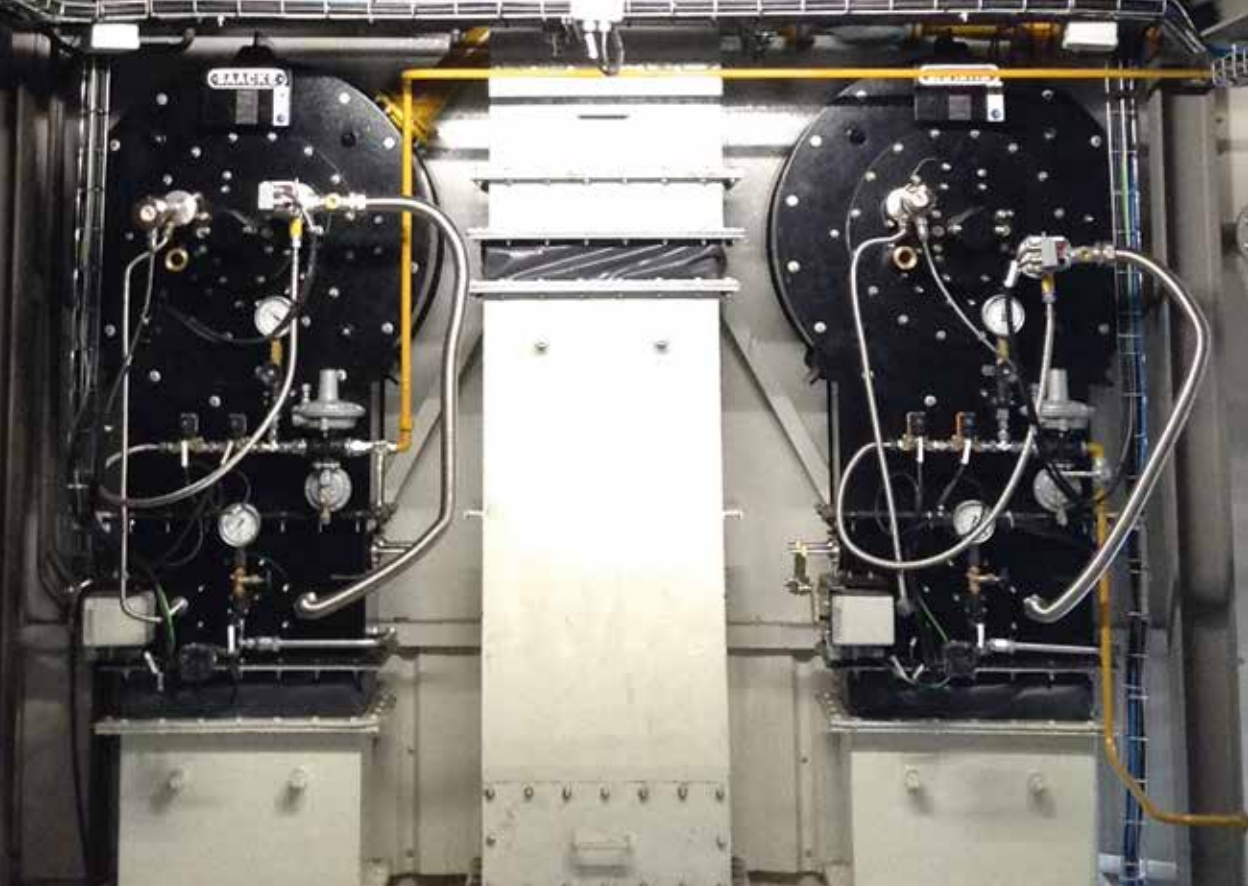
in ear tones. Initially trying to imitate synthetic sounds with my voice, I found that the combined voice and echo became its own hybrid instrument, making a mono signal from an amplified voice, sound like a detailed electronic production, just from the physiological features of the listener. This inspired me to also compose for the eyes, so I started working with programmed lights as well. An important aspect in my *Fake Synthetic* work is that the sonic and visual elements stimulate physical reactions in the audience’s body, and that this can trigger questions of what is real and fake, or if there actually is a difference between the two. These ideas have led to a collaboration with video artist Erik Ferguson, who works with flesh-like, organically looking digital animations, and further development of this work is my next step for the “fake synthetic” concept. I would like to expand the live presentation to a multidisciplinary work involving video and movement as well as sound, acoustics, and philosophical reflections.

Camille Blake



Stine Janvin (NO) is a vocalist, performer and sound artist who works with the extensive flexibility of her voice and the ways in which it can be disconnected from its natural, human connotations. Created for variable spaces from theaters to clubs and galleries, the backbone of Janvin’s projects focus on the physical aspects of sound, vocal instrumentation, and potential dualities of the natural versus artificial, organic/synthetic, and minimal/dramatic. In addition to commissioned work and collaborations for and with other artists, such as Ula Sickle and Adam Linder, Janvin is also performing regularly with Native Instrument (Shelter Press, Entr’acte) and her alter ego ST/NE (Laura Lies In). As an interpreter, Janvin is a member of the Holly Herndon Ensemble, and performs contemporary music by composers such as Catherine Lamb, Maja S.K Ratkje, and Øyvind Mæland.

<https://stinesthetics.com>



MANTRacks and Sonic Fields: A VirtuAural Duology

Francisco López

MANTRacks and Sonic Fields is a long-duration sound meta-piece composed of two parts (a duology), created with original environmental sound matter from two contrasting locations, industrial and natural, in Paris and the North Sea island of Vlieland, respectively. Unlike canonical “field recordings” or “soundscapes,” this piece moves forcefully away from representation or documentation and delves into a territory of ontological deep exploration of sonic substance. It explores a decidedly compositional sonic realm whose ultimate goal is not “abstraction” but rather a much deeper connection to the matter of “reality.” Not representational but immersive. An aural virtuality without simulation (or “VirtuAural”). With this perspective—akin in aim and tone to the recent philosophical field of “object-oriented-ontology”—this piece works sonically with extreme dynamics, unorthodox editing, listening-enhancing strategies, and a sense of penetration into detail and texture.

PART 1—untitled #352

Created from original environmental sound matter recorded at the Régie de Chauffage Urbain / RCU (urban boiler plant facility) in Fontenay-sous-Bois, near Paris. Initially developed for the audio-only installation-performance soundtrack of the choreographic project *Exposure* by Anne Collod. Premiered for blindfolded audiences at the RCU as part of the Biennale de Danse du Val-de-Marne 2017. Selected complex layers further evolved and distilled into extensive electric mantras (“MANTRacks”). Composed, mixed and mastered at “mobile messor” (Den Haag, Dublin, Paris) and Dune Studio (Loosduinen), 2016–2017. Special thanks to Barbara Ellison.

PART 2—*Sonic Fields Vlieland*

Created from original environmental recordings done in the island of Vlieland (North Sea, Holland). Originally conceived to be listened at specific geo-located positions in Vlieland. Composed, edited, mixed, and mastered at Dune Studio (Loosduinen) in 2017. Field assistant: Barbara Ellison.

A production of Amsterdam-based organization Soundtrackcity. Commissioned by Into The Great Wide Open Festival (Vlieland). With support from AVRO Cultuurfonds, Stroom Den Haag and an anonymous donation.



Francisco López (ES) is internationally recognized as one of the main figures in the realm of sound art and experimental music. Over the past forty years he has developed an impressive sound universe that is completely personal and iconoclastic and based on a profound listening to the world. He has realized hundreds of sound installations, projects with field recordings, and concerts / performances in over seventy countries on the six continents, including the main international concert halls, museums, galleries, and festivals. His extensive catalog of sound pieces has been released by 400 record labels / publishers worldwide.

<https://franciscolopez.bandcamp.com>



“Play Back” Curing Tapes

SHOJIKI

Rewinding curing tape with a motor. The performers use a switch to control the rotation direction of the motor and its ON/OFF. Each time the tape is rewound on to the motor axis, it makes peeling sounds and continuant sounds. Magnetic tapes, such as cassette tapes, playback sound through magnetic heads when they are rewound from one axis to another. The performance of Shojiki analogically connects the two movements of “Rewinding a magnetic tape” and “Rewinding a curing tape.” The magnetic tape, which is a sonic reproduction medium, has a powder that can be magnetized which is called a “magnetic substance” coated on to it, and on the other hand, curing tape has an “adhesive agent” coated on to it. Sounds

can be recorded, played back, and erased on magnetic tapes many times, and on the other hand curing tapes are made for temporary adhesion, and therefore can be taped on and peeled off several times. Just as the magnetic substance on the magnetic tape wears down and degrades, the adhesive agent on the curing tape also becomes weak after being used. SHOJIKI refers to the physical characteristics of sonic reproduction mediums from this coincidental tie between the two different tapes and “playback” curing tapes.

Camera for video documentation: shikakun,
Manami Seki
Thanks to: Makoto Oshiro, biki, pool sakuradai

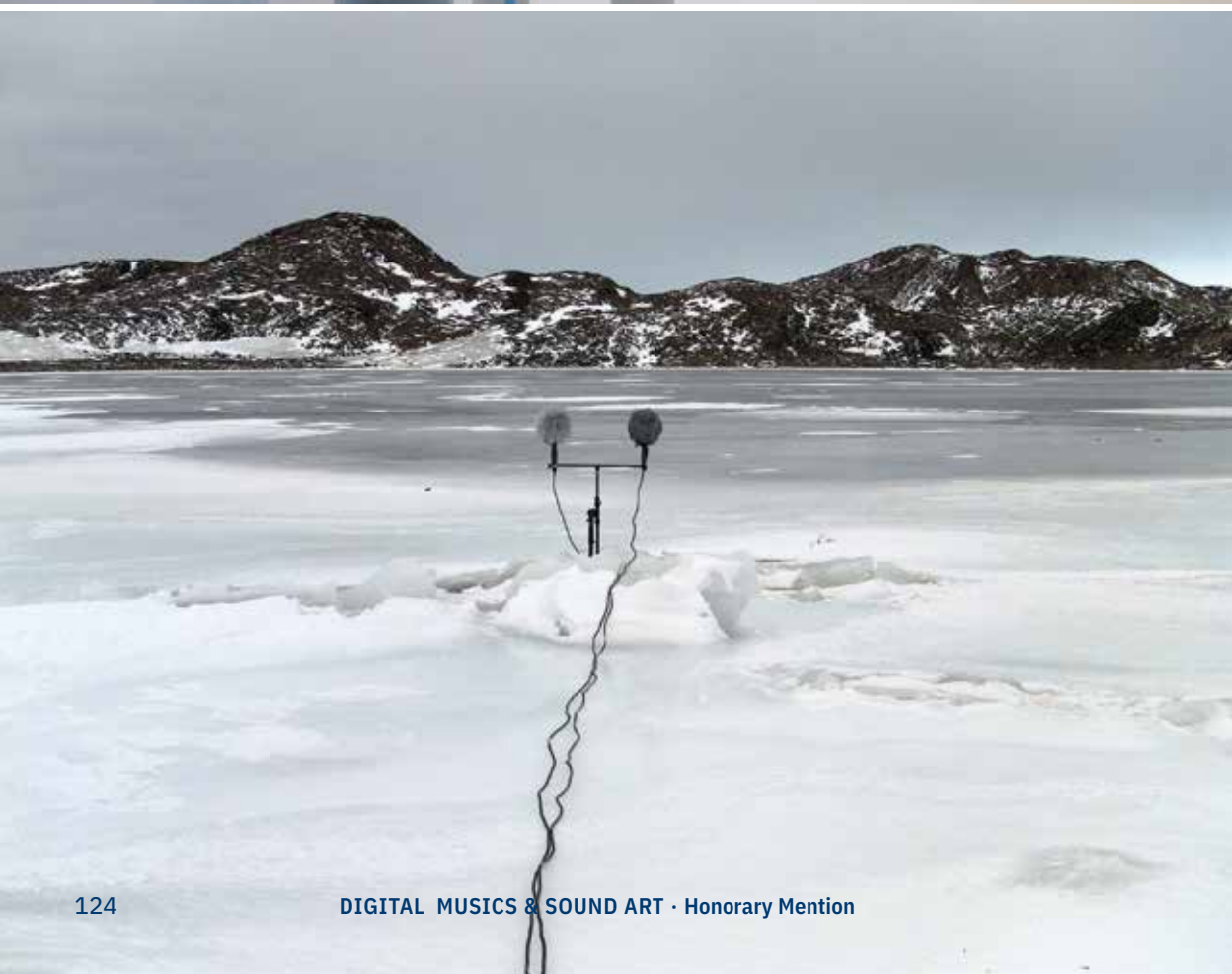


shikakun&Manami Seki



SHOJIKI (JP) is the duo **Muku Kobayashi** and **Mitsuru Tokisato**, formed in 2016 and based on the concept of playing honestly as much as possible. Recent performances use a motor and a curing tape, and in 2018 a cassette tape *KB* was released.

<https://shojiki.club>



Polar Force

Speak Percussion, Philip Samartzis, Eugene Ughetti

Polar Force is a phenomenological investigation of wind, water, and ice through spatial sound performance. It looks to Antarctica, the windiest, coldest, and driest continent on earth, a place where these energies flourish and we humans don't. During an hour-long work, vivid multi-channel Antarctic field recordings are combined with live sound research, undertaken by two performers reminiscent of scientists in a remote polar field station.

Some of the recordings were made using an array of digital recorders placed throughout Casey Station during a 100-knot blizzard. The blizzard is notable as the strongest ever recorded there during summer. Sounds of sea ice, icebergs, and glaciers also feature in the performance. The field recordings are used to form a series of multichannel environments to provide audiences with vivid and tactile experiences of the natural, anthropogenic, and geophysical forces shaping the frozen continent. In dialogue with the field recordings are a series of industrially designed instruments. These purpose-built instruments use pressurised air, high flow air, manual and motorised valves, 20 hand-tuned fipples and corrugated tubing in combination with carbonated ice and water to build a rich range of musical responses. Electro-magnetic coil microphones, hydrophones, accelerometers, and RF condenser microphones deliver the

nuances of these instruments into a 14.2 channel speaker diffusion.

Polar Force occupies a custom designed white inflatable structure. Inspired by the architecture of polar stations, this portable venue offers a white backdrop, projection surface, and climate control for the work. The custom-built lighting system includes 190 metres of cold-white LED strips and DMX controlled spotlights.

Polar Force references climate change and global geopolitical tension including the exploration and exploitation of frontier territories. It is a sophisticated example of hyperrealism where recorded sound is choreographed with musical performance.

Concept, Co-Director, Composer and Instrument Design: Eugene Ughetti

Co-director: Clare Britton

Sound artist & Field recordings: Dr. Philip Samartzis

Performers: Matthias Schack-Arnott & Eugene Ughetti

Lighting designer: Keith Tucker

Sound design, Audio system design, Instrument design & Construction: Nick Roux

Production & Technical Management: Megafun

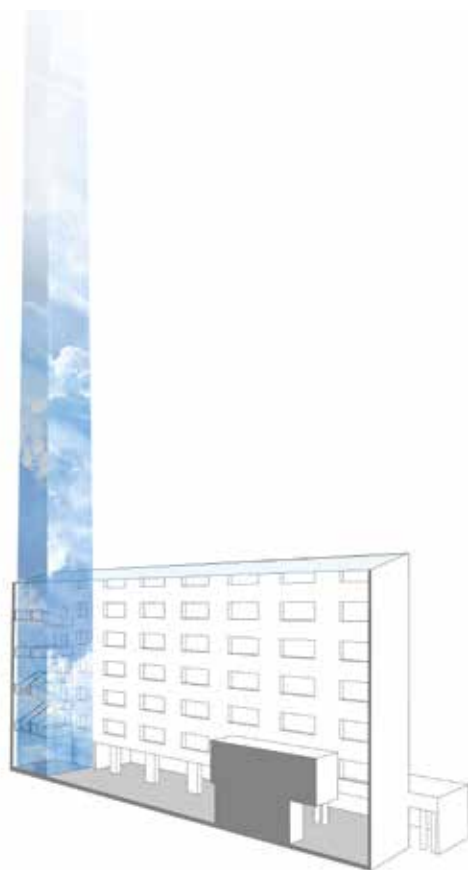
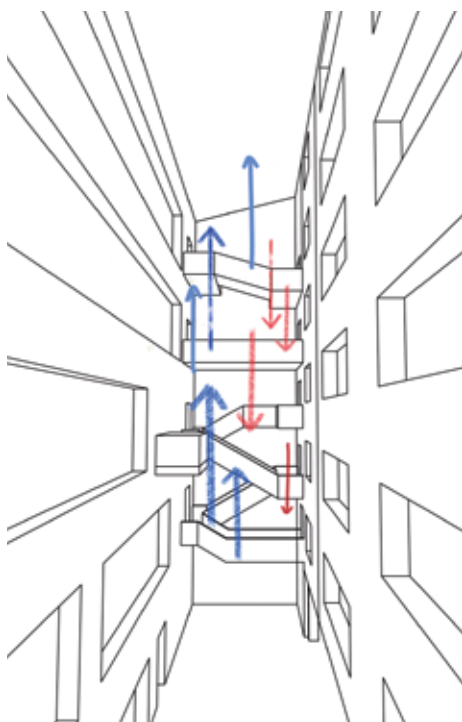
RMIT Industrial Design Atelier Leader & Air Consultant: Dr. Malte Wagenfeld

Producer: Sheah Sutton

Supported by: Australian Antarctic Division, Australia Council for the Arts, Creative Victoria, City of Melbourne, Bogong Centre for Sound Culture, School of Art—RMIT University, APRA AMCOS Art Music Fund, Besen Family Foundation

Speak Percussion (AU) has shaped the sound of 21st century Australian percussion music. Internationally recognized as a leader in multidisciplinary experimental music, Speak engages in risk-taking and innovative projects. **Eugene Ughetti** (AU), Speak Percussion's artistic director, is known for tackling complex and ambitious art music projects whether as director, composer, performer, or conductor. His artistic output primarily explores the materiality of percussion, but his work might also engage with ideas like drum aged rum, supersonic performance, or the percussive military. **Philip Samartzis** (AU) is a sound artist who focuses on the social and environmental conditions informing remote wilderness regions. His art practice is based on deep fieldwork where he deploys complex recording technology to demonstrate the transformative effects of sound within a fine art context.

<https://www.speakpercussion.com>



Åsa Stjerna & Christian Hörgren

Sky Brought Down

Åsa Stjerna

Sky Brought Down is a permanent site-specific sound installation that was developed for a new indoor atrium and main staircase at the Center for Imaging and Intervention at Sahlgrenska University Hospital, Gothenburg, Sweden. The work was part of my dissertation in artistic research: *Before Sound—Transversal Processes in Site-Specific Practice*, (2018) University of Gothenburg.

Sky Brought Down takes as its conceptual foundation the sky outside the hospital. A weather station on the roof of the hospital forwards weather data in real time to the sound installation. This data is transformed into different types of sound textures. Low pressure systems, high pressure systems, precipitation, wind speed, wind pressure, and light all generate different sorts of sonic expressions in real time, according to a complex structure of algorithms.

A total of 16 speakers, which are mounted behind the wooden panelling that runs through the atrium from floor to ceiling, provide for a vertical listening experience where a glass ceiling allows a visual direct contact with the sky, which is subsequently sonified in the building through the work. By increasing the corporeal as well as conceptual experience of the site, the aim was thus to establish an immersive relation between visitor and site.

Commission: Department of Public Art, Region Västra Götaland. (Konstenheten, Västfastigheter, Västra Götalandsregionen)
Curator: Brita Bahlenberg
Software developer: Andre Bartetzki
Technical concept and realization: Manfred Fox



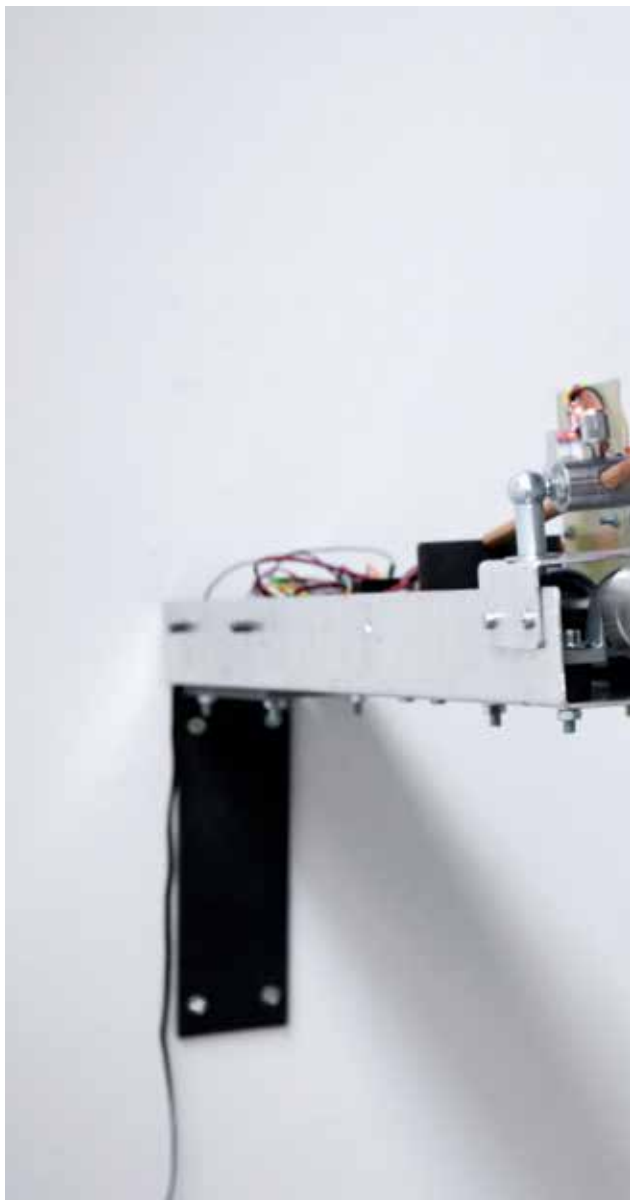
Åsa Stjerna (SE) is an installation artist, who uses sound and listening as her artistic media of exploration. Through her site-specific sound installations, she explores the often hidden underlying historic, social, political, and poetic phenomena connected to a place, making these perceivable. She is currently involved with several public art projects dealing with the articulation of urban spaces through sound and listening. Stjerna has participated in a number of exhibitions in Sweden and internationally.

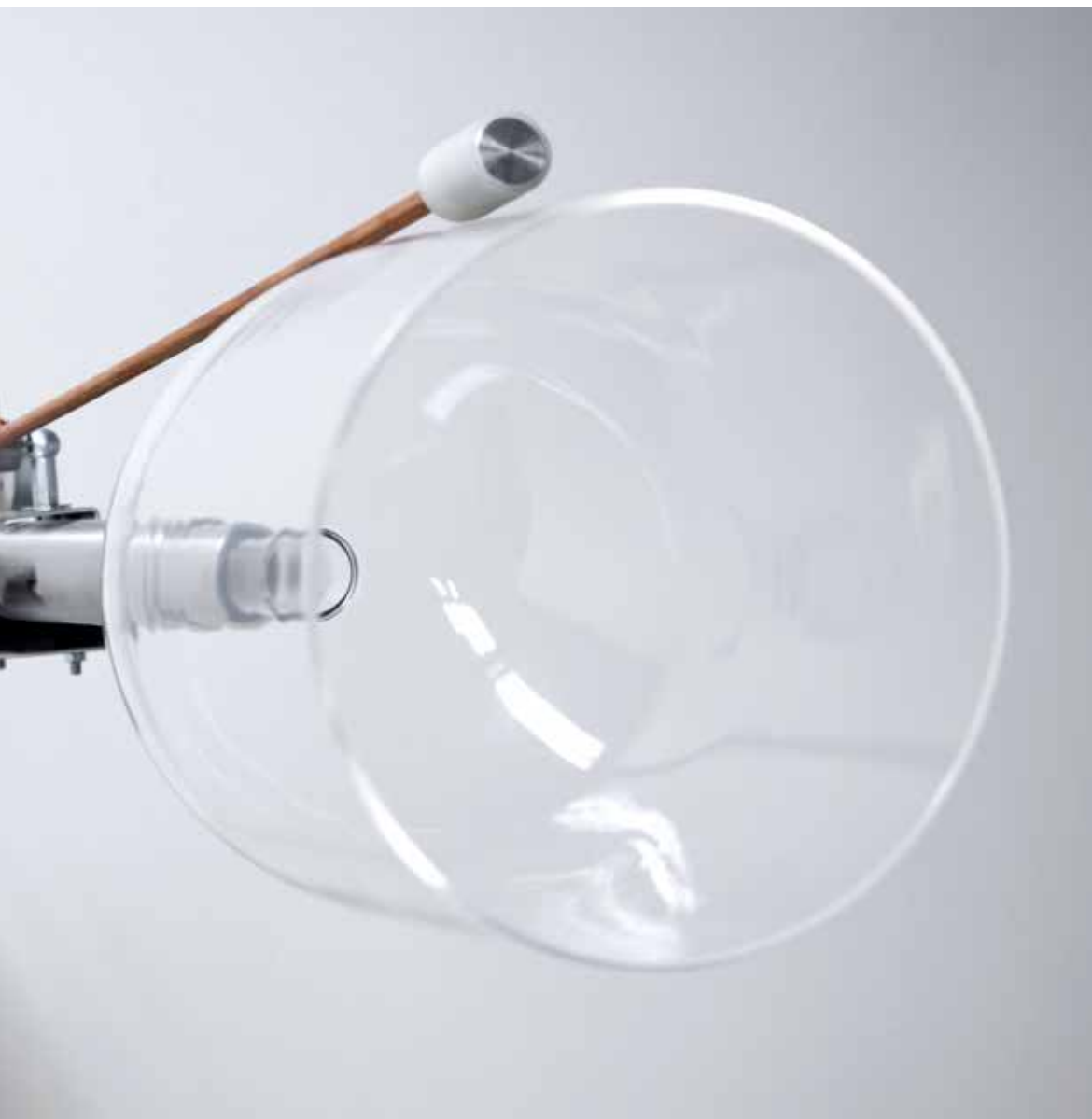
<https://vimeo.com/322340478>

Smart.ing Bodies

Evelina Rajca

Sand has become an increasingly crucial part of everyday life. High-purity silicon dioxide particles are the essential raw materials from which we construct concrete, glass, fiberoptic cables, computer chips, and other high-tech hardware. Minerals are the physical components on which the virtual world but also “our nature” is vibrating. *Smart.ing Bodies* is a multisensory sound installation. A kind of sensory vitreous organ, consisting of two glass resonators, sensors, motors, and an algorithmic composition created partly by AI learning processes. The glass instruments are made of quartz sand, which Rajca collected from disappearing beaches and mountains around the world. These minerals got purified and burned into specific glass shapes. The chemical components, the material thickness, and the shape of the glass resonator determines the spectrum of frequencies that can be triggered while being played. A tuning process similar to the art and physics of tuning bells. These new glass bodies are each rotating based on an algorithmic program around their own axis, while a drum stick with a piezo electric sensor inside is striking the glass and sensing the vibrations. Here, a small electrical charge is produced which is monitored, processed within the algorithmic program, and subsequently modulates each other's in/activity. While being played, the glass bodies resonate—pure (perfect) tones are transforming into noise and standing waves and are challenging each actor's natural material frequencies. In order to keep on playing and to avoid a “resonance disaster” (the destruction of the glass or motor) the algorithmic program that is driving the hard- and software has to learn to conduct a variety of smart frequencies. These resonating and sensing instruments are turning into self-regulating devices, trying to avoid a resonance catastrophe by countering destructive forces i.e. violent oscillations—accelerations.





G.J. van Rooij

Evelina Rajca (PL) studied from 2006–2011 at the Academy of Media Arts in Cologne and at the Central Academy of Fine Arts in Beijing. Rajca investigates through her interdisciplinary work the influence of historical and contemporary cultural technologies on society, and how normative social behaviors in turn are embedded in technical systems. How human and non-human systems reorganize, for example, with the intention of controlling (unexpected) upheavals, is a recurring question. Evelina Rajca's recent works *Managerial Revolution* and *smart.ing bodies* explore both the processes of resistance, and their boundaries.



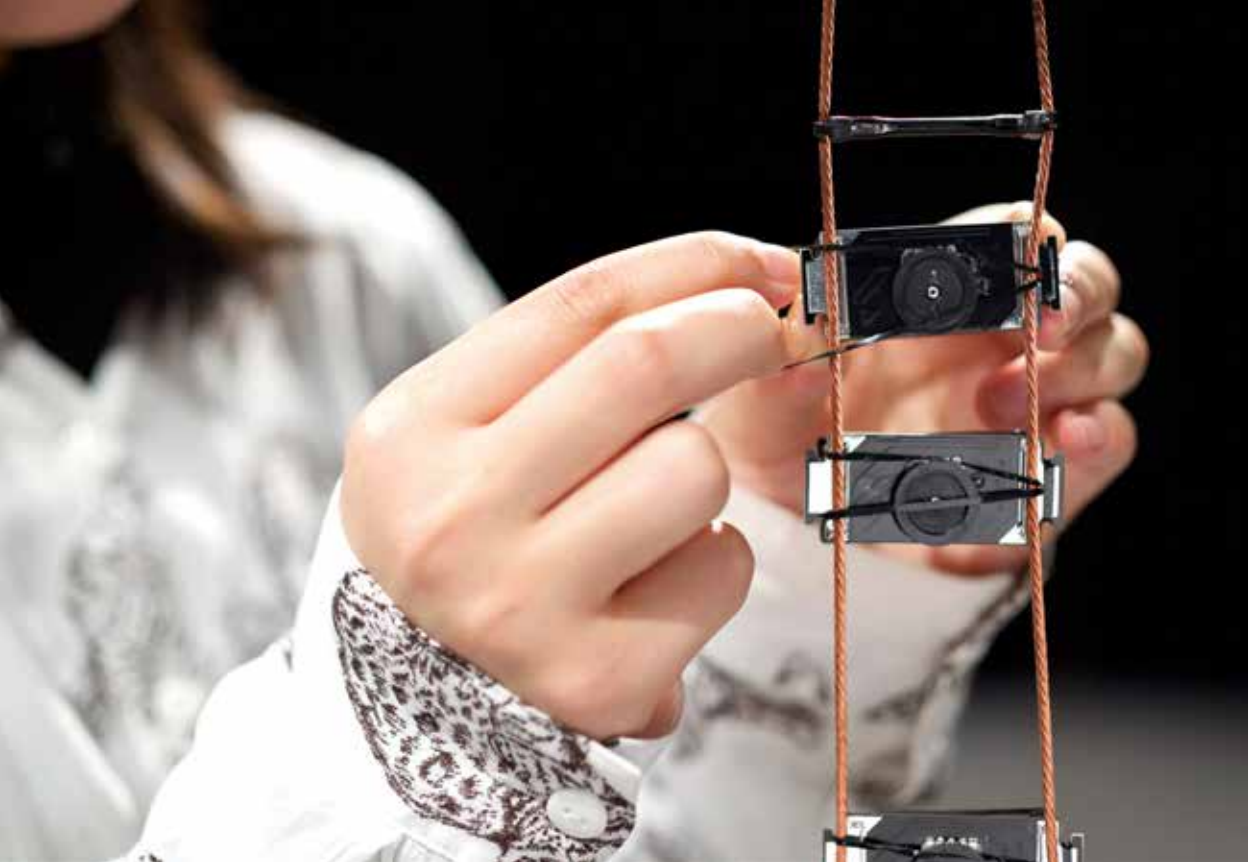
The SINE WAVE ORCHESTRA stay

The SINE WAVE ORCHESTRA

Each visitor is given a small device which can play a sine wave, chooses its frequency, and positions it at a location on one of the 49 spiral-shaped columns of copper wire that are arranged in a grid in the exhibition space. These sine waves remain audible for the rest of the exhibition period, which means that the sound field—starting with absolute silence at the beginning of the exhibition—gets increasingly complex with every single visitor's contribution towards the end of the exhibition. It is thus a collective performance, creating work that continues to change while revealing different sonic qualities depending on the listening point, and number and position of the device being installed.

Referred to as “music being produced outside of traditional music boundaries, a collective deconstruction of the ‘ego of self-expression’ that is prevalent in most musical styles” [Toop et al, 2004], and “‘sonic/musical events,’ where people get together to share a certain time and place, even though there aren’t actually performers intending to play sounds to an audience” [Miwa, 2004], *The SINE WAVE ORCHESTRA* has provided and maintained a framework that offers visitors participation in the creation of the work itself. The work is defined by the interplay of the visitors and the sine waves they played.

A sine wave is said to be the most basic sound, therefore called pure tone, which contains neither



Kazuomi Furuya, Courtesy of Yamaguchi Center for Arts and Media [YCAM]

overtone nor noise but a single frequency. In the early 19th century, French mathematician Joseph Fourier discovered a certain formula for representing any kind of sound through combinations of multiple sine waves (known as “Fourier transform”). Because of its fundamental importance, a purpose not restricted to sound and the sheer

infinite number of possibilities of application, *The SINE WAVE ORCHESTRA* originally chose to dedicate their work to the sine wave.

Commissioned by Yamaguchi Center for Arts and Media [YCAM]
Equipment support: FOSTEX COMPANY
Co-developed with YCAM InterLab



Gottingham
Courtesy of YCAM

The SINE WAVE ORCHESTRA is a project that works exclusively with sine waves and was launched in 2002 by Ken Furudate, Kazuhiro Jo, Daisuke Ishida and Mizuki Noguchi. “The single sine waves, which the participants each play freely without a score or conductor, rise and intricately interfere with each other like thin strings, and ultimately create an ocean of sine waves.” Based on this image, *The SINE WAVE ORCHESTRA* presents works between and within performances, installations, and workshops and invites the public to create a collective sound representation.

http://swo.jp/works_stay.php

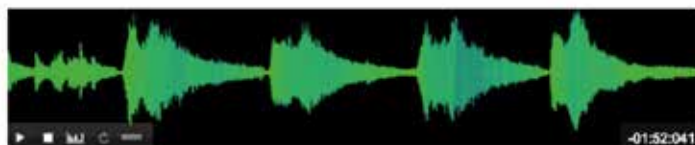
Tempo **Prestissimo** Play Notes

f *f* *f* *mp* *pp* *f*

Tempo **Adagio** Play Notes

fff *p* *p*

The following video will be played at the same time as the notes above



Freesound share URL

<https://freesound.org/s/25475/>

Wiki-Piano.Net

Alexander Schubert

Wiki-Piano.Net is a piece for piano and the internet community. It is composed by everyone. At every time. The composition is notated as an editable Wiki internet page and is subject to constant change and fluctuation. When visiting the website *wiki-piano.net* everybody can see the current state of the piece and make alterations. The website allows the visitor to place media content, comments, audio, and pictures in the piece but also provides tools for traditional score editing.

When a performer decides to play the piece in a concert, the current version of the website score at that date will be performed. Whatever is found on the website at that moment will be the score for the player, who follows all instructions of the page from top to bottom. Hence no performance will ever be the same. Through the editing process of the community, new versions of the piece will constantly evolve.

The piece offers the audience to actively engage in the process of the composition and to shape the result as they like. The work questions traditional roles of authorship and copyright and provides a democratic tool. The role of the composer in this case is reduced to providing a framework. The initial state of the piece was blank, so that the piece is not a remix of an original work, but rather a software designed to enable collaborative practices. Through that it reflects processes of collective creativity and community interaction. The goal

was not to create a perfect final piece but rather to mirror processes of online behaviour and transport these concepts to a classical concert situation. As a result, the different versions of the piece show elements of typical online / meme humor just as much as random trolling and insightful composition. Also the evolution of ideas, passages, and material over the time proved interesting. The constant mutating and alteration of existing material can be accessed in the archive function of the piece *wiki-piano.net/archive*.

The technical realisation of the performance is realized exclusively in the browser. The projection of all visual material and playback of sounds in the concert is handled from the page *wiki-piano.net/audience*.

In this way, no score, materials, or programs need to be bought and the performance material is immediately available for everybody with an internet connection and a browser. The framework is freely available and does not involve monetarization or the decision of the composer, publishing company, or any other third party.

Concept, Composition: Alexander Schubert

Commissioned by Zubin Kanga

WIKI.PIANO.NET is part of the fellowship program

#beethoven, a project by PODIUM Esslingen for the Beethoven anniversary 2020, supported by the Federal Cultural Foundation.

UI + UX: Christoph Lohse / Büro für Exakte Ästhetik

Webdevelopment: Dominic Osterried



Alexander Schubert (DE) was born in 1979 in Bremen and studied Bioinformatics in Leipzig and Multimedia Composition with Georg Hajdu in Hamburg. He's a professor at the Musikhochschule Hamburg, the artistic head of the electronic studio at the conservatory in Lübeck, and was a guest professor at Folkwang University in 2016. Mainly he's working as a freelance composer with a focus on virtuality, interface design, and post-digital aesthetics. In his works he focuses on the role of the body, representation and authenticity in a digitalized world, and performance setting.

<http://wiki-piano.net>



Wind from Nowhere

Haein Kang

Wind from Nowhere is a data-driven sound installation, which mechanically reproduces the moment when leaves gently rustle along with the wind blowing through the trees.

The title derives from Samuel Butler's novel, *Erewhon*. Erewhon is the reverse spelling of the word "Nowhere." The book paradoxically symbolizes Utopia and is famous for predicting the emergence of artificial intelligence. In the fictional land of Erewhon, humans destroy machines, fearful of the appearance of intelligent and conscious

machines that could threaten human existence one day.

In contrast to the novel, *Wind from Nowhere* affirms the advancements of technology and uses them as a poetic and aesthetic tool. It utilizes the pre-collected weather data from an online weather forecasting site. Wind speed data represented as numerical values regulate the speed of motion and turn into either a breeze or a gust.

Custom mechatronic devices wave a series of paper like the leaves swaying in the wind. Mechan-



ical parts of soft materials, such as elastic link-ages, produce the organic movements of paper. Fluttering paper appeals to the visual, auditory, and tactile senses to manifest the wind. Wind data creates wind phenomena!

Supported by the center for digital arts and experimental media (DXARTS) at the University of Washington. Special thanks to Richard Karpen.



Haein Kang (KR) is a multimedia artist, a creative technologist, and currently a doctoral candidate in DXARTS at the University of Washington. Her artwork engages poetically with technology and explores the infinite possibilities of artistic expression. She has presented her works at various international venues including SOMA Museum, Seoul Museum of Art, ICMC, and ISEA, and has also received awards and grants from multiple organizations including the San Francisco Arts Commission, Murphy & Cadogan, and 4Culture.

<https://www.haeinkang.org/wind-from-nowhere> · <https://vimeo.com/236468918>

 **PRIX
ARS ELECTRONICA**

u19—create
your world

Every Day is Friday: Create your Future—Create your Present!

Sirikit Amann, Nikolaus (Niki) Glattauer, Anita Landgraf, Conny Lee,
Magdalena Reiter

When we talk about youth, we often speak in the same breath about the future. The two terms are so closely interlinked that one sometimes forgets that young people are in the here and now. They need to be heard right at this moment—not at some later time. And they need to shape and influence their present, not “only” their future. This need is reflected in the great diversity of submissions received this year. The range and multifaceted nature of the projects make the u19 competition time and again the most richly varied category of Prix Ars Electronica, for it is obvious that, in this event, young people not only realize their own ideas: they also demonstrate unexpected possibilities of digital technologies and thus make inroads in all conceivable directions.

But the vision of u19—create your world extends much further than just to increasingly perfect ways of working with digital media. The focus is placed on issues like climate change, strategies to combat bullying, and the concerns of an up-and-coming generation that resists being pigeonholed. It is this very search for answers to present-day questions—often approached in an unconventional manner—that shows the seriousness with which young people perceive the world. One insight gained by juries in previous years is that we could have awarded prizes to many more projects than there were prizes to give. For this reason, the framework of the u19 category was expanded: this year, for the first time, twenty-four prizes (instead of the previous sixteen) will be awarded. This abundance of prizes illustrates how important the u19 category is in Prix Ars Electronica. We want to recognize the first works and projects created by young, creative people and—even if their works do not yet attain the level worthy of an Award of Distinction—encourage them to continue on this path.

But this is not the only change that was made in this category. Experience has shown that works by very young entrants often score points for wit, off-beat humor, and an unconventional approach to

carrying out a task. Up until now, the jury could not always give these clever submissions by the younger participants—who were competing against the frequently more elaborate works of the older entrants—the attention they deserved. To create a more level playing field, two new age groups were introduced this year: the “Young Creatives” (up to age 14) and the “Young Professionals” (age 14 to 19). This makes the competition fairer and at the same time gives us a better overview of the broad spectrum of projects that are submitted in this special category in all their variety.

With the very young participants, the emphasis is on the pleasure of experimentation, playfulness, and a richness of imagination. These works do not have to be perfect, but they should be convincing with their wit, charm, or their particular audaciousness. This year as well, it was more important to the jury to gain a sense of the personal motivation and individuality of the young artists than to judge a highly polished work. “Young Creatives” is open to many forms of creativity: whether it is a drawing, model, sketch, sculpture, a particularly beautiful photograph, an exceptional Lego artwork, or the first programming projects—there is room for all of this and much more in the “Young Creatives” category.

We would especially like to invite primary schools to participate in this category: let us share in these very young people’s fantastic worlds of thought, in their questions about the evolution of our habitat, and in their unbridled spirit of discovery!

Young Creatives

With the expanded range of prizes for u10, u12, and u14, we want to show how varied the approaches are in these different age groups. The **ABC-Coding** project of Europaschule Linz, for example, demonstrates that even primary school pupils can explore the basic principles of coding in a child-friendly manner and can also explain them in such a way that grasping computational

thinking becomes child's play. This is precisely the most effective way of learning: when a child is "infected" with the joy of learning from others in a group of peers. For this project, the primary school children received the u10 Award of Distinction.

With her excellent mini-film **get_bullied!**, the winner of the u10 Prize, nine-year-old Mina Sophie Hackl, proved that with a cheeky, fresh perspective, even serious topics like bullying can be treated in a light and effective manner. She succeeds in positioning figures from a game environment in a new context and in breathing personality and character into them with a small storyboard she drew herself.

The three prizewinners of the u12 category could not be more different from each other and are symptomatic of this age group.

His homage to the classic computer game *Rogue* earned Simon Heppner the u12 Prize: in his self-programmed game **Dungeon of Math**, one battles against monsters by solving math problems—completely in line with the principle of learning through playing. The winner of the u12 Award of Distinction scored points with a cat video that encourages us to treat our environment in a sustainable manner: Katharina Landl's and Mona Rathenböck's **Nachhaltigkeit** ("Sustainability") takes a witty, tongue-in-cheek approach to the main theme of this year's submissions.

Honorary Mention goes to **Der Gobi kommt** ("Gobi Comes") by Amelie, Laurin, and Niklas Steinhuber. This animated science fiction film deals in essence with friendship, animosity, the fear of the unknown, and solution-oriented thinking. The figures in the film were made with various found materials, with the "alien language" translated into human language through subtitles—an elaborate project executed with great attention to detail.

The superb **Digitaler Mordversuch** ("Digital Attempted Murder") by NMS Hittisau's Cyber-Werkstatt, was the winner of the u14 Prize. The film captures the current power relationship between end users and the large tech companies in a gripping manner and describes the pitfalls of the "Internet of things" in the form of a compelling and exciting story. Even most adults do not consider that a coffeemaker connected to the Internet could pose a threat, that a refrigerator that automatically orders more milk could lead to societal problems, or that the camera on a baby monitor

could also be accessed by third parties. It is all the more astounding that it is school students who explore this topic here, hitting the nail precisely on the head with a surprising story full of wit and hyperbole.

The two u14 Awards of Distinction demonstrate the wide range of possibilities:

With **Why war Rap**, NMS Liefering presents a musical work that opens our eyes to the horrors of war and explores the question "Was does war have to do with me?" in a touching and emotional manner.

Benjamin Aster's **Plottegoino** testifies to his innovative spirit and great enthusiasm for tinkering and for handicrafts with his marvelous little plotter that transfers digital texts to paper.

Über Nacht – Eine neue Macht ("A New Power Overnight"), by the film class of the SchülerInnen-schule im WUK, illustrates how quickly—namely more or less overnight—the achievements of a democratic society can be thrown overboard.

Young Professionals

A degree of professional execution is at the forefront in the "Young Professionals" group as well: a thought, a topic, a need, or an idea is to be given a concrete form by means of an appropriate medium (which can also be analog), preferably including a critical examination of the conveyed subject matter. Beauty alone, however, is insufficient here—creative thinking and unexpected perspectives are what is called for.

In this regard, the largely absent engagement with global politics or with local political events is surprising: issues such as the political swing to the right in Europe and the trivialization of right-wing parties, topics that are widely covered by the media, were virtually non-existent.

Does this mean that young people have no interest in political systems? Not entirely: particularly among the films, there were a few submissions that dealt with authoritarian structures or dystopian societies in which people have to "function" with as little reflection as possible.

The political dimension of climate change and related environmental issues appeared to be a point of contact for the young people: in 2019, influenced by the "Fridays for Future" campaign, particularly the idea "We only have one planet" has (again) found a place in the minds of young people and was expressed in many works in vari-

ous ways. Perhaps they had the feeling that with this topic, they had the best chance of bringing about change and making themselves heard. Only a very few of these entries made it onto the short list however—namely those that truly stood out among this great abundance of works.

Another very dominant thematic area was the pressure to conform, the control and restriction of one's own life prospects by external forces, but also the breaking out of prescribed structures. Self-discovery, non-conformity, group formation, and setting boundaries are all part of growing up. The desire to present these topics in an artistic manner, however, is particularly evident this year. The exploration and discussion of "otherness" and marginalization, or of mental illness, shows how important their immediate environment and personal comfort or discomfort are for youth.

Although we recognized a few recurring themes, the submissions were in fact very diverse in terms of their form, ranging from radio plays and robotics to computer games, open source maker projects, and practical software tools. We would like to note here that the open source mentality was particular evident to us among the very young participants. The "Young Professionals" as well would be advised to be bolder in terms of digital openness and knowledge- and code-sharing, as there were only very few highlights among their submissions with regard to openness.

A number of very good final projects for technical schools were submitted as well. It is tremendous that the students in these schools are apparently encouraged to identify a specific need in their immediate surroundings and find solutions for it. Vocational schools are also called on to support their students in their work on suitable projects and to submit these works. Perhaps collaborations with other types of schools—whose focus is more on aesthetics and design but often do not require any practical application—would be fruitful for appropriate projects. This could present an opportunity to make even more of what are already high-quality, practical projects.

No submissions involving business ideas with a start-up character made it into the final round this year. In this area we noted the absence of social relevance and critical examination of a genuinely relevant problem.

It was conspicuous that music-related projects and analog games were weakly represented this

year (and, incidentally, in previous years as well). We would be interested in seeing what more could be gotten out of these media in the context of "create your future."

There was a noticeable surplus of film submissions. The quality of the films—whether animation, stop-motion, live-action, or documentaries—was overall very high. It is thus not surprising that among the many outstanding submissions, it was a film project that walked away with the Golden Nica. What is remarkable, however, is how clear and unequivocal the jury's decision was in this case.

Alexander Lazarov won us all over with his coming-of-age series **DSCHUNGEL** ("JUNGLE"), as his project went one step further than other film entries. He designed his five-part miniseries especially for the smartphone and executed it professionally with a well-chosen team. Mobile phones and social networks are omnipresent in the plot lines as well and often serve as a linking element. Lazarov not only captured his immediate, current environment—that of young adults in Vienna—but also developed his own aesthetic fingerprint: the visual language, the living environments, and the aesthetics of the medium of Instagram allow an authentic insight into his generation's attitude towards life. But the young artist does not attempt to describe his generation to anyone or to defend it; his series is not made for an audience "out there" that he wants to provide with an inside view. Rather, **DSCHUNGEL** is a declaration of love to his generation, with equal portions of sensitivity, humor, and a quite critical gaze. Alex Lazarov's work immediately convinced the jury, not only for its technical sophistication but also for the emotions that elicit images and scenes. And this combination—technical refinement coupled with artistic emotion—is precisely what the Golden Nica of the Prix Ars Electronica is all about.

The great diversity of the submissions is reflected in our other prizewinners as well. With **Rake – Minimize your Information** (Vienna Federal Training and Research Institute of Graphic Arts) and **Gift of Nature** (HLW Kreuzschwesternschule Linz), two decidedly non-pop culture projects won the two Awards of Distinction for "Young Professionals": The installation **Rake** reflects the increasingly unmanageable flood of information that we are served every day and challenges the actual relevance of the information that opaque algo-

rhythms have deemed relevant. **Gift of Nature** looks at the misdeeds of the advertising industry, which has now discovered how to use the theme of sustainability to its advantage. The oversized packaging of a single piece of pasta or strawberry, which is presented as organic and regional and touted with glowing but hollow phrases, shows that it is important to take a second, critical look at products that are ostensibly presented as sustainable. The “netidee SPECIAL PRIZE 2019” comes from the field of practical application. “Improve your work” is the subtitle of **Tweakr.io**, and this is precisely what makes this work worthy of the award: it opens up new possibilities for the work between graphic artists and their clients. The tool allows us to share pictures with others, and to give feedback and discuss solutions right in the picture. **Tweakr.io** is thus one of those works that many people have long been waiting for, and whose usefulness becomes clearly evident after only a few seconds. The application is a modern tool for collaboration via the Internet that caused us to ask ourselves: “Why doesn’t this exist yet?” The project by Antonia Beck, Tobias Gruber, Clemens Makoschitz, Tobias Micko, and Sebastian Schreibmaier therefore perfectly embodies the essence of this special prize.

The Honorary Mentions given this year testify to the diversity of the themes addressed by the “Young Professionals.”

In the largely humorous copies of existing news formats—whether fake-news items or imitations of news programs—the critical examination of the content or of the media itself was often missing. But a praiseworthy reportage on the gender gap and the impressively touching and very professionally-made documentary **Kunst und Überleben** (“Art and Survival”) by a group of students from Graz’s Ortweinschule show that the up-and-coming generation is still able to derive something new from familiar formats.

A large number of animated films are submitted each year, utilizing techniques ranging from cutout animation and animated cartoons to 3D animation. Particularly popular are animated films with Lego figures. With **LEGO Feuer und Wasser** (“Lego Fire and Water”), Thomas Speckhofer not only succeeded in creating a perfectly staged, dramatically appealing Lego film; he also succeeded in filling the individual figures with life, in incorporating enticing special effects, and in making fire-breath-

ing dragons fly. The result is a very cool fantasy film. Just to provide an impression of the work involved in the project: for the scant seven-minute film, twenty-four individual images had to be produced per second, which means a total of more than 11,000 pictures.

An entirely different approach to the moving image was taken by students from BORG Bad Leonfelden with **Shape of you**. The world has seen innumerable music videos, which makes it that much more challenging to create a music video that truly captivates the viewer—and this one succeeds. The work’s treatment of the dance performance of **Shape of you** by the “1 Million Dance Studios” is professional, creative, and above all infused with a great deal of humor.

Films dealing with the near future are also among the Honorary Mentions. “Blue moon, you saw me standing alone / Without a dream in my heart / Without a love of my own,” wrote Lorenz Hart in his lyrics for **Blue Moon**, a song that in the mid-twentieth century became a worldwide hit through the interpretations of Billie Holiday, Frank Sinatra, and Elvis Presley. The congenial images to the song are now supplied posthumously, as it were, by the foursome from HTBLVA Spengergasse: their film, rich in special effects, garnered an Honorary Mention at the Prix Ars Electronica in the “Young Professionals” category. Through the “cold lens,” as the accompanying text aptly refers to it, the film focuses on loss, grief, and above all loneliness—and does this against the background of the extraordinarily beautiful and at the same time cruelly cold world of outer space.

Fremdkörper #3 (“Foreign Body #3”), a film based on the composition of the same name by Stefan Pris, is another winner of an Honorary Mention in the “Young Professionals” category. No less brittle and dissonant than the musical work—performed here by the ensemble Klangforum Wien—are the film’s images themselves. “A pixilation in an insane asylum that borders on everyday school life,” is how the young filmmakers of BORG Mistelbach describe their small work of art—the very border, of course, that they deliberately and consistently cross from the very first moment of the film.

It is gratifying when, in addition to the many new and exciting young participants, some “old acquaintances” appear among the entrants as well. It is lovely to see how many children, youths,

and young adults “stick with it,” expanding their knowledge and skills and submitting projects of an increasingly high quality. One of them is Simon Mück, whose **Surprise me** serves as a textbook example for the category “Young Professionals.” His exploration of the theme of a totally optimized society plays with dystopian concepts, and the work is extremely professional in every respect, from the plot, camera work, editing, music, and sound to the design of the film poster and the casting of the superb actor. One senses the great attention to detail in every shot.

Among the film entries, we would also like to single out the work **ERROR_351**, by the young filmmaker Katharina Maunz. This short film examines the subject of the pressure to conform and the experience of being different as seen from the viewpoint of the queer community. We explicitly and warmly invite a broad range of young people to submit works and look forward to seeing what perspectives are opened up through this.

An area characterized by a high level of competence and ingenuity is that of computer games. **Turenia** is a round-based area-control strategy game that makes it easy for beginners to get started. Not only is the analog-like design appealing; the game mechanics, the various strength levels of the troops, the special capabilities that can be activated, the sophisticated sound, and the many painstakingly animated details all make HTBLVA Spengergasse's **Turenia** an impressive work that fully deserves an Honorary Mention.

In terms of gamification, the project **JUSA – HTL. A 3D computergame** made a convincing impression in the “Young Professionals” category with its combination of stimulating gaming experience and practical application. The game's design is fully in line with the current trend toward “escape room” games and represents an interesting form for introducing HTL Braunau am Inn.

What would the u19 be without the sophisticated technical applications? The **Augmented Reality Welding Assistant** is a digital assistant displayed in the welder's field of vision with the aid of a VR headset. This makes it one of those projects that understands new technologies not merely as fun and games, but rather invests a great deal of cre-

ative groundwork in finding a meaningful area of application in which actual workplaces can be innovatively supported and work processes significantly simplified. The great relevance that Felix Nikolas Bauernfeind and Julian Josef Kienast's **Augmented Reality Welding Assistant** has for workers operating welding equipment is what makes the project so worthy of recognition. It is an application that we hope to see in use very soon!

That young people develop a fascination for drones is not a novelty. But building a drone from scratch themselves and making the construction plans and code available for free for everyone is a rare accomplishment! One can download all of the necessary information and code, construct the drone oneself, and then continue tinkering with it. Especially nowadays, when so many people are looking for new start-up ideas, this kind of courage to engage in digital openness and to share one's knowledge and code is greatly needed.

OpenDrone by Thomas Brych, Michael F. Hitzker, Tim-Matthias Klecka, and Markus Kurzmann represents an example par excellence for this kind of successful social engagement. The drone's area of application also offers the four designers an opportunity to throw their support behind an issue: their project is to be used in the future to identify trees infested by bark beetles and serve as an early-warning system. This concept rounds out the many environmental and climate-change-related projects of this year and reflects the great environmental consciousness of today's digital natives in all fields.

It was a great pleasure for us to examine the many diverse, nerdy, funny, serious, cheery, sad, strident, garish, subtle, charming, realistic, artistic, gripping—in short, colorful—entries; to discuss them and ultimately to select those that we felt were most convincing and present them with the 2019 prizes. We are certain that in the case of a number of these prize winners, we will see more of their work in the future. For the coming year we would like to especially invite all girls and young women, as well as LGBTQ youth, to share their perspectives on technology with us.



Young Professionals



DSCHUNGEL

Alex Lazarov

DSCHUNGEL ("JUNGLE") is a web series of five episodes (each about ten minutes long) that describes the last day of summer in the life of various teenagers in Vienna.

There are no boundaries between genres and stylistic influences. Sequences that look like rap music videos; surreal dream scenes underlaid with Orthodox choir music; elements of found-footage thrillers and coming-of-age films like those from the 1980s: all this and more is merged in the web series to create an overall work in which my team and I saw an opportunity to try out as many new things as possible without striving for perfection. The project is a portrait of the

Internet generation, a declaration of love to the youth of the twenty-first century and to all the opportunities open to them.

The basic idea behind *DSCHUNGEL* was to create something that would depict my inner way of thinking and the real world in which I live in a unique and honest way. A film can create a space in which these two aspects blend together, and where one can no longer precisely say what is autobiographical and what is invented.

The balance between various perspectives and the specificity of "unspecificity" that results from this were aspects that I very much wanted to incorporate into my film project. The major goal of the



undertaking was to try out as many new things as possible, to put together a large team of young people, and to combine different artistic and cultural influences.

I wanted to create a film project that only I could accomplish in order to capture a particular moment in my life—conscious of the fact that one will perhaps never again have the perspective of the world that one has at the very moment as a young person.

Screenwriter, director, editor, producer: Alex Lazarov

Camera: Stefan Krenn

Production design, costumes, and masks: Lucy Li, Catherine Hu

Casting and production manager, assistant director: Daniel Prem

Sound: Roman Lichtenegger

Music: Istvan J. Balazs, Jakob Lippert

Camera assistant: Simon Ulrich

Color editing and production assistant: Marin Lazarov

Cast: Alduin Gazquez, Paul Basonga, Gabriel Holzer, Patricia Avram, Emil De Cilia, Isabella Campestrini, Toni Steger, Elena Platon, Florian Mayer, David Dopeheide, Karoline Sachslehner, Lea Stern, Evelyn Preiss, Akeem Julien, Adrian Anton Kaminitshchek, Manfred Fuchs, Boris Lazarov



Alex Lazarov (b. 2000) is a young creative artist from Vienna who has been a film enthusiast since his childhood. While still in school, he began shooting his first short films and releasing them on the Internet. In recent years he has produced not only numerous film projects (short films as well as music and advertising videos) but also YouTube videos that describe his creative process and are available on his “Alex Lazarov” channel. He is currently active as a director, screenwriter, editor, producer, photographer, and graphic designer.

www.alexlazarov.at



Rake – Minimize your Information

Tessa Aichelburg, Luis Hofmeister, Lukas Kaufmann, Paul Schreiber

With our installation *Rake – Minimize your Information* we want to encourage people to reflect on their daily media consumption. We use our electronic devices every day to access media of every kind from social platforms and the web. In our society we have become accustomed to seizing the first information we can find and then passing it along without any additional investigation or research. The ability to access information faster and in greater amounts than ever before is slowly but surely leading to disaster. In our project, every piece of information released by a media agency monitored by us is analyzed by an algorithm and sorted according to its relevance for the average reader. The most superfluous messages are

weeded out, printed out, and then shredded. The pile of paper snippets grows ever larger, as do the savings in otherwise wasted reading time. This is why we chose the name *Rake*: our installation acts like a rake—sorting out needless information and collecting it in a pile.

We would like to thank our school for its financial support, without which this project would not have been possible. A huge thank you to our supervising teachers as well, who were a constant source of motivation and who invested a great deal of time and energy in our team. We also want to express our gratitude to the metal-shop technician at our school, who welded our frame together, and our porter, Margarete, who stored many of our building materials for us.

Tessa Aichelburg (2001), **Luis Hofmeister** (2001), **Lukas Kaufmann** (2000), and **Paul Schreiber** (2002) are a young, dynamic, and motivated team of four students in the Multimedia Department at Vienna Federal Training and Research Institute of Graphic Arts. Each one of us worked with great enthusiasm on this project, which is of particular interest to us. The allocation of responsibilities was clear from the outset: Paul Schreiber was our team leader, head of development, and software programmer; Tessa Aichelburg was responsible for the hardware, Lukas Kaufmann for management, and Luis Hofmeister for motion graphics. At the same time, we always supported each other in all of our work.



Gift of Nature

Students from HLW für Kommunikations- und Mediendesign der Kreuzschwestern Linz

Dishes, cutlery, hygiene products, toys, furniture: today, nearly everything is made of plastic—and the bulk of it is used for packaging. The goal of our project is to satirize the waste of plastic by using a label of our own design for organic products. Our product range consists of pasta, dried fruits, and snacks, all of which are touted for their sustainable and organic production in Austria. These products, however, are packaged in ridiculously small portions and packed in exorbitant amounts of plastic.

The first step in our project was to come up with a name, design, and logo for our fictitious company. The double meaning of the name *Gift of Nature*

(the German word *Gift* means poison) is intended to illustrate in a tongue-in-cheek manner how the true gifts of nature are adulterated and poisoned, and how they can ultimately even harm nature. In the physical realization of the project, we first reproduced product blanks out of polymer clay and produced from them the blister packaging for the individual products through deep-drawing. We decided to use blister packs to illustrate the massive use of plastic, as this kind of packaging is frequently encountered in our daily life. But blister packs have many negative qualities; sometimes people are even injured when attempting to open this type of packaging.



Franziska Atzlesberger (b. 2000), **Philip Bacher** (b. 2000), **Isabel Beckerle** (b. 2000), **Stella Egger** (b. 2000), **Eva Freudenthaler** (b. 2000), **Anna Freund** (b. 1999), **Lea Gangl** (b. 1999), **Hannah Grillnberger** (b. 2000), **Nadine Kaiser** (b. 2000), **Theresa Kneidinger** (b. 2000), **Simon Limberger** (b. 2000), **Sophia Pum** (b. 2000), **Katharina Raab** (b. 2000), **Simon Reif** (b. 2000), **Felix Ziegler** (b. 1999). The name of our project, *Gift of Nature*, says it all. Because we are very committed to our environment, we—the mixed group of the fifth grade students at HLW für Kommunikations- und Mediendesign der Kreuzschwestern in Linz—wanted to use this project to draw attention to the excessive use of plastic. Together, we developed a logo and a corresponding corporate design for the newly-created brand “Gift of Nature.” Each person in our group played an important role in the production process and was involved in the design decisions.

netidee

SPECIAL PRIZE 2019

A netidee SPECIAL PRIZE endowed with €1,000 is being awarded for the fourth time in 2019. It singles out for recognition a project dealing with the internet of the future and, above all, taking an innovative approach to this encounter. What problems can the internet of the future still “solve?” netidee is especially interested in projects that utilize the internet as a driving force for regional development. Special experts were called in to advise the jury in awarding this prize.

The focus of netidee is meant to be on the future of the internet as seen through the eyes of children and young people—those so-called digital natives who’ve grown up with it and for whom it’s something taken completely for granted. Thus, the internet is becoming not only a medium but also a format that’s replacing many familiar aspects of everyday life as well as preventing certain things from occurring. This critical confrontation is the aim of the 2019 netidee subcategory.

Tweakr.io

Drop your file, improve your work

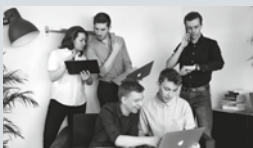
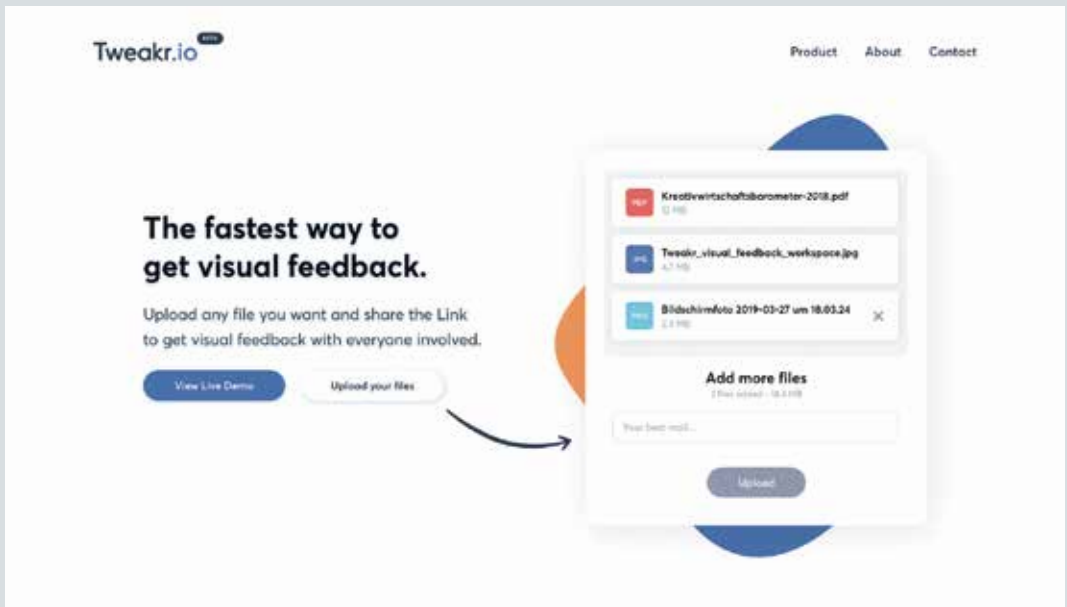
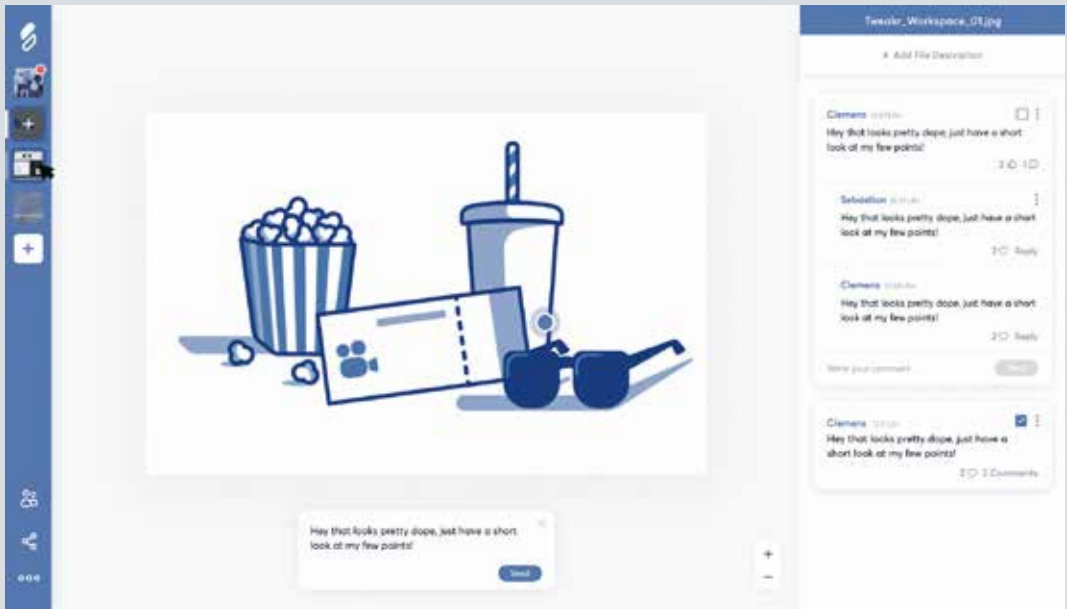
Antonia Beck, Tobias Gruber, Clemens Makoschitz, Tobias Micko, Sebastian Schreibmaier

The object of the *Identik* board game is to draw a picture according to the verbal instructions of another player. Player 1 has a picture in front of them and gives Player 2 verbal directions for drawing the picture without seeing that player’s output. This inevitably elicits a great deal of laughter, and just like the familiar “telephone game,” what emerges at the end is something completely different.

This is the very same problem that graphic artists and designers deal with every day in their work. Clients receive the initial drafts and react immediately, complaining about all the things that are missing, all the changes that still need to be made, and so on. This communication is carried out largely via email, meaning that visual subject matter is conveyed on a verbal level. It is not much different from speaking via telephone or Skype, or meeting personally with the client to discuss every change, which is often not an option—especially in a global context.

Last year, part of the team behind *Tweakr* worked on *Icarus_thegame* (Honorary Mention in the u19-CREATE YOUR WORLD category of Prix Ars Electronica 2018). Coordinating a team of six people—all of whom work visually—was not an easy undertaking for the seventeen-year-olds that we were at the time.

Last May, drawing on our own experience with the above-described problem, we created the idea for *Tweakr*. From that moment on we have been working on developing *Tweakr*, with which we have been in our private beta phase since mid-February. Some forty design agencies and freelancers use this tool and provide us with daily insights into their use cases and applications. On the basis of this beta phase, *Tweakr* went online on April 30, 2019, in a public beta test phase. The product is already being promoted at various design conferences and other events. Our goal is to have a thousand active users by September 2019. In September, the product *Tweakr* will be launched in conjunction with the formation of a company.



Antonia Beck, Tobias Gruber, Clemens Makoschitz, Tobias Micko and Sebastian Schreibermaier (all born in 1999 or 2000) have been working together for several years. They have received awards at a number of international competitions and support each other with their wide-ranging expertise. In the course of the project, various collaborations were launched with design agencies and companies and a valuable network was established. This knowledge and experience also flowed continuously into the development of *Tweakr*.

www.tweakr.io



Augmented Reality Welding Assistant

Felix Nikolas Bauernfeind, Julian Josef Kienast

This project is aimed at developing an augmented-reality welding assistant for the Palfinger company that makes use of Microsoft HoloLens. The worker sees the part to be secured next as a three-dimensional hologram placed in the precise position. In addition, all the required information, such as the settings for the welding device, is visible as hologram images. The HoloLens scans the basic model using a self-designed reference point. To control the application, the worker can use a hand gesture or merely verbal commands. In this way, the welding process is carried out step by step without the worker having to be familiar with plans or to read drawings. A total of five different pieces of software were used to create this project. We also had to teach ourselves the C# programming language.

This project should demonstrate how a workplace can look in the future. With the application that we programmed, a worker now only has to put on the glasses in order to receive all the necessary information in the form of a three-dimensional hologram in the exact position. The model is thus constructed step by step. This is not only extremely time-saving and cost-reducing; thanks to our application it also results in enormous savings in resources, as neither plans nor measuring devices are required. The Palfinger company would like to use Microsoft HoloLens in its operations in the future. With the help of our project, a first important step has been taken in this direction.

The project team consists of two students—**Felix Nikolas Bauernfeind** (b. 1999) and **Julian Josef Kienast** (b. 2000), who are in their final year in the Department of Engineering Management– Mechanical Engineering at HTL Vöcklabruck—as well as two contact persons at Palfinger AG. The rights to the diploma project also belong to the Palfinger company. It was their enthusiasm for computer science that motivated Felix and Julian to launch this project, although it does not actually correspond to their current field of study, and they picked up the necessary knowledge on their own.





Blue Moon

Jaqueline Eder, Selina Maurovich, Kilian Mayer, Stephanie Stigler

Blue Moon is a profoundly personal meditation on existence, loss, and love through the cold lens of the breathtakingly beautiful world of outer space. The *Equinox* carries a crew of four scientists to the edge of the solar system to begin terraforming for a future colony. Due to external circumstances, the geologist Aurora is separated from her husband, Quentin, and now must cope with her sudden loneliness.

In summer 2017, Kilian Mayer and Jaqueline Eder met at the Danube River to come up with a story for a film. One sunken cell phone later, the two had a rough outline. They envisioned a fearful astro-

naut floating through space. In the fall of that year they were joined first by Stephanie and then by Selina. Kilian wrote the script, while Stephanie began working on designs. Shooting started in the spring. After the laborious postproduction phase, the film went through the editing process and was given the final touches. At the end of June, the film was finished and picked up by several festivals, including DueMila, Kino im Vogelhaus, and YOUKI. The team has now split up, with the result that two new sci-fi films are currently in production: one an animated film and the other a live-action movie.



The project team attends HTBLVA Spengergasse technical school in Vienna. **Kilian Mayer** (b. 2001) is the crazy perfectionist of the team (direction, camera, music, sound, modeling, VFX, script, storyboard). **Jaqueline Eder** (b. 2000) is the down-to-earth anchor (production, animation, coordination, casting). **Stephanie Stigler** (b. 1999) is the fearless dreamer (concept art, design, storyboards, matte paintings). **Selina Maurovich** (b. 2000) combines a dose of madness with a fondness for birds (animation, matte paintings).

ERROR_351

Katharina Maunz

ERROR_351 is a metaphor for how hard it is to stand out, to look “different”. It shows the conflict between staying true to who you are, and the constant pressure of others, telling you to change and to fit in—trying to take away your color. This experimental short film shows four people facing that exact conflict, starting to fight back. But should you treat others like you want to be treated, or should you treat them like they treat you?

ERROR_351 is my second short film project. I wanted to come up with a concept that was close to my heart and in some way tells a personal story. I like working in metaphors, for me it is clear what I want to say, but there is enough room for everyone to interpret it in their own way. I have always been called crazy for being and looking different to others, so that was the theme I chose in the end. The people in the film are all crazy in their

own ways, which I love, so I asked them to be part of the project.

I wanted to portray being different, and how people sometimes tell you that that’s a bad thing. And I wanted to show young people who have decided to fight back.

But while working on the project I found myself thinking about another question—should you treat others like you want to be treated or should you treat them like they treat you? And that is what you see at the end of the film. Is it okay to bully someone just because they bullied you?

Concept, director, camera, sound design:

Katharina Maunz

Sound design: Martha Schnuderl

Actors: Tino Romana, Lena Hödl, Mareike Lerch, Paul Petritsch, Elai Menai, Isabella Maunz, Lunem Noc, Conner Adam, Paul Petritsch, Katharina Maunz



Katharina Maunz (b. 2000) attended school in Graz until 2016 and worked on several film productions and various projects in her free time, both in front of and behind the camera. She discovered the world of film making at a short film workshop with Jakob M. Erwa. With her first own project *sensations* she won the main prize in her age group at YOUKI International Youth Media Festival in Wels and it was also screened at the video&filmtagen in Vienna. *ERROR_351* is her second project. She is now studying Fashion Design in Berlin and continues to work on more film projects on the side.





Fremdkörper #3

Students of the visual arts program at BORG Mistelbach

As part of our visual arts class, our instructors invited the Kollektiv MuKaTo (Peter Muzak, Karoline Riha, and Thomas Renoldner) to lead a three-day animated film workshop with us. Benedikt Leitner, a member of the ensemble for contemporary music Klangforum Wien, began the workshop by presenting several pieces of contemporary music to which animated films were to be made. Three groups were formed to work on three different pieces of music.

At the beginning we could not really warm to Stefan Prins's piece *Fremdkörper#3*, because we couldn't identify with it right away—we even found it jarring. But with time we began to be able to work with the sounds, and the piece became the unifying element of our film. We listened to it several times and talked about the images and feelings it evoked in us. Our associations with the music began to concur with each other, with the many individual thoughts merging to make a unified whole, until finally the basic framework of the plot started to take shape. The staccato, the “weird tones,” disturbing noises, and disruptions led us

to the principal theme of “madness,” which in our minds the work described: The protagonist, a young woman, finds herself together with other “patients” in an “institution.” The film is about coercion, pressure, and violence for the purpose of enforced conformity through a system and about breaking out of it—a pixilation in an insane asylum that borders on everyday school life.

It was quickly clear who would play the main roles, and the distribution of jobs was an easy matter as well. Camera, make-up, direction, animation: each of us found his or her place in the project. Peter Muzak supported us tremendously, enabling each team member to give their best in the respective areas of responsibility. We learned an incredible amount in these three days. The project offered space for all of the diversity and idiosyncrasies within this truly colorful group.

Film for a composition by Stefan Prins

A “Musik Aktuell / MuKaTo” project in cooperation with Musikfabrik NÖ and Klangforum Wien at BORG Mistelbach supervised by G. Furlinger and K. Krall



Anastasia Drauschke (b. 2003), **Julia Frohner** (b. 2003), **Alina Koch** (b. 2003), **Moritz Köfler** (b. 2004), **Victoria Krätschmer** (b. 2004), **Julia Lanscha** (b. 2003), **Sophie Schneider** (b. 2003), and **Ash Schusko** (b. 2004). Our group of students from the visual arts program in BORG Mistelbach was divided into three small groups, each of which worked on one piece of music.



JUSA-HTL. A 3D Computer Game

Sarah Reischenböck, Julia Schober

We wanted to develop an exciting 3D computer game with the Unity video game engine. For this, we used Unity's ProBuilder to create a three-dimensional mockup of Braunau HTL (secondary technical school), which serves as the game environment. In the rooms of the school, innovative puzzles with a technical background must be solved in order to progress to the next room. The subject matter of the puzzles is linked to the various departments of the school and helps identify commonalities/differences between the individual areas. The target group is third and fourth grade students from the Neue Mittelschule (new secondary school) and the other secondary school who will be incoming students at the HTL. The 3D computer game *JUSA-HTL* aims to help them get started in their new school. The task of the player is to collect the signposts integrated in the game in the form of orange cubes, which guide them

through the HTL. This will make it easier for the new students to find their way around the school and give them an idea of the subjects taught there. We chose Unity for creating the game. Since we were not familiar with Unity nor with the C# programming language that is used, we had to get up to speed on them, which meant studying tutorials and books. For modeling the 3D objects, we used ProBuilder, while integrating the sometimes tricky puzzles was done with Visual Studio and C#. We chose Visual Studio because it works well with Unity and allowed us to insert the created scripts into Unity quickly and easily. The new code can be tested immediately. Errors are recognized and can be corrected right away. We chose C# because Unity offers and supports this script language.

HTBLA Braunau am Inn
Advisor: Kurt Kreilingner

The two aspiring computer scientists **Sarah Reischenböck** (b. 2000) and **Julia Schober** (b. 2000) learned a great deal through this project. We familiarized ourselves with Unity and taught ourselves the C# programming language. At the beginning we had to study up on the subject matter. Together we acquired a solid base of knowledge that we continued to build on throughout the entire project. Julia was responsible for the modeling of the 3D objects and the environment, while Sarah took care of the programming and the implementation of the puzzles.



Kunst und Überleben

Zoe Borzi, Johannes Fischer, Nicolas Glockner-Lösch, Nikolaus Heckel, Jonathan Steininger, Raphael Wohlgemuth

The documentary film *Kunst & Überleben* (“Art and Survival”) portrays four people who have made art the primary focus of their lives. Kat, Bexi, Lisa, and Franz talk about their lives as artists, their everyday life, their dreams, and about the discrepancy between an artist’s life and the day-to-day demands they face. Anyone who wants to be an artist needs courage, because the path to success is littered with challenges.

All of us—six young filmmakers—wanted to try our hand at making documentaries. So we decided to try this out with our annual project, which we worked on primarily in our spare time. We started looking for a topic in the fall of 2017 and completed the film in July 2018. This time period was filled with many hours of work and a huge learning curve. In the course of our work on this project, we discovered our love for documentaries, with the result that we are now working on our next one.

We see that we have learned a great deal but also recognize that the learning process is never over. In terms of subject matter, we explored art on two levels in our film—on the one hand because art was, after all, the subject of the film, but on the other because we ourselves were faced with the decision of whether we should choose a career as an artist instead of a financially secure job.

All in all, we want this film to highlight the situation of artists, so that they receive more appreciation and understanding in the future. We also hope to help young adults when choosing between a financially secure job and a career as an artist.

Director, assistant editor: Zoe Borzi
Producer, assistant director: Jonathan Steininger
Camera: Nikolaus Heckel
Sound, sound design: Raphael Wohlgemuth
Editor: Nicolas Glockner-Lösch
Animation: Johannes Fischer



Zoe Borzi (b. 2000), **Johannes Fischer** (b. 2000), **Nicolas Glockner-Lösch** (b. 1999), **Nikolaus Heckel** (b. 2000), **Jonathan Steininger** (b. 2000), and **Raphael Wohlgemuth** (b. 1999) are six young filmmakers who met during their filmmaking training at Ortweinschule in Graz. Their goal was to try their hand at the genre “documentary film.” *Kunst und Überleben* was awarded the Jury Prize at Vienna’s short film festival, video&filmtage. The film is also now being screened at various festivals throughout the world.



LEGO Feuer und Wasser

Thomas Speckhofer

After a dragon destroys their hometown, two siblings must make it on their own in the woods and overcome many dangers while their parents and other inhabitants of the town seek refuge in a nearby fortress ...

I made the film *LEGO Feuer und Wasser* ("LEGO Fire and Water") using the stop-motion technique. This means that for every second of film, I shot twenty-four individual photos, which were then

pieced together using a computer to create fluid sequences of movement. Then visual effects and the soundtrack were put in as well—I naturally added the music and every other sound that is heard in the film, since Lego figures are innately mute. I got the idea for making this film at the Lenzinale Film Workshops in Weyregg, Upper Austria, which I attended in the fall of 2016.

Thomas Speckhofer (b. 2000) is eighteen years old and graduated from BG Vöcklabruck in summer 2018. He now studies mathematics and physics at Johannes Kepler University Linz. He has been making LEGO films for the past six years using the stop-motion technique. In addition to filmmaking and mathematics, he also enjoys playing the piano.



OpenDrone

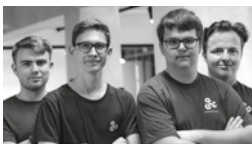
Thomas Brych, Michael Franz Hitzker, Tim-Matthias Klecka, Markus Kurzmann

The idea for *OpenDrone* came from Tim Klecka. Last summer he began searching for an open source drone but was unable to find anything—there simply were no satisfactory open source drones that were modular, easy to build, simple to expand, and had a functional app for flight control. So Tim decided to put together a competent team, which was an easy matter, as his idea was enthusiastically received by the fellow students he approached. Because Austria is currently suffering from a massive infestation of bark beetles, the project team wants to use the drone to contain this infestation. *OpenDrone* will therefore later be augmented to include a camera. The drone's brain will be given an attachment as well, which by means

of an artificial intelligence will recognize whether a tree is infested or not.

OpenDrone is open source, meaning that anyone can download the 3D printing data and software for free from GitHub and then assemble the device. The total cost of the drone is about 200 euros, making it significantly less expensive than various other overpriced drones. The drone will also have the capability of flying on autopilot.

Johannes Oppitz supported us in our participation in the Maker Faire Vienna and advised us every Wednesday, when we worked on the project as part of our elective class. Christian Reisinger is our project development teacher and helped with organization. Ralph Jank and Michael Stumpf assisted us with programming questions, and Markus Klecka helped us with the PCB.



The project team consists of **Tim-Matthias Klecka** (b. 2000), **Thomas Brych** (b. 2000), **Michael Franz Hitzker** (b. 2000), and **Markus Kurzmann** (b. 2001). Tim Klecka is the project leader and works alongside Thomas Brych on the flight controller and on the drone in general. Michael Hitzker and Markus Kurzmann work on the app. Markus is also responsible for communication from the flight controller to the app. All four are in the same class at HTL Perg and share a great interest in emerging technologies.

<https://www.opendrone.at>



Shape of you

Students from BORG Bad Leonfelden

More than forty students from BORG Bad Leonfelden worked the entire year on this approximately ninety-second rotoscope animation, a dance performance to the song *Shape of You*. To make this film, over 1,300 individual frames were drawn in OpenToonz, an open source animation program. Each student drew thirty-six pictures, which at a frame rate of twelve fps means three seconds. The constant change in the visual impression in contrast to the continuously fluid movement of the dancers results in a remarkable visual work.

Animation is an integral part of the syllabus in media design. For this project we wanted to try out the relatively new open source program OpenToonz. As our basic technique, we chose rotoscope animation, which we augmented with various other program-specific animation techniques. Work begun by students who then switched schools or couldn't finish it due to illness was completed by other classes in their conventional art class, where they drew the individual pictures in an analog manner using fineliner pens or colored pencils.

The students from **BORG Bad Leonfelden** came from five different classes from all four grades at our school. Four classes were from our media/art section and one class came by way of an elective subject from the science section. The project was supervised by Wolfgang Hoffelner. Several groups of students worked under the direction of Notburga Freudenthaler and Thomas Achitz.



Surprise Me

Simon Mück

What if our entire life were being directed? What would happen after 4040 weeks? Would we still have our own thoughts, our own will? The goal of “The Company” is to perfect the life of every individual. It is the seventy-eighth year in the life of Member 0815. His day begins with the daily routine, as always. But it is a special day—namely his last ... *Surprise Me* is a short film I made as a diploma project. The film explores in a somewhat subtle manner the subject of loneliness in a fictitious future. I don't think that every futuristic theme has to be related to technology. At a time when automation and efficiency are becoming an increasingly important element of society, one often forgets to ask where all of this is leading. My

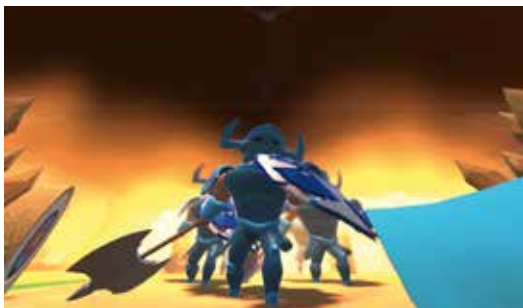
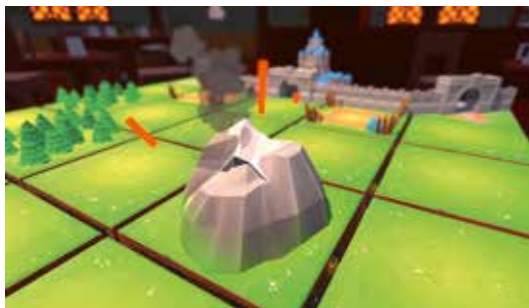
film plays with the idea of the absolute efficiency of a society, extending all the way to the precise planning and time management of all activities of every single person. Does efficiency ultimately lead to social isolation or to an ordered coexistence? During my final school year, I noticed more and more how much one writes in the calendar as a “to-do.” I then asked myself what would happen if one took this organization to extreme lengths. It was from this basic idea that the concept for my film evolved.

Music: Tade Theuretzbacher
Screenwriter, director, camera, editor: Simon Mück
Starring: Klaus Uhlich



Simon Mück (b. 1999) attended HIB Boerhaavegasse from 2011 to 2014 and the AudioVision program at H12 Hegelgasse from 2014 to 2018. Since October 2018 he has been doing the obligatory civic service as an alternative to military service. He has been a passionate filmmaker since primary school. Over the years he has created numerous short films on various topics, and what began as a hobby has become increasingly professionalized. Simon archives his films and other projects in his portfolio: <https://mueck.myportfolio.com/projekte>

<https://www.youtube.com/watch?v=SmtPdPPGnqk>



Turenia

Fabian Farkas, Jan Hofbauer, Hannah Koch, Tristan Nitzsche, Florian Weihs

Turenia is a round-based strategy game that can be played by individual players or as a local co-op game. Players collect resources in order to put troops into place and interact with a long, narrow, chessboard-like playing field to gain tactical advantages. The object is to capture the opponent's castle and seize his land!

Many games try to produce depth and in the process forget to keep the complexity of the game to a minimum. Newcomers are so inundated with the mechanics of the game that they become confused. These types of games are rewarding only for those players who have thoroughly familiarized

themselves with the rules and the mechanics of the game; they do not offer a good playing experience for the casual player. Our objective is to provide an easily understandable yet challenging playing experience through simple designs in the various areas.

The game was developed in Unity 3D. Certain elements, such as the audio, models, and graphics, were produced in part using Autodesk Maya and Adobe Photoshop. This game was created as part of a diploma project at Vienna's HTBLVA Spengergasse.



The team behind *Turenia* consists of **Fabian Farkas** (b. 1999), **Jan Hofbauer** (b. 1999), **Hannah Koch** (b. 1999), **Tristan Nitzsche** (b. 2000), and **Florian Weihs** (b. 2000). Fabian Farkas was responsible for the programming and for the particle effects in the game. Jan Hofbauer devised all the characters and their animation in the game, while Hannah Koch designed the UI. Tristan Nitzsche saw to the audio and the accessibility in the game. Florian Weihs developed the game design and created the 3D assets. Regular team meetings helped us to monitor progress and discuss suggestions for improvements.



Young Creatives

Digitaler Mordversuch

Students from NMS Hittisau's CyberWerkstatt

Digital corporations are exerting more and more influence over our lives, and they could actually even make an attempt on our lives. Our intensive involvement with digital media and the technical possibilities of our time gave us the idea of playing through just such a case and capturing it on video. We included self-driving cars, the "helpers" of everyday life such as Siri, Alexa, and Google, the cross-linkage of things and people, and the globalization of data through corporations. That is how our film project about life in the digital age came about.

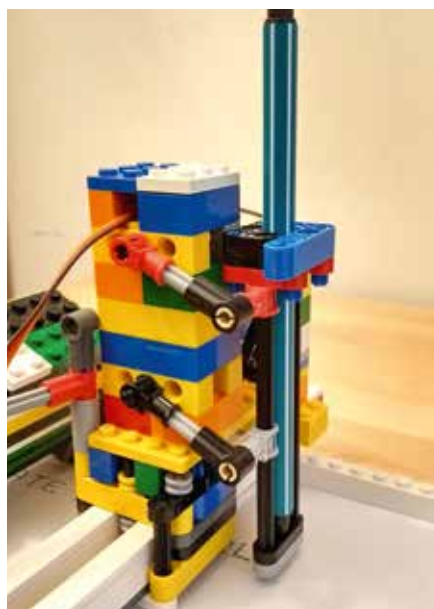
We students discussed the topic, developed the idea, wrote the script, collected and created the required costumes and stage sets, acted, managed the lighting, found locations, filmed, and edited the scenes. We were advised and supported by two teachers. The film locations were NMS Hittisau (physics hall, auditorium, music room, computer room), Helmut Schwärzler's repair shop, and the underground parking garage at Sozialzentrum Hittisau.

Mittelschule Hittisau, CyberWerkstatt
Teachers: Melchior Schwärzler, Hanno Metzler



We, **Matteo Gärtner** (b. 2005), **Philipp Giselsbrecht** (b. 2005), **Rafael Gmeiner** (b. 2005), **Johanna Hofer** (b. 2005), **Iannis Kadgien** (b. 2005), **Martin Kohler** (b. 2005), **Daria Madlener** (b. 2005), **Stella Reinecke** (b. 2006), **Yannic Schwärzler** (b. 2006), and **Peter Stumvoll** (b. 2006) worked together to make the film *Digitaler Mordversuch* (Digital Attempted Murder). This school year, NMS Hittisau started offering CyberWerkstatt as an elective course, which we all chose because we are very interested in computers and digital media.

<https://www.nms-hittisau.at/projekte-2018-19/digitaler-mordversuch>



Plottegoino

Benjamin Aster

Plottegoino is an Arduino-controlled Lego plotter that can print any desired letters. A servomotor operates a switch for a Lego motor. By means of a gear wheel, two rubber wheels are turned that advance the paper line by line. Another servomotor moves a carriage with a pen back and forth. A third motor is mounted on this carriage. Two Lego arms convert its rotary movement into an up/down movement. A holder contains a felt-tip pen that makes dots on the paper through this up/down movement. The Arduino controls the three servomotors in such a way that the lettering that has been entered is plotted. With the exception of the Arduino parts, the plotter consists almost

entirely of Lego blocks, and servomotors are also mounted by means of a Lego construction.

In the fall of 2018 I had begun making several smaller projects with my Arduino UNO. Shortly before the Christmas break I received several servomotors. Over Christmas I then finally had time to try them out. I wanted to use them to create a more ambitious project, which led me to the idea of making a plotter out of Lego blocks. In this project I learned and improved several programming techniques. For the submission of the project, I spent a great deal of time working on video editing and learned a great deal about this as well.



Benjamin Aster (b. 2005) attends the Akademisches Gymnasium Salzburg. In his spare time, he enjoys programming, especially with Arduino, and creates mechatronic projects. He also works with robotics and designs models for 3D printing. Benjamin is very interested in mathematics: in 2017 he was the Austrian national champion in his age group in the Känguru Mathematics Competition. Another of his hobbies is singing: as a member of a children's choir, he has sung in China and at such notable events as the Salzburg Easter Festival.

Why war Rap

3a class from NMS Liefering

In several workshops organized by the Friedensbüro Salzburg in the winter semester of 2018/19, the 3a class from NMS Liefering explored the topic “War in Syria” in terms of its subject matter as well as from the perspective of literature (in a writing workshop with the Syrian-Austrian writer Luna Al Mousli) and music. The focus was on the question “What does war have to do with me?” Especially motivating for the students was the rap workshop, held as part of a music class and conducted by the rapper Yasin Ulu (Nasihat), in which they wrote their own rap lyrics. The students could so clearly relate to the question “What does war have to do with me?”, it was not difficult for them to spontaneously create their own lyrics to the prerecorded beats in loosely organized groups and

to put them to a rhythm. In a follow-up workshop held by the public access television station FS1 Salzburg, the lyrics were filmed as video clips, allowing the students to learn about and experiment with the technical equipment (camera work, sound engineering, lighting, etc.) under professional guidance, which was a great deal of fun for many of the students.

Text: Anneliese Graß

Workshop director: Desirée Summerer, Friedensbüro Salzburg

Writing workshop: Luna Al Mousli

Rapper: Yasin Ulu (Nasihat)

FS1: Markus Weisheitinger-Hermann

Teachers: Anneliese Graß, Chris Pucher



Rabela Abdul (b. 2004), Ivan Abdulaziz (b. 2005), Leonita Ahmeti (b. 2005), Juana Bermudez (b. 2005), Uygar Eroglu (b. 2005), Stephanie Gomez (b. 2005), Redon Hashani (b. 2004), Linett Haszonics (b. 2006), Marcel Joham (b. 2005), Darko Jovanovic (b. 2005), Tamas Kincse (b. 2004), Nemanja Mihajlovic (b. 2004), Benjamin Naere Srest (b. 2005), Yusof Nazari (b. 2005), Rebecca Novac (b. 2005), Andjelina Rikanovic (b. 2004), Gülseren Sivari (b. 2005), Michael Trinh (b. 2003), Renato Vrdoljak (b. 2005): Our group is made up of students whose parents or who themselves come from fourteen different countries. In our daily school life together, we learn to understand various cultures and to respect each other.

Über Nacht – Eine neue Macht

Film class of the SchülerInnenschule im WUK



Feature film. Fiction.

Lilo and her friends like their school. But overnight, the Neue Leistungspartei (NLP – “New Achievement Party”) comes into power, with the new school principal, Engelbert, and his sidekick heading up a violent regime. From now on, only discipline, performance, and progress count. For the students at the school, a seemingly hopeless struggle begins. The film class at the SchülerInnenschule im WUK grapples with socio-political themes. The students collaborate in developing a film idea in which current issues and socio-political topics are explored. The film *Über Nacht – Eine neue Macht* (“A New Power Overnight”) emerged from the students’ engagement with elections and political power and powerlessness in a democratic state and the resulting visions of the future from the students’ perspective.

Film class of the SchülerInnenschule im WUK
Teacher: Simon Hirt
SchuelerInnenschule.at



Adjoa Ackwonu (b. 2006), Dario Kragler (b. 2004), Darius Schinner (b. 2003), Felix Germ (b. 2005), Immanuel Stürzebecher (b. 2004), Jonas Urbanek (b. 2007), Julie Langer (b. 2004), Konstantin Heigerth (b. 2004), Laurin Schieder (b. 2007), Levin Theuer (b. 2004), Luis Huber (b. 2007), Magdalena Schmied (b. 2006), Maia Sagmeister (b. 2005), Malies Obermair (b. 2006), Niklas Obermair (b. 2004), Paula Zyma (b. 2004), Tobias Schön (b. 2002). These seventeen students, ranging in age from ten to fifteen, and a teacher who supported and mentored the film class were involved in the project. All of the tasks that needed to be done to complete the project were divided up among all of the team members. The development and realization of the film was carried out in a democratic process in which there was room for all opinions and ideas.

<https://www.facebook.com/Filmklasse-WUK-305092737058900>



Dungeon of Math

Simon Heppner

Dungeon of Math is a rogue-like game that I programmed using the Python3 programming language and the corresponding Pygame module. In this game the player themselves is a figure who runs around in a labyrinth battling monsters, discovering treasure, solving math problems, and, at the end, finding the exit. There are various opponents in this game, from level one to four (one being the weakest and four the strongest), that you can combat with a specific system requiring you to solve mathematical puzzles. In addition, one can dig through the walls of the labyrinths and discover rooms such as “treasure halls.” All levels are generated randomly. At the tenth level one reaches the exit and the game ends.

One day I had the idea of programming a game in which you run around in a labyrinth, and which combines math and gaming fun. I started off slowly with text labyrinths, until one day I added a dedicated generator for the labyrinths and incorporated graphics. At the beginning, the game was actually called “dungeonRunner,” but because one needs math to battle the monsters (I’m a math fan), I renamed the game for Ars Electronica. For the past two years I have attended a programming class (<http://spielend-programmieren.at>) where I have learned a great deal, much of which I was also able to apply to this game. So I would like to give a big thanks to my programming teacher, without whom I would not have even known about this competition.



Simon Heppner (b. 2006) attended Vienna’s Burgenland-Croatian kindergarten “Viverica.” He is currently a third grade student in the Europaklasse at the private Sacré Cœur secondary school of the Archdiocese of Vienna, where his mother teaches in primary school. His hobbies are programming Python, tennis, playing Fortnite, and hiking.

<https://github.com/spheppner/dungeonRunner>



Nachhaltigkeit

Tagesablauf eines tierischen Vorbildes

Katharina Landl, Mona Rathenböck

A day in the life of Bobby the cat, in which he demonstrates how simple it can be to improve the world: He uses glass bottles instead of plastic bottles, takes public transportation, and finds it important to be involved in politics as well. Bobby also shows that it takes only small amounts of money to help people—in this case animals. The

film *Nachhaltigkeit – Tagesablauf eines tierischen Vorbildes* (Sustainability: A Day in the Life of a Beastly Role Model) is easily understandable for children too, and is intended to show that we can improve our environment in simple ways. We selected this project because we want to present our work as well.



Katharina Landl (b. 2006), from Linz, attended Pöstlingberg elementary school and is now a student at Petrinum Gymnasium (High School). She takes theater classes, plays the piano, and is a filmmaker. **Mona Rathenböck** (b. 2005), from Linz, attended Karthof elementary school and is now a student at Kreuzschwestern Gymnasium (High School). Her hobbies are painting and drawing, filmmaking, and playing the violin.

Der Gobi kommt

Laurin Steinhuber, Amelie Steinhuber, Niklas Steinhuber

An extraterrestrial creature lands on Earth. Here it finds food, a place to sleep, and is welcomed with open arms. What it does not know, however, is that there is an armed man lying in wait, with horrible plans for the extraterrestrial.

Laurin has made many animated Lego films together with his elder brother Niklas, and has also acted in some of his sister's short films. Laurin and Amelie wanted to make a special animated film for YOUKI 2018 and decided to build their own sets using whatever they could find at home. This took the most time, but after two weeks of intensive work building models, they were able to begin with the photography for *Der Gobi kommt* (Gobi comes). Within two days their

carport was turned into a photo studio and over 2000 photos were shot. Then the editing of the film began, using an old version of Pinnacle. Subsequent photography was then no longer possible, however, as the stage sets had already been dismantled. Because the synchronization proved to be very difficult, Laurin decided to switch to a "foreign language," and to make the entire film with subtitles.

Idea and script, stage sets, photos, editing, sound, voice-over: Laurin Steinhuber
Idea and script, stage sets, photos: Amelie Steinhuber
Stage sets: Niklas Steinhuber
Support with editing, subtitles, and sound; voice-over: Michael Grassberger
The film was a prizewinner at the YOUKI 2018 in Wels.



Laurin and Amelie Steinhuber (b. 2008) live in Taiskirchen and attend the fifth grade at Bildungswerkstatt Knittlingerhof in Hohenzell. Laurin likes playing chess, soccer, and table tennis and is currently learning the cello. Amelie enjoys karate class and is also learning the cello. **Niklas Steinhuber** (b. 2003) is in the ninth grade at Bildungswerkstatt Knittlingerhof in Hohenzell. He likes playing chess and soccer and enjoys attending karate class.



get_bullied!

Mina Sophie Hackl

In this film I show how a girlfriend is bullied by another girl and how the girlfriend is helped. I told this story because I was bullied myself in school and know how it makes one feel. I also want other kids to help classmates who are being bullied, and for everyone to have the courage to speak up. For my film I made screenshots with my smartphone

using Gacha Life, an app with which one can create individual figures and backgrounds. I saved the screenshots as photos and then assembled them with iMovie to make an animation (a tip from Mama). This animated film is the first of many on various topics.

Mina Sophie Hackl (b. 2009) is in the fourth grade at VS Altenberg (primary school). She greatly enjoys drawing, painting, dancing, singing, reading, and playing the guitar. She is particularly fascinated by digital design techniques and smartphone apps with which she can work in artistic and creative ways. She has now completed seven films on a variety of topics. She loves creating new worlds and drawing characters, which she does with various materials that she searches for and finds everywhere. To enable her to combine analog drawing and design with digital processing, she has now been given an iPad and an Apple Pencil, as her goal is to create an animation with pictures she has drawn herself.





ABC-Coding (Activity Based Coding)

Students of the “Grüne Familie” elementary school class, Europaschule Linz

We, the children of Europaschule Linz, begin working with various robots in our lessons and gaining our first insights into coding as early as preschool. Through this, we expand our knowledge base and learn about how these devices are operated. We transition from the terminology of conversational language to the commands of programming language.

How did this come about?

Our teachers gave us the assignment of fundamentally rethinking learning opportunities in school. After an animated discussion process, we quickly decided on the topic of “digitization” as the focal point. Although we are still quite young (the youngest pupils are only six years old), it was

important to us to be introduced to digital learning opportunities, to understand them, and to learn ourselves how to program.

Based on our input, the school endeavored to develop a new concept: right from the beginning, school children should become familiar with digital media and learn the basics of programming and the programming languages. We wanted not just to work with robots but also to later allow other schools to benefit from our experiences. For this reason, we also produced brief learning tutorials that were posted online.

Europaschule Linz – Praxisvolksschule der
Europaschule Linz
Teachers: Ulrike Danninger, Wolfgang Wagner,
Dominik Hagmüller



Our group is the “Family Class” in Europaschule Linz. Our “Green Family Class” has forty-eight kids, from preschool to fourth grade, who come from many different countries. The youngest kids in our group are six years old and the oldest twelve. It was our task to test “robots” for the school and then to produce a tutorial. In addition, the older kids helped the younger ones with programming.

 **PRIX
ARS ELECTRONICA**

Jury

Prix Ars Electronica 2019—Jury



Computer Animation

Ferdi Alici, Ina Conradi, Nobuaki Doi, Birgitta Hosea, Alex Verhaest

Artificial Intelligence & Life Art

Memo Akten, Jens Hauser, Vladan Joler, Irini Papadimitriou,
Moon Ribas



Digital Musics & Sound Art

Rikke Frisk, Christina Kubisch, Soichiro Mihara,
François Pachet, Shilla Strelka

u19—create your world

Sirikit Amann, Nikolaus (Niki) Glattauer, Anita Landgraf,
Conny Lee, Magdalena Reiter

Computer Animation



Ferdi Alici (TR) is the founder and director of Ouchhhh, a talented new media and motion design agency. Ferdi strives to find balance between art, science, and technology in every work he creates. As a new media artist and designer, he believes that science inspires great art, thus their integration is vital to Ferdi's approach. He creates award-winning outdoor A/V performances, video mapping projections, kinetic sculptures, and immersive experiences that touch upon the belief in employing design principles based on nature and applying these to computational design. Ferdi's work has been featured in world-renowned museums, organizations, and publications and he has worked with numerous international brands and recently for Netflix USA and Sony USA.

Ina Conradi (US/SG) is Associate Professor at Nanyang Technological University Singapore, School of Art, Design and Media, an award-winning new media artist living and working in Singapore, and has a studio base in Los Angeles. Her digital paintings are animated and fit variable media spaces, creatively employing digital painting, 3D animation, and since 2016 digital placemaking. Her film *Chrysalis* was bestowed prestigious 2018 Lumiere Award by Advanced Imaging Society Hollywood and 2017 Lumiere Award EMEA chapter (Europe, Middle East, and Africa). The latest collaborative project connecting digital medicine, arts, and STEAM in collaboration with Fraunhofer MEVIS: Institute for Digital Medicine received the 2019 Raw Science Film Festival Award.



Nobuaki Doi (JP) has worked in various fields of animation. Since 2015, he has been working as Festival Director for New Chitose Airport International Animation Festival. In the same year, Doi founded a company called New Deer. It distributes internationally renowned independent animation films in Japan and produces short and feature films and

indie games by Japanese independent animators. As a critic, Doi has published two books on animation: *Personal Harmony: Yuri Norstein and the Aesthetics of Contemporary Animation* (2016) and *An Introduction to Animation in the 21st Century* (2017).



Birgitta Hosea (SW/UK) is a London-based artist, who works in expanded animation creating artworks through installation, animated performance art, and experimental drawing on paper. She did a PhD in animation as a form of performance at Central Saint Martins. Her work is exhibited in galleries internationally and she has written a number of publications on experimental animation, digital art, and animated installation. She is currently Reader in Moving Image at the University for the Creative Arts where she is engaged on StoryFutures, an AHRC Creative Clusters research project into immersive technologies

Alex Verhaest (BE) is a filmmaker investigating the possibilities of interactivity and responsivity within cinematic arts. The basis of each film is a highly narrative script, existing or newly written, around which she creates a cinematic installation consisting of objects, videos, and interactive videos. In September of 2013, her debut solo *Temps Mort/Idle Times* opened at Grimm Gallery, Amsterdam. Her work has been selected by several arts and new media festivals and competitions: the FILE electronic language festival in Sao Paulo, the New Technology Art Award in Gent, TAZ Oostende, and Arts Festival Watou, and her work is featured in the Akzo Nobel Collection. She won the New Face Award at the Japan Media Arts Festival and the Golden Nica at the Prix Ars Electronica 2015.



Artificial Intelligence & Life Art



Memo Akten (TR) is an artist, researcher and philomath from Istanbul, working with computation as a medium, inspired by the intersections of science and spirituality and the collisions between nature, science, technology, ethics, ritual, tradition, and religion. Combining critical and conceptual approaches with investigations into form, movement, and sound, he works with computational systems and algorithms, designing behavioral abstractions and data dramatizations of natural and anthropogenic processes, to create interactive, non-interactive, or responsive moving images as well as video, sound and light installations and performances. Alongside his practice, he is currently working on a PhD in artificial intelligence and expressive human-machine interaction, to enable collaborative creativity between humans and machines at Goldsmiths, University of London. His work has been shown and performed internationally, featured in books and academic papers, and he received the Prix Ars Electronica Golden Nica for his collaboration with Quayola, *Forms*, in 2013.

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 the University of Copenhagen's Medical Museion and the Art/Science Chair at the École Polytechnique Paris-Saclay, a distinguished affiliated faculty member at Michigan State University, where he co-directs the BRIDGE Art program, as well as faculty member at the Department for Image Science at Danube University Krems, Austria, and guest professor at the University of Applied Arts in Vienna.



Vladan Joler (RS) is SHARE Foundation director and professor at the New Media department of the University of Novi Sad. He leads SHARE Lab, a research and data investigation lab for exploring different technical and social aspects of algorithmic transparency, digital labor exploitation, invisible infrastructures, black boxes, and many other contemporary phenomena at the intersection between technology and society.



Irini Papadimitriou (GR/UK) is a curator, producer, and cultural manager, working at the forefront of digital culture in the UK and internationally. Currently Creative Director at FutureEverything, she was previously Digital Programmes Manager at the V&A and Head of New Media Arts Development at Watermans. Her more recent exhibition, *Artificially Intelligent*, was on display at the V&A in 2018. She is a co-curator for the Art + Data experience at Mozilla Festival and a co-founder of Maker Assembly.

Moon Ribas (ES) is a Catalan avant-garde artist and cyborg activist best known for developing *Seismic Sense*, an online seismic sensor implanted in her feet that allows her to perceive earthquakes taking place anywhere on the planet through vibrations in real time. Ribas transposes the earthquakes into sound, as in her piece *Seismic Percussion*; or into dance, as in *Waiting For Earthquakes*. In 2010 she co-founded the Cyborg Foundation, an international organization that aims to help people become cyborgs, defend cyborg rights, and promote cyborg art. Ribas also co-founded the Transpecies Society in 2017, an association that gives a voice to non-human identities, defends the freedom of self-design, and offers the creation of new senses and new organs in community.



Digital Musics & Sound Art



Rikke Frisk (DK) is the founder and co-director of the community-focused culture production company Indgreb (www.indgreb.dk) specialized 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. Rikke's latest initiative is Talk Town—a debate festival on gender, equality, and feminism of which she is co-initiator and festival director, 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. She is a member of the board of Denmark's leading venues for contemporary, experimental Jazz and world music: Copenhagen Jazzhouse and Global. Rikke has a background in architecture and communication.

Christina Kubisch (DE) belongs to the first generation of sound artists. Trained as a composer, she has artistically developed such techniques as magnetic induction to realize her sound installations and compositions.

She has been teaching as a professor for audio-visual arts and in recent years has restarted live performance. Christina Kubisch's work displays an artistic development which is often described as "synthesis of arts"—the discovery of acoustic space and the dimension of time in the visual arts on one hand, and a redefinition of relationships between material and form in music on the other.



Soichiro Mihara (JP) aims to make art that openly engages with the world and creates systems that employ a wide range of materials, media, and technologies, such as acoustics, bubbles, radiation, rain-

bow, microbes, moss, air stream, soil, and electrons in order to continually question the here and now. Since the 2011 earthquake and tsunami struck the East coast of Japan, he has been working on a series *blanks project*, which explores the boundaries of the systems that drive modern society. Since 2013, he has participated in artist in

residency programs in many fields: from a center of contemporary art to an extreme environment such as an arctic region (Ars Bioarctica), the Amazon rainforest (LABVERDE), and the South Korean demilitarized zone DMZ (The Real DMZ Project).



François Pachet (FR) received his Ph.D. and Habilitation from University Pierre and Marie Curie (UPMC), after an engineer's degree from Ecole des Ponts ParisTech. He joined SONY Computer Science

Laboratory Paris, where he developed several award-winning technologies such as MusicSpace, Continuator for interactive music improvisation, and Flow Composer, which paved the way for AI-based score composition. François Pachet was elected EurAI Fellow in 2014 and doctor honoris causa of the University of Pernambuco (Brazil) in 2017. He was Principal Investigator of the *Flow Machines* ERC-funded project, which produced (with the musician SKYGGE) "Daddy's Car," a song in the style of the Beatles, and *Hello World*, the first mainstream music album composed with AI. He is also a musician and has published two music albums (jazz and pop) as composer and performer. His current goal is to build a new generation of tools to assist music creation.

Shilla Strelka (AT) is a cultural journalist, music curator, concert organizer, and DJ based in Vienna.

The main focus of her journalistic and curatorial practice is electronic music and the communal rhythms of high and counter culture. In 2012 she initiated the concert series Struma+Iodine. Since 2015 she is the artistic director of Unsafe+Sounds Festival and works as co-curator for Elevate Festival Graz (since 2017), Stromschiene at Alte Schmiede Kunstverein, and the open-air concert series Parken (since 2016). Strelka studied Digital Media at the Academy of Fine Arts, Vienna and finished her studies in film and media, philosophy, German literature, and art history. Strelka has written texts on music, film, and popular culture for mica – music austria (chief editor), and many other magazines.



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 is currently director of cultural education at KulturKontakt

Austria, a non-profit organization that promotes education and culture in Austria as well as Eastern & Southeastern Europe. She has 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 Federal Chancellery Minister.

Nikolaus (Niki) Glattauer (AT) is school principal, columnist, and author in Vienna. After a successful career as a journalist, which he finished as deputy editor-in-chief of the Austrian magazine *NEWS*, he held several teaching positions at secondary school. He writes a weekly column for the daily Austrian newspaper *Heute* and is a member of the educational advisory board of the daily Austrian newspaper *Kurier*. Glattauer is also a member of the board of the Institute for Children's and Youth Literature. Glattauer's narrative non-fiction books *Der engagierte Lehrer und seine Feinde* (The Dedicated Teacher and His Enemies) and *Die PISA-Lüge* (The PISA Lie) became bestsellers in Austria, as did his fictional satires on everyday school life from the point of view of suffering parents under the title *Leider hat Lukas* (Unfortunately, Lukas has...).



Anita Landgraf (AT) is a game agent and owner of the White Castle Games agency. Her love for the game was instilled in her by grandma and dad (card games), as well as by her brother (Star Quest).

While studying political science she worked at the “Brot & Spiele” board game pub, where she was “discovered” by agency founder Ronald Hofstätter as a reinforcement for White Castle Games. After two years of learning by doing, she took over the agency herself and has now been running it for eight years.

Conny Lee (AT) is long-standing u19—create your world juror. She's gained fame on the ORF–Austria Broadcasting Company's radio station FM4, producing and co-hosting the bilingual FM4 morning show and contributing content that deals with her favorite topics: games, literature, and comics. She also moderates events and panel discussions.



Magdalena Reiter (AT) leads the urban initiative OPEN COMMONS LINZ, which promotes digital public goods and transparent structures in an open, digital society. Among other things, she brought the non-

profit program “Jugend hackt” to Austria in 2016. Since the beginning of 2018, she has also organized the technology event “Hello World” for children aged 8 to 12. Before that, Reiter worked for many years as a freelance designer with a focus on design theory and network policy. In doing so, she investigated which conditions are fruitful for collaborative work and creative collaboration in digital everyday life. Since 2015 Reiter has co-organized the “Netzpoltische Abend” at Metalab Vienna as a founding member and is active in Wikimedia Austria.



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.

TAWSTAR, 2016 Photo: Peter Verplancke

S+T+ARTS

PRIZE'19



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

“Can the Arts inspire Artificial Intelligence? Can Artificial Intelligence inspire the Arts? The first ever ‘AI meets Music’ Festival in Linz will address these questions by exploring how musicians interact with AI. The specific context of music and AI will nurture wider reflections on the future role of the digital for our society and will help shape tomorrow’s technologies with a distinctive European art-inspired human touch.”

Roberto Viola, Director General of Communications Networks, Content and Technology, European Commission



European
Commission

Horizon 2020
European Union funding
for Research & Innovation



S+T+ARTS



waag
technology & society

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This project has received funding from the European Union’s Horizon 2020 research and innovation program under grant agreement No 732019.

STARTS – Science, Technology, and the ARTS

The S+T+ARTS = STARTS program is a program of the European Commission 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 of engineers, scientists and artists, STARTS is currently funding four different pillars: STARTS Residencies of artists in technology institutions, STARTS Lighthouse pilots to finance research with artists as active parts of projects that work on concrete challenges for industry and society, STARTS Academy uniting engineers and artists to teach digital skills to citizens and young adults in a playful way, and the annual STARTS Prize to give visibility to outstanding examples of collaboration between art and technology.

Innovation in and for Europe

It has long been an established fact that innovation is at the core of a competitive economy. Europe has historically focused its attention in engineering on R&D and standardization. Today, however, focusing only on technology is not 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 has launched the STARTS initiative—Innovation at the nexus of Science, Technology, and the ARTS.

STARTS Prize'19

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

The European Commission’s STARTS Prize is designed to spotlight people and projects that have the potential to make a sustainable positive impact on Europe’s economic, technological, social, and ecological future. This competition seeks innovative projects at the nexus of science, technology, and the arts, and honors the best of them with the STARTS Prize. The STARTS Prize aims to showcase and celebrate 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, and Waag stage at partner institutions worldwide. 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 open new pathways for innovation.

In an elaborate process of open call and nominations by advisory experts, a total of 2,278 entries from 88 countries were submitted in the application period that ran from January 10 to March 11, 2019. Out of the total number of 2,278 entries, four groups of experts nominated 28 projects for the STARTS Prize, which were presented to the STARTS Prize jurors for final consideration. Following extensive deliberations, they decided to award *Project Alias* by Bjørn Karmann and Tore Knudsen for Artistic Exploration, and *Ciutat Vella's Land-use Plan* by 300.000 Km/s for Innovative Collaboration. Furthermore, they selected 8 projects for an Honorary Mention.

Submission and evaluation process

On behalf of the European Commission, Ars Electronica in collaboration with BOZAR and Waag issued an open call for entries to a competition that determined the fourth recipients of STARTS Prize. Considering the interdisciplinary approach, the STARTS Prize'19 was again launched with a dual approach for submissions:

Submission via open call

The STARTS Prize open call started on January 10, and ended on March 11, 2019. Submissions could be made either by artists / creative professionals or the researchers / companies involved.

The competition was open:

- to groundbreaking collaborations and projects driven by both technology and the arts.
- to all forms of artistic works and practices with a strong link to innovation in technology, business, and/or society.
- to all types of technological and scientific research and development that has been inspired
- by art or involves artists as catalysts of novel thinking.
- to artists and teams from all over the world.

Purely artistic or technologically driven projects were not the focus of this competition. The com-

petition 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, 22 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 to ensure a wide reach out and fast introduction to the new award.

Nominations

All submissions were evaluated by a nomination committee in the order of their arrival. The STARTS Prize Nomination Committee nominated 13 projects for prize consideration by the jury. 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 enter their submission also for the STARTS Prize. Of these submissions a total of five projects per category were nominated for prize consideration by the three Prix Juries (Computer Animation, Artificial Intelligence & Life Art, and Digital Musics & Sound Art).

The resulting list of 28 nominations represents a comprehensive overview of the international state of the art collaborations between art and technology. Therefore all 28 projects are published in the *CyberArts 2019 book*.

Jury Selection

In the final round, all 28 nominations were evaluated by the STARTS Prize Jury in order to select two prize-winning projects and eight Honorary Mentions. The jury consisted of eight experts, one representative of each Prix Ars Electronica category, and five representatives of the nomination committee.

STARTS Prize'19, a joint project by Ars Electronica, Bozar, and Waag.

Poesis into Praxis: Hybrid Creative Activisms

Joint statement of the STARTS Prize'19 Nomination Committee (Francesca Bria, Nadav Hochman, Daehyung Lee, Alexander Mankowsky, Şerife (Sherry) Wong) and the STARTS Prize'19 Jury (Ferdi Alici, Francesca Bria, Rikke Frisk, Nadav Hochman, Daehyung Lee, Alexander Mankowsky, Moon Ribas, Şerife (Sherry) Wong).

From the total of 2,278 entries, 731 projects were directly submitted to STARTS Prize'19. These entries were reviewed by the STARTS Prize Nomination Committee, an international group of leaders from the arts, academia, and industry. This diverse group spent three days reviewing the applications and singled out 13 projects to be nominated as finalists for the STARTS Prize. In parallel, three additional Prix Ars Electronica juries—focusing on the categories of Computer Animation, Digital Musics & Sound Art, and Artificial Intelligence & Life Art—reviewed the projects that were submitted to the wider Prix Ars Electronica. Each of these three Prix Ars Electronica juries was then asked to nominate five additional projects from their specific award category for the STARTS Prize. Out of this group of 28 finalist projects for the STARTS Prize, the two Grand Prize winners and 8 Honorary Mentions were determined by the STARTS Prize Jury, a group comprised of the STARTS Prize Nomination Committee and one representative from each of the three Prix Ars Electronica juries.

The European Commission's STARTS Program and Prize has become a dynamic global barometer through which new collaborative, cross-disciplinary, creative visions can be examined. With 2,278 project submissions to this year's competition, representing work by artists, designers, technologists, and scientists, the program has grown to function as a critical instrument in showcasing alternative ways to see and question ourselves and others while maintaining an unbounded terrain that allows freedom in creative and technical experimentation. Throughout vibrant deliberations, the jury recognized and emphasized time and again the cruciality and significance of the STARTS program's distinctly European message, shining light on new pathways to innovative yet positive societal change driven by deep humanistic values and rooted in a long and extraordinary tradition of responsible cultural experimentation. In the face of tectonic technological develop-

ments, environmental changes, and consequent volatile political climates, the majority of this year's projects go beyond the dialectic of legitimate and illegitimate ends and instead unfold the ways in which emerging technological developments affect not only what we can do but also what we can be. The jury noticed numerous projects' deep concern with emergent means of production that attempt to redefine our relations with and understandings of new forms of technology. Against technological totality that is becoming ever more efficient and translucent, many projects offer instruments for individual and collaborative interventions that promote social and political awareness while facilitating an authentic sense of agency for positive change.

This tendency was apparent throughout the review process. Many of the submitted projects deal with current and future environmental concerns, raising awareness but also providing concrete tactics and solutions. Other projects unveiled surveillance systems, delineating the mechanisms through which technological devices are constructed and helping us gain control (even if only partial) over our surroundings. The jury also noted the recurrent complicated relationship between the artificial and the biological, the subjectivity of science and the potential mutability of the body and identity. Finally, the jury appreciated the continued integration of more traditional artistic methodologies into unexpected environments and situations, offering alternative perspectives and insights within the field of medicine and medical training, in transportation of autonomous vehicles applications, and in strengthening dialogue and a sense of meaning among diverse communities—all emphasizing the centrality of humans and other living creatures in the development of technological ecosystems.

It seems to us that the message from these projects is clear: the more evasive technology becomes, the more extrinsic agency becomes possible and necessary and, as a result, every-

thing around us becomes a means in its service. The basic gesture here, so it seems, is to show how artistic thinking provides us with an empowered sense of hope for positive change—even in a state of totally administered, seemingly impenetrable, and universally invasive technological environments. And as the winners and nominees of this year STARTS Prize exemplify, this change is apparent and tangible on the individual, group, and societal levels.

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, showcasing; and 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.

STARTS Prize'19

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.

Project Alias. Rename your home assistant and make sure it never listens.

Björn Karmann, Tore Knudsen

As many domains of our private and social lives are being transfigured by new technologies of identification, monitoring, analyzing, and controlling, Karmann's fungus-looking "parasitic" device offers a poetic yet concrete DIY intervention that allows anyone to appropriate any

voice-activated appliances, thus making smart assistants less invasive. As the project title suggests, Karmann effectively uses the artistic *alienation effect* ("making it strange," or defamiliarization) to make the technology different and alien to us, as something to be carefully observed, learned, and potentially changed. It is a magnificent example of turning poesis into praxis, offering a balance in conveying technology's means of communicability while effectively changing its mediality.

Project Alias exemplifies how contemporary technologies—in this case, smart assistants—require that we open ourselves to the *passive* reception of the condition under which technology can be used: the user is used by the voice assistant in order to collect data about our private lives and environments. The medium is indeed the message, as McLuhan used to say, and we the users and our private data increasingly, and in some cases unintentionally, become the content of that message. *Project Alias* offers to flip these power relations on their head, allowing us a more reciprocal exchange: producing white noise to prevent the speaker from constantly listening or teaching it to recognize our voice to help secure our privacy. *Project Alias* breathes new life into the metaphor of the parasite by turning it into an applicable political tool, hijacking a technological "host" in order to change their operations and in turn affect their relations to their surroundings. The parasitic intervention can take one of two forms: the host might do all it can to eradicate the parasite, or it might rearrange things to *accommodate the needs* of the parasite. In either case, the presence of the parasite means that things cannot, and will not, remain the same. *Project Alias*, the jury hopes, will prompt the industry to incorporate and adjust to this parasitic disturbance and provide us with transparency and control over our own technological environments.

STARTS Prize'19

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 pathway for innovation.

Ciutat Vella's Land-use Plan

Big data, KDD, and Citizen Participation to Ensure Coexistence between Economic Activity and Citizens' Quality of Life
300.000 Km/s

In Jean-Luc Godard's seminal 1965 film by the same name, "Alphaville" was a dystopian smart city that was optimized and consequently ruled by a central computer processor labelled "IBM." And come the early days of the implementation (and eventual failure) of early versions of these technologies around the year 2000, smart cities were in fact presented as glitzy versions of Alphaville. In today's updated version of Alphaville, we see Big Tech succeeding both technically and politically in applying technologies more familiar to us on our smartphones to entire city neighborhoods, namely the Toronto waterfront. Yet again as in *Alphaville*, a data-driven ecosystem is being erected in which the extent of citizens' participation is restricted to the mere configuration of tools that were designed and developed by overlord-like companies. And given Godard's grim vision of the data-driven city, it is no wonder that citizens across the globe today are worried by what this increasing integration of sensors and data-collection into our cities augurs for our collective futures.

300.000 Km/s represents a refreshing alternative path for smart city technologies. The Barcelona initiative wants to reverse the top down, Big Tech-led smart city approach by putting citizens first, and using arts, technology, and data science to unleash the potential of human-centered urban planning and innovation. It proposes an urban plan designed through a large-scale participatory democratic process that engages thousands of citizens via the online platform *decidim.barcelona*. The objective is to then apply the learnings and insights gathered through this platform to tackle gentrification and find a balance between urban design interventions that serve tourists and the

city's other commercial and economic engines, and interventions that serve the day-to-day needs of local residents. Can the digital layer influence how urban planners grapple with questions of social justice and health such that our cities champion the common good over capitalist gains for the few? Can the arts, data science, and democratic participation revive social, ecological, and economic equities in our urban spaces? In grappling with these questions, this work shows us compelling new way to meld crowdsourcing and data analysis to erect a new collective infrastructure for a shared, prosperous, urban future.

STARTS Prize'19

Honorary Mentions

Anatomy of an AI System

Kate Crawford / AI Now Institute and
Vladan Joler / SHARE Lab

A leading political axiom of our time is that the future will belong to those that best harness the technologies of Artificial Intelligence. The *Anatomy of an AI System* hopes to construct a different path. In this collaboration between Kate Crawford, a world-leading AI researcher from New York University's AI Now Institute, and Vladan Joler, an artist from the SHARE foundation, digital AI assistant technologies such as the Amazon Echo are exposed as new forms of extractivism, whose immediate reliance on human cognitive and affective labor extend into questions around capital, physical labor, and even the natural world. And how, despite their growing ubiquity, the ultimate social, environmental, economic, and political costs of these technologies still remain unknown. AI is already employed in ways that exacerbate inequality and increasingly threaten global democracies. Yet it also represents one of humanity's greatest opportunities to solve acute epochal challenges such as climate change and equitable access to healthcare. Despite the palpable fact that Artificial Intelligence is already deeply shaping our societies and fundamentally changing the human experience, it has been until now largely developed and deployed by private companies without public awareness or consent, and shielded from collective view as a form of "intellectual

property.” Through its minutely-detailed high-resolution map, the *Anatomy of an AI System* allows us a more panoramic view of the diverse range of system extractions intrinsic to the current applications of this technology. Through this, we are urged to grapple with the ethical, legal, social, and economic implications of the current uses of AI and how we might in turn develop and deploy new forms of artificial intelligence in which the sources and later applications of these powerful algorithms might remain open and just.

Arte Eletrônica Indígena **Thydêwá**

The jury found this initiative to be a strong example of partnerships that center the voices of indigenous communities and amplify their perspectives as part of contemporary identity and collective heritage. Indigenous people are among the front-line stewards of the environment and their continual contributions to modern cultural and ecological systems are critical inputs for innovation. In hopes of further supporting these peoples’ roles in the innovation ecosystem, *Arte Eletrônica Indígena* demonstrates best practices for creative capacity building in rural indigenous communities.

This project brings to attention the cultural symbols and creative output of eight indigenous villages in the Brazilian state of Bahia through supporting their close collaborations with artists from Brazil, Bolivia, and the UK. The jury recognized the importance of the impetus for this intercultural partnership coming from the non-governmental organization Thydêwá, a group of intercultural individuals that has been working closely with these communities for 17 years to promote positive social transformation. The dialogue created by these art residencies presents a powerful counter-narrative around and a show of meaningful resistance to the traditional integration-focused programs that all too often attempt to homogenize the artistic traditions and productions of historically-marginalized peoples. By incorporating digital tools into new creative formats, the residencies situate electronic art as a compelling medium for collaborative creative processes and proposes the crucial role indigenous people can and should play in the continued development of the global tech-

nological ecosystem. This multi-layered artistic engagement urges meaningful dialogues around the practical uses of technology to activate collaborative creative processes—and this can enrich digital practices for all.

Biocomputer Rhythms **Eduardo Reck Miranda**

Can a genuine sense of creative partnership be established between a human and micro-organism? Miranda’s *Biocomputer Rhythms* sets out to examine how a computer built out of living slime mold can play with and improvise on a musical instrument—in this case a piano—together with a professional musician. The resulting duet between the two living entities is unpredictable and suggests a new kind of “creation of a machine that is creative,” as Miranda describes it. The jury agreed that *Biocomputer Rhythms* is a significant exemplar of recent Bioart practices that continue to blur the lines between the programmable, the calculable, and the unpredictable. The work extends the range of existing interactions between humans and silicon-based computers, and offers a speculative creative application that is, perhaps, more aligned with the human tendencies to hesitate, improvise, and contrive.

BLP-2000 / Black List Printer **BCL – Georg Tremmel and Shiho Fukuhara**

Foucault’s concept of Biopolitics—how regimes of authority manage our bodies to achieve control—is disturbingly reimagined in *BLP-2000 / Black List Printer*. BCL’s project asks us to consider a plausible biotechnological future in which an unofficial “Black List” of potentially harmful and forbidden DNA sequences has been created and shared among companies for bio-security reasons. The output of this project is a never-ending printing machine that stores and chronicles DNA sequences that companies might label as harmful and forbidden. The jury noted that while the project is a powerful and poetic reminder of the ethical dangers that are inherent to the development of new biotechnological tools, its means of production—a DIY DNA Synthesiser and hackable processes—reveal a great sense of potential socio-political strength.

SimCath

**Fernando Bello, ICCES & Salomé Bazin,
Cellule studio**

SimCath is a simulation unit which is used for training medical professionals in cardiological surgical procedures. The jury commended Salomé Bazin for bringing her artistic practice as a multimedia artist with experience in theater design to the field of medicine. Her studio, Cellule, worked with the Imperial College Centre for Engagement and Simulation Science in London on the development of an immersive environment that resembled a theater stage that mimicked a real surgical environment. This scenographic environment was then used for simulation training for surgeons, creating a learning environment that more accurately mimics the real high-stakes situations of invasive procedures than the traditional staid classroom. The jury was fascinated and compelled by Salomé's creative application of her experience in stage scenography to the societally-critical context of medical training.

SLAP—See Like A Pony

Sabine Engelhardt

Imagine you are driving a car. How do you perceive and preempt what another car on the road is going to do? Now what if that other car is an autonomous vehicle (AV)? Would and should your reactions be different? Driving is a collective intuitive process that relies on acquired heuristics, imparted knowledge, and a shared empathy with the other drivers on the road. Average human drivers and bystanders at present have neither the heuristics and the knowledge, nor the empathy to safely and effectively interact with autonomous vehicles. This presents a significant public safety concern, but also opens up a greater conversation on what effect autonomous driving, and autonomous systems in general, will have on humans. How will we adapt, and in turn how will we be changed?

The jury felt that Sabine Engelhardt's ponies were an engaging way to understand how autonomous vehicles could be designed to signal in a way that can be intuitively understood by humans. Part of Daimler's series of projects exploring empathy in self-driving cars, *SLAP* explores the application of

biomimetic design principles to this emerging technology. By mounting cameras on herself and her horses, Sabine Engelhardt is able to trace the reactions of her horses as they wander through meadows and forests and encounter obstacles. In observing the positioning of the horses' ears and nuances in their physical nudges, clear modalities of communication are revealed that help shape our understandings of the role of empathy between horse and rider when navigating through space and how this might be applied to emergent AV technologies. As autonomous transportation is increasingly deployed, new forms of human-centered signals that are anchored in an awareness of their psycho-social impacts on our perception and decision-making abilities must be developed. The complexity in resolving this element of human-computer interaction in autonomous vehicles is daunting, but the answers might already be hiding in the stable.

The Murder of Pavlos Fyssas

Forensic Architecture

Among the submissions received for this year's STARTS Prize that tended to call upon collaborative action to fight global challenges such as climate change or technological impact, this project was a stark reminder of how far ultranationalists will go in pursuit of their own agenda. Forensic Architecture used an interdisciplinary artistic approach and a vast partnership between researchers, scientists, video artists, and institutional partners to create video-based evidence of the role of the Greek political party Golden Dawn in the 2013 murder of Greek anti-fascist rapper Pavlos Fyssas. By revealing Golden Dawn's abuse of human rights by means of creating counter narratives to prevailing authoritative understandings of investigated events, the project continuously and meaningfully encourages an increase in public dialogue on nationalism, immigration, and politics. The jury found that though the questions raised by this project yet remain unresolved, they may be more relevant than ever in the current global political moment.

This is grown.

Jen Keane

This is grown. is a project by Jen Keane that proposes a groundbreaking solution to our troubled relationship with nature. Working at the intersection of design and research, Keane has transformed her frustration with plastic pollution into an actionable idea for reducing the amount of plastic waste. *This is grown.* takes an organism-driven approach to material design. Thanks to her learning about bacterial cellulose from scientists at Imperial College London, Keane has been able to culture the bacteria herself. Using new tools to manipulate the natural growth process, she has succeeded in employing it to furnish an unprecedented form of textile creation that she calls “microbial weaving.”

Keane’s multi-disciplinary collaboration with biology, biomaterial science, and mechanical engineering strongly suggests that bio-fabrication technology could become a leading paradigm in 21st century fabrication. Combining technological ability with environmental responsibility in a unique way, *This is grown.* allows us not only to imagine, but also to shape the future of production. Far more than aesthetic design, the project proposes an end to the damaging cycle of petrochemical-based production and wastage. “After all,” Keane states, “nature has had 3.8 billion years to perfect the ultimate circular economy: Life. Maybe we can still learn something.”

STARTS Prize'19 Nominations

30°

Mathias Foot, Janna Nikoleit, Franziska Rast,
Stephan Schakulat

A-MINT

Alex Braga

Alterplex

Hakan Lidbo

Beholder

United Visual Artists

Cave of Sounds

Tim Murray-Browne in collaboration with Dom
Aversano, Susanna Garcia, Wallace Hobbes,
Daniel Lopez, Tadeo Sendon, Panagiotis Tigas,
Kacper Ziemianin

Hello, Shadow!

Joon Moon

ISM Hexadome

Institute for Sound & Music (ISM)

Journey on the Tongue

Ayako Suwa, Evala, Yasuaki Takehi

Meandering River

onformative, kling klang klong

Mitigation of Shock

Superflux

PatentPandas.org

Jie Qi, Carol Lin, May Qi, Ira Winder

Solar Powered Website

Kris De Decker, Marie Otsuka, Roel Roscam
Abbing, Lauren Traugott-Campbell

SPACE WASTE LAB

Studio Roosegaarde

Stone Web—Expanding Space

Idalene Rapp, Natascha Unger

Stop-Motion VR

Denny Koch, Johannes Schubert

SoundShirt 2.0

CuteCircuit

Voice of Nature

Thijs Biersteker

Wastelands

Tagny Duff



S+T+ARTS
PRIZE '19



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.

Project Alias

Rename your home assistant and make sure it never listens.

Bjørn Karmann, Tore Knudsen



Alias is a teachable “parasite” that is designed to give users more control over their smart assistants, both when it comes to customization and privacy. Through a simple app, the user can train *Alias* to react on a custom wake word/sound and, once trained, *Alias* can take control over your home assistant by activating it for you. When you don’t use it, *Alias* will make sure the assistant is paralyzed and unable to listen by interrupting its microphones.

This makes *Alias* act as a middle-man device that is designed to appropriate and control voice-activated devices. Equipped with speakers and a microphone, *Alias* is able to communicate and manipulate the home assistant when placed on

top of it. The speakers of *Alias* are used to interrupt the assistant with a constant low noise/sound that feeds directly into the microphone of the assistant. First, when *Alias* recognizes the new user-created wake word, it stops the noise and quietly activates the assistant with a sound recording of the original wake-word. From here the assistant can be used as normal. *Alias* is made with a Raspberry Pi that runs a small neural network locally for wake word detection. Everything is made to work locally and disconnected from the internet. *Alias* does also host its own Wi-Fi, which allows users to interface with it through a browser to train, reset, and turn *Alias* on/off.

Our relationship with technology is formed by how

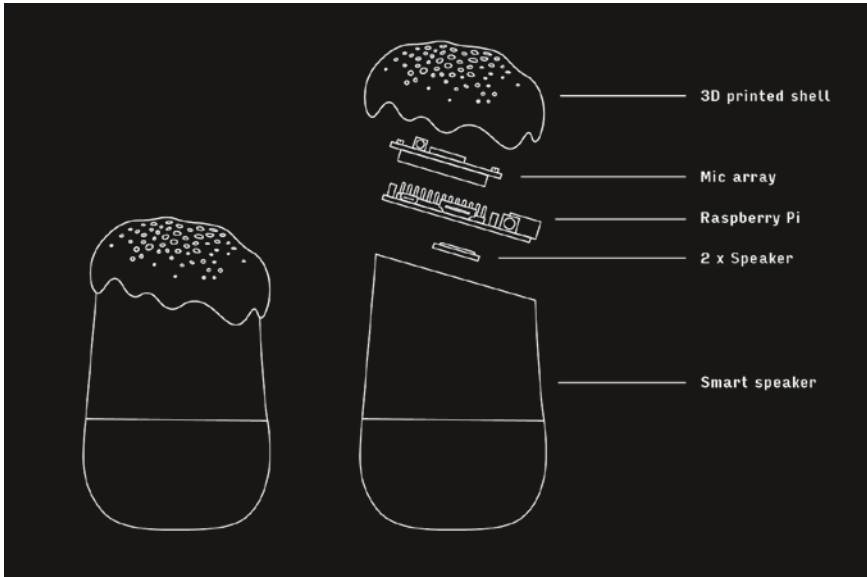
we interact with it. However, commercial smart products for the home tend to treat the user as passive consumers. Especially smart home assistance has shown design patterns that limit the possibilities of interaction and agency from the user perspective, even in the most private and personal sphere—the home. Our interaction patterns are highly determined by the designers of these products, and with *Alias*, we are interested in how this power relation can be redefined, especially when it comes to privacy. The exciting future that “smart” technologies can give us often comes with conditions that diminish our privacy and the feeling of being in control. With *Alias* we want to challenge this condition and ask what kind of “smart” we actually want in the future.

In order to manifest and communicate these values, we looked at how Cordyceps fungus and viruses can appropriate and control insects to fulfill their own agendas. We used this rather scary side of nature as inspiration to create our own parasite for smart home systems. This resulted in the making of *Project Alias*, which we see as a demonstration of how maker-culture and open source can be used to redefine our relationship with smart home technologies, by delegating more power and control from the designers/companies to the end users of the products.

Definition of “Alias”:

- 1. Used to indicate that a named person is also known or more familiar under another specified name.
- 2. Misidentify (a signal frequency), introducing distortion or error.





Bjørn Karmann (DK) is a Danish designer working at Tellart, Amsterdam. He holds a Master's Degree in Interaction Design from the Copenhagen Institute of Interaction Design and a Bachelor's degree in Communication Design from Kolding Design School. Graduating from CIID with highest honor, his graduation project (*The Objectifier*) has won multiple awards and pushed the thinking of machine learning as a means of prototyping and enriching spatial interaction. Bjørn combines his curiosity for new and emerging technologies with his passion for physical and human interactions, while finding a

balance between nature and technology. With experience in design, installation art, robotics, and physical computing, he works across multiple disciplines and manifests between physical and virtual space. **Tore Knudsen** (DK) born in 1992, is an Interaction designer based in Copenhagen, Denmark. He holds a Master degree in Interaction design from K3, Malmö University, and has previously worked as a digital designer. Currently, he is working as a User Experience designer at Topp Innovation & Design in Malmö, Sweden. Tore's interest in design and technology started with photography and has expanded into many different mediums, ranging from web to physical installations. His work is often driven by an interest to explore and challenge our relationship with modern technology and he mainly does so through design and prototyping.

http://bjoernkarmann.dk/project_alias · www.toreknudsen.dk



S+T+ARTS
PRIZE '19

Grand Prize Innovative Collaboration

Awarded for innovative collaboration between industry or technology and the arts (and the cultural and creative sectors in general) that open new pathways for innovation.



Ciutat Vella's Land-use Plan

Big Data, KDD and Citizen Participation to Ensure Coexistence between Economic Activity and Citizens' Quality of Life
300.000 Km/s

The project embodies a new way of making urban planning. Fueled by massive information (open data and big data) and complemented with qualitative data arising from citizen participation, the project applies novel methodologies of spatial analysis based on machine learning and artificial intelligence to inform, simulate, and draft a public policy that puts the focus on preserving liveability in cities.

The use of technology has radically transformed an existing type of master plan which regulates public establishments, food shops, and tourist services in the central district of Barcelona. The area has a dense and vulnerable population living within a fragile urban morphology. At the same time, it has a high rate of economic activities—specializing in leisure—that generates negative impacts on the life quality of residents such as noise, cleanliness, people in public space, and increment of logistics.

Given the complexity of the urban context, the project has undergone 4 phases, each of them generating its own outcome: research (data driven diagnosis), co-creation (citizen participation), proposal (simulation tool), and approval (regulatory framework).

The research phase started in October 2016 with the drafting of four preliminary studies prior to the kick-off of the drafting process (April 2017) related to the description of the urban fabric (data atlas), the impact of nocturnal activities on health, and the tourist trends and their impact on local commerce.

Specifically, the data atlas (consisting of more than 150 cartographies of the district) provides a solid structure to justify the *Plan's* main objective—to preserve the quality of life in cities—thanks to the use of cutting-edge technologies (sensitization, machine learning, artificial intelligence) and European transparency laws that have made avail-

Housing density



69,6% premises are housing
7,6% premises are business
3,6% premises are offices

Population density



774 inhab/Ha CVella (avg)
951 inhab/Ha Raval (máx)
622 inhab/Ha Bcn (avg)

2nd district with more unemployment rate
24% demand for social services

13.000 loss of population last 10 years
9,2% raise of rental prices (2013-15)

Quality of construction



4 m²/m2 of land (avg)
4 floors (avg in residential buildings)
31% streets < 10 m wide
63% plots < 200 m²
150 m2 avg of business premises

Buildings before 1940

Buildings in poor conditions

Extreme residential vulnerability

Saturation of diurnal activities



5 public establishment/Ha
20,98 public establishment/1.000 inhab.
28 public est. 50 m radius (max)

2.831 public establishment + hotel 2010
1.980 public establishment 2010

3.040 public establishment + hotel 2017
2.191 public establishment 2017

41,15 % bars and restaurants 2017

Saturation of nocturnal activities



Demonstrated health impact due to noise of nocturnal activities.

Noise complaints related to **street cleaning and waste collection**.

Impact in the public space due to **overcrowding**.

Impact of logistics related to premises.



able relevant information about public management, urban services, and citizens' behavior.

The data atlas not only illustrates and measures for the first time the physical and sociodemographic characteristics of the urban fabric, the type and saturation of economic activities, and the paths of citizens and visitors in the neighborhood but also describes the urban impacts on the health of inhabitants (caused by noise, pollution, or residential vulnerability).

The co-creation phase, driven by technicians and the previous diagnosis, has forged a large consensus thanks to a participatory process (local entities, retailers, and neighbors worked together in workshops, public events, interviews with selected actors, and online participation through the City Council digital democracy platform *decidim.barcelona*), and the political implication of the City Council, that co-authored the plan.

From the citizens' perspective, they were involved in a massive data collection process, empowering them to build data sovereignty structures and participate in decision-making at a local level. On the public bodies side, the project proposes a system both to inform and evaluate urban planning and policies at a European level, supplying a common ground of knowledge that can be exchanged and compared between cities.

In parallel to the participation process, the proposal phase was based on a predictive model of economic activities aimed at measuring and anticipating different urban impacts like noise, police complaints, and social vulnerability, that led us develop a master plan with a strong parametric and dynamic component. Prior to the final approval, we created a software to simulate different scenarios according to the regulatory

parameters and set the limit value in accordance to the plan objectives.

The plan was initially approved in September 2017, following a period of public information that led, after incorporating the feedback from different actors, to the final approval in February 2018. Today, the plan has been in force for almost a year. The city council is applying the master plan by means of a software, based on the regulatory parameters, that ensures transparency and makes the process of opening a business easier, faster, and trustable.

As a result of this two-year process, the project emphasizes the role of urban planning as an instrument to put the city as a common good over the free market. It proposes an innovative contribution by means of a real case study to European urban planning discipline and public policies framework regarding the regulation of economic activity under the Services Directive. In a growing urban world, we must ensure that European cities are able to guarantee the right to the city, i.e., citizens' rights to health, work, shelter, and leisure but also that urban environments allow citizens to reach a full life in harmony with economic activity.

Primary authors: Mar Santamaria and Pablo Martínez (300.000 Km/s)

Legal and technical consultants: Graciela Chaia, Carlota Casanova and Daniel Lorenzo

Co-authors from Barcelona City Council: Gala Pin (city councilor); Jordi Rabassa, Santi Ibarra and Ferran Caymel (district councilors); Mònica Mateos (district manager); Josep M. Coll, Marc Pinedo and Ana Olalla (business licenses department); Yolanda Hernández, Tristan Llusà and Francesc Palau (lawyers); Barcelona City Council Planning Department

Participatory process: Raons Públiques SCCL

Preliminary studies: Universitat Autònoma de Barcelona, Barcelona Public Health Agency, TAE and 300.000 Km/s

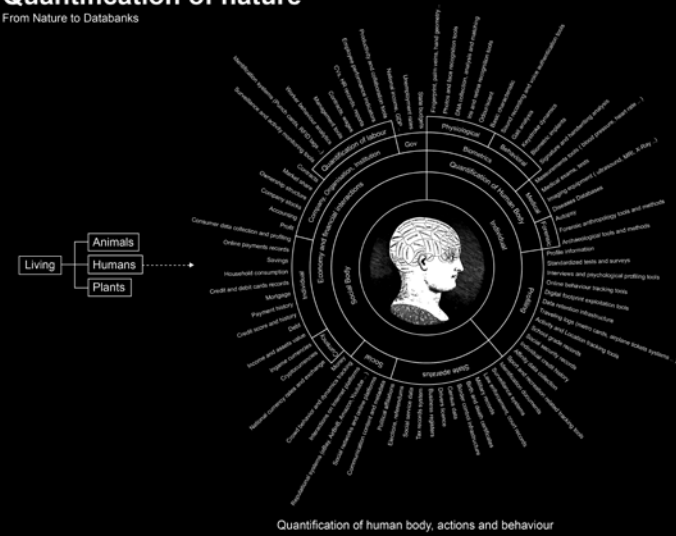
300.000 Km/s (ES) is an urban innovation office based in Barcelona that explores the potentials of data and new computation paradigms to extract relevant information with the aim to improve urban planning and decision-making. Directed by Mar Santamaria Varas and Pablo Martínez Diez, our interdisciplinary team works in the fields of urban analysis, cartography, strategic planning, development of digital tools, and digital humanities. In the last five years, we have collaborated with public entities, international firms, cultural and scientific institutions, and non-profit organizations. Our projects have been recognized with various awards and mentions—among others BBVA-Cívico Data Visualisation Award (2014), Open Data Institute Awards (2016), CityVis Prize (2017), Biennial Española de Urbanismo y Arquitectura (2018), and Lluís Carulla Award (2018)—and have been exhibited at the Biennale di Venice, the Chicago Arts Institute, the Center of Contemporary Culture of Barcelona, and Madrid CentroCentro, among others.

<http://300000kms.net/ciutat-vellas-land-use-plan>

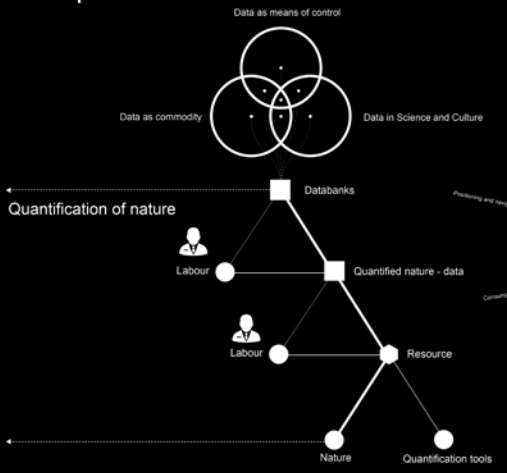
S+T+ARTS  HONORARY
PRIZE '19

MENTIONS

Quantification of nature
From Nature to Databanks



Data exploitation



Anatomy of an AI System

Kate Crawford / AI Now Institute and Vladan Joler / SHARE Lab

Anatomy of an AI System is a large-scale map and long-form essay investigating the human labor, data, and planetary resources required to build and operate an Amazon Echo. The exploded view diagram combines and visualizes three central, extractive processes that are required to run a large-scale artificial intelligence system: material resources, human labor, and data. The map and essay consider these three elements across time—represented as a visual description of the birth, life, and death of a single Amazon Echo unit.

At this moment in the 21st century, we see a new form of extractivism that is well underway: one that reaches into the furthest corners of the biosphere and the deepest layers of human cognitive and affective being. Many of the assumptions about human life made by machine learning systems are narrow, normative, and laden with error. Yet they are inscribing and building those assumptions into a new world, and will increasingly play a role in how opportunities, wealth, and knowledge are distributed.

The stack that is required to interact with an Amazon Echo goes well beyond the multi-layered “technical stack” of data modeling, hardware, servers, and networks. The full stack reaches much further into capital, labor, and nature, and demands an enormous amount of each. The true costs of these systems—social, environmental, economic, and political—remain hidden and may stay that way for some time.

We offer up this map and essay as a way to begin seeing across a wider range of system extractions. The scale required to build artificial intelligence systems is too complex, too obscured by intellectual property law, and too mired in logistical complexity to fully comprehend in the moment.

Maps and design: Vladan Joler and Kate Crawford
Published by: SHARE Lab, SHARE Foundation (<https://labs.rs>) and The AI Now Institute, NYU (<https://ainowinstitute.org>)



The Voice of the Sea, Óscar Octavio "Ukumari" and the Pataxó de Barra Velha community. With Jonás Pataxó.



The Voice of the Sea, Óscar Octavio "Ukumari" and the Pataxó de Barra Velha community.



The Voice of the Pankararu Earth, Alberto Harres, André Anastacio and the Pankararu Community.



The Voice of the Pankararu Earth, Alberto Harres, André Anastacio and the Pankararu Community.

Arte Eletrônica Indígena

Thydêwá

The Arte Eletrônica Indígena (AEI) project was designed and executed by the NGO Thydêwá. It consisted of a series of ten short artistic residencies in indigenous communities in the Brazilian Northeast in order to cocreate works of electronic art. These were exhibited to the public at the Museum of Modern Art, Salvador da Bahia, in August 2018 and have since toured the indigenous communities themselves.

The participating artists came from Brazil, Boliva, and the United Kingdom, and the indigenous communities are those that make up the network of indigenous "points of culture" with which the NGO works. The purpose of the project was to stimulate intercultural exchange through artistic cocreation between indigenous and non-indigenous people, to reduce prejudices on all sides through collaboration, and to challenge mainstream perceptions of indigenous peoples as "traditional" or "backward," and therefore not capable of engaging with new, high-tech forms of art.

The resultant artworks marry the concerns and practices of the indigenous communities with electronic and digital technologies to produce highly original results. The strong interactive dimension to many of the works demands that the spectator engage with them, thus breaking down prejudices in the gallery setting also.

Five of the most engaging works of electronic art presented were:

- *The Earth that is Us*, Bruno Gomes and the Karapotó Plak-ô community, digital body painting.
- *The Voice of the Sea*, Óscar Octavio "Ukumari" and the Pataxó de Barra Velha community, electronic sound art with found materials.
- *The Voice of the Pankararu Earth*, André Anastácio, Alberto Harres and the Pankararu community, electronic sound art with local ceramics.
- *Pulsation*, Aruma-Sandra de Berduccy and the Camacã Imboré community, electronic textile art.
- *The Hãhãhãe Wishing Tree* Paulo César Teles, Rosana Bernardo and the Pataxó Hãhãhãe community, movement sensitive sculpture with found materials.



Pulsation, Aruma-Sandra de Berduccy and Camacã Imboré community.



The Earth that Is Us, Bruno Gomes and Karapotó Plak-ô Community



Hãhãhãe Wishing Tree, Paulo César Teles, Rosana Bernardo and Pataxó Hãhãhãe community.



Hãhãhãe Wishing Tree, Paulo César Teles, Rosana Bernardo and Pataxó Hãhãhãe community.

The Arte Eletrônica Indígena project was designed by the NGO Thydêwá, www.thydewa.org

Core project team:

Director of Thydêwá, project coordinator, curator: Sebastián Gerlic

Executive producer, curator: Tiago Tao

Local production, coordinator for collective processes: Anna Campagnac

Graphic designer, website: Helder C Jr

Curator: Thea Pitman

Artists and Indigenous communities:

Bruno Gomes (BR) and the Karapotó Plak-ô community, Alagoas

Óscar Octavio “Ukumari” (BO) and the Pataxó de Barra Velha community, Bahia

André Anastácio and Alberto Harres (BR) and the Pankararu community, Pernambuco

Aruma—Sandra de Berduccy (BO) and the Camacã Imboré community, Bahia

Paulo César Teles and Rosana Bernardo (BR) and the Pataxó Hãhãhãe community, Bahia



Thydêwá is a non-governmental organization that runs programs, projects, and campaigns to raise awareness of discrimination against indigenous people and promote a culture of peace. It was founded in 2002 by indigenous people from different ethnic groups in the Brazilian Northeast working together with non-indigenous people. Thydêwá uses intercultural dialogue to promote dignity and wellbeing for all. It has also garnered a very strong track record for encouraging critical appropriation of new technologies by indigenous communities, particularly through the ethnojournalist platform Indios Online, set up in 2004.

<http://aei.art.br>



Biocomputer Rhythms

Eduardo Reck Miranda

Biocomputer Rhythms is a piece for prepared piano and percussion. It is a musical duet between a piano and a biocomputer: the biocomputer listens to the piano and produces musical responses during the performance. The responses are played on percussion instruments and on the same piano played by the pianist. The piano is prepared with electromagnetic actuators positioned inside the instrument to vibrate its strings. Electromagnetic actuators are also used to vibrate percussion instruments. The biocomputer plays its musical responses by sending voltages to these actuators. The musical responses produced by the biocomputer are based on music that it had listened to before. The system memorises the sounds that it hears through a microphone and makes variations on them. In essence, the biocomputer works like an Artificial Intelligence musical system. However, there is no complicated Artificial Intelligence (AI) modelling or programming here. The biocomputer uses electronic components grown out of biological organisms, which produce intelligent behavior by default.

My research is aimed at harnessing biological organisms to become components of computing architectures for new kinds of AI, which I paradoxically refer to as Natural AI. I am interested in

using biological agents as components of a computer rather than sources of inspiration to implement abstract models for software simulation.

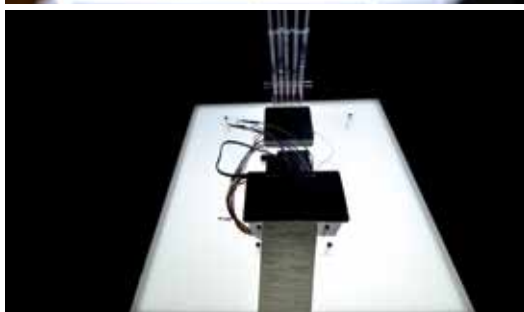
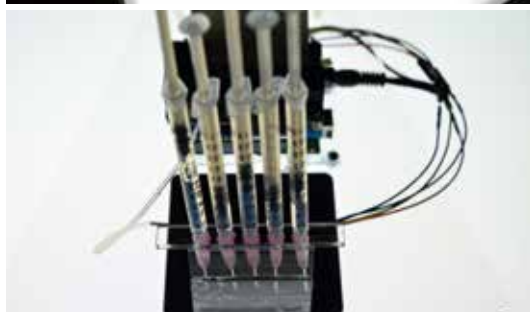
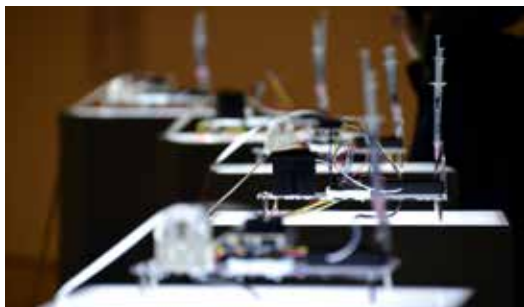
At the core of the biocomputer are *biomemristors*, which I developed with my assistant Edward Braund at the Interdisciplinary Centre for Computer Music Research (ICCM), University of Plymouth, UK. A biomemristor is a memristor made with a slime mould found in the woods. They normally grow on decaying leaves and tree bark. Its intracellular activity produces fluctuating levels of electricity, which can be relayed through its body, and this prompts it to behave like a memristor. The memristor is a relatively unknown electronic component: it is a resistor with memory. The memristor is exciting because its behavior has been found to be comparable to the behavior of biological neurones and certain processes in the brain, which is paving the way for the development of brain-like processors. The discovery that a slime mould can be harnessed to act as a memristor is providing an alternative, and perhaps more environmentally friendly, route for making memristors: to grow them out of biological material.

Composer: Eduardo Reck Miranda
Assistant engineer: Edward Braund



Eduardo Reck Miranda (BR/UK). Eduardo's distinctive music is informed by his unique background as a classically trained composer and Artificial Intelligence (AI) scientist. He studied music and computer science in his native Brazil and at the University of York in England. He subsequently received a PhD in sound design with Artificial Intelligence from the University of Edinburgh, Scotland. He worked at Sony Computer Science Laboratory in Paris as a research scientist in the fields of AI, speech, and evolution of language. Currently he is Professor in Computer Music at the University of Plymouth, where he founded the Interdisciplinary Centre for Computer Music Research (ICCMR).

<http://neuromusic.soc.plymouth.ac.uk>



BLP-2000 / Black List Printer

BCL – Georg Tremmel and Shiho Fukuhara

DNA Synthesisers or “DNA Printers” are devices that chemically synthesise or “print” DNA sequences. Currently, the synthesis of long DNA sequences is still an expensive process, therefore DNA Synthesisers are centralised and offered as a service to universities and research institutions. When a specific DNA sequence is ordered, the DNA information is sent to the company, the DNA is synthesised and returned in its physical form, ready to be used for biological experiments. This centralisation also has an intended side-effect: the companies act as censors, controlling which DNA is to be synthesised—and which not.

An unofficial “Black List” of potentially harmful and forbidden DNA Sequences has been created and is shared amongst the companies—officially for bio-security reasons.

Because of the expensive chemicals involved in the process, it was not really feasible to create a DIY DNA Synthesiser—until now. DIY microfluidics make the process possible and more affordable. But it is still error-prone and creates mutations in the physical DNA sequences.

BLP-2000 creates prototype DNA Synthesisers that only print the “forbidden,” black-listed DNA Sequences.

The physical DNA is outputted within water droplets, which are embedded and dried on paper, which not only acts as a storage medium for the digital information of the DNA, but also stores the actual, physical DNA. DNA is continuously synthesized, printed, and archived on the paper, creating a pool of forbidden DNA sequences—but most of them will not be printed perfectly—they will have errors and mutations.

The process of printing black-listed DNA Sequences also creates a moral and societal dilemma:

- Do we actually want to give everyone the ability to print “forbidden” DNA?
- Should we stop DIY DNA Synthesisers in the name of biosafety?
- Can we stop them?

Or do we need to put our trust in artists, hackers, and researchers, that they don’t realise the bad dreams of biotechnology, but focus instead on the good dreams?

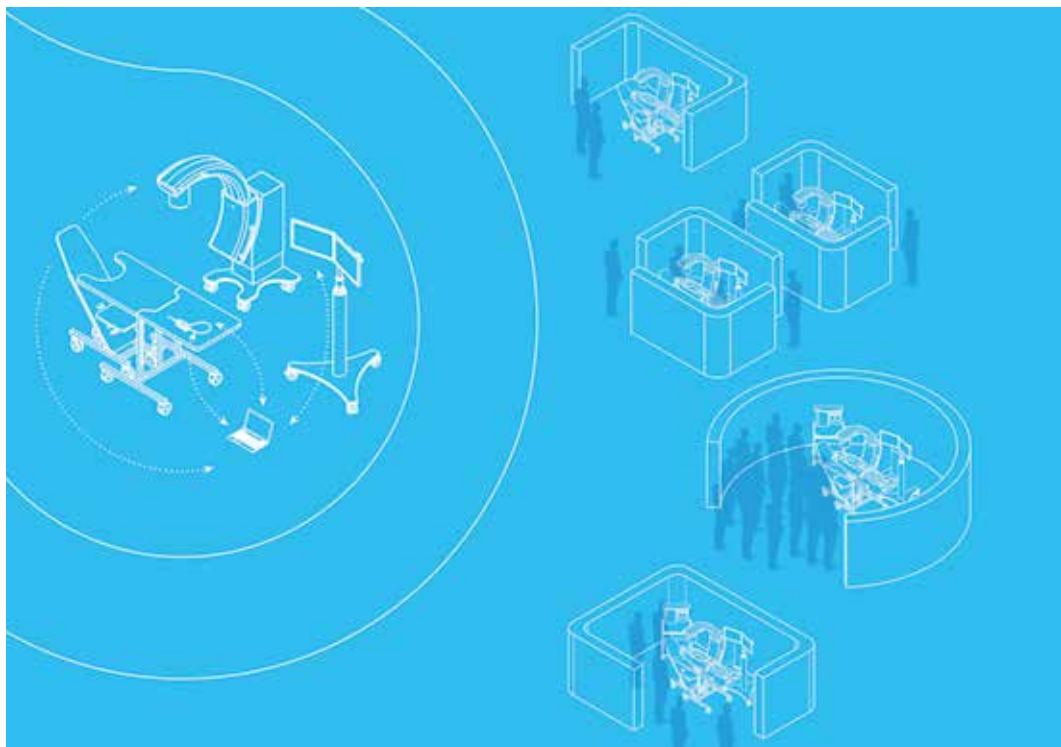
Support by: Hideo Iwasaki and the metaPhorest Research Group at Waseda University
Noboru Tsubaki, Director of Aomori Triennale 2017
“Unlimited”
Aomori Contemporary Art Centre



BCL – Georg Tremmel and Shiho Fukuhara. Georg Tremmel (AT) has a background in Media Art, Computer Science and Biology, he studied at the University of Applied Art in Vienna and at the Royal College of Art in London, where he started his ongoing collaboration with Shiho Fukuhara. He is also a Researcher at the University of Tokyo’s Laboratory of DNA Information Analysis, a Visiting Researcher at the metaPhorest Research Group, and the founder of the BioClub Tokyo. Shiho Fukuhara (JP) studied Fine Art at Central St. Martins and holds an MA in Interaction Design from the Royal College of Art.

She was Artist-in-Residence at the Palais de Tokyo in Paris and at IAMAS in Gifu, Japan. They formed the Artistic Research Framework BCL as an homage to Heinz von Foerster’s Biological Computer Laboratory, to continue the mission to explore the relations, congruences, and differences of biological and cultural codecs through artistic interventions and social research.

<https://bcl.io>



SimCath

Fernando Bello, ICCES & Salomé Bazin, Cellule studio

How do surgeons prepare for an operation, when they know that the smallest mistake could be the line between life and death?

That was the question Cellule faced when developing *SimCath*, a cardiology suite for simulation training. By training in a simulation environment, future surgeons have an opportunity to rehearse for complex surgery, performing common interactions between patients and clinicians in a low risk environment. Developing *SimCath* was reminiscent of building a theater set, a stage which mimics the real surgical environment in such a way that the surgeons acting through their roles are immersed in the performance of surgery and the relationship between patients and clinicians.

In collaboration with ICCES, we worked with patients and clinicians to develop an immersive simulation suite “close enough to reality” so that their behaviors within the simulation environment

were as close to that of a live operating theater as possible. Engineered by the Cellule team, the *SimCath* elements have been designed and developed to be minimal, lightweight, and allow for affordable batch production. Robust engineering and simplified interface allow for any clinical staff to use it. The unit can be transported easily from hospital to hospital, allowing teams to quickly set up a full-scale operation in numerous different contexts and configurations.

SimCath is the fruit of collaboration between various disciplines: engineering, computer science, cardiology, performance, scenography, and product design, as a truly innovative cross-disciplinary research between art, human sciences, and engineering.

Research and project development by ICCES, The Imperial College Centre for Engagement and Simulation Science at Imperial College.



Salomé Bazin—Cellule studio (FR) Salomé is a multidisciplinary designer and founder of Cellule design studio. Her vision is to combine design with new technologies to explore new ways to engage people with healthcare, their own body and data, working across product and experience design. Cellule's work has been featured in Dezeen, Science Gallery, New Scientist... It has been described by the Design Museum as one of the "10 most exciting UK emerging design studios of 2019." **Fernando Bello – ICCESS (MX)** is a computer scientist and engineer working at the intersection of medicine, education, and technology. He is Director of the Centre for Engagement and Simulation Science, leading the SiMMS –Simulation and Modelling in Medicine and Surgery research group. He has published widely, is involved in several simulation-based training programs in the UK and abroad, and is Academic Co-director of Imperial's MSc in Surgical Innovation.

http://cellule.co.uk/design_for-impact.html



SLAP – See Like A Pony

Sabine Engelhardt

With *SLAP* I want to make robotics not only understandable but truly approachable. Clifford Nass drew the comparison of robots with domesticated animals. They are useful, but also dangerous. But, how do we communicate with animals? Can we feel them? How does it work?

Luckily, I have three ponies which are happy to serve as guinea pigs. I have rampaged with them as a small tribe through the woods for years. So some communication must occur. They are as creatures alien to us, but also familiar. And they can develop a lot of kinetic energy. Neuroscience has a concept for interaction called Mind Reading. It works with living beings: while watching, we replay them in our own minds, whereby a mood emerges in us, serving us to predict their next actions. The perception-prediction-action feedback loop works mutually, a never-ending process. Now I try that in a novel way with my ponies. As a

first step, I applied a camera between the ears of one of the ponies. The result was interesting to watch, but something essential was missing. The mutuality was missing—the resulting impressions remained alien to me.

I had to take another step and equip all three ponies with a camera. I always tried to stay out of the camera and by accident was caught now and then until I finally understood that this was the missing piece. With four cameras, three ponies, one human: The mutual cycle of perception-prediction and action was made visible.

If you interact with ponies, you cannot plan deeper interaction, or reproducible activities. But, you can give chance a chance, provoke a bit—and something will happen. Wandering around—the aforementioned rampage—works perfectly. As an example, I attached a video clip compiled from a bike trip with my ponies featuring them walking



through a gate. Look at the white ear and how it follows me while standing perfectly still.

<http://seelikeapony.blogspot.com/2017/05/eine-radtour-mit-dem-e-fatbike1.html>

I learned how feedback loops were working, and it proved very helpful for the engineers and designers of robotic interaction. I also learned a lot about myself in relationship to these ponies—I am way too agitated, they are cool. For the

self-driving cars, we created the so-called ‘Cooperative Car,’ which has inherited some attitudes from my cool ponies.

For me there is also a touch of magic happening while watching the videos and the movement of the ears, to see the fur so close and nature passing by through their ears. I hope I can share this magic moment with every viewer.

Video: Marcus Werner



Sabine Engelhardt (DE) studied librarianship in Mannheim and Stuttgart. She studied Communication Science and Philosophy in Berlin, focused on mnemonics as a computer supported knowledge management technique for her masters, and joined the research department at Daimler with Alexander Mankowsky. She has been with Daimler Research since then, working in diverse areas like Knowledge Management and on the Female Perspective on mobility. She developed the perfume device for the current Mercedes-Benz cars and loves this aspect of creating new perfumes in her job. SLAP represents an exciting new endeavor.

<http://seelikeapony.blogspot.com> · <https://www.youtube.com/watch?v=2ZLkWtaCDu0>



Screenshot - 1, A still from our full investigation shows CCTV footage as well as documents released to us by the Athens court. (Forensic Architecture)

The Murder of Pavlos Fyssas

Forensic Architecture

Shortly after midnight on 18 September 2013, Pavlos Fyssas, a young Greek anti-fascist rapper, was murdered in his home neighbourhood of Keratsini, Athens. Both the killer and others who participated in the attack were members of the neo-Nazi organization Golden Dawn.

Golden Dawn have committed acts of violence against migrants and political opponents ever since their formation in the 1980s, yet most of their crimes have gone unpunished as a result of the silent support among the ranks of the Greek police, aligned to their nationalist cause. Following the murder of Fyssas, a Greek citizen, the national government was finally forced to make a series of arrests. Sixty-nine members of Golden Dawn, including all of their fifteen parliamentarians, were brought to trial. Charges in the trial, relating to events as far back as 2008, allege that even while

holding seats in the national parliament, Golden Dawn operated as a criminal organisation. Even as the ongoing trial threatens the existence of Golden Dawn as a political party, the Greek courts remain reluctant to investigate the role of the police in covering up these crimes.

Forensic Architecture was commissioned by the Fyssas family and their legal representatives to reconstruct the events of the night from the audio and video material made available to the court. The resulting video investigation and accompanying report, presented to the Athens courtroom on 10 and 11 September 2018, brings together CCTV footage, recordings of communications between police and emergency services, and witness testimony. We established a precise timeline and reconstruction of the events that led to the murder.



CCTV Analysis – 1, Footage from multiple CCTV cameras in the vicinity of the scene of the murder is synchronised, and the movement of people and vehicles between one frame and another is plotted within a 3D model. (Forensic Architecture)

The investigation established that members of Golden Dawn, including senior officials, acted in a co-ordinated manner in relation to the murder, and that members of Greece’s elite special forces police, known as DIAS, were present at the scene before, during, and after the murder, and failed to intervene.

Project lead: Christina Varvia
 Project coordinator: Stefanos Levidis
 Video investigation: Simone Rowat
 Research assistance: Stefan Laxness, Nicholas Masterton, Sofia Georgovassili, Sarah Nankivell, Fivos Avgerinos, Dorette Panagiotopoulou
 Sound analysis advisor: Lawrence Abu Hamdan, Shakeeb Abu Hamdan
 Research support: Eyal Weizman
 Project support: Sarah Nankivell, Robert Trafford

Forensic Architecture is a research agency based at Goldsmiths, University of London. FA undertake advanced spatial and media investigations into cases of human rights violations, with and on behalf of communities affected by political violence, human rights organizations, international prosecutors, environmental justice groups, and media organizations. Through the analysis, location, and reconstruction of violent events, FA aims to develop and disseminate innovative new techniques for evidence gathering and presentation. FA has successfully tested its methodologies in landmark international legal and human rights cases, including at the ECHR, ICC, and the UN, as well as publishing and exhibiting their work in major artistic and cultural institutions worldwide.

<https://forensic-architecture.org/investigation/the-murder-of-pavlos-fyssas>



This is grown.

Jen Keane

This is grown. was motivated by a frustration with plastics and a visible disparity between scientific research and design manifestations around natural materials.

Taking an organism-driven approach to material design, the project began under the premise that a greater understanding of nature could help us not just replace the petrochemical based materials of today with more sustainable ones, but perhaps allow us to devise entirely new systems of making and categories of materials previously unimagined. After all, nature has had 3.8 billion years to perfect the ultimate circular economy: Life. Maybe we can still learn something.

Introduced to bacterial cellulose by scientists at Imperial College London who are studying the material and the bacteria that produce it, I was inspired not only by its material qualities but the way it is grown. Learning from the biologists and material scientists, I cultured the bacteria myself, and crafted new tools to manipulate its natural growing process, eventually employing it in a new form of textile creation I call “microbial weaving.” In the context of traditional weaving, I am weaving

the warp and the bacteria grow the weft. This allows for the potential to weave patterns not possible with traditional weaving and engineer the material strength in multiple directions. Incredibly lightweight, transparent, and rivaling its synthetic counterparts in tensile strength, the hybrid material created also offers huge potential for customization and application in numerous industries from high performance composites to biomedical applications.

I grew the upper of a shoe to show how this material process could affect the way we design and make things in the future. Nature doesn’t make materials in sheets and cut them for assembly. It makes only as required. Therefore the upper was designed and grown in a single piece with no sewing; one continuous yarn held in place by the cellulose produced by the bacteria.

Designer: Jen Keane

Footwear design contributor: Markus Westerberg

Scientific advisors:

Imperial College London: Dr. Tom Ellis, Dr. Koon-Yang

Lee, Marcus Walker (PHD candidate), Dr. Martin Hervy

Cornell University: Dr. Juan Hinestroza

Photography: Tom Mannion, Adam Toth, Vita Larvo



Jen Keane (US) is a designer and creative researcher working at the intersection of design and science, technology, and craft. Inspired by notions of sustainability, and a fascination with new digital and biological tools, she is exploring how new technologies could be employed to design a new generation of hybrid materials, and perhaps change our approach to making altogether. A recent graduate of the MA Material Futures program at Central Saint Martins in London UK, Keane worked previously for the German sportswear brand adidas in materials design, development, and innovation strategy. Holding a Bachelor of Science in Fiber Science and Apparel Design from Cornell University, NY, USA she takes

a cross-disciplinary approach to material design and believes that a closer dialogue between science, design, and industry is essential in bringing real change to our material value systems and means of production.

<https://www.jenkeane.com>

S+T+ARTS 
PRIZE '19

NOMINATIONS



30°

Mathias Foot, Janna Nikoleit, Franziska Rast, Stephan Schakulat

Covering 71% of the Earth's surface, water is an important part of the global ecosystem. Every development and change in the sea also affect life on earth. Datasets help us to understand conditions and ecological processes such as changes in salinity or temperature. Scientists of various disciplines have spent the last 100 years gathering data in order to analyze it and discover relations between different sets of data. However, the more frequent and more comprehensive studies are being conducted, the more accurate predictions can be made about the future. These predictions directly influence political, economic, and social decision-making processes on a global scale.

30° is a data visualization of marine data in the form of an installation. The measurement data originate from the thirtieth longitude and are printed in chronological order in small typography on three translucent surfaces with a total size of almost 3 x 4 meters. The installation makes the

dataset visually readable by illuminating the individual measuring points by a projector located behind the surfaces. Short animations visualize parameters such as temperature, salinity, oxygen, or data fluctuations and comparisons of individual points of measurement. A scale allows the chronological classification of each measurement. 30° hopes to draw attention to the efforts of scientists who have dedicated their work to gaining a better understanding of the sea in order to preserve the world's oceans.

While still studying, the interdisciplinary team 30° joined together to successfully participate in the annual "University Competition for the Science Year 2016*17". The group consists of Janna Nikoleit, Franziska Rast (both graduates in Spatial Strategies), Mathias Foot, and Stephan Schakulat (both graduates in Communication Design).

Supported by Science Year 2016*17 – Seas and Oceans, a joint initiative of the Federal Ministry of Education and Research and Wissenschaft im Dialog.

Mathias Foot (DE) graduated in Communication Design (BA) from the Interactive Media Department at the Muthesius Academy of Fine Arts in 2018. Since then he has been working as a freelance communication designer and lecturer for 3D Design in Kiel. **Janna Nikoleit** (DE) graduated with an MA in Spatial Strategies and Scenography in 2018. Since then she has been working as a designer, based in Hamburg, in the fields of spatial urban scenography and communication design. **Franziska Rast** (DE) is currently working on her Master Thesis and will graduate in Spatial Strategies and Scenography in 2019. Apart from her studies she is working in the field of architecture and spatial urban scenography. **Stephan Schakulat** (DE) graduated with an MA in Communication Design from the Department of Interactive Information Design at the Muthesius Academy of Fine Arts, Kiel in 2018. Since then he has been working as an interactive information designer in Kiel.

<https://30-degrees.net>



A-MINT

Alex Braga

A-MINT is a metaphor of a sustainable future, where man and machines work together in perfect symbiosis to cross a frontier that man alone could not dare. *A-MINT* is a new kind of adaptive Artificial Music Intelligence, the first one of its kind capable of cracking the improvisation code of any musician in real time and able to improvise with him. Creating music and video along the execution, without any preset pattern, pitch, or bpm. A new organic and lively form of contemporary electronic music. The futuristic real-time electronic orchestrations, enhanced by the generative video projections, rewrite the rules of live electronic music, and plunge the audience into a unique experience, always different because of the

impulses and interpretations of the Artificial Music Intelligence *A-MINT*, a trip in unknown and never-explored-before territories and boundaries, made of new sounds, technology, images, energy, sweat, heart, and soul.

A-MINT is the first Artificial Intelligence to enter Conservatories and musical institutions as a proper instrument to study alongside the traditional ones. Braga is the first Artificial Music Intelligence teacher with his masterclasses in Conservatorio Santa Cecilia in Rome, University Pompeu Fabre in Barcelona, and Conservatorium in Brussels.

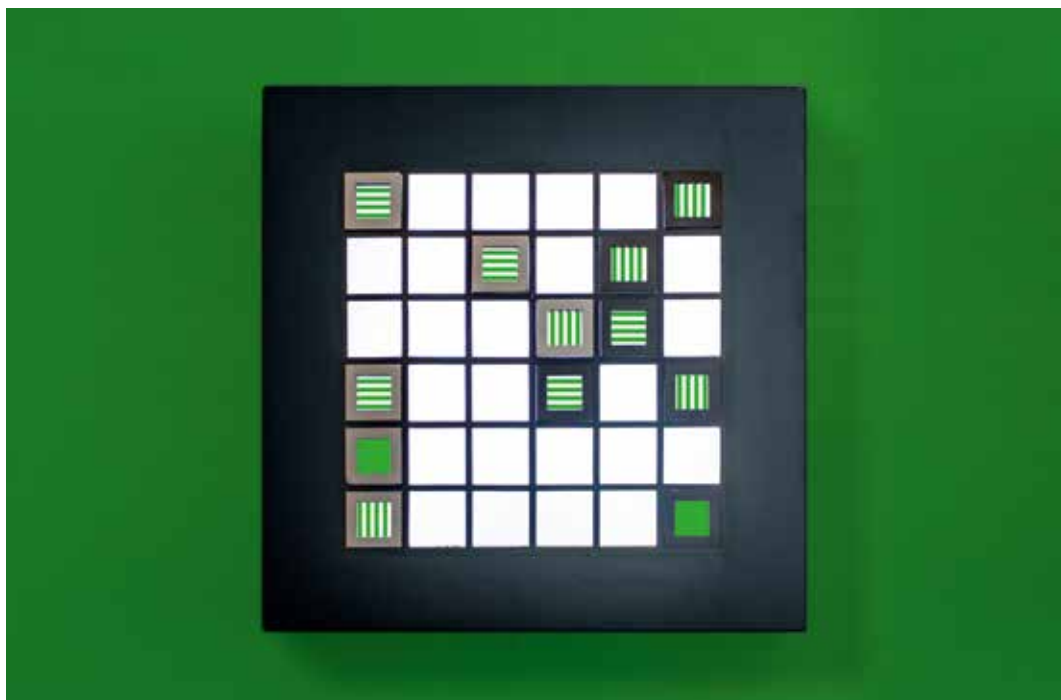
Concept: Alex Braga

Coding: Francesco Riganti Fulginei, Antonino Laudani



Alex Braga (IT) experiments in the field of technology and sustainability and is touring the world with the revolutionary *A-MINT* project. He has exhibited internationally at CENTRE POMPIDOU, MACRO, GNAM, among others, and his collaborations include John&Doug Starn, Extraweg, John Digweed, PublicServiceBroadcasting, UNITED NATIONS, Google, WorldBank, Univ. RomaTre, Santa Cecilia, Univ. P. Fabre, Conservatorium of Brussels, and Nat Geo. He composed the soundtrack to the film *Flesh Out* that was screened at the Berlinale (world premiere) and Tribeca in 2019. He is currently building the first village printed in 3D on site with clay and rice fiber.

<https://www.a-mint.it>



Alterplex

Hakan Lidbo

Alterplex is a strategic board game where the board is invisible, except seen through the pieces. The moving properties of the pieces are decided by the animations of the board, constantly changing, following a hidden pattern. The game is synchronized with a musical structure that guides the players with timing and strategy. As the players have to predict many possible futures, the game becomes a training tool for non-linear thinking. The rules are very simple; each piece can move in the same direction as the animation inside the piece. If the animation is still, it may not move.

The key to master this game is to predict the changing patterns of the board by following the music. The patterns change in cycles of 10 seconds with 6 different colors, completing the loop in 1 minute. Both players move whenever they want within a cycle.

Concept, rules, music, and design: Hakan Lidbo
Woodwork and painting: Farzaneh Farkish,
Per Magnusson
3D modelling and print: Mikael Sjosten

Hakan Lidbo (SE). Following a career in electronic music with more than 350 records released within numerous genres, Hakan Lidbo is now exploring new ideas with the same inexhaustible energy in the fields of interactive art, games, innovations, architecture, society, media, events, and robotics. He also founded the Rumtiden Idea Lab in Stockholm Sweden, where his team explore the intersection between new art forms, science, and society.

<https://www.hakanlidbo.com/alterplex>



Max Björnerud

Beholder

United Visual Artists

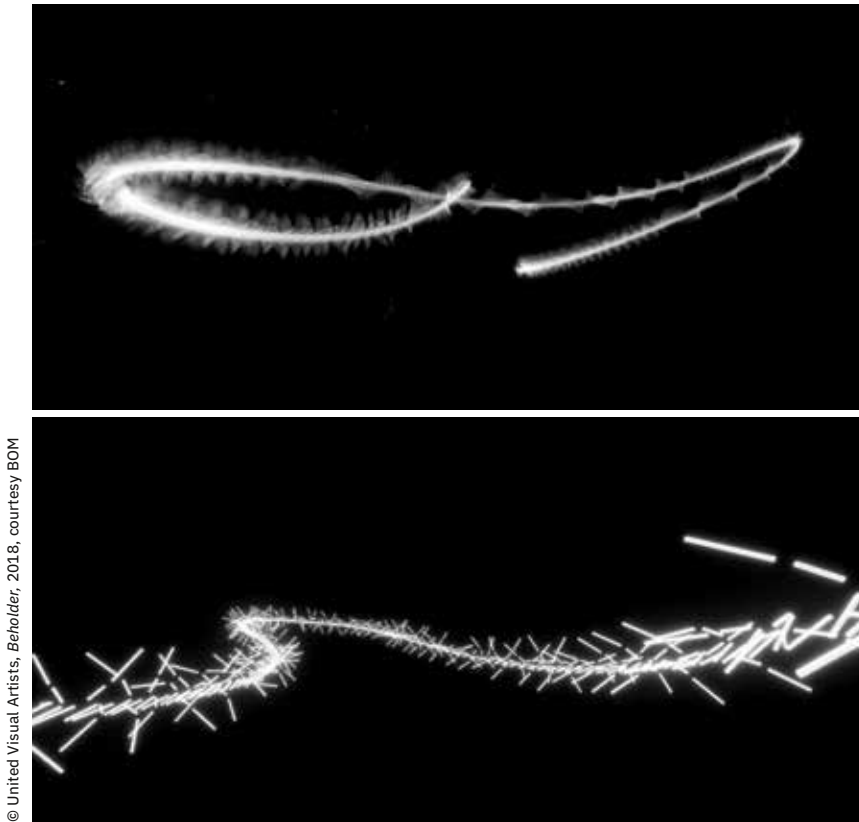
Beholder continues UVA's investigations into time perception and the relativity of our experiences. It centers around the wonder of everyday phenomena as seen through autistic perspectives, inviting us to re-evaluate our perception of beauty.

"My son Oliver is profoundly autistic, he has never been able to communicate with words and sees the world in a very different way to that of a neurotypical person. When BOM gallery invited UVA to make a work using VR and in collaboration with

high functioning autistic artists, I felt compelled to embrace the idea and hopefully raise awareness about the condition. Rather than focus on the negative aspects of autism, *Beholder* is a work that celebrates some of the fascinating aspects of the neurodivergent perception."

Matt Clark, Founder of UVA

Beholder was on display at V&A Museum in September 2018 and at Birmingham Open Media gallery from October 4 to December 8, 2018.



© United Visual Artists, *Beholder*, 2018, courtesy BOM

United Visual Artists (UVA) is a London-based practice founded in 2003 by artist Matt Clark. UVA's diverse practice integrates new technologies with traditional media such as painting, sculpture, performance, and installation. UVA have a collaborative approach and have worked with artists including choreographer Benjamin Millepied, filmmaker Adam Curtis, and musicians Massive Attack. UVA's work is collected by Fondation Cartier and MONA. Commissioners include The Victoria & Albert Museum and the Serpentine Gallery.

<https://uva.co.uk/works/beholder>



Cave of Sounds

Tim Murray-Browne in collaboration with Dom Aversano, Susanna Garcia, Wallace Hobbes, Daniel Lopez, Tadeo Sendon, Panagiotis Tigas, Kacper Ziemianin

Cave of Sounds is a project connecting music's prehistoric origins with the technological radicalism of the music hacker scene. It emerged from an open-ended process which I began in 2012 as composer in residence at Music Hackspace, London. I announced an open invitation to form a collective of musicians where each person would express their personal musical self by creating a new musical instrument. But these instruments would exist alongside each other, in the emerging ecosystem of the collective. In this way, we created a new kind of contemporary ensemble encapsulating non-hierarchical collective creativity. There was no selection process. After the first meeting, eight chose to remain. We worked through an experimental process of group improvisation, akin to a jam session for instrument builders, stretched over months and years. Every few weeks we met to experiment, listen, and discover what themes and ideas resonated. In 2018, we finalized the design and declared the project complete.

These eight instruments have no expert players and have never featured in a 'performance.' Instead, they are exhibited as an interactive sound installation, arranged in a circle around a luminescent hub. Visitors are invited to play the instruments freely without mediation or guidance. In this way they are simultaneously connected across time to the musical worlds of the instruments' creators and across space to the other participants through a spontaneous act of musical play.

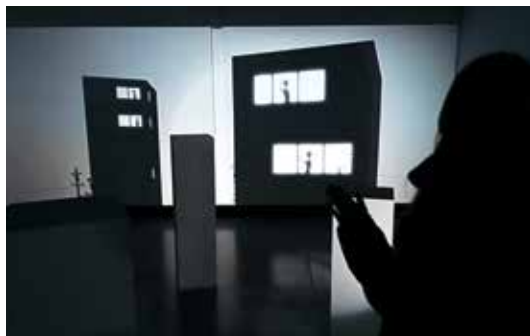
The artists received production support from Terry Tyllesley, Anastasia Alekseeva, Harry Murdoch and Sets Appeal (Hela Dondertman, Sophie Jacobs and Bridget Murton). Documentation films by Mind The Film and Anastasia Alekseeva.

Cave of Sounds was created through a Sound and Music Embedded residency with Music Hackspace and further developed using public funding by the National Lottery through Arts Council England with support from Music Hackspace, Somerset House Studios, and British Council.

Tim Murray-Browne (UK) is an artist and coder creating interactive installations. He uses technology to explore how we construct our sense of self through interactions with our environment and each other. He was London's Music Hackspace's first composer-in-residence through Sound and Music's *Embedded* programme, during which period he initiated the *Cave of Sounds* project with seven other artists, musicians, technologists from Music Hackspace: Dom Aversano, Susanna Garcia, Wallace Hobbes, Daniel Lopez, Tadeo Sendon, Panagiotis Tigas, and Kacper Ziemianin.



<http://caveofsounds.com>



Hello, Shadow!

Joon Moon

Hello, Shadow! is an interactive art installation implementing a kind of augmented reality mixed with a shadow. I have been developing this kind of AR media from my previous work *Augmented Shadow* (2010). This media augments the reality by mapping virtual shadows on the real shadows of objects. Users have to move the angle of a lighting source to observe shadow shapes that are generated by computer graphics, then get to understand the virtual world embedded in the shadows. Because of the characteristics of a shadow located at the boundary between imag-

ination and reality, the users feel a unique fantasy and poetic emotions with intellectual fun due to the unexpected shape of the shadows.

I have been experimenting with the unique visual language and interaction rules of this AR media. This time I have developed a new device which is capable of performing more sophisticated augmented shadow and many more possibilities. Under the theme of an encounter with the shadow world, *Hello, Shadow!* is the first art work using the device.



Joon Moon (KR) is mostly working on experimental media and computational art such as augmented reality, tangible interface, generative art, and sound visualization. He is also a university teacher, freelance designer, and computer programmer. His works were exhibited at MOMA (New York), Microwave, Onedotzero, FILE, Cinekid, Scopitone, and major museums of Korea such as National Museum of Modern and Contemporary Art, Seoul Museum of Art, Gwanju Design Biennale, and Kumho Museum.

<https://www.joonmoon.net>



ISM Hexadome

Institute for Sound & Music (ISM)

The *ISM Hexadome* is a platform for installation and live performance, featuring a 52-channel immersive sound system, assembled on a 15.5-meter wide, 7.9-meter high hexagonal structure, holding 6 projection screens. This system enabled artistic collaborations between both sound and visual artists to create immersive audio-visual installations and also perform live. Live performances held approximately 200 people while installations were presented on rotation over the course of the day, where the public could come and go as they please. The *ISM Hexadome* had the honor of being hosted at the Gropius Bau in Berlin. Over four weekends, the selection of live performances and installations were presented by nine audio-visual artist collaborations from Peru, the Netherlands, Belgium, Armenia, England, Australia, Germany, Canada, and the USA. These works represented a diverse range of concepts and disciplines, from 3D universes, artificial neural networks, ancient iconography, matrixes of oscillators, collages of voices and hymns, electron microscopes, and at one point, a cast of live actors leading crowd participation—to name just a few.

Institute for Sound & Music (ISM), Pfadfinderei, ZKM, IRCAM, System 180. Gropius Bau and the Berliner Festspiele, and Norient – Network for Local and Global Sounds and Media Culture.

ISM Admin Team and further volunteers include:

Nick Meehan, Marie Kristin-Meier, Brendan Power, Ben Fawkes, Martyn Roberts, Mea Liedel, Joanna Petkiewicz, Clemens Miegel, Sarah Miller

Sound engineers: Holger Stenschke, Benjamin Miller, Ecki Güther, Mirna Stanić

With special thanks to Ludger Brümmer, Götz Dipper and the rest of the ZKM team

Video engineers and Project design: Tobias Götz, Jan Honza Taffelt

With thanks to Frederick Roeser, Marco Ciceri, Anne Sebald, and the rest of the Pfadfinderei team

Norient—helping with curation of 2 collaborations: Theresa Bayer, Thomas Burkhalter, Hannes Liechti, Sandra Passaro

System 180: Christoph Blanc, Alexander Prickel

Artists that created work for the ISM Hexadome include: Tarik Barri with Thom Yorke, Holly Herndon and Mathew Dryhurst, Ben Frost with MFO, Peter van Hoesen and Heleen Blanken, Frank Bretschneider and Pierce Warnecke, CAO and Michael Tan, Lara Sarkissian and Jemma Woolmore, René Löwe with Pfadfinderei, Brian Eno with Peter Chilvers

With special thanks to Thomas Oberender, Artistic Director of the Berliner Festspiele, Stephanie Rosenthal, Director of Gropius Bau. And a special thanks to all the board members of the Institute for Sound & Music.

The **Institute for Sound and Music e.V.** is a Berlin-based non-profit organization dedicated to the culture of Sound, Immersive Art, and Electronic Music. Presently, the ISM is raising support and awareness for its ultimate goal to establish a new and permanent home for a cutting-edge museum experience in Berlin, through a series of three global touring exhibitions. The core team is a community of dedicated individuals, living in Berlin, working in the field of sound, art and technology, who share this common goal for creating a permanent space.

<http://berlin-ism.com/en/news/the-ism-hexadome-in-review-martin-gropius-bau>

<https://www.youtube.com/watch?v=GAD-2JE-G-k>

Journey on the Tongue

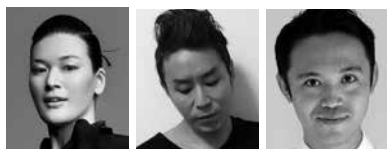
Ayako Suwa, Evala, Yasuaki Kakehi

Journey on the Tongue is a totally new taste and sound installation which invites you on a spectacular multi-sensory journey. Realized by the three artists Ayako Suwa, the pursuer of “Expressive food,” sound artist Evala, the founder of *See by Your Ears*, and media artist Yasuaki Kakehi, who explores new haptic experiences. This work is a new perception of sound and taste.

In your mouth, on your tongue, you will taste a sound experience of the journey to the various destinations. When you wear earplugs to cancel extraneous sounds and put a candy “Taste of Journey” in your mouth, the journey starts with sounds vibration. Then you can hear the sounds clearly inside your body. Though you close your eyes and ears, the experience evokes various dreamscapes via the multiple sensations of sound, touch, and flavor. Everything synthesizes in the mouth to provide a sense of time passing and spatial movement.

The journey starts by selecting one aroma from the twelve scents blended especially for the exhibition. This aroma becomes the compass that guides guests to their destinations as they taste a candy which has several layers of tastes and textures in harmony with the fragrance and sounds. A vibration actuator expresses a soundscape by Evala in your mouth through your bone conduction. Then you leave on a spatial journey via tasting and hearing. It all depends on you. It can seem like a long journey that takes many years or a few hours, even though the experience only lasts 4 minutes. This invisible experience is a challenge for people of today who place disproportionate emphasis on what we can see.

Director, Taste & Aroma: Ayako Suwa
Sound & composition: Evala (*See by Your Ears*)
Tactile device: Yasuaki Kakehi
Supported by LEXUS
Special thanks: DENTSU LIVE inc., Nihon Firmenich K.K.



Ayako Suwa (JP) started the works of “food creation” in 2006 after graduating from Kanazawa College of Art. Creating food as art that explores the human instincts of desire, curiosity, and evolution, she presents new values for food that are neither gourmet tastes, nutrition, nor an energy source. **Evala** (JP) is a sound artist and musician. He shows the spatial and immersive music experience in his original project *See by Your Ears*. He has been creating edgy works of electronic music and exploring music

experience with the use of 3D sound systems as new instruments. **Yasuaki Kakehi** (JP) is an HCI researcher and media artist. Associate Professor of the Interfaculty Initiative in Information Studies, The University of Tokyo. He received his PhD from the University of Tokyo. He has created interactive works that augment our experiences in the physical environment richly with the combination of digital technologies and physical materials.

<https://lexus.jp/international/brand/intersect/tokyo/garage/journey-on-the-tongue.html>



Meandering River

onformative, kling klang klong

Meandering River is an audiovisual art installation comprised of real-time visuals and music composed by an A.I. through machine learning. The piece reinterprets the shifting behavior of rivers in the landscape, regarded from a bird's eye view. Minor changes of riverbeds are not visible for the bare eye, as they are gradually happening over time. Spanning over multiple screens *Meandering River* visualizes these altering landscapes and makes the changes visible. It leaves the observer with a unique perception of time.

By investigating scientific research that examines the natural phenomenon of meandering rivers,

different algorithms were developed to authentically simulate the unpredictable movements of rivers and reinterpret their organic structures, rhythmic fluctuations, and visual materiality. The accompanying soundscape was developed with the help of an A.I. to complement the mesmerizing movements of the visuals. Values outputted directly from the river simulation were analyzed and interpreted in real-time to influence the musical parameters and reflect the performative nature of the work.

Concept and visuals: onformative
Musical score: kling klang klong

onformative (DE) is a studio that aims to challenge the boundaries of art, design and technology. Guided by an emotional approach, they search for new forms of creative expression. Their meaningful artworks explore the relationship between humans and technology. **kling klang klong** (DE) develops intelligent acoustic scenographies within science, art and communication. The studio focuses on putting the visitor as an active participant in interplay with an organic sound environment and thereby intensively exploring music, soundscapes, and installation art.

<https://onformative.com/work/meandering-river>

Mitigation of Shock

Superflux

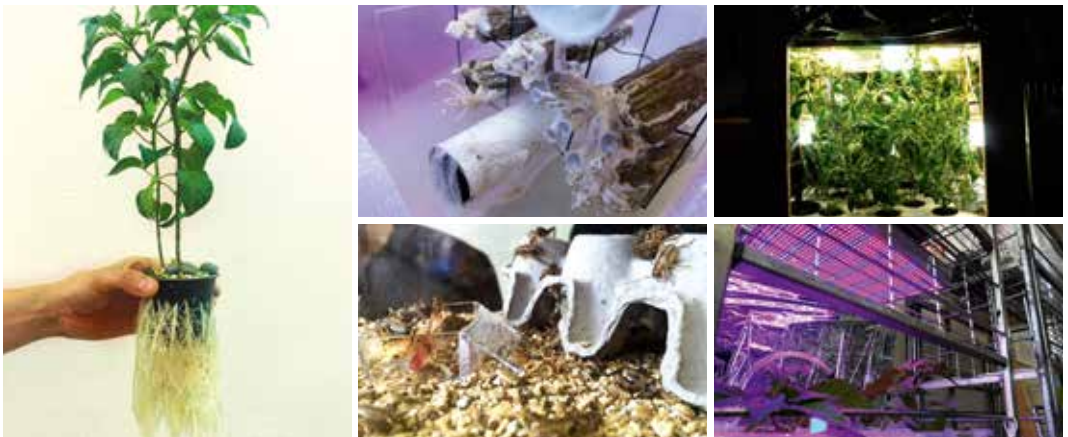
Climate change will transform the lives of people living in Europe in ways it is difficult to imagine. In the next few decades, the region is expected to experience huge problems with food insecurity, extreme weather, and resource scarcity.

Mitigation of Shock (MOS) is an experiment giving the future consequences of climate change immersive, visceral form. Superflux wanted people to experience what living with climate-related resource scarcity might feel like, and potential adaptations for mitigating the worst of its effects. The team designed and built a near future apartment featuring a DIY food computer system improvised from the detritus of a technological utopia that never quite arrived. Experimental food production stacks occupy areas in the home once intended for relaxation. Salvaged consumer items

like IKEA shelves, decorative fog makers, and computer fans have been resourcefully hacked together with programmable micro-controllers, plumbing supplies, and LED lamps. Plants grow in nutrient dense fog without soil, sunlight, or water. Containers of live mealworms wriggle next to containers of edible mushrooms which fruit on logs of recycled cardboard. Fox skins, snares, and hand-drawn maps mark the locations of edible plants, suggesting urban foraging. Evidence from the world outside infiltrates the space: a radio playing the hourly news; newspapers on the coffee table dated 2050; and a view of the future cityscape from the window.

Lead artists: Jon Ardern, Anab Jain

Project team: Maël Hénaff, Mikhala Clementine, Jon Flint, Alix McCabe, Vytautas Jankauskas, Jake Charles Rees, Danielle Knight, Matt Edgson, Nicola Ferrão



Superflux (UK) imagine and build future worlds you can experience in the present moment. By creating new ways of seeing, being, and acting, the Studio prompt us to critically examine our choices and decisions, today. Founded by Anab Jain and Jon Ardern in 2009, the Anglo-Indian studio's work involves the design and production of visceral experiences, tactile toolkits, and strategic interventions to shape understanding of the present, and provoke thinking about future possibilities.

<http://superflux.in/index.php/work/mitigation-of-shock/#>

PatentPandas.org

Jie Qi, Carol Lin, May Qi, Ira Winder

PatentPandas.org is a resource built to explain (scary) patent law using (not-scary) panda comics. The website has three core parts:

- Resources: information pages that explain the patent system (like prior art, what is patentable, infringement, etc.) using friendly language and humorous panda comics.
- Stories: accounts by everyday inventors who had adventures (or misadventures) involving patents, which highlight what they learned from their experiences.
- Get Help: for innovators who are in need of legal support, we compiled a list of pro bono law clinics that offer to help innovators referred by *patentpandas.org*

All pages have been reviewed by legal experts for accuracy.

PatentPandas.org was born at the Berkman Klein Center for Internet and Society at Harvard Law School by fellow Jie Qi, after she experienced patent issues of her own. One company tried to patent her work after a job interview and, in another case, a crowdfunding campaign backer successfully patented her and her collaborators' product.

In communities known for innovation, patent issues happen more often than many of us know. Our hope is to share our knowledge so that others don't have to suffer the fear and confusion that we did. PatentPandas.org shares important information that is often difficult to find and only learned through many conversations with experienced patent lawyers and inventors.

We believe that patent law is important for all creators to know—to understand the laws surrounding what we make empowers us to better share our work with the world.

Creator, author: Jie Qi
Author, editor: Carol Lin
Illustrator: May Qi
Web design: Ira Winder
Legal support: Suffolk Law School IP & Entrepreneurship Clinic, University of Southern California IP and Technology Clinic, Harvard Law School Cyberlaw Clinic, Stanford Law School Juelsgaard IP and Innovation Clinic, BU/MIT Technology Law Clinic
Funded by: Berkman Klein Center for Internet & Society and MIT Media Lab
Special thanks to: Ben Virgin, Caitlin Devereaux, Austin Stenberg, Jef Pearlman, Loletta Darden, Jessica Fjeld, JP Ellis, Andy Sellars, and Joi Ito



Jie Qi (US) is a designer, educator, inventor, and entrepreneur. She cofounded Chibitronics, which makes toolkits blending art with engineering, and is project assistant professor at University of Tokyo. Carol Lin (US) is an alum of Harvard Law School Cyberlaw Clinic and holds a JD/MBA from Harvard Law and Business Schools. May Qi (US) is a professional doodler and undergraduate at Brown University. Ira Winder (US) is an educator, researcher, and practitioner of computational methods for urban planning and systems engineering at MIT.

<https://patentpandas.org>

LOW-TECH MAGAZINE

This is a solar-powered website, which means it sometimes goes offline. ☀

About | Low-tech Solutions | High-tech Problems | Obsolete Technology | Offline Reading | Archive | Domain | ☰

How to Make Wind Power Sustainable Again

High-tech Problems

If we build them out of wood, large wind turbines could become a textbook example of the circular economy.

June 2018



Reinvesting the Small Wind Turbine

Low-tech Solutions

A wooden rotor and tower greatly increase the net energy output over the lifetime of a small wind turbine.

May 2017



Low-tech Magazine: The Printed Website

Obsolete Technology

Read Low-tech Magazine with no access to a computer, a power supply, or the internet.

March 2017



Heat your House with a Mechanical Windmill

Low-tech Solutions

Given the right conditions, a mechanical windmill with an oversized brake system is a cheap, effective, and sustainable heating system.

October 2016



Keeping Some of the Lights On: Redefining Energy Security

Low-tech solutions

To improve energy security, we need to make infrastructure less reliable.

November 2015

Solar Powered Website

Kris De Decker, Marie Otsuka, Roel Roscam Abbing, Lauren Traugott-Campbell

Low-tech Magazine questions the belief in technological progress, and highlights the potential of past knowledge and technologies for designing a sustainable society. Because a web redesign was long overdue—and because we try to practice what we preach—we decided to build a low-tech website that meets our needs and abides by our principles.

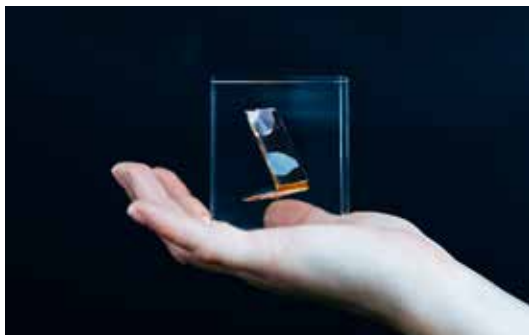
To reduce energy use, we opted for a back-to-basics web design, using a static site instead of a database driven content management system. We further apply default typefaces, dithered images, off-line reading options, and other tricks to lower energy use far below that of the average website. In addition, the low resource requirements and

open design help to keep the blog accessible for visitors with older computers and/or less reliable Internet connections.

Because it uses so little energy, the website can be run on a mini-computer which needs only 1-2 watts of power, which is supplied by a small solar installation on the balcony of the author's home in Barcelona. Typical for off-the-grid renewable power systems, energy storage is limited. This means that the website will go off-line during longer periods of cloudy weather. To help visitors "plan" their visits to the solar powered website, we provide them with several clues, such as a battery meter, current sky conditions, and weather forecast.

Kris De Decker (BE) is the creator and author of *Low-tech Magazine*, an online publication that highlights the potential of past knowledge and technologies for designing a sustainable society. **Marie Otsuka** (JP) is a designer, developer, and educator exploring systems of use. Her research focuses on tools and methods for making work. She is currently drawing typefaces and programming scripts at Occupant Fonts. **Roel Roscam Abbing** (NL) is an artist and researcher whose work engages with the issues and cultures surrounding networked computation. Currently he also works as a teacher in Digital Media at the department of Graphic Design in Artez, Arnhem. **Lauren Traugott-Campbell** (US) is a graphic designer and artist working in exhibition and print design at MGMT Design in New York City. Her work investigates the materiality of digital systems and the labor involved in making them run.

<https://solar.lowtechmagazine.com>



SPACE WASTE LAB

Studio Roosegaarde

“Space waste is the smog of our universe.”

Daan Roosegaarde

Right now, there are more than 29,000 objects larger than 10 centimeters floating around the earth, apart from the 8.1 million kilos of space waste which endangers our satellite communication, and nobody really knows how to fix it. *SPACE WASTE LAB* is the multi-year living lab with the European Space Agency and Studio Roosegaarde to capture space waste and upcycle it into sustainable products. The project is accompanied by an education program with more than 2,000 participating students, live performance, and accompanying exhibition.

The *SPACE WASTE LAB PERFORMANCE* is a unique large-scale outdoor artwork of LEDs and real-time

tracking information to visualize space waste above your head on an altitude of 200 to 20,000 kilometers. A real piece of space waste is part of the outside exhibition. Specially designed software and camera technology enables the performance to work, in compliance with strict safety and aviation regulations.

Together with the support of people and organizations like Dutch astronaut Andre Kuipers, Franco Ongaro (Director European Space Agency), NASA, and many space experts, Studio Roosegaarde raises awareness regarding this world matter, proposing solutions on how to make a difference and to startup this process.

Design and concept: Studio Roosegaarde
Supporting knowledge partner: European Space Agency
Photos: Studio Roosegaarde, European Space Agency

Studio Roosegaarde (NL) is a pioneer for the liveability of our future landscape in the global world. Clean air, clean water, clean energy, and now clean space are our new future values. As social design lab, Dutch artist and innovator Daan Roosegaarde (1979) and his team of designers and engineers connect people and technology to improve daily life in urban environments and spark imagination.

<https://www.studioroosegaarde.net/project/space-waste-lab>



Willem de Kam

Stone Web – Expanding Space

Idalene Rapp, Natascha Unger

Basalt, an igneous rock formed by cooling lava, is the most common rock in the Earth's crust. Basalt's advantageous mechanical, chemical, and thermal properties spurred industry to explore it and develop the eco-friendly Basalt Fiber.

In *Stone Web*, Basalt is transformed into a light, stable modular system that can be used for small scale applications such as furnishing or combined to create large, spatial structures, or urban furniture. Due to its scalability and production optimization, for example using robotics, future applicability ranges from landscape design to architecture. *Stone Web*, seen equally as an art object and product, finds its place between space, urban object, furniture, architecture, boundary, and installation.

To make the modules, fiber is soaked in resin and

wrapped web-like around a form. After the resin has cured a skin of Basalt Fiber is left. Depending on the thickness of the filament, the surfaces exhibit different densities and strengths.

For us it was important that the technical as well as aesthetic dimension of the project blend and translate the multilayered nature of the material. Revealed by the viewers' movement, the net-like assemblies form varying complexities and degrees of transparency, while their formations continually shift and blur. Spatial boundaries emerge, obscure, and become visible and transparent. The surprising strength and stability allow the viewer to interact physically and playfully, by sitting, walking, or climbing on the structure.

Supported by the Berlin Academy of Art, Weißensee, Prof. Christiane Sauer

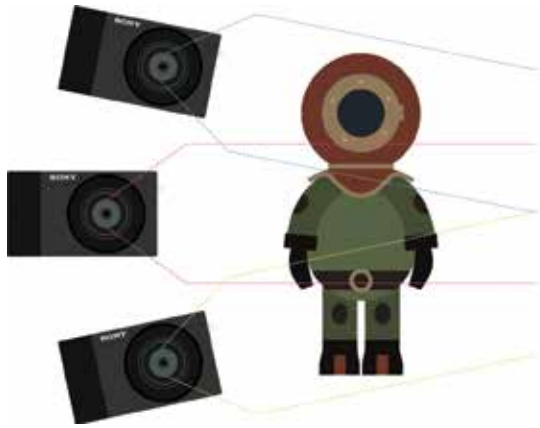


Weißensee Kunsthochschule Berlin, Natascha Unger, Idalene Rapp



Idalene Rapp (DE) and Natascha Unger (DE) are a Berlin-based experimental design duo, driven by a captivation with elemental and spatial relationships, experimenting through spatial design and materiality. Their collaboration dates back to their time at the Berlin Academy of Art, Weißensee, where they completed their BAs and MAs in Textile and Surface Design. Throughout their creative partnership, they have developed a fascination with testing and exploring the limits of materials.

<https://rapp-unger.com/stone-web-expanding-space>



Stop-Motion VR

Denny Koch, Johannes Schubert

With *Stop-Motion VR*, the project team uses Stop-Motion Animation to transport one of the oldest and most traditional methods of film production into the interactive world of virtual reality. One of the motivations for bringing two seemingly antagonistic technologies together was the team's observation that, due to the simplicity and special charm of the animation method, stop-motion films and clips are still created and shared on the Internet even in the age of YouTube.

Based on the conviction that especially individual creatives and smaller creative teams would benefit from a simple and direct method to realize their ideas in Virtual Reality, the goal was to develop an easy-to-use and comprehensive workflow and an accompanying manual. In order to be able to develop the workflow on the basis of real and demanding production conditions, the team

at Babelsberg (Potsdam, Germany) cooperates with the puppet film production Laika & Nemo of the Film University Babelsberg KONRAD WOLF and the company merger Metropolis VR.

The technical developments in the field of processing real objects for use in virtual space were also a great incentive for the team to implement the project. Photogrammetry is a technology available for the digitalization of static objects that allows three-dimensional models to be reconstructed from rows of individual photographs. Since stop-motion animations are a series of individual static, photographed animation phases, this method offers an optimal technical basis for the development of a workflow.

The project was made possible with the support of MIZ – Media Innovation Center Babelsberg (Medieninnovationszentrum Babelsberg)

Denny Koch (DE) studied interface design at the Potsdam University of Applied Sciences and wrote his bachelor thesis on virtual reality there in early 2015. On the basis of the theses developed during his bachelor thesis, Denny taught a course on Presence in Virtual Reality in the winter semester 2015/16 on behalf of the FH Potsdam as a lecturer in the field of interface design. Parallel to his teaching activities, he co-founded the company SCENID in Berlin in 2015, where he works as an interface designer and in software and hardware development. **Johannes Schubert** (AT) is a Berlin/Vienna/London based independent film producer of fiction, animation, and documentary films. Born and raised in Vienna, Johannes studied at Film University Babelsberg close to Berlin, where he passionately produced films that went to over 100 festivals around the world, won numerous awards, got cinema released all over Germany, and were nominated for the European Film Awards.

<https://vimeo.com/197169070> · www.miz-babelsberg.de · www.scenid.com · www.schubert.film





SoundShirt 2.0

CuteCircuit

The *SoundShirt* brings music to life in a way that it can be felt physically, live, in real time, on the body, in a tactile language unique to each piece of music being performed, opening new and diverse ways of enjoying music for the audience.

Using the *SoundShirt*, it is now possible to feel each passage of the music and each section of the orchestra as a unique and separate haptic sensation during a live performance. The orchestra's instruments are mapped to different areas of the garment; for example, the sounds of the violin section, being more energetic and lighter, are felt along the arms and shoulders, while deeper sounds such as bass or kettle drums are felt in the lower areas of the back and torso. The entire composition comes to life as a sensory language composed of a series of haptic, tactile, vibratory, and touch-like sensations across the body of the person wearing the shirt. The shirt is wirelessly connected to a computer on stage that is running the music analysis software algorithms in real-time, so the sensation of the music is always perfectly synchronized with the live performance of the orchestra.



Going through months of user testing, CuteCircuit created this unique wearable technology completely in-house, starting from the fashion design, to the hardware design, the actuation modules, and the software development. The *SoundShirt* contains 30 individual powerful miniature actuation modules controlled by the CuteCircuit Q software, the ultra-low latency computer software that translates the music captured from the instruments (via microphones placed on stage) into haptic data that gets streamed to the shirts of the audience members in real-time for a truly immersive music experience.

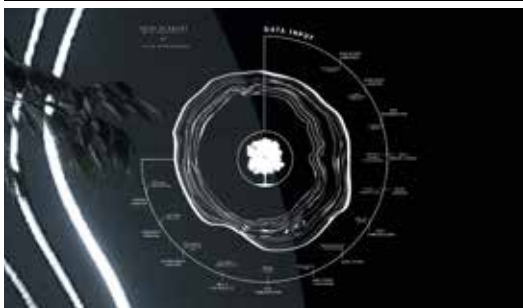
Cofounder CuteCircuit, CEO: Ryan Genz
Cofounder CuteCircuit, Chief Creative Director:
Francesca Rosella



CuteCircuit (UK), founded in 2004, is the world's first wearable-technology fashion brand. CuteCircuit interweaves leading edge fashion design with emerging technologies and smart fabrics to create fashions that not only look beautiful, but carry within them magical capabilities and interactive connections which create a new paradigm for both innovation and sustainable fashion production. CuteCircuit's co-founders, **Francesca Rosella** and **Ryan Genz**, have a background in fashion design (Valentino), and interaction

design and anthropology respectively, and hold a number of patents in the field of wearable technology, such as 3D Augmented Reality Audio, Interactive Luminous Garments, and Sensor Enhanced Fabric constructions.

<https://cutecircuit.com/soundshirt>



Voice of Nature

Thijs Biersteker

Using the real time data coming from a living tree in order to talk about the urgency of climate change, *Voice of Nature* aims to provoke a new relationship with nature surrounding us.

Using environmental sensors, 1600 real time data points were generated to create a data visualization that shows how the tree was “feeling” about environmental changes happening around it.

Trees are nature’s record keepers, they document their lives through annual growth rings hidden behind their bark. They reveal environmental changes and disease, forest fires, droughts, and pollution levels throughout the tree’s life. The sensors connected to its roots, leaves, and branches, monitor environmental conditions such as CO₂ levels, temperature, moisture and light levels, which are fed to an algorithm to generate digital rings every second instead of every year. Using their natural climate monitoring ability to convey the

urgency of climate change to us ordinary people? In collaboration with the Delft University of Technology the artwork combines bio-generated data to create a visual language. Showed on a giant halo behind the tree, the rings confront people with the tree’s health. Giving nature a voice that might be heard by humanity. By touching the tree, the artwork calmed down or its energy levels grew, leaving the spectator with an empowering message that change is at their fingertips.

Artist: Thijs Biersteker
 Production: Woven Studio
 Producer: Sophie de Krom
 Co-production: Here Your Art (CN)
 Partner: TU Delft
 Enabler: Xing Guang Hua City Construction (CN),
 Lumen Art Projects Ltd (UK)
 Motion design: Jurriaan Hos
 Creative coding: Mickey van Olst
 Electronics: Bas van Oerle
 Soundscape: End of Time

Thijs Biersteker (NL) creates interactive awareness installations about the world’s most pressing environmental and social issues today. He combines scientific research and new technologies to deliver an empowering experience that is accessible both intellectually and technologically. His award-winning immersive art installations, often described as eco- or awareness art, make the impact of the age of the Anthropocene tangible using a fluid mixture of data, kinetic motion, digital visualizations, analog elements, and the virtual and real worlds.



<https://www.youtube.com/watch?v=AGbmut3hy7w> · <http://thijsbiersteker.com/project/voice-of-nature>

Wastelands

Tagny Duff

Wastelands is a playful, yet serious biological art project exploring speculative fiction scenarios and current bioengineering practices applying methanogenic bacteria, archaea and bacteriophage to regulate methane production through anaerobic degradation. This biological art project speculates on a future 500 years from now when humans are using the biotechnology to create biogas, fueling the world with only our waste—excrement, methanogens and viruses—the key ingredients for the production of methane biogas. Although practiced for decades, interest in anaerobic fermentation has only recently focused on its use in the economic recovery of fuel gas from industrial and agricultural surpluses. However, this technological drive does not challenge or change the deeper issues around the industrialization of animal agri-

culture, but rather it re-enforces the same vision of utilitarianism where large-scale efficient monoculture production is manifested through the labor of living beings.

Artist, project concept, design, photography, sculpture, and biotechnological engineering: Tagny Duff
Time Traveler and *Cosmos* bioplastic sculptures, collaboration by Tagny Duff with WhiteFeather Hunter, co-designer and sole sculptor.

Researched and co-produced in collaboration with Bridge Artist Residency Program, Dr. Dana Kirk and ADREC at Michigan State University, Sylvain Moineau Labs at University de Laval, and Speculative Life Labs at Concordia University. Tagny Duff also acknowledges the work and intellectual property of WhiteFeather Hunter and Courtney Books in independently conducting the research, development, and protocol for the bioplastic material, which remains the sole intellectual property of WhiteFeather Hunter and Courtney Books.



Tagny Duff (CA) is an interdisciplinary media artist, scholar, and educator working across media art and microbiology with a keen interest in viruses, microbial interaction, and scientific practices from a cultural point of view. Duff's earlier biological art works *Living Viral Tattoos* (2006–ongoing) and *Cryobook Archives* (2010–ongoing) explore the scientific manipulation and potential of human-microbial relations with retroviruses. Duff has exhibited biological art works nationally and internationally, most recently in the Broad Art Museum where she showcased the *Wastelands* installation (2018–2019), produced during the Bridge Artist Residency Program at Michigan State University.

<https://tagnyduff.blog>



Impressions of the STARTS Prize'19 jury meeting.



Ferdi Alici (TR) is the founder and director of Ouchhh, a talented new media and motion design agency. Ferdi strives to find balance between art, science, and technology in every work he creates. As a new media artist and designer, he believes that science inspires great art, thus their integration is vital to Ferdi's approach. He creates award-winning outdoor A/V performances, video mapping projections, kinetic sculptures, and immersive experiences that touch upon the belief in employing design principles based on nature and applying these to computational design. Ferdi's work has been featured in world-renowned museums, organizations, and publications and he has worked with numerous international brands and recently for Netflix USA and Sony USA.

Francesca Bria (IT) is Senior Researcher and Advisor on Technology and Innovation policy. She has a PhD in Innovation Economics from Imperial College, London and an MSc in Digital Economy from University of London, Birkbeck. As Senior Programme Lead at Nesta, the UK Innovation Agency, she has led the EU *D-CENT* project, the biggest European Project on direct democracy and digital currencies. She also led the *DSI* project on Digital Social Innovation in Europe, advising the EU on digital social innovation policies. She has been teaching in several universities in the UK and Italy and she has advised Governments, public and private organizations, and movements on Technology and Innovation policy, and its socio-economic impact. Francesca Bria is an adviser for the European Commission on Future Internet and Innovation Policy. She is currently the Commissioner of Digital Technology and Innovation for the city of Barcelona, Spain, and she is leading the *DECODE* project on data sovereignty in Europe.



Rikke Frisk (DK) is the founder and co-director of the community-focused culture production company Indgreb (www.indgreb.dk) specialized 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. Rikke's latest initiative is Talk Town—a debate festival on gender, equality, and feminism of which she is co-initiator and festival director, 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. She is a member of the board of Denmark's leading venues for contemporary, experimental Jazz and world music: Copenhagen Jazzhouse and Global. Rikke has a background in architecture and communication.

Nadav Hochman (US) is co-founding director of The Tech + Arts Initiative at The Tech Museum of Innovation in Silicon Valley (CA, USA), facilitating creative collaborations between global artists, designers, industry partners, and research institutions. Prior to joining The Tech, Hochman led acclaimed projects in the tech industry, academia, and the art world. His work has been exhibited at MoMA (NYC), Google Zeitgeist, and SXSW, and featured in media outlets such as *Popular Science*, *The Atlantic*, *Wired*, and *The Guardian*. Hochman holds a PhD in Art History from the University of Pittsburgh.





Daehyung Lee (KR), art critic, curator, and acclaimed POWER LEADER 2012 by Forbes Korea, has been curating contemporary Asian art for the last 17 years. He curated the Korean Eye: Moon Generation exhibition in 2009 and its nomadic show until 2012 at the Saatchi Gallery in London. Currently he leads Hyundai Motor's ARTLAB and its global art partnerships that include MMCA's Hyundai Motor Series to Tate Modern's Hyundai Commission, LACMA's *The Hyundai Project*, and Bloomberg's *Brilliant Ideas*. Most recently, he curated the Counterbalance: The Stone and the Mountain exhibition at the Korean Pavilion, La Biennale di Venezia 2017 and the Max Mara "Coats!" exhibit in Seoul in 2017. He holds an MA in Curatorial Studies from Columbia University in New York and has advised the interdisciplinary playground ZERO1NE (2018), Gwangju Biennale (2016), Busan Biennale (2014), and Cheongju Craft Biennale (2013).

Alexander Mankowsky (DE), born in Berlin 1957, 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, focused on the ever-changing culture of mobility, the interdependency of social and technological innovation, and other aspects of envisioning paths into the future.



Moon Ribas (ES) is a Catalan avant-garde artist and cyborg activist best known for developing *Seismic Sense*, an online seismic sensor implanted in her feet that allows her to perceive earthquakes taking

place anywhere on the planet through vibrations in real time. Ribas transposes the earthquakes into sound, as in her piece *Seismic Percussion*; or into dance, as in *Waiting For Earthquakes*. In 2010 she co-founded the Cyborg Foundation, an international organization that aims to help people become cyborgs, defend cyborg rights, and promote cyborg art. Ribas also co-founded the Transpecies Society in 2017, an association that gives a voice to non-human identities, defends the freedom of self-design, and offers the creation of new senses and new organs in community.

www.cyborgarts.com

Şerife (Sherry) Wong (US/TR) is an artist, activist, and AI ethics consultant. In 2018, she founded Icarus Salon, an initiative to enrich the dialogue on the ethics of emerging technology. She was a Program Manager for the Autodesk Residency Program and created the Impact Residency at Pier 9 Technology Center (San Francisco, 2015-2018) where she worked with over 100 leading creative technologists exploring the future of robotics, AR/VR, engineering, 3D printing, and architecture. Şerife Wong has also worked on the development team at the Electronic Frontier Foundation and was assistant editor of *Artnet Magazine*. As an artist, she has exhibited internationally at venues such as Art Basel Miami, Shanghai Art Fair, FIAC Paris, ARCO Madrid, and Art Cologne. She is now focusing on her AI ethics work, which includes serving on a scientific advisory panel for USAID and Duke University on the future use of AI to address humanitarian challenges, and researching AI ethics and governance for the Center for Advanced Study in the Behavioral Sciences at Stanford University.



S+T+ARTS PRIZE '19

Nomination Committee



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S+T+ARTS PRIZE '19 International Advisors

22 international advisors who have reputation and credibility in the field recommend projects and help to encourage wider ranges of participants as well as a geographical and gender balance.



Jussi Ängeslevä (FI) is a designer, an artist, and an educator. With a home base at the Berlin University of the Arts and the Royal College of Arts, but lecturing around the planet, he is working with digital

materiality and interaction design. Parallel to the academic work, he is the Vice Creative Director of ART+COM studios. His design ethos is leveraging hardware, software, and physical and graphic design in the search for elegance in highly specific solutions, where the meaning of a work is inseparable from the medium communicating it.

Camille C. Baker (CA/UK) is a Reader at the School of Communication Design, University for the Creative Arts, Epsom, UK. She is also a media artist-performer/researcher/curator who has done recent work in participatory mobile and sensor performance using wearable technologies, and is now exploring creative coding and electronic development for smart-fashion projects. Her other research interests have included responsive interfaces and environments, video art and live cinema, experience design, telematics, networked communities, web animation, digital media curating, and music composition and performance.



Maurice Benayoun (MoBen, 莫奔) (FR) is an artist, a theorist and curator, and a pioneering figure in the field of New Media Art. His work explores media boundaries, from virtual reality to large-scale public

art installations, from a socio-political perspective. Benayoun has been widely awarded (4 Prix Ars Electronica awards, Golden Nica 1998 ...) and exhibited at major international museums, biennials, and festivals. Some of MoBen's major artworks

include *Tunnel under the Atlantic* (1995) and *World Skin: a Photo Safari in the Land of War* (1997). MoBen's most recent works investigate the concepts of critical fusion and transactional aesthetics. Benayoun is currently Professor at the School of Creative Media, City University Hong Kong.



Isabel Berz (ES) is Head of IED REC, the Research and Education Center at the Instituto Europeo di Design, Spain. As fashion designer, researcher, and educator, Isabel launched her own fashion label in

1990. In 2004 she was nominated Director of the Fashion School at IED Madrid, and in 2016 she founded IED REC, Research and Education Center in Madrid as an incubator of research at the intersection of Fashion, Design, Craft and Technology. IED REC creates research programs like IED CoDesign project *Las Manueles* and the IED Craft Platform and is a partner in the *Worth Partnership Project*, funded by the EU's COSME program, and the *Re-FREAM* project, funded by the EU's Horizon 2020 program.

Régine Debatty (BE) is a writer, curator, critic, and founder of *we-make-money-not-art.com*, a blog which received 2 Webby awards and an honorary mention at the STARTS Prize. Régine Debatty writes and lectures internationally about the way in which artists, hackers, and designers use technology as a medium for critical discussion. She also created *A.I.L. (Artists in Laboratories)*, a weekly radio program about the connections between art and science for Resonance 104.4 FM in London (2012–14), and is co-author of the "book sprint" *New Art/Science Affinities* published by Carnegie Mellon University.





Nick Ervinck (BE) is fostering a cross-pollination between the digital and the physical and explores the boundaries between various media. Studio Nick Ervinck applies tools and techniques from new media, in order to explore the aesthetic potential of sculpture, 3D prints installation, architecture, and design. Through his divergent practice, a strong fascination with the construction of space is noticeable. Not only does Nick Ervinck focus on the autonomous sculptural object, he also questions its spatial positioning and points to the phenomenological experience and embodiment of space. Ervinck's work in short oscillates between the static and the dynamic, prospecting new virtual or utopian territories. Nick Ervinck creates huge installations, sculptures, prints, work drawings, and animated films. For several years he participated in many individual projects and group shows.

Beatrice de Gelder (NL) is Professor of Cognitive Neuroscience in the Faculty of Psychology and Neuroscience at Maastricht University in Maastricht, The Netherlands, and a member of the Maastricht Brain Imaging Centre (M-BIC). Prior to her current assignments, she was a Senior Scientist at the Martinos Center for Biomedical Imaging, Harvard University. She received an MA in Philosophy, an MA in Experimental Psychology, and a PhD in Philosophy from Louvain University in Belgium. Her current research focuses on face and body recognition and, recently, on the neuroscience of art.



Chiaki Hayashi (JP) is the co-founder and currently the Representative Director of Loftwork Inc., which produces over 600 projects annually. She manages the operation of the company's creative platform Loftwork.com, which has 25,000 registered creators, FabCafe—a digital manufacturing café, and MTRL, a workspace facility that offers hands-on production materials. She is currently Japan Liaison to the Director at the MIT Media Lab. She recently started the initiative Hidakuma, which aims to promote the local craftsmanship and woods of Hida.

Dr. Drew Hemment (GB-SCT) is an artist, designer, and academic researcher. He is Chancellor's Fellow at Edinburgh Futures Institute, Project Lead of GROW Observatory, Founder of FutureEverything, and is on the Editorial Board of Leonardo. His work has been covered by *New York Times*, BBC and NBC, and recognized by awards from the arts, and technology and business sectors, including STARTS Prize 2018 (Honorary Mention), Lever Prize 2010 (Winner), and Prix Ars Electronica 2008 (Honorary Mention).



Anja Hendel (DE) has been Director of Innovation Management and Digital Transformation for Finance at Porsche AG since 2017, working alongside Dr. Mahdi Derakhshanmanesh to head up the Porsche Digital Lab in Berlin. This technical laboratory is a platform for collaborating with technology companies, start-ups, and scientific institutions, and deals with the practical application of concepts such as blockchain, artificial intelligence, and the Internet of Things at Porsche. With a degree in business data processing, Anja Hendel worked as Assistant to the Chief Financial Officer at Porsche from 2015, and was responsible for the IT portfolio and strategy prior to that from 2013. Before joining Porsche, she managed various departments at the pharmaceutical company Celesio AG (today: McKesson Europe AG) from 2007 onwards, including the SAP services and the IT project portfolio departments. Before this, Hendel worked at Stuttgart-based consulting firm Capgemini Deutschland GmbH for six years.

Hiroshi Ishii (JP/US) is the Jerome B. Wiesner Professor of Media Arts and Sciences at the MIT Media Lab. Joining the Media Lab in 1995, he founded the Tangible Media Group to make digital tangible by giving physical and dynamic form to digital information and computation. Here he pursues his visions of *Tangible Bits* (1997) and *Radical Atoms* (2012) that will transcend the current dominant paradigm of Human-Computer Interaction: *Painted Bits* of Graphical User Interfaces. For his visionary work in HCI, he was granted tenure by MIT in 2001 and the SIGCHI Lifetime Research Award in 2019.





Pascal Keiser (FR) has developed transversal projects between culture, digital society, and economy since 2003. He is co-founder and general coordinator of French Tech Culture since late 2013, the national cultural and digital label of the French government. He is co-founder of The Bridge, European accelerator of startups on crossovers culture & technology in Avignon, and was director of Technocité Creative Industries Knowledge Center in Mons from 2007 to 2017. He also directed the digital program of Mons 2015, European Capital of Culture, and is a member of the steering committee of the new VERTIGO program, funded under the Horizon 2020 European STARTS initiative.

Kilian Kleinschmidt (DE) is an international networker and a humanitarian and refugee expert with 30 years of experience in a wide range of countries, emergencies, and refugee camps as a United Nations official, aid worker, and diplomat. He is the founder and Chairman of the startup Innovation and Planning Agency (IPA) which aims to connect the millions of poor and disadvantaged with relevant and underutilized resources and modern technologies of the 21st century through its project *SWITXBOARD*. He is involved in several initiatives and projects that promote global connectivity through better use of globalization and is currently developing a number of ventures that aim at sustainable investment and social impact in very fragile environments.



Sophie Lamparter (CH) is founder and CEO of DART, a testing lab bringing Design, Art, Research and Technology together to create clever human-machine interfaces. DART works with research projects and early startups, enterprises, and investors. Sophie Lamparter's passion is finding new ideas and talent with a creative approach to technology. She helps them scale their ideas and consults with organization to challenge the status quo and launch new partnerships. Before starting DART, she was Associate Director at swissnex San Fran-

cisco, Switzerland's Innovation outpost in Silicon Valley. Sophie Lamparter has organized and curated interdisciplinary exhibitions and programs in media, digital and data arts, interaction and game design, robotics, VR, AR, architecture, and urbanism. She debuted as a STARTS Prize juror in 2017 and has spoken at international events such as SXSW in Austin, Gray Area in San Francisco, and the Lift Conference in Geneva.



Christiane Luible (AT) is co-leader of the department Fashion & Technology at the University of Art and Design Linz. Her main field of interest is practice-led design research for the field of fashion design and she focuses on the 3D modelling and virtual simulation of fashion and the influence of digital media on the process of fashion design. She has received several international Design Awards such as the Lucky Strike Junior Design Award. She collaborated on large European clothing research projects and is today responsible for several research projects dealing with fashion and technology.

Kenric McDowell (US) has worked at the intersection of culture and technology for twenty years. His résumé includes work for Nike, Focus Features, HTC Innovation, and Google. He currently leads the Artists + Machine Intelligence program at Google Research, where he facilitates collaboration among Google AI researchers, artists, and cultural institutions. Kenric McDowell's work often draws from the history of culture and philosophy for metaphors and models that can be applied to emerging 21st century culture and technology.





Marta de Menezes (PT) is a Portuguese artist (Lisbon, 1975) with a degree in Fine Arts from the University of Lisbon, and an MSt in History of Art and Visual Culture from the University of Oxford. She has been

exploring the interaction between Art and Biology, working in research laboratories demonstrating that new biological technologies, DNA, proteins, and live organisms can be used as an art medium. Her work has been presented internationally in exhibitions and articles. She has been artistic director of Ectopia – Experimental Art Laboratory since 2005 and director of Cultivamos Cultura since 2009.

Elaine W. Ng (KR) is the editor

and publisher of *ArtAsiaPacific*, a 25-year old publication dedicated to contemporary art from Asia, the Pacific, and the Middle East. In the mid 1990s she worked at Hanart



TZ Gallery, a pioneer promoting contemporary art from China, Hong Kong, and Taiwan. From the 2001–2002 Ms. Ng managed Videotage, one of Asia's first non-profit organizations for film, video, and new media. Ms. Ng currently sits on the advisory board of Asia Art Archive in Hong Kong, New Hall Art Collection at Cambridge University, and Alserkal Avenue in Dubai. Additionally, she lectures at Hong Kong Baptist University's Academy of Visual Arts and is a board member of Asia Art Archive in America, where she serves as secretary. Ms. Ng is based in Hong Kong.



Bastian Schäfer (DE), born in 1980, is a maverick, kitesurfer, TED speaker, father of a boy and a girl, and automotive engineer. After working at Volkswagen Design, he joined Airbus in 2006, working in

different projects for the A340, A350, and A380. In 2009 he joined the project team that created the award-winning Airbus Concept Cabin with its bionic structure. Bastian Schäfer is the project leader of the *Bionic Partition* project, where he is focusing on generative design combined with 3D printing technology.



Hugues Vinet (FR) is the Coordinator of the *VERTIGO* project. He has been Director of Research and Development of IRCAM since 1994 and manages all related research, development, and technology transfer activities.

He previously headed the Musical Research Group of the French National Institute of Audiovisual where he developed advanced R&D in real-time audio signal processing and human-machine interfaces. He participates in many bodies of experts in the fields of audio, music, multimedia, information technology, and technological innovation.

Filip Visnjic (UK) is a lecturer, cura-

tor, and a media technologist born in Belgrade, now living in London. He is the founder and editor-in-chief of *creativeapplications.net*, a site that tirelessly reports innovation and catalogues projects, tools, and platforms at the intersection of art, media, and technology.



In 2012, Filip Visnjic co-founded Resonate, an educational platform and a festival located in Belgrade, and the same year he launched *HOLO*, a magazine about art, science, and technology. He is currently Director of Platform at FRM, working on a new canvas for digital art, and he also lectures at a number of universities in the UK.



Jo Wei (CN) is a curator, researcher, and the founder of the Pan Bio-Art Studio (PBS). She is currently a researcher of Art, Science and Technology (AST) in the Central Academy of Fine Arts (CAFA), Beijing. Her

recent research interests include AST in a posthuman context, bio art/bio design, and others. Among her many curatorial programs are the exhibitions *Quasi-Nature: Bio Art, Borderline, and Laboratory* (2019, Hyundai Motorstudio, Beijing), *Kairos* (2018, Ars Electronica, Linz), and *When Forms do not Become Attitude* (2016, CAFAM, Beijing). Wei was also the co-curator of *Ethics of Technology* (2016) and *Post-Life* (2018), the 1st and 2nd editions of Beijing Media Art Biennale.



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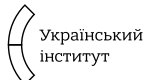
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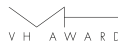
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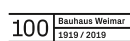
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Lavishly illustrated and containing texts by the prize-winning artists and statements by the juries that singled them out for recognition, this catalog showcases the works honored by the Prix Ars Electronica 2019.

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 3,256 submissions from 82 countries in four categories: Computer Animation, Artificial Intelligence & Life Art, Digital Musics & Sound Art, and the u19—create your world competition for young people.

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