CyberArts 2019

Prix Ars Electronica

S+T+ARTS
Prize'19

ARS ELECTRONICA
Art, Technology & Society

HATJE
CANTZ

CyberArts 2019

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S+T+ARTS Prize'19

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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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Innovation at the nexus of **S**cience, **T**echnology and the **ARTS**

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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

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 competition was not limited to any genres such as media art, digital art etc., and not limited to Information and Communication Technologies.

Recommendations by international advisors

To encourage a wider range of participants as well as a geographical and gender balance, 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 developments, 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.
Bjørn 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 glitzier 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 news 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 technological 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, ICCESS & 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 Kakehi

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

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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.

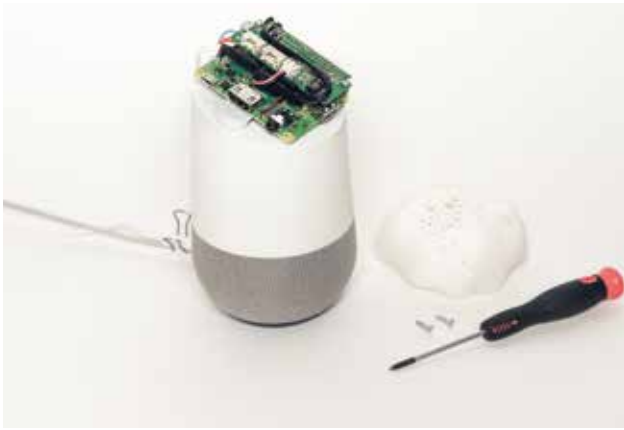
This makes *Alias* act as a middle-man device that is designed to appropriate and control voice-activated devices. Equipped with speakers and a microphone, *Alias* is able to communicate and manipulate the home assistant when placed on top of it. The speakers of *Alias* are used to interrupt the assistant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

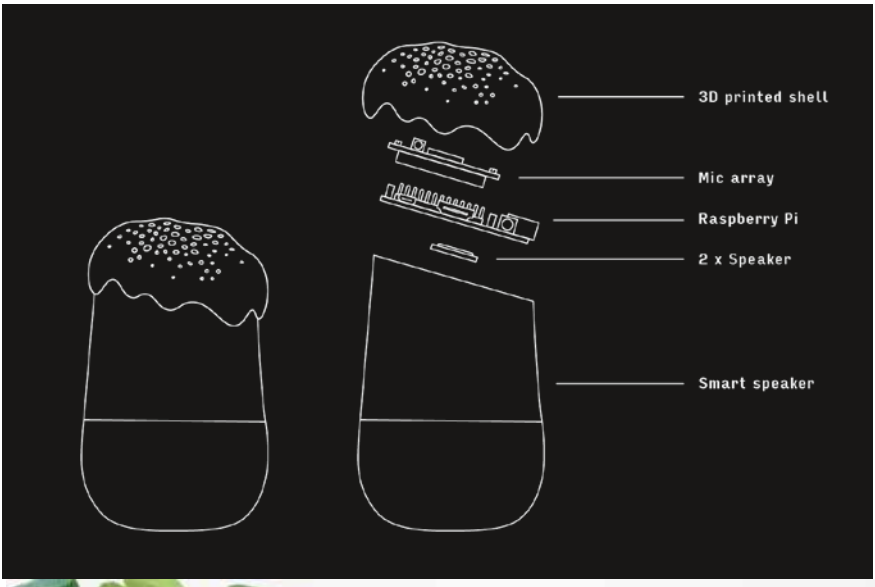
Our relationship with technology is formed by how

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

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Jorge Franganillo

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

0 m2 housing/m2 land — 15

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

Population density

0 inhabitants/m2 of housing — 0,005

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

0 Quality of construction indicator — 9

4 m^2/m2 of land (avg)
4 floors (avg in residential buildings)
31% streets < 10 m wide
63% plots < 200 $m2^2$
150 m2 avg of business premises

Buildings before 1940
Buildings in poor conditions
Extreme residential vulnerability

Saturation of diurnal activities

0 m2 surface of premises — 4.000

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

0 m2 surface of premises — 4.000

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 Martinez 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-Civio 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 of 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 PRIZE'19

HONORARY

MENTIONS

Anatomy of an AI System

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

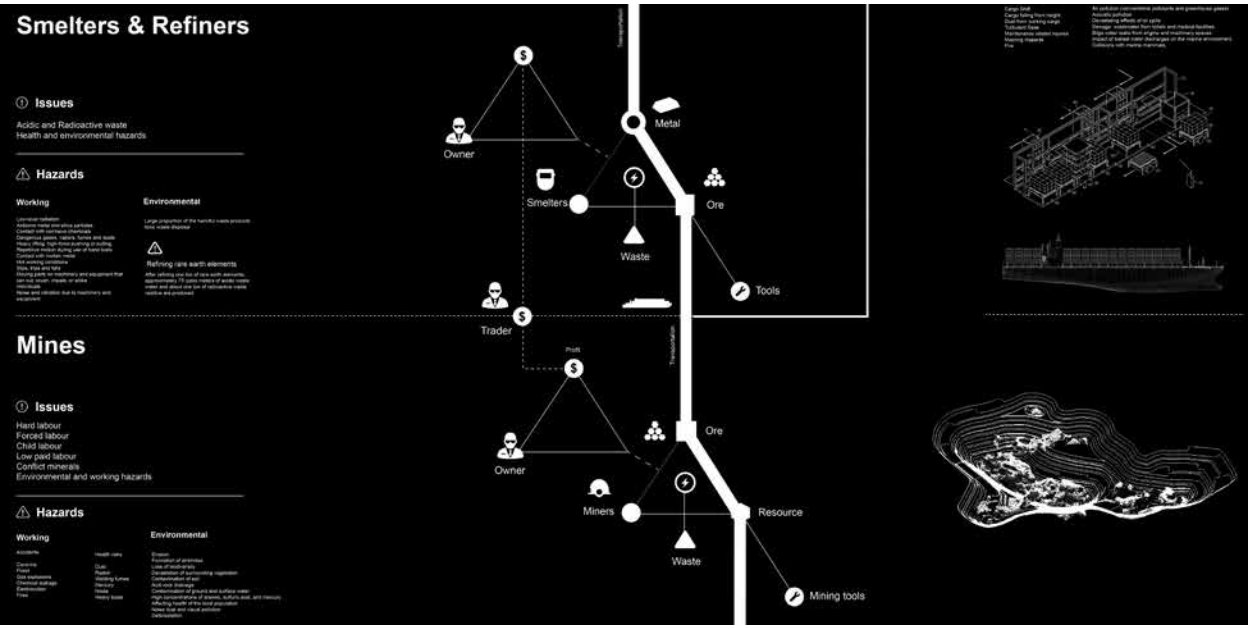
Anatomy of an AI System is a large-scale map and long-form essay investigating the human labor, data, and planetary resources required to build and operate an Amazon Echo. The exploded view diagram combines and visualizes three central, extractive processes that are required to run a large-scale artificial 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.

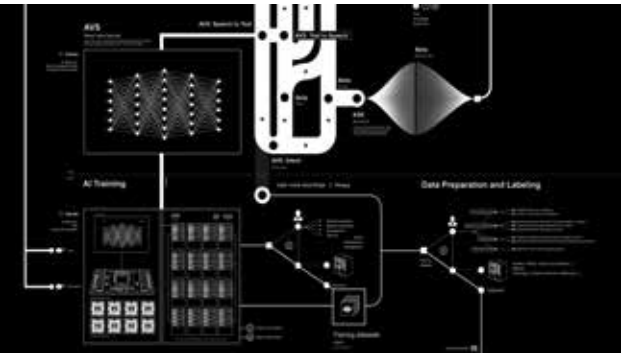
At this moment in the 21st century, we see a new form of extractivism that is well underway: one that reaches into the furthest corners of the biosphere and the deepest layers of human cognitive and affective being. Many of the assumptions about human life made by machine learning systems are narrow, 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.

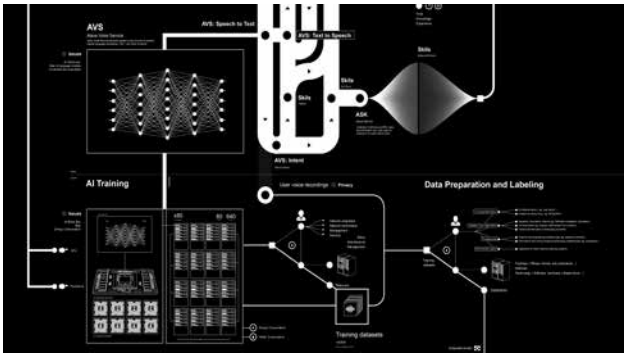
The stack that is required to interact with an Amazon Echo goes well beyond the multi-layered "technical stack" of data modeling, hardware, servers, and networks. The full stack reaches much further into capital, labor, and nature, and demands an enormous amount of each. The true costs of these systems—social, 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)*







Kate Crawford (AU) is a widely-published researcher, academic, and author who has spent over a decade studying large-scale data systems, machine learning and artificial intelligence. She is the co-founder and co-director of the AI Now Institute at NYU, which conducts research on the social implications of artificial intelligence. She is a Distinguished Research Professor at New York University, and a Principal Researcher at Microsoft Research New York. In 2016, she co-chaired the Obama White House symposium on the social and economic implications of AI. She has published in many academic journals and advised policy makers at the European Commission, the United Nations, the Federal Trade Commission, and the City of New York. In 2018, she was selected for a Richard von Weizsäcker Fellowship at the Robert Bosch Academy in Berlin. **Vladan Joler** (RS) is SHARE Foundation founder and professor at the New Media department of the University of Novi Sad. He is leading 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 on the intersection between technology and society.

https://anatomyof.ai

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.

Ângelo Rosário

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

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

Rosana Bernardo

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.

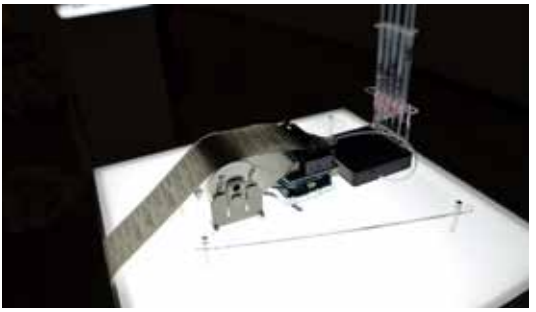
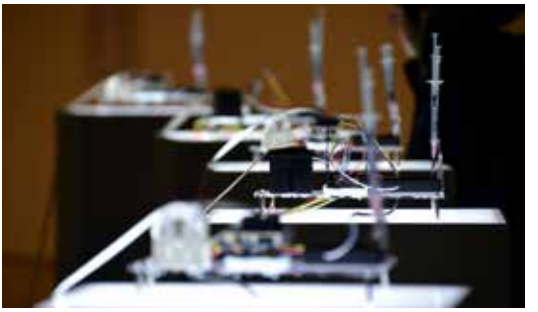
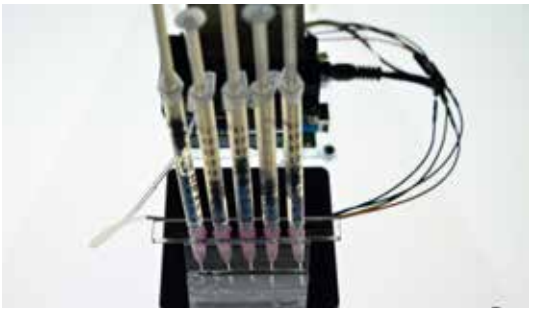
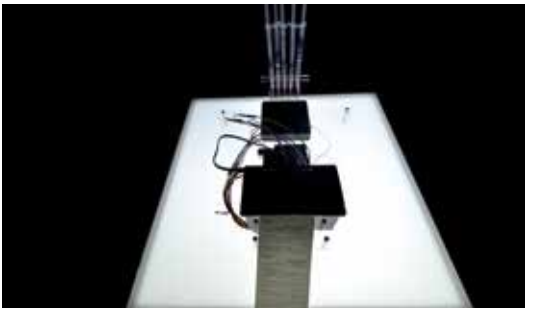
My research is aimed at harnessing biological organisms to become components of computing architectures for new kinds of AI, which I paradoxically refer to as Natural AI. I am interested in using biological agents as components of a computer rather than sources of inspiration to implement abstract models 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.

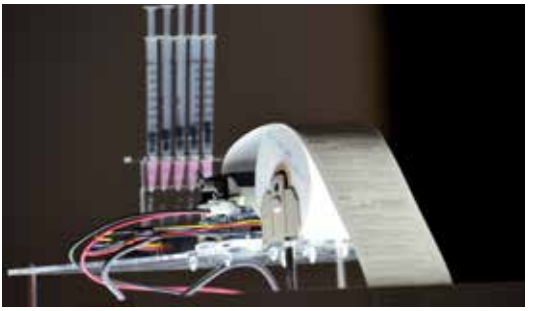
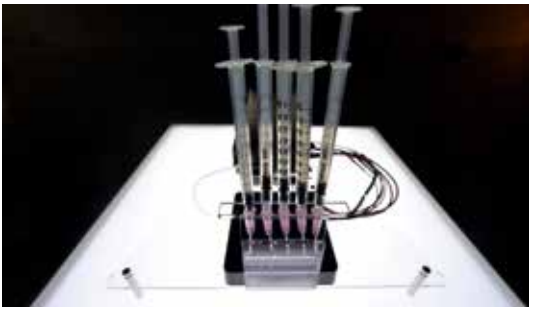
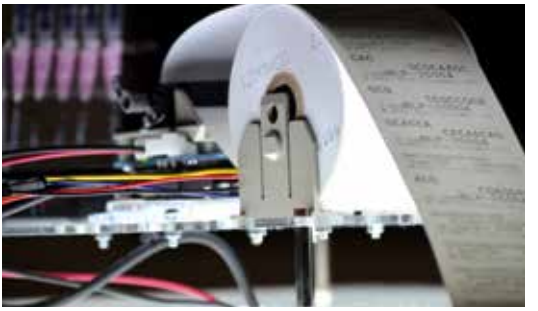
Composer: Eduardo Reck Miranda
Assistant engineer: Edward Braund

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:

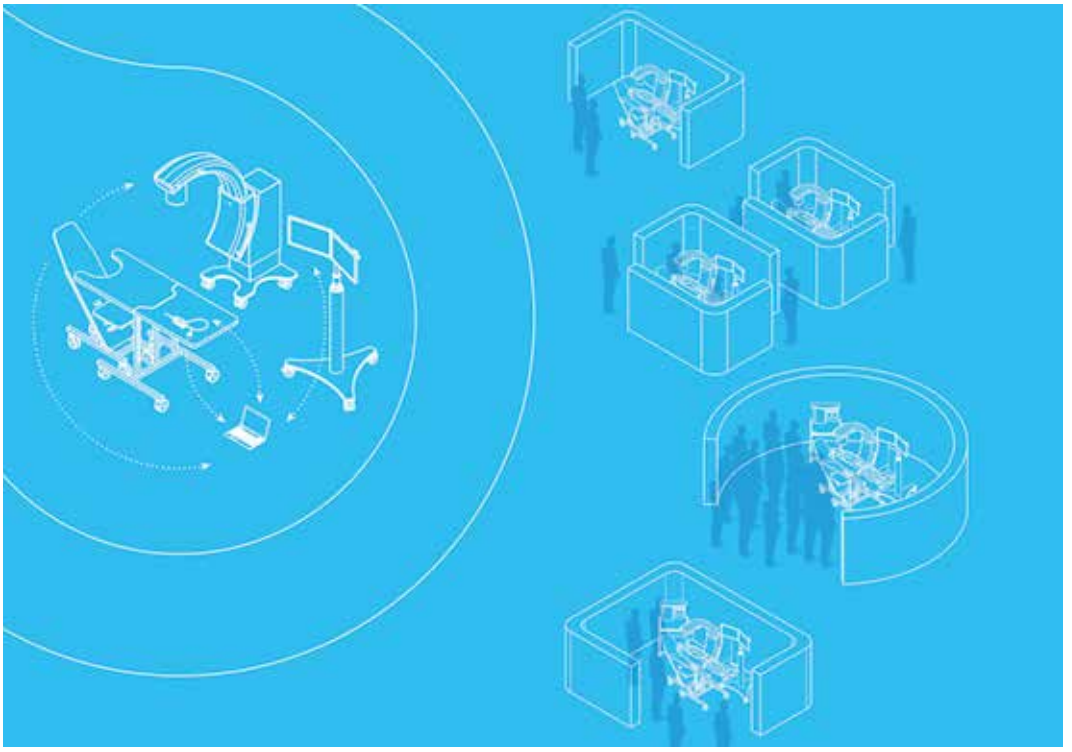
- Do we actually want to give everyone the ability to print "forbidden" DNA?
- Should we stop DIY DNA Synthesisers in the name of biosafety?
- Can we stop them?

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, ICCESS & 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 ICCESS, 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 ICCESS,
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

Tom Mannion

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

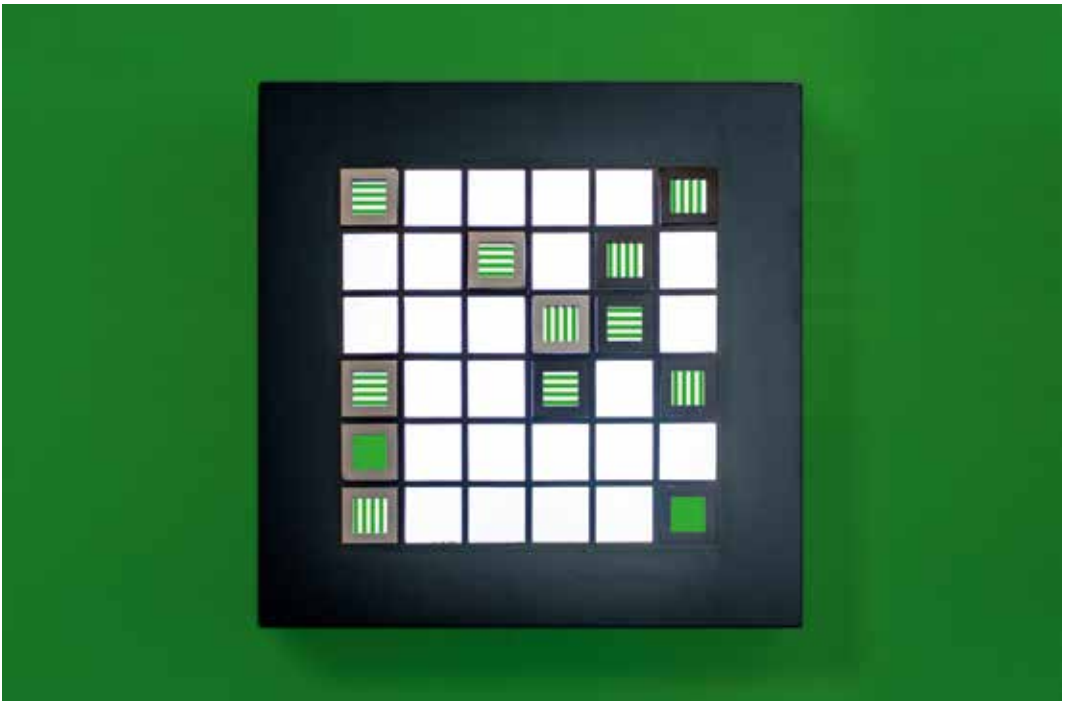
A-MINT is a metaphor of a sustainable future, where man and machines work together in perfect symbiosis to cross a frontier that man alone could not dare. *A-MINT* is a new kind of adaptive Artificial Music Intelligence, the first one of its kind capable of cracking the improvisation code of any musician 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


Max Bjorverud

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

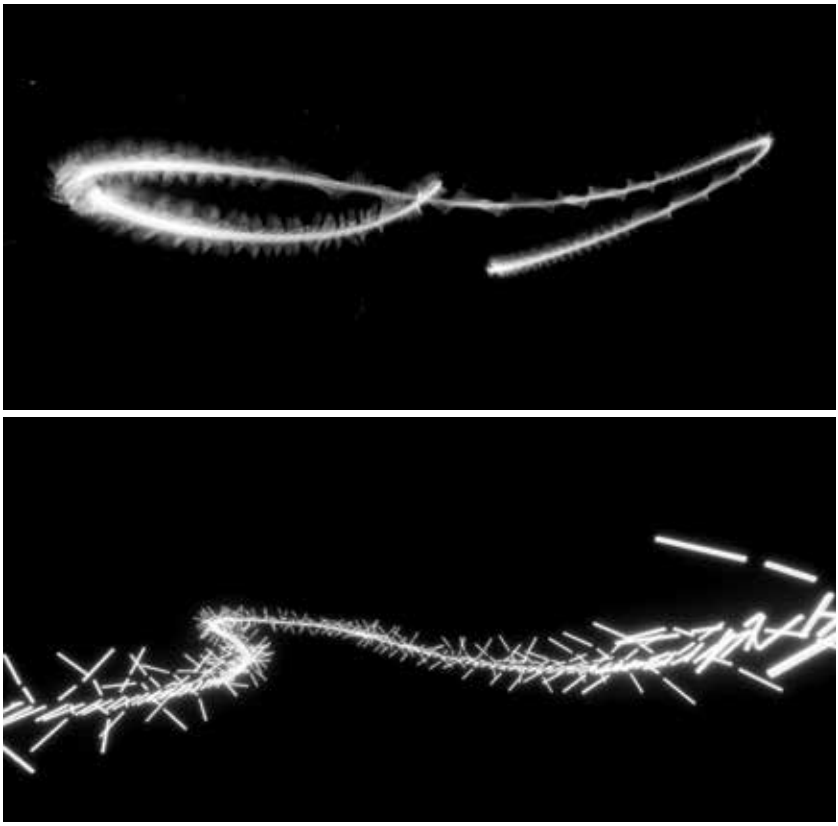
Beholder

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

Suzi Corker

Anastasia Alekseeva

Cave of Sounds

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

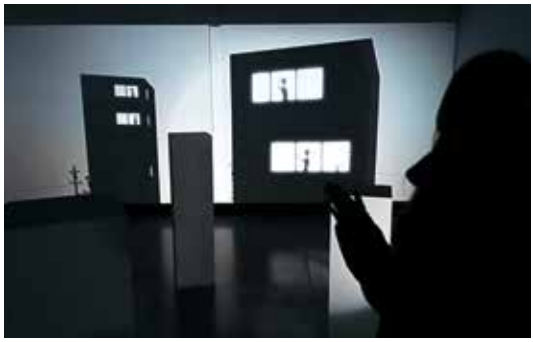
Cave of Sounds is a project connecting music's prehistoric origins with the technological radicalism of the music hacker scene. It emerged from an open-ended process which I began in 2012 as composer in residence at Music Hackspace, London. I announced an open invitation to form a collective of musicians 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 Tyldesley, 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

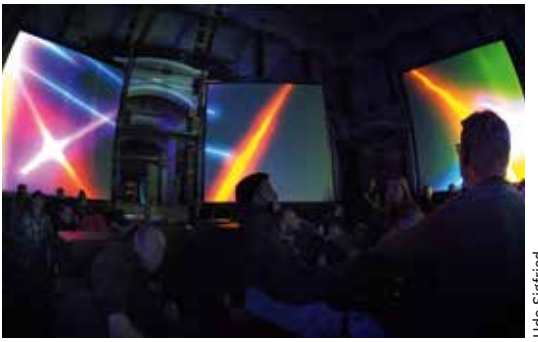
Hello, Shadow! is an interactive art installation implementing a kind of augmented reality mixed with a shadow. I have been developing this kind of AR media from my previous work *Augmented Shadow (2010).* This media augments the reality by mapping virtual shadows on the real shadows of objects. Users 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 imagination 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

Giovanni Dominici



Udo Sigfried

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.

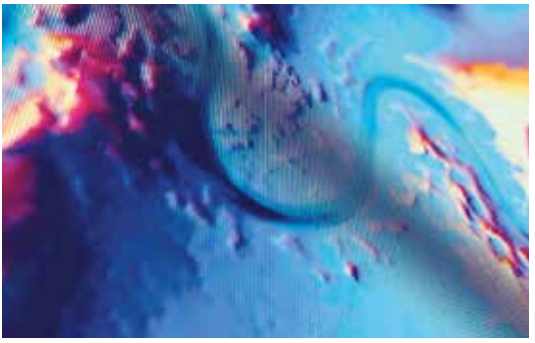
The journey starts by selecting one aroma from the twelve scents blended especially for the exhibition. This aroma becomes the compass that guides guests to their destinations as they taste a candy which has several layers of tastes and textures in harmony with the fragrance and sounds. A vibration actuator 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 Ferráo

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

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.

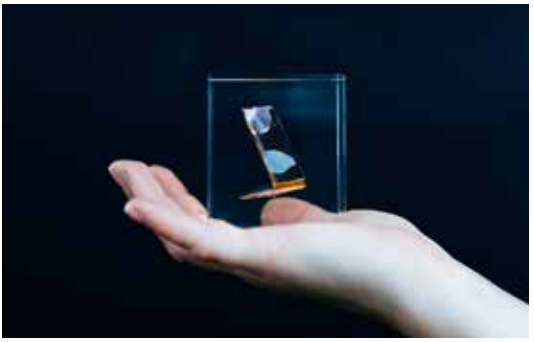
To reduce energy use, we opted for a back-to-basics web design, using a static site instead of a database driven content management system. We further apply default typefaces, dithered images, off-line reading options, and other tricks to lower energy use far below that of the average website. In addition, 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

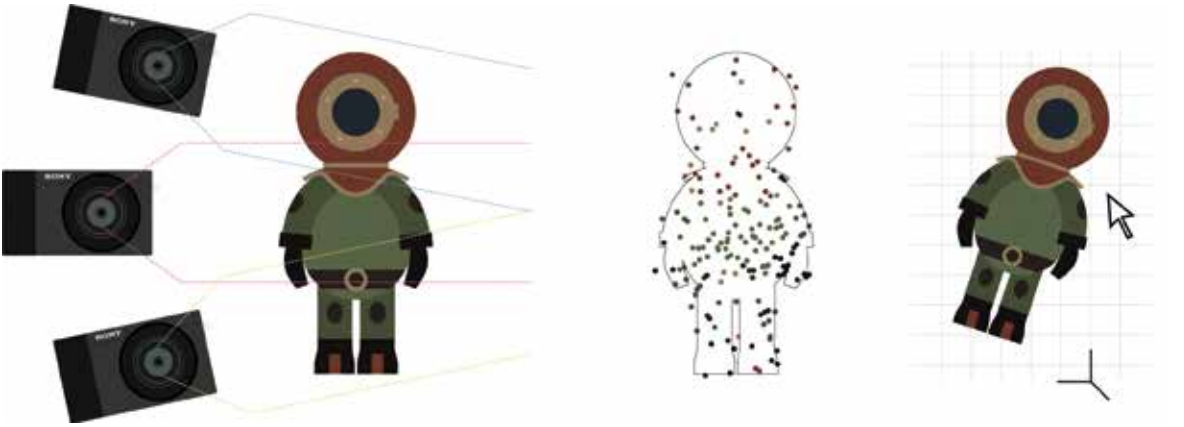
Basalt, an igneous rock formed by cooling lava, is the most common rock in the Earth's crust. Basalt's advantageous mechanical, chemical, and thermal properties spurred industry to explore it and develop the eco-friendly Basalt Fiber.
In *Stone Web,* Basalt is transformed into a light, stable modular 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.

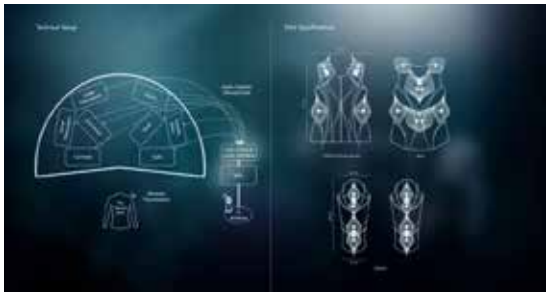
Based on the conviction that especially individual creatives and smaller creative teams would benefit from a simple and direct method to realize their ideas in Virtual Reality, the goal was to develop an easy-to-use and comprehensive workflow and an accompanying manual. In order to be able to develop 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.

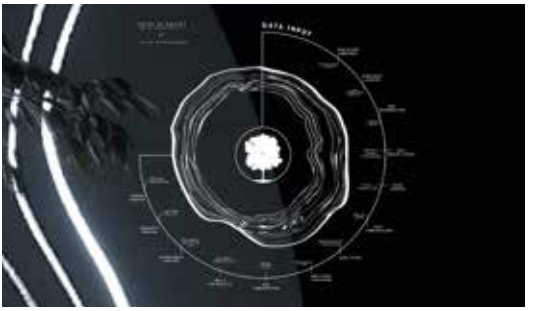
Going through months of user testing, CuteCircuit created this unique wearable technology completely in-house, starting from the fashion design, to the hardware design, the actuation modules, and the software development. The *SoundShirt* contains 30 individual powerful miniature actuation modules controlled 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 CO_2 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

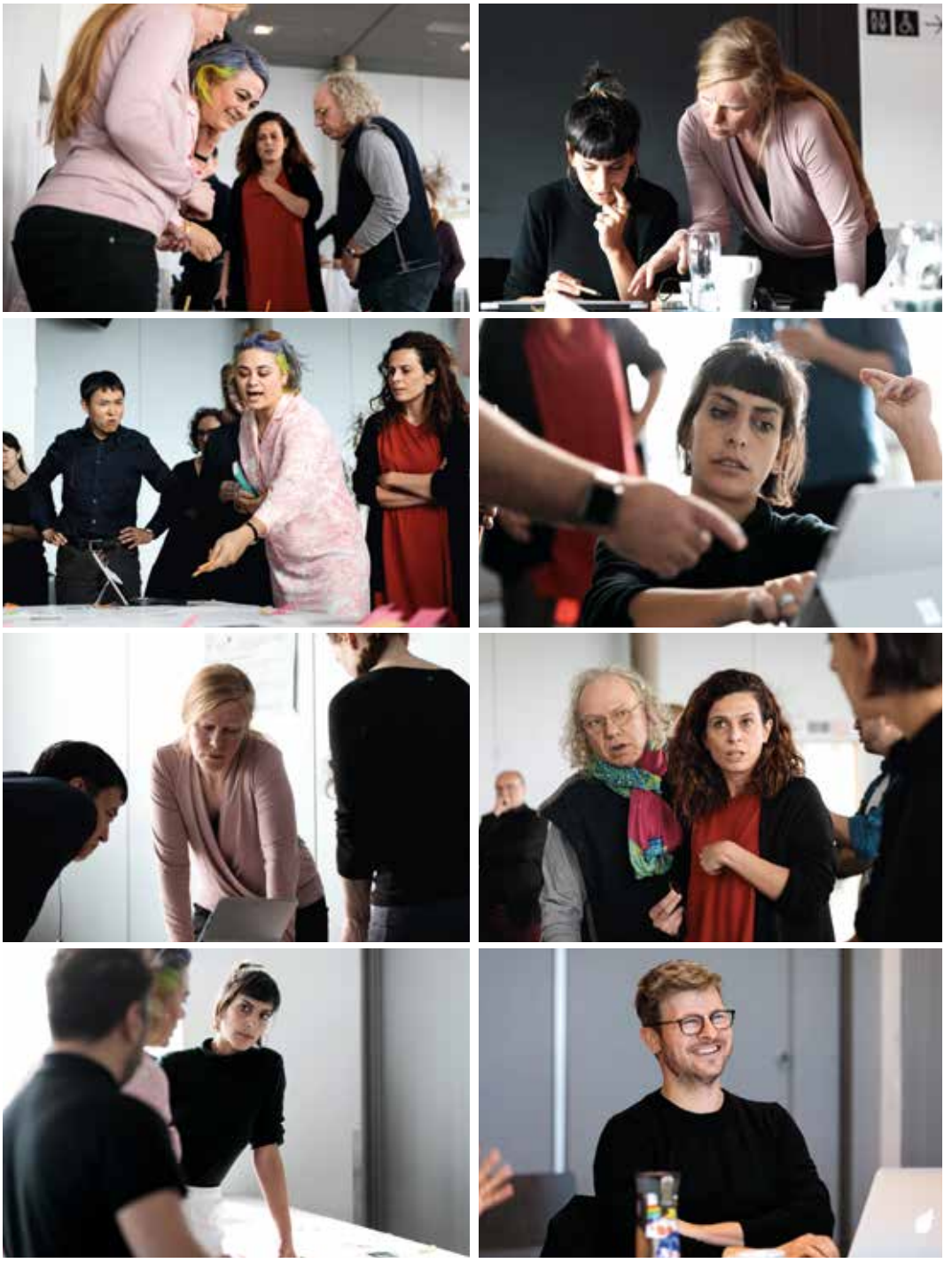
Wastelands is a playful, yet serious biological art project exploring speculative fiction scenarios and current bioengineering practices applying methanogenic bacteria, archaea and bacteriophage to regulate methane production through anaerobic degradation. This biological art project speculates on a 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 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.

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.

S+T+ARTS PRIZE'19 Jury

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, Birbeck. 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. Frikke 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 ZER01NE (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 Istituto 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 Manuelas* 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 Francisco, 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, curator, 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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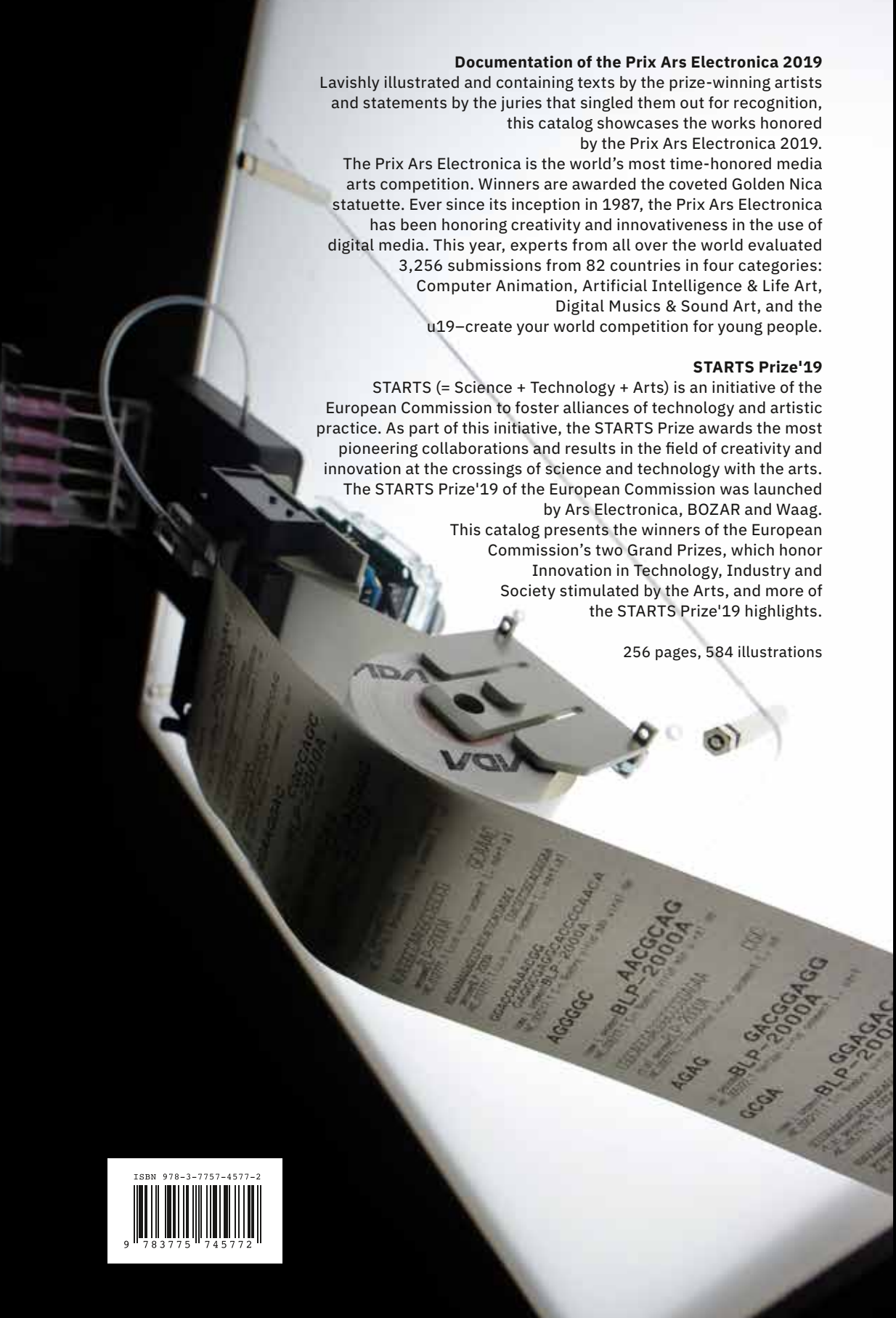
Front: *Labor* by Paul Vanouse, photo: Tullis Johnson
Flap: *TORSO #1*, Peter Kutin, photo: David Višnjić
Back: *BLP-2000 / Black List Printer*, BCL– Georg Tremmel and Shiho Fukuhara, photo by the artists
Flap: *This is grown*, Jen Keane, photo: Tom Mannion



Documentation of the Prix Ars Electronica 2019

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.

STARTS Prize'19

STARTS (= Science + Technology + Arts) is an initiative of the European Commission to foster alliances of technology and artistic practice. As part of this initiative, the STARTS Prize awards the most pioneering collaborations and results in the field of creativity and innovation at the crossings of science and technology with the arts. The STARTS Prize'19 of the European Commission was launched by Ars Electronica, BOZAR and Waag.

This catalog presents the winners of the European Commission's two Grand Prizes, which honor Innovation in Technology, Industry and Society stimulated by the Arts, and more of the STARTS Prize'19 highlights.

256 pages, 584 illustrations

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