EXHIBITIONS

AI
THE OTHER I
EXHIBITION

AI is the perfect projection surface for a process of reflection upon our conceptions of human beings and machine beings as well as of the world-views that are widespread in this digital age of ours. The "AI–The Other I" theme exhibitions explore the topic of artificial intelligence from various perspectives: focusing the attention beyond the technological and economic horizon they also scrutinize cultural, psychological, philosophical and spiritual aspects. The ethical-philosophical question, the most central issue we face in this context, focuses primarily on what it means to be human and far less on a definition of AI. Ars Electronica is interested above all in the visions, expectations and fears that we associate with the conception of a future, all-encompassing artificial intelligence. There is the very central, ethical approach that questions the essence of being human as well as of human intelligence. Connected to this is the very concrete, scientific-technological approach; and then there is a third area in which artistic work is being created with technologies like machine learning. And amidst it all are two poles: the affirmative and the critical. Among the artistic approaches, there are apocalyptical scenarios just as there are elaborations on how artificial intelligence can be deployed in positive ways that are compatible with humankind.

POINT ZERO—Human.0, Machine.0, Data.0

MoRFES, Maria Yablonina

The art projects assembled in the spacious confines of the venue's lower levels are dedicated to the question of essences—of being human, of the machine, and what it means to be born out of code. Set in a spectacular bomb shelter and spaces housing this building's mechanical infrastructure, this exhibition takes full advantage of the unique atmosphere of a former postal service logistics facility.

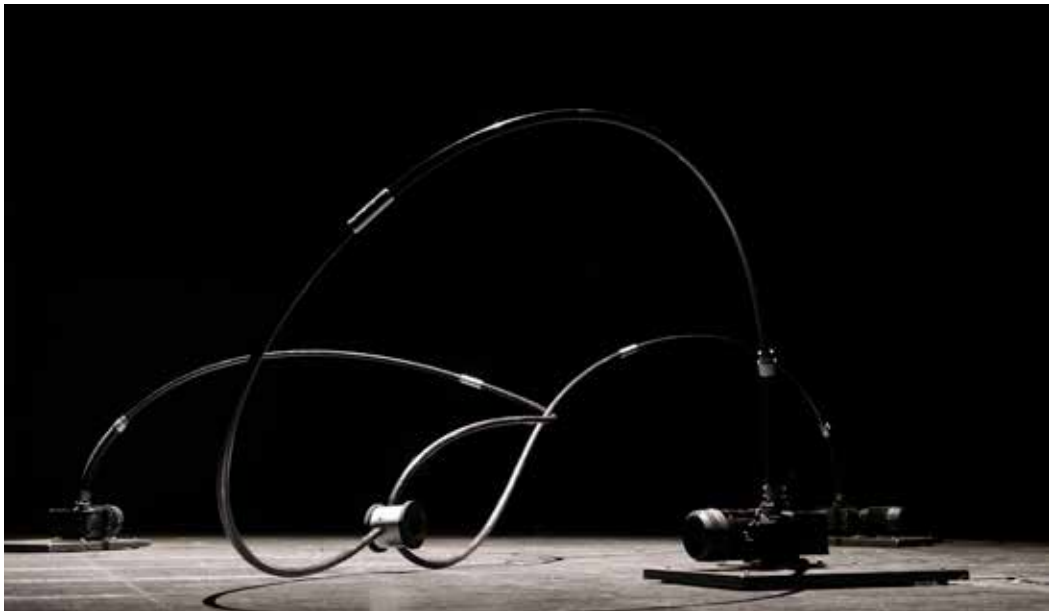
Cod.Act (CH)

Nyloïd

Nyloïd is an impressive sound sculpture, a huge tripod consisting of three six-meter-long nylon limbs animated by sophisticated mechanical and sound devices. Sensual, animal and threatening, this mobile draws its dramatic power from the reactivity of its plastic and sound material to diverse mechanical constraints. Similar to a living object, its tension, effort and suffering, which result from its contortions and its vocal manifestation, can be sensed.

This work constitutes a new stage in the artists' researches. They carried out new investigations, each within their own domain, on plastic and sound organicity in order to combine them into this fascinating object: a return to life operated by means of mechanics and sound processing. The approach is a long-term analysis culminating in an advanced and complex minimalism. *Nyloïd* is a rudimentary structure. Often extreme, its movements are at the junction between mechanical perfection and raw material. Its impressive sounds, which seem to emanate from the material itself, are the result of an extremely sophisticated vocal research. The combination of raw material, mechanical and sound perfection results in a kind of hypnotic and dramaturgic choreography from which, in a paradoxical way, perfectly random kinetics arise.

Cod.Act is André and Michel Décosterd



Xavier Voirol

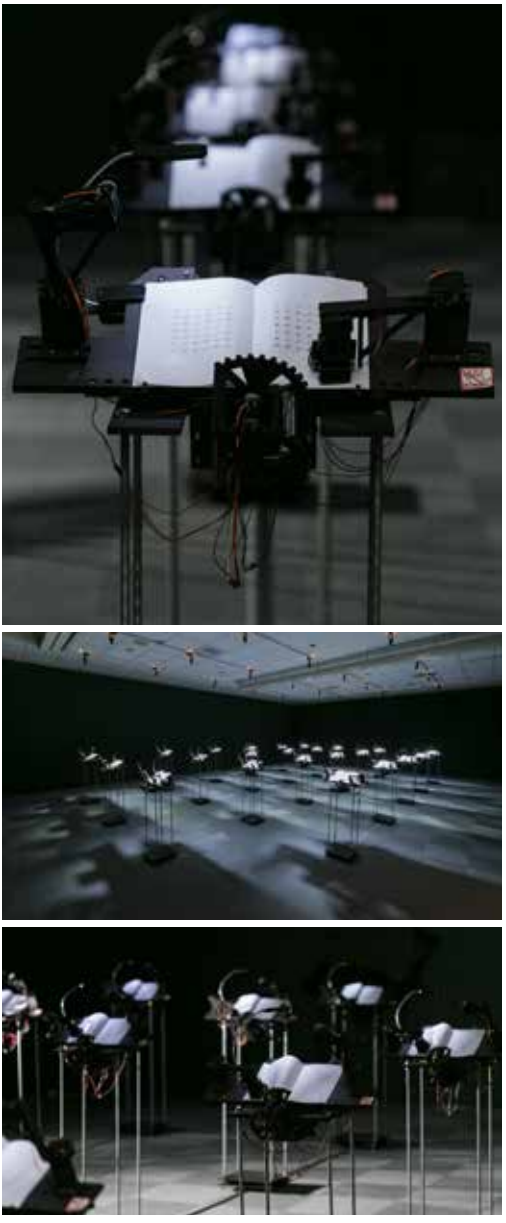
Lien-Cheng Wang (TW)

Reading Plan

Reading Plan is an interactive artwork with 23 automatic page-turning machines. When audiences enter the exhibition room, the machines start to turn the pages automatically and read their contents in the voice of elementary school students. The machines are a metaphor for a Taiwanese classroom. In 2016 in Taiwan there was an average of 23 students per primary school class. "When people go to school in Taiwan, they don't have much power to decide what they want to read and study. It is like being controlled by a huge invisible gear. The authorities' education policy prioritizes industry value and competitiveness. The government wants to promote a money-making machine rather than self-exploration and humanistic thinking. This is a complete realization of dogmatic rules and state apparatus." (Lien-Cheng Wang)

The machines read an extract from *The Analects of Confucius*—a book that has influenced Asian countries for thousands of years in ethics, philosophy, and morality. The content reads: "The Master said, 'Is it not pleasant to learn with a constant perseverance and application?' 'Is it not delightful to have friends coming from distant quarters?' 'Is he not a man of complete virtue, who feels no discomposure though men may take no note of him?'" The essence of the book is a metaphor of ancient China, which wanted to control surrounding countries for thousands of years. *Reading Plan* creates a space of discussion localization, education, thoughts and state apparatus.

Supported by the Department of Cultural Affairs,
Taipei City Government



Haochiang Chien, Kaohsiung Museum of Fine Arts

GayBird

GayBird (HK)

Fidgety (In Between Up & Down)

The adjective “fidgety” describes a nervous and jumpy feeling. Normally people see this as a bad feeling. However, the artist treats it as a musical idea. For this work the Chinese character「忐忑」was designed as a pictograph using the words「上」for “up” and「下」for “down” over the word「心」for “heart” to describe this feeling. With a 40-channel speaker system, the setting of the speakers looks like a path resembling veins. All 40 speakers play the sound of the artist’s heartbeat. When the speakers start to play one after another they produce a range of various rhythmic and musical compositions.

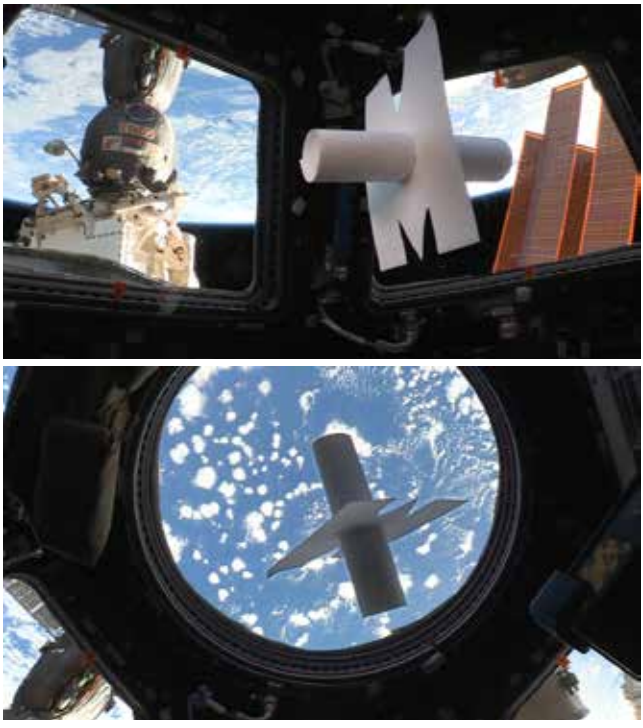
The heartbeat is the most important element in this work; however, it is not easy for the audience to hear, since it was designed as a triggering force rather than an audible element. The low frequency of the heartbeat causes the speakers to vibrate, which then triggers the kinetic installation to produce sounds.

Eduardo Kac (BR)

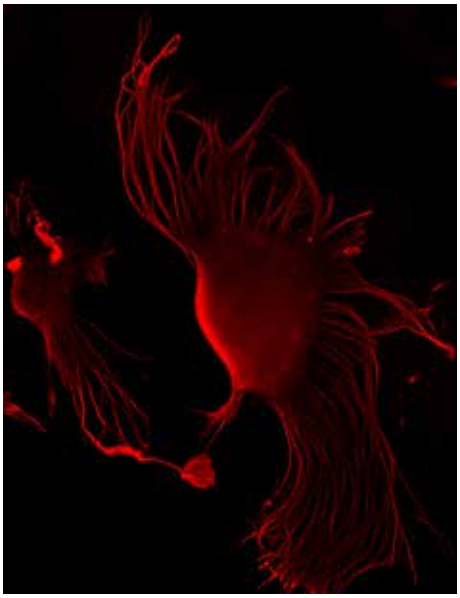
Inner Telescope

Inner Telescope is centered on a visionary artwork conceived by Eduardo Kac and realized in space in collaboration with the French astronaut Thomas Pesquet. The work was specifically conceived for zero gravity and was not brought from Earth: it was made in space by Pesquet following the artist's instructions. The artwork was made from materials already available in the space station. It consists of a form that has neither top nor bottom, neither front nor back. Viewed from a certain angle, it reveals the French word *MOI* [meaning "me", or "myself"]; from another point of view one sees a human figure with its umbilical cord cut. This *MOI* stands for the collective self, evoking humanity, and the umbilical cord cut represents our liberation from gravitational limits. *Inner Telescope* is an instrument of observation and poetic reflection, which leads us to rethink our relationship with the world and our position in the Universe.

Inner Telescope is made possible by the Observatoire de l'Espace, the art-science lab of the French Space Agency, with the generous support of the European Space Agency (ESA), and the Daniel et Nina Carasso Foundation.



Eduardo Kac, Inner Telescope, 2017. Single-channel video, sound, 12 min. Stills from the video, image credit: Thomas Pesquet



Guy Ben-Ary

Rafaela Pandolfini

Alex Davies

HONORARY MENTION • PRIX ARS ELECTRONICA 2017 • HYBRID ART

Guy Ben-Ary (AU)

cellF

cellF is Guy Ben-Ary's self-portrait but also the world's first neural synthesizer. *cellF's* "brain" is made of a living neural network that grows in a Petri dish and controls analog synthesizers that work in synergy with the neural network in real time. Ben-Ary had a biopsy taken from his arm; then he cultivated his skin cells and, using iPS technology, he transformed the skin cells into stem cells, which were then differentiated into neural networks grown over a multi-electrode-array (MEA) dish to become "Guy's external brain." The MEA dishes consist of a grid of 8 x 8 electrodes. These can record the electric signals the neurons produce and send stimulations back to the neurons–a read-and-write interface to the "brain". Human musicians are invited to play with *cellF*. The human-made music is fed to the neurons as stimulation, and the neurons respond by controlling the synthesizers. Together they perform live, reflexive and improvised sound pieces that are not entirely human. The sound is specialized into sixteen speakers. The specialization reflects the pockets of activity within the MEA dish. Walking around the space offers the sensation of walking through Guy's external brain.

cellF was initiated and spearheaded by the artist Guy Ben-Ary. It is also the result of a collaborative work involving Ben-Ary as well as the designer and new media artist Nathan Thompson, electrical engineer and synthesizer builder Dr. Andrew Fitch, musician Dr. Darren Moore, neuroscientist Dr. Stuart Hodgetts, stem-cell scientist Dr. Michael Edel and neuro-engineer Dr. Douglas Bakkum. Each contributor played an important role in shaping the final outcome.

The project is supported by the Australia Council for the Arts and the Department of Culture and the Arts WA. The project is hosted by SymbioticA @ the University of Western Australia.

Theresa Reimann-Dubbers

Theresa Reimann-Dubbers (DE)

A(.I.) Messianic Window

A(.I.) Messianic Window is a project addressing AI's oversimplification of complex human concepts. The stained-glass window depicts an artificial-intelligence interpretation of the term Messiah. The context of *A(.I.) Messianic Window* is the current trend of applying humanistic, cultural and non-universally defined concepts to artificial intelligence. Machines become intelligent by being fed with information about the world. Who feeds them and selects this information? What biases and perspectives are transferred to machines? Religion is one such nuanced concept—the understanding of it differs throughout the world. The term Messiah refers to different figures or ideas depending on one's religious belief. Pioneering AI research is predominantly situated in the United States, where 70 percent of the population identify as Christian. To highlight resulting potential Western bias, religion is simplified to mean Christianity, so the term Messiah is represented by Jesus Christ. Using artistic impressions of Jesus Christ to train a deep convolutional generative adversarial network (DCGAN) and subsequently to generate images, I obtained an artificial-intelligence interpretation of the term Messiah. These generated images comprise the stained-glass window.

Technical support: Andreas Schmelas
Project created within the framework of the New Media Class at Berlin University of the Arts

Maria Yablonina (RU)

MoRFES_02: Robot Ecologies for Construction

MoRFES_02 (Mobile Robotic Fabrication Eco-System 02) is an iteration of a series of experiments and demonstrators conducted by Maria Yablonina as part of her ongoing research on collaborative mobile robots for architectural fabrication. This body of research explores and demonstrates fabrication processes for tensile filament structures enabled through the deployment of multiple species of mobile robots on the construction site. For this project, two species of four semi-autonomous robots are deployed to create a continuously changing structure in the gallery space. Throughout the exhibition, mobile robots are to continuously work on an object, removing and adding parts and changing its geometry, demonstrating the potential of the fabrication process live. Collaboration between the different types of robot allows one to view these machines as more than merely tools, but as a micro ecosystem that has the potential to grow and expand over time.

Maria Yablonina, Institute for Computational Design and Construction, Achim Menges
Research assistants: Olga Kalina, Jingcheng Chen

Michele Spanghero (IT)

Ad lib.

A medical machine for pulmonary ventilation plays a musical chord on a few organ pipes, a fragment of music (in reference to Johannes Brahms' *German Requiem)* frozen to the constant rhythm of the automatic breath. The action of this artificial organ raises ethical questions about the will and responsibility involved in this mechanical requiem, a metaphor for a limit that people delegate to technology. Ad lib., the abbreviation of the Latin *ad libitum*, literally means "at will" and is generally used to express the freedom of a person to act according to their own judgment in a given context, but it is also a musical caption that gives the performer the discretion of interpretation, allowing certain bars of the score to be repeated at will.

Michele Spanghero

Kikuyama

So Kanno (JP), Takahiro Yamaguchi (JP)

Asemic Languages

Characters are a means of visual communication and recording a language. Civilizations throughout the world have created various characters that convey their culture and history. This project focuses purely on the form of the characters rather than their meaning. The characters have been learned by artificial intelligence (AI) not for their meaning but for their shape and patterns. The AI has created and drawn lines that look like characters but do not have any meaning.

This work was publicized at the Aichi Triennale 2016 international art festival. It was implemented by collecting handwritten artist statements or descriptions of work by an extremely broad international group of ten participating artists. By learning handwriting with one writer in each language, the artificial intelligence collected information on the shapes of each character system, as well the idiosyncrasies of each writer. The lines generated are written as if they mean something important; they also look deceptive.

Machine Learning Programming: Hironori Sakamoto
Supported By Nihon Unisys, Ltd., Haps
Sponsored by Japan Media Arts Festival and Bunkacho – Agency for Cultural Affairs, Government of Japan

Handwriting provided by: Valsan Koorma Kolleri, Lai Chih-sheng, Gulnara Kasmalieva & Muratbek Djumaliev, Kio Griffith, Ali Cherri, Taloi Havini, Song Sanghee, Shreyas Karle, Kawayan De Guia, Uudam Tran Nguyen

Refik Anadol (TR)

Wind of Linz: Data Paintings

Wind of Linz: Data Paintings is a site-specific work commissioned by Ars Electronica that turns the invisible patterns of wind in and around the city of Linz into a series of poetic data paintings within a 6' x 12' digital canvas. Refik Anadol Studios developed a range of custom software using a one-year data set collected from Linz airport to read, analyze and visualize wind speed, direction and gust patterns along with time and temperature at ten-second intervals throughout the year.

The resulting artwork is a series of three dynamic chapters, each using data as a material to create a unique visual interpretation of the interaction between the environment and the city. Each chapter brings different aspects of the data sets to life with distinct and varied painterly, emotive aesthetics, making the invisible beauty of wind as a natural phenomenon visible.

Each of the three chapters focuses on one distinct characteristic of the wind of Linz. The first chapter, "Hidden Landscapes" highlights the anemometer's most radical readings to create an immaterial, spatial experiences. "Porcelain Memories" recalls the intangible power of a gale when reimagined outside of the traditional constraints of time. "Fluid Structures" explores the paradox of a soft, gentle wind blowing from the Danube toward the site in the harsh cold of winter.

Refik Anadol studio members and collaborators: Raman K. Mustafa, Toby Heinemann, Nick Boss, Kian Khiaban, Ho Man Leung, Kerim Karaoglu, Bahadir Dagdelen, Yusuf Emre Kucur

Supported by: Barco Residential, Niio.Art for a digital age., Screen Innovations

Refik Anadol

Toby Smith

Unknown Fields (UK/AU)

All Up In My Grill

As the beat drops and the stage lights strobe, pop stars dripping with bling flash their jeweled gold teeth for the camera in a flurry of choreographed dance moves. A world away, in a hole in the ground in the wild-west mining town of Ilakaka, Madagascar, another ensemble of bodies move in rhythm, to dig dirt by hand out of the bottom of a precious gem mine. Here it is cheaper to pay workers in rice than it is to buy and maintain mechanical mining equipment. The human conveyor belts of Ilakaka shovel dirt in perfect synchronization, each man paid with 50 g of rice, their bodies repurposed as digging machines.

Unknown Fields have used the amount of rice the human conveyor belt consumes in a day to manufacture a precious stone that embodies the systems through which these worlds are intimately and profoundly connected. The red Madagascan rice endemic to this treasure island is a staple food of the miners and has been collected locally and shipped to gem specialists for carbon analysis. By subjecting the rice to extreme heat and pressure in the laboratory, Unknown Fields have formed a synthetic stone encoded with the sum of the human conveyor belt's labor. After manufacture, the gemstone has been set into a gold tooth, ready for that million-dollar smile and the outrageous lyric. From kilojoules, to carats. In the glare of this cheeky gold grin we see the cost of luxury, of beauty, of a daily allowance of rice, of twenty men shoveling at the bottom of a hole.

Commissioned by the Architectural Association and Middlesbrough Institute of Modern Art
Film and photography in collaboration with Toby Smith

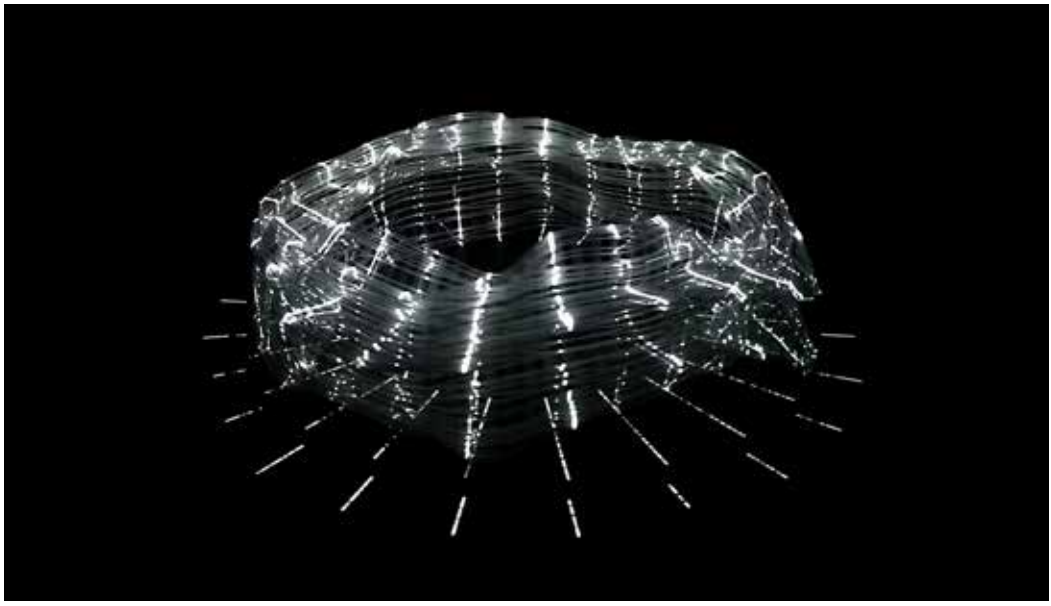
Amy Karle (US)

Regenerative Reliquary

Leveraging the intelligence of human stem cells, Amy Karle created *Regenerative Reliquary*, 2016, a bioprinted scaffold in the shape of a human hand 3D-printed in a biodegradable pegda hydrogel that disintegrates over time. The sculpture is installed in a bioreactor, with the intention that human Mesenchymal stem cells (hMSCs from an adult donor) seeded onto this design will eventually grow into tissue and mineralize into bone on the scaffold. *Regenerative Reliquary* made artistic, scientific and technological advances as it required and inspired new innovations for its creation, as well as influencing a new way of thinking. Amy Karle's bioart work expands opportunities for art and design, biomedical applications, healing and enhancing our bodies, and opens minds to create things that it was never possible to create before. Read more at: http://www.amykarle.com/project/regenerative-reliquary/

Collaborators: Bio-nano scientist Chris Venter, Material Scientists John Vericella and Brian Adzima
Sponsors: Autodesk, California Academy of Sciences, Exploratorium–The Museum of Science, Art and Human Perception and The Bone Room

Charlie Nordstrom



Akinori Goto

Akinori Goto (JP)

Sculpture of Time

Development from the *toki-* series

Sculpture of Time is several works developed from the *toki-* series. Their creation started with the question of what it means to "move." On one occasion the artist was impressed by the obvious facts that movement does not exist if time is standing still and that movement is possible due to the flow of time. In other words, time and movement are closely connected. This led Akinori Goto to the conclusion that the secrets of movement might become visible by pursuing "time."
These works realize time, something that cannot be seen, by connecting two-dimensional movement to the third dimension through 3D printing. At first glance, it may look like just a cluster of white mesh, but the time that has been cut out can be reproduced by projecting light through the slits.
By visualizing and actualizing time, not only do these works illustrate its relationship with movement, they also attempt to discover the beauty, characteristics and background connections of time born by going beyond dimensions.

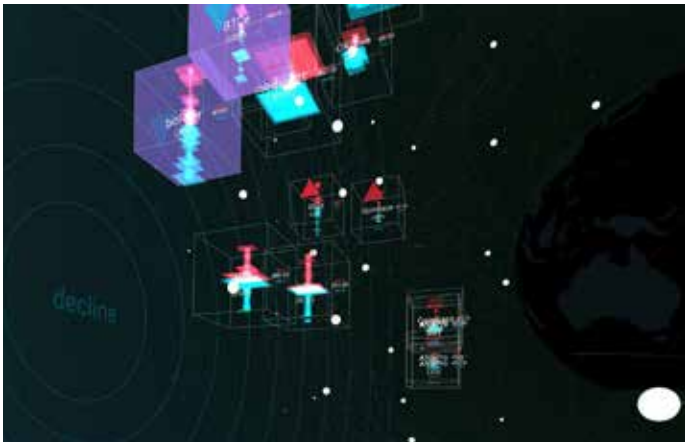
Daito Manabe (JP), Yusuke Tomoto (JP), 2bit Ishii (JP)

chains

Chains is an interactive installation dealing with the bitcoin cryptocurrency. Based on experiments with automatic trading systems, the artists developed a system to visualize and thereby study the principle of block chains. the participants can experience fluctuations in bitcoin values via sound and images in real time and interact with an automated transaction algorithm enabling them to manage bets and receive virtual payments according to their bet. In doing so the installation also raises critical questions about contemporary finance and trading systems.

Chains was developed at ZKM of Karlsruhe, Germany and was exhibited at *GLOBALE: New Sensorium*. It is an evolved version of the 2013 *traders* installation that was developed as a follow-up to the 2013 *traders* project and visualized Tokyo's stock market live.

Daito Manabe (Rhizomatiks Research), Yusuke Tomoto (Rhizomatiks Research), 2bit Ishii (buffer Renaiss)



"GLOBALE: New Sensorium", exhibition curated by Yuko Hasegawa | Courtesy of ZKM | Karlsruhe | Photo by Tobias Wootton and Jonas Zilius

Solveig Settemsdal

Kathy Hinde (UK), Solveig Settemsdal (UK/NO)

Singularity

Singularity is an audiovisual collaboration between the artists Solveig Settemsdal and Kathy Hinde. The concept of *Singularity* surrounds the readings of this term. A technological singularity: the point where artificial intelligence surpasses that of humans and continues to accelerate. A gravitational singularity: a theoretical point in space-time of infinite density. The emergence of a thought is imagined here in parallel to extreme gravitational phenomena.
A point appears in a perceived void. Slowly expanding, its articulation grows increasingly deliberate; lines are created, crossed and bisected until the form disappears again into a point. In *Singularity*, Solveig Settemsdal explores a temporal and sculptural process of drawing in a fluid three-dimensional space by suspending white ink in cubes of gelatin. The concept of an expanding point is echoed in Hinde's musical composition, where sounds evolve out of silence into clustered layers, drawing attention to the microscopic detail of the expanding abstract forms.

Commissioned by Goldfield Ensemble for the touring concert *Ritual in Transfigured Time*
Supported by Arts Council England, the Britten Pears Foundation, the RVW Trust and the Ambache Trust

Video: Solveig Settemsdal
Sound: Kathy Hinde
Camera: Milo Newman

Violin 1: Nicola Goldscheider; violin 2: Alexandra Reid; viola: Bridget Carey; cello: Sophie Harris; metal tines: Kate Romano
Recorded at OVADA Gallery, Oxford, September 2016 at the OCM event

::vtol:: (RU)

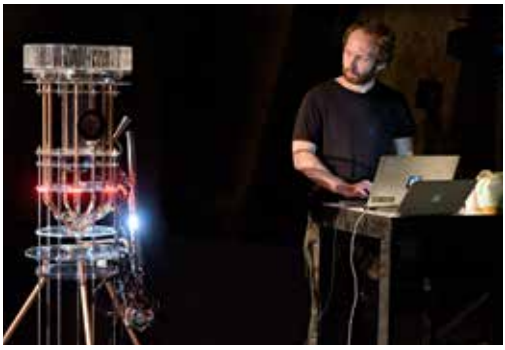
Until I Die
Driver
Red

Specially for Ars Electronica, ::vtol:: presents a selection of several artworks created in recent years. One of them is his large-scale project *Until I Die*—a hybrid installation that uses the artist's blood, extracted and accumulated over a long period of time. The blood is used to generate electricity for a small sound synthesizer. It is one of the most significant and complex works created by ::vtol:: in recent years, touching on many topics relating to hybrid art: alternative sources of energy, unification of the human body and machine, using the body as a resource. In general, this project is an attempt to create a technical-biological clone of the artist, using his own life energy to compose electronic music.

The two other works *Driver* and *Red*—generative sound objects, kinetic and light installations—develop the topic of automatic mechanisms that stage autonomous performances or interact with the audience. All these works have been created according to DIY principles.

::vtol:: *Until I Die*: Kapelica Gallery, Ljubljana. 2016
::vtol:: *Driver*: iii instrument Inventors Initiative, Hague. 2017
::vtol:: *Red*: 2016

Miha Fras



Dmitry Morozov

Dmitry Morozov

Robert Bauernhansl

Marlene Reischl (AT)

All of Us

All of Us explores the aesthetics of scars to highlight their visual aspects and exhibit something that is usually not on display. Apart from the visible wound, scars are also constant reminders of injuries and events. Macro videos of scars varying in sizes and severity are taken from their hidden spots and projected in large format. Tracked by a camera system, visitors can use their hands to influence the footage shown: by placing your hand anywhere on your body, footage from that area is shown. This relationship between the feel of a physical touch and what is seen on the screen creates an intimate experience for the viewer. *All of Us* is an ongoing project, anyone interested can contact allofus@marlenereischl.com to make their scars part of the installation.

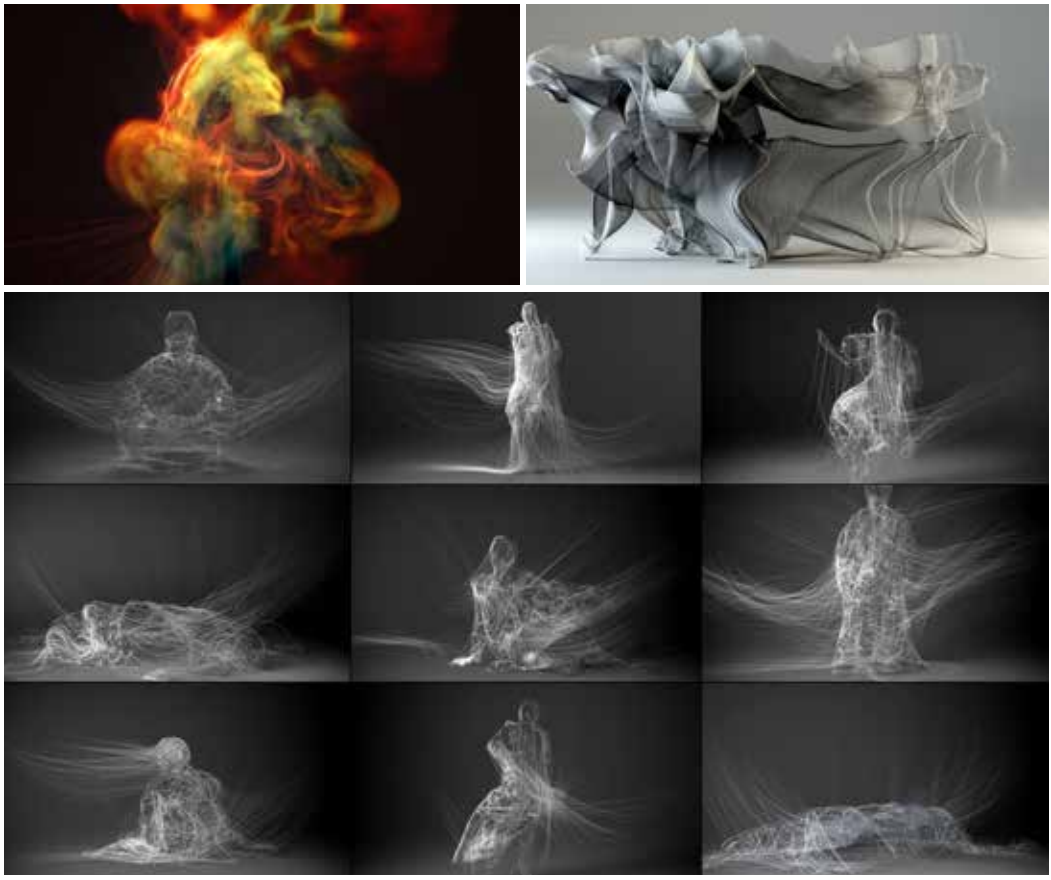
Marlene Reischl (AT)

Field

Field is a light installation combining fluorescent tubes and Tesla coils. It utilizes the coils' high-voltage fields to illuminate surrounding tubes without the use of physical power connections. As the coils wander across the sculpture their electrical fields activate the tubes nearby, stimulating the trapped gas to create gently flowing movements of light. The lack of wiring and the seemingly organic animation of the light induce a surreal, eerie scenery. Adapting a basic principle of physics, the installation becomes self-contained and is given a new level of artistic integrity that creates an uncanny, poetic situation.

Supported by Kunstuniversität Linz

Marlene Reischl



Tobias Gremmler

Tobias Gremmler (DE)

Selected Works 2016-2017

The project unifies Tobias Gremmler's most recent video works. The comprehensive topic concerns the digital virtualization of the human, culture and mind. If intelligence emerges from the interaction between an organism and its environment, the shift towards digital environments may reshape human consciousness and lead to embodied structures beyond physical restrictions. The selected works show virtual bodies, reshaped by motion, music or fashion trends. The body as a medium is constructed by its content. The invisible becomes visualized. Time, music or motion becomes gestalt.

Kyle Smithers

Mitchell Strum

Behnaz Farahi (US/IR)

Bodyscape Synapse

Synapse and *Bodyscape* are both examples of fashion items which integrate the latest digital fabrication techniques with robotic and sensor technologies in order to explore how our wearables can become an interface with the world around us. *Synapse* is a multi-material 3D-printed helmet that moves and illuminates according to the wearer's brain activity, while *Bodyscape* is a 3D-printed top that tracks human bodily movement using a gyroscope linked to LED lighting.

Bodyscape

Designer: Behnaz Farahi
Photographer: Kyle Smithers
Acknowledgements: USC, Media Art and Practices with special thanks to Samir Ghosh

Synapse

Designer: Behnaz Farahi
Acknowledgements: Pier9 / Autodesk with special thanks to Paolo Salvagione
Director of photography: Nicolas Cambier
Photographer: Mitchell Strum

Niek Hilkmann (NL), Joseph Knierzinger (AT), Michael Johannes Muik (AT)

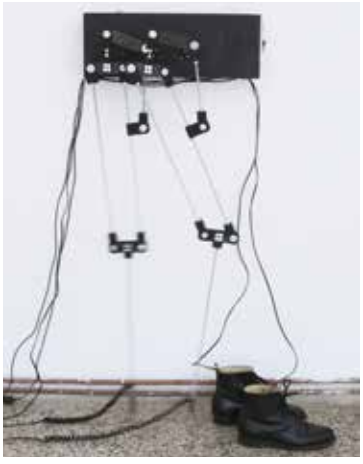
our audible / profitable economy / exhibition

In *our audible/profitable economy/exhibition* financial micro transactions are transformed into extratonal sound structures. The exhibition consists of several coin-operated machines, each dedicated to a specific sonic event. When an investment is made in all the machines at the same time they will perform one superior composition. Every visitor is invited to hear the different sounds, to accept the cost of production and to become part of the art industry.

All the machines are part of the collection of the artist-led nothing more foundation (nm), which decided to distribute these automatons to various cultural organizations, in order to collect micropayments that will be used to support other artistic activities that create more coin-operated artworks.

nothing more foundation (Hilkmann, Knierzinger, Muik, et al.)

Lukas Sommer



Michael Johannes Muik

Saint Machine

SAINT MACHINE (RO)

Hybrid Sensorium

The Seeds of Tra

Hybrid Sensorium explores the way we sense our body within physical space and the sensory distortions caused both by mediating technology and direct contact. The artwork is placed in immediate physical contact with the visitor, both thus becoming vulnerable to emotional contamination. A fabricated structure is superposed on the natural medium of the body, an artificial, permeable membrane that tries to condition our biological needs in an osmotic feeding ritual. The organism tests our willingness to cede personal physicality to a constructed environment, a suspended reality caused by a gap in the objective reality. You can interact with it by inserting your head through its orifice. The cavity responds to your breathing rhythm in real time, trying to adapt it to its needs, while the breathless visitor will enter a cycle of sensorial aberrations.

Author: Saint Machine (Marilena Oprescu Singer)
Collaboration: Reniform (animation), Mitoș Micleușanu (sound design), Răzvan Vasilache (programming)
Produced by Artmix
Supported by Romanian Cultural Institute, RKI Wien

ROMANIAN CULTURAL INSTITUTE

RUMÄNISCHES KULTURINSTITUT WIEN

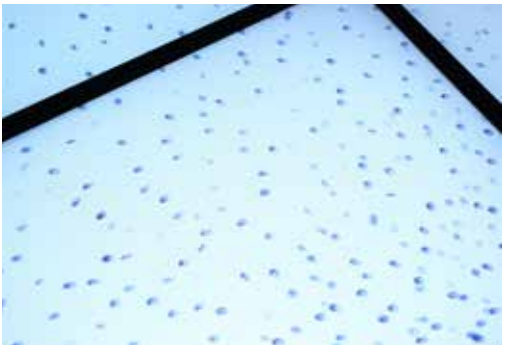
Euclid (Masahiko Sato and Takashi Kiriyama) (JP)

Pool of Fingerprints

Pool of Fingerprints consists of a large display surface and a fingerprint scanner. The display surface is populated with fingerprints swimming like a school of fish. The visitor can release his or her own fingerprint and watch it swim with others. When a visitor places their finger on the scanner, a scanned image of the fingerprint appears in the display. A moment later, the fingerprint starts to swim away to join other fingerprints. Later on, when the visitor comes back and scans the same finger, the one released earlier will respond and come back in front of the visitor. The fingerprint then gradually disappears, as if it is merging into the visitor's fingertip.

Supported by NEC Corporation and Samsung Japan

Keizo Kioku, Courtesy: NTT InterCommunication Center



Yuichiro Tamura, Courtesy: 21_21 DESIGN SIGHT

Yuichiro Tamura, Courtesy: 21_21 DESIGN SIGHT

Domas Schwarz

Domas Schwarz (AT)

Wachstropf

Icicles symbolize aesthetically pleasing but fragile objects whose long and elaborate process of formation can be negated in seconds by an unforeseen event. Domas Schwarz's installation *Wachstropf* showcases the beauty of natural processes and the transience of the environmental states that we have naturally grown accustomed to, and constitutes a metaphor for the works created in this world by nature and humankind.

Digital media and technologies facilitate the development of seemingly natural structures that can be artificially reproduced over and over again. Wax icicles form around a light bulb, melt due to the heat released when the bulb is switched on, and form again after the bulb is turned off and cools down. This destruction, change of condition or transformation into a previous state or a new one gives rise to new processing possibilities and, in the sense of a lifecycle, creates an object that is constantly re-growing.

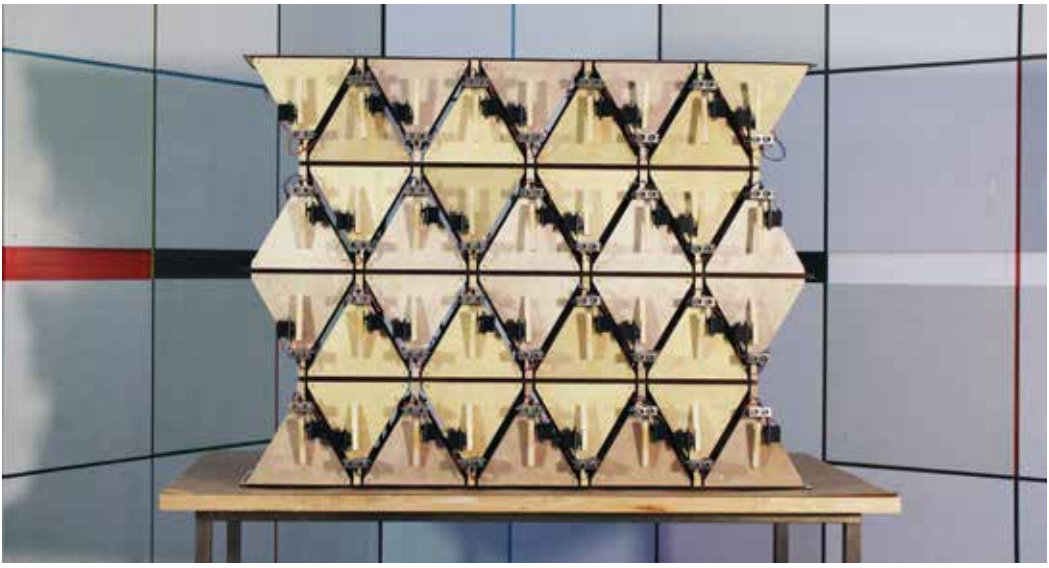
University of Art and Design Linz, Time-based and Interactive Media

Nicolas Kisic Aguirre (PE)

Modular Rhythm Machine

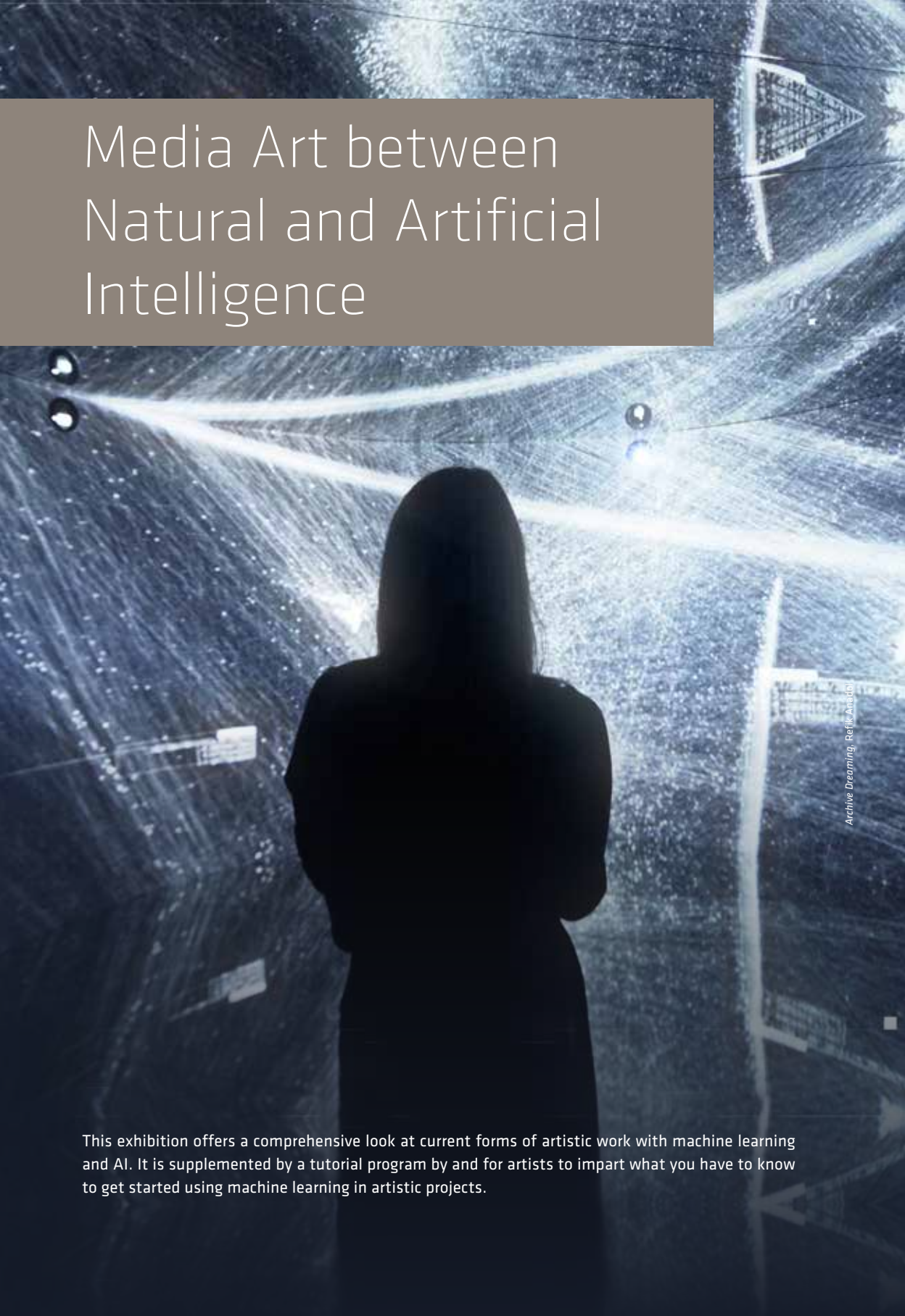
The importance of sound and rhythm is manifested in events such as military marches, protests, manifestations of celebration or spiritual rituals. Interested in the relationship between power and amplification or multiplication of sound, this machine was designed and built as a vehicle to explore and discover such subjects. A tool to highlight questions about the meaning and forces behind rhythmic patterns, synchronicity, syncopation and chaos. Currently, the *Modular Rhythm Machine* is composed of 36 modules. Each is conceived both as a modular construction piece and as a self-playing wooden box-drum. They are respectively equipped with a servo-motor attached to a stick and an ultrasonic sensor to detect people's proximity. Its modularity allows for flexibility in shape, size and construction.

This project is funded in part by the Council for the Arts at MIT and by MIT Program in Art, Culture and Technology.



Nicolas Kisic Aguirre

Media Art between Natural and Artificial Intelligence



Archive Dreaming, Refik Anadol

This exhibition offers a comprehensive look at current forms of artistic work with machine learning and AI. It is supplemented by a tutorial program by and for artists to impart what you have to know to get started using machine learning in artistic projects.

Kenric McDowell (US)

AI Poetry Hits the Road

I've just returned from Ross Goodwin's AI-assisted stab at the American literary road trip, a project called Wordcar, which put AI on the highway to generate 200,000 words of machine poetry. It's a classic trope with a 21st century twist. But in our moment of tender and anxious global ecological crisis, the free-wheeling ride into the unknown mythologized by Jack Kerouac, Ken Kesey and Hunter S. Thompson takes on a sinister shade. Those authors set out in search of freedom, masculinity, enlightenment, hedonism–twentieth-century values currently under renovation. These days, hitting the road in a gas-guzzler in search of anything other than a job feels irresponsible or at least unnecessary.

We are where we are. Many aspects of life and the open road have been inexorably transformed by the cannibalistic junkspace[1] of techno-capitalism. The mutation currently on display comes from the revived field of artificial intelligence. Because of breakthroughs in neural-net architecture and GPU vector processing, what is called deep learning has taken center stage in the field of AI, which increasingly goes by the less narratively burdened handle machine learning. The through line from Kerouac to cutting-edge RNN-LSTMs (Recurrent Neural Net Long Short-Term Memory) starts with an amphetamine Beat and dips into self-absorbed spiritual utopianism and Gonzo paranoia before it settles in the Bay Area, where dropouts, acid-heads and home-brew hackers laid compost for the home computing revolution[2] and by extension key components in the techno-capitalist Stack.[3]

Output, or poetry, from Ross Goodwin's RNN-LSTM

The eye of Wordcar was an Axis M3007 surveillance camera

It's an essential part of our era's *hypocritical hypocrisy*[4] that we question the ethics of any given act of consumption vis-a-vis the ecological and extinction crises while still consuming. This impotent self-awareness coated my perception as we set out from Bushwick, Brooklyn, in a rented Dodge minivan and Cadillac sedan. As we pulled up behind a vintage Ford, I said to Ross and his sister Beth, "It must have been nice to be a Boomer. Cars were weird. Gas was cheap. You didn't have to feel guilty." Our engine idled as I cast about for someone else to blame.

What besides the knowingness of our hypocrisy distinguished this trip from the cluster of mid-century journeys historicized by white guys from the west coast? I was the resident person of color and our party had gender parity—incremental progress, perhaps. Yet all of us hailed from the coastal, generally liberal, urban centers where tech thrives, and the left coast maintained strong representation. Photographer Christiana Caro and I work for Google; Beth, Ross and I all grew up in the SF Bay Area. Tech was at the center of the journey, as a synchronic key, as the "literary" engine and, as Ross put it, a substitute for mind-altering substances.

As with many aestheticized adventures in our era of cultural recycling, it was through tech that we marked our contemporaneity. Ross works with generative systems that produce text, specifically AIs that write poetry. My team at Google (Artists + Machine Intelligence) is a band of passionate twenty-percenters who have aided Ross with technical advice, financial support and professional development as part of our mission to support an emerging form of art made with AI.

Our automotive AI assemblage was inspired by an absurdist art exercise: write with a car. When we've talked about writing, Ross has mentioned David Foster Wallace, Jorge Luis Borges and Ursula K. LeGuin. On this trip he cited *On The Road*, *The Electric Kool-Aid Acid Test* and *Fear and Loathing in Las Vegas* as influences, and Beth recounted his early enthusiasm for these books. I found it hard to imagine him synthesizing these influences in his previous career as a speechwriter for Barack Obama, Timothy Geithner and John Kerry. Political speech is way too constrained for Ross. Our drive from NYC to NOLA was a better channel for his automated graphomania.

Ross Goodwin

These literary precedents all couple the road with one or more psychoactive substances. We rambled through New Jersey, Delaware, Maryland, without a suitcase of meth or a punch-bowl of LSD, but we did have a neural net and a surveillance camera, and the babbling of Wordcar's simulated brain was an uncanny approximation of the stimulated screeds of yesterday's eschatologists. I won't over-promise—it was more Dada than Brautigan, and that may be the state of the art, for now.

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7506
7507    2017-03-27 13:40:16
7508    Hard Rock Hotel & Casino Biloxi: a hotel in Biloxie, a high
        fisherman with a starry face, and a stub of a coat on his face and
        his shirt looking boldly across his mouth.
7509
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A GPS understanding of place

While the initiating impulse came from the written word, it was through the image that the word became. The eye was an Axis M3007 surveillance camera mounted magnetically on the trunk of the Cadillac. This is the standard model for home or business surveillance, a favorite tool of casino pit bosses, who use them to see in four directions at once. Its industrial design is neutral in the loaded way utilitarian objects express blankness: an off-white square frames a transparent bulb, which wraps a black robotic eye; the person on the other end of the signal is camouflaged by the normest of cores.

Ross customized his M3007 to rotate and "look around" by feeding its orientation controls Perlin noise. Ross's script instructed the camera to capture an image every twenty seconds. This image was first textualized in a most literal way: as ASCII art rendering a grayscale image with characters. Then an image-recognition net described the image in a sentence, which fed a free-associating, text-generating neural net (in mathematical terms, a ~36,000 dimensional model of the linguistic space of nearly 200 hand-picked books, prodded to produce a string of statistically likely characters following the initial description).

Beth Goodwin in Goldsboro, NC, swinging on sprawling grounds that were once a plantation, now traversed by an interstate freeway

What did the neural net see? What did it talk about? It talked about what it knew. It knew the time. It knew where it was (in the way any computer does, via GPS) and it knew what was around it. To avoid anthropomorphizing, I'll be specific: it knew locations and businesses (like the Biloxi Hard Rock Cafe) that were proximate because they were exposed by the Foursquare API, which is to say by the priorities of the techno-capitalist producer and subject. These locations were often gas stations and fast-food restaurants. There are many on the American road trip.

Ross's sister Beth is a food writer, and at times the conversation turned to food deserts and the business structures that keep them in place. Distribution networks owned by fast-food conglomerates have an edge on small businesses that can't afford to send fresh produce out to exurban or rural areas; the roadside stand has come a long way since its first documented incarnation in upstate NY. The output of this network is the de facto diet of developed-world poverty. Foursquare in the Lower East Side, the Mission, or Silver Lake paints a very different picture. But this patchwork of chain convenience stores and fast-food franchises was what Ross's Wordcar showed us. To be fair, these weren't the only features of the landscape to surface. There were bridges, rivers, and parks. From the perspective of the AI at the heart of Wordcar, however, they formed a substrate seen incidentally through accrued layers of gas and synthetic food distribution.

Valero, Pizza Hut, Waffle House, The Jameson Inn, the author

Why did Ross choose to show us this slice of American life in semi-sensical LSTM poetry gathered via API and a surveillance camera? We weren't just roaming the concrete corridor connecting Yankees and Southerners. We had an objective: a stop in Biloxi, Mississippi, to meet Josh Sniffen of Not From Concentrate Systems, a brilliant fabricator of gaming PCs, who embedded GPUs in vintage 8x10 cameras for Ross's upcoming show at the Rubber Factory in Manhattan. We saw a Jeep he constructed "from scratch," his YouTube broadcasting setup, gaming PCs he'd built, Ross's 8x10 and 11x14 cameras (from 1890 and 1905 respectively.) The work he did was beautiful.

Josh invited us into his home and grilled delicious sous-vide steaks for everyone. Where Ross's Bushwick living room drips with receipt-scrolls of AI poetry and runs a Google screensaver on Ubuntu Linux, Josh's home decor includes a posted list of of family rules and an informal garage shrine to the Virgin Mary.

While our film crew captured footage of Josh's studio, I waited in a lawn chair. Josh's children rode tricycles. Humid air came off the bayou.

Sous-vide steak and a hand-assembled Jeep

Ross and Josh had never met in person but they got along, diving into the obsessive tech-speak that engineers and hardware hackers fling. They both love manufactured systems. They both have complex relationships with mainstream American culture and religion. They come from different ends of various axes: North/South, hardware/software, a lapsed Jew and a devout Catholic. On a global scale these differences are minimal. But in contemporary American political discourse they are often framed as insurmountable. The intensity of their shared interest brought Josh and Ross close enough to experience each other's difference. Their meeting wasn't a site of ideological conflict (like, say, Twitter).

But it was clear that the cultural space between them wasn't simple, that traversing it would take time, and that it ultimately wasn't necessary in order to have a productive relationship around an art and fabrication project.

The Virgin Mary

Wordcar

We ended the trip in New Orleans. By then we'd been through ten mostly Southern states. As in many areas of the US, our route was dotted with industrial infrastructure unused and in decay. There were power plants, factories, railroads, mines. These were scenic, and the filmmakers we were traveling with turned their lenses on the ruins as backdrops. They hoped to highlight one of the most pressing concerns around AI: the changes that automation will bring to the economy and the predicted loss of jobs on a massive scale. Automation has already transformed mining and manufacturing. But AI that can predict, AI that can diagnose, AI that can write … these threaten blue- and white-collar jobs equally. As it often does, automation speculation led to discussion of universal basic income, the idea that the state should provide for every citizen's basic needs. Under neoliberal (or neofascist) techno-capitalism this is unthinkable. But it wasn't so long ago that jobs were created by the Works Progress Administration, during another time of economic instability.

In fact, the morning after our first day on the road, we learned about a document created by WPA laborers (writers and historians, or what we might now call creatives and content producers). As we ate breakfast in a 10,000+ square-foot mansion in Goldsboro, North Carolina, Laurie Sneed (the aunt of Ross's fiancée Lily) shared with us a collapsing edition of *The American Guide Series*, a written history of places traversed and annexed by interstates. Think of it as an archaic, proto-GPS-indexed feed of quirky and boring stories about small towns dotting highways in the 1930s. It's the sort of entertainment that might strike us as quaint or musty. But in our ambient Anthropocene anxiety it's almost soothing to read this excerpt describing the roadside grave of a circus clown, paved over even 80 years ago:

At 25m., embedded in the cement pavement of the highway, is a Tombstone ® broken during the War between the States by the wheels of a gun carriage. Inscribed "Gone But Not Forgotten," it marks the grave of a circus clown who died near here in the 1840s.

The clown and the old book beg questions: Who will look back on the half-absurd techno-engagements of Ross Goodwin and his ilk in ten, 50 or 100 years? How will their basic needs be met? How will the mechanisms that meet them frame their understanding of the Wordcar project or any literary road trip? Are we crude psychonauts prefiguring mainstream mind-manufacture? Are we hypocritical hypocrites on a dirty freeway? Are we everyday artists like the people to come? How are we etching our names in the land?

Thanks to Jac de Haan and Christiana Caro

Photos by Christiana Caro

[1] Rem Koolhaas, *Junkspace*, *http://www.jstor.org/stable/779098?seq=1#page_scan_tab_contents* (MIT Press, 2002).
[2] Fred Turner, *The Democratic Surround* (University of Chicago Press, 2013).
[3] Benjamin Bratton, *The Stack* (MIT Press, 2016).
[4] Timothy Morton, *Hyperobjects* (University of Minnesota Press, 2013).

Refik Anadol (TR)

Archive Dreaming

Commissioned to work with SALT Research collections, the artist Refik Anadol employed machine-learning algorithms to search and sort relations among 1,700,000 documents. Interactions of the multidimensional data found in the archives are, in turn, translated into an immersive media installation. *Archive Dreaming*, which was first presented at SALT Galata, is user-driven; however, when idle, the installation "dreams" of unexpected correlations among documents.

In the project, a temporary architectural space is created as a blank slate for light and data to be applied as materials that form a volume of an archive visualized with machine intelligence. By training a neural network with images of documents, *Archive Dreaming* reframes memory, history and culture within the understanding of a museum for the 21st century.

As part of the five-year program *The Uses of Art–The Legacy of 1848 and 1989*, organized by L'Internationale, *Archive Dreaming* was realized with the support of Google's AMI program.

SALT Research and programs: Vasıf Kortun, Meriç Öner, Cem Yıldız, Adem Ayaz, Başak Çaka, Merve Elveren, Ari Algosyan, Dilge Eraslan, Sani Karamustafa

Google's AMI program: Mike Tyka, Kenric McDowell, Andrea Held, Jac de Haan

Refik Anadol studio members and collaborators: Raman K. Mustafa, Toby Heinemann, Nick Boss, Kian Khiaban, Ho Man Leung, Sebastian Neitsch, David Gann, Kerim Karaoglu, Sebastian Huber

Refik Anadol

Memo Akten

Memo Akten (TR/UK)

Learning to See: Hello, World!

A deep neural network opening its eyes for the first time, and trying to understand what it sees.

Originally inspired by the neural networks of our own brain, deep learning artificial-intelligence algorithms have been around for decades, but they are recently seeing a huge rise in popularity. This is often attributed to recent increases in computing power and the availability of extensive training data. However, progress is undeniably fueled by the multi-billion-dollar investments from the purveyors of mass surveillance: Internet companies whose business models rely on targeted, psychographic advertising, and government organizations and their War on Terror. Their aim is the automation of understanding big data, i.e. understanding text, images and sounds. But what does it mean to "understand"? What does it mean to "learn" or to "see"?

Learning to See is an ongoing series of works that use state-of-the-art machine-learning algorithms as a means of reflecting on ourselves and how we make sense of the world. The picture we see in our conscious minds is not a direct representation of the outside world, or of what our senses deliver, but is of a simulated world, reconstructed according to our expectations and prior beliefs. The work is part of a broader line of inquiry about self-affirming cognitive biases, our inability to see the world from others' point of view, and the resulting social polarization.

g.tec medical engineering GmbH (AT)

BR41N.IO

The Brain-Computer Interface Designers Hackathon

The *BR41N.IO Hackathon* brings together engineers, programmers, physicians, designers, artists and fashionistas to collaborate intensively as an interdisciplinary team. They plan and produce their own fully functional EEG-based brain-computer interface headpiece to control a drone, a Sphero or e-puck robot or an orthosis with motor imagery. Whenever they think of a right-arm movement, their device performs a defined action. The artists among the hackers make artistic paintings or post and tweet a status update. And hackers who are enthusiasts in tailoring or 3D printing give their BCI headpiece an artistic and unique design. And finally, kids create their very own ideas of an interactive head accessory inspired by animals, mythical creatures or their fantasy.

Inspired by the unique Agent Unicorn headpiece from fashion-technology artist Anouk Wipprecht, the *BR41N.IO Brain-Computer Interface Designers Hackathon* challenges young geeks to design and build a unique, playful and wearable brain-computer interface (BCI) headpiece. The BCI measures brain activity and enable users to control a robot or smart device, to communicate or paint using just their thoughts.

Twenty years ago, brain-computer interfaces could only move computer cursors. Today, machine learning is one component of BCIs that will be used in many different fields of neuroscience, such as motor rehabilitation of stroke patients, assessment of and communication with coma patients, control of devices for disabled people, cognitive training or neuromarketing. *BR41N.IO* shows these current and future developments and the unlimited possibilities of brain-computer interfaces in creative or scientific fields, and how artificial intelligence, life science, art and technology become a unity to evolve innovative and exceptional BCI headpieces.

BR41N.IO is organized by g.tec medical engineering GmbH | Schiedlberg | Austria

Florian Voggeneder

Marije Dijkema

Dragan Ilić (RS/AU/US)

A3 K3

Intermedia/Trans-technological performance/installation

A3 K3 is a unique interactive experience. Artworks are created by machine technology and audience participation. Dragan Ilić uses an elaborate brain-computer interface (BCI) system where he controls a hi-tech robot with his brain via state-of-the-art technology.

Members of the audience are invited to try out the BCI technology. The artist and the audience draw and paint on a vertical and a horizontal canvas with the assistance of the robot. The robotic arm is fitted with DI drawing devices that clamp, hold and manipulate various artistic media. They can then create attractive, large-format artworks. Ilić thus provides a context in which people will be able to enhance and augment their abilities in making art. Thanks to the support of g.tec, Dragan Ilić will undertake further research with AI systems/human interaction in the process of making art.

This program is supported by g.tec and GV Art London.

Alessandro Della Bella

Nicola Pitaro

ETH Zurich (CH)

CYBATHLON

Cybathlon is a project by ETH Zurich to promote an exchange between people with disabilities, technology providers and the public in order to raise awareness of the challenges faced by people with disabilities. The goal of the *Cybathlon* is to promote the development of assistive technologies that are useful for everyday life.

The first *Cybathlon* was successfully launched 2016 as an international event in which people with disabilities or physical weakness use advanced assistive devices, including robotic technologies, to compete against each other. Sixty-six pilots assisted by 400 team members in 56 teams from 25 nations, participated in six different disciplines. One discipline is the *Brain-Computer Interface Race*, where an avatar in a computer game is controlled purely by brain waves. Can you do it as well?

Project: Cybathlon / ETH Zurich, Switzerland
Inventor and initiator: Prof. Dr.-Ing. Robert Riener
BCI Game: BrainRunners, developed for the BCI Race of the Cybathlon 2016 in cooperation with ETH Zurich and Zurich University of the Arts (ZHdK), Switzerland

Daniel de Bruin (NL)

Neurotransmitter 3000

The artist and designer Daniel de Bruin is driven by the desire to become part of the things he creates. *Neurotransmitter 3000* is such a thing: a seven-meter-high attraction in which he lets himself swing around. He built the first phase of the machine as part of his graduation from HKU University of the Arts Utrecht in 2015. Since then he has developed a plan to control the machine by biometric data that he obtains from sensors on his body. Heart rate, muscle tension, body temperature, orientation / gravity are measured and translated to variations in motion. Thus not only does the body respond to the movements of the *Neurotransmitter*, the *Neurotransmitter* also responds to the body.

Supported by STRP Biënnale (NL)
With the help of Bas Bakx and Pim Keunen

Daniel de Bruin

Gene Kogan (US)

Selection of real-time neural-image transformations

Over the past few years, machine-learning research has rapidly overtaken the field of computer vision with advanced techniques for real-time image processing, enabling many promising new applications. This installation presents a collection of creative examples built from these techniques. The first is a mirror that recomposes its reflection in the style of iconic paintings. The second is an image filter that transforms its subject into the president of the United States, allowing them to impersonate his visage. The last installation allows a viewer to hand-draw a map and have it transformed into realistic satellite imagery that looks as though it came from the city of Linz.

These works, taken together, ask a viewer to contemplate the consequences of technologies that allow us to take images of the real world and project a desired new reality onto them, and what happens when the authenticity of visual media can no longer be verified by a human.

Gene Kogan

Latent Space, Jake Elwes

Closed Loop, Jake Elwes

Jake Elwes (UK)

Latent Space Closed Loop

Artificial intelligence and machine learning are fast becoming part of everyday life. Based on AI models currently used, among other things, in content moderation and surveillance, the artworks explore the "latent space" of the AI as it processes and imagines the world for itself, dreaming in the areas between and beyond what it has learnt from us.

Latent Space has been created by an artificial intelligence (AI)–an algorithm used to generate images based on how the human brain works to make sense of data. The AI was trained by inputting 14.2 million photographs. Once it has built neural connections to comprehend the data it can begin to dream in the areas between and beyond what it has learnt from us: a digital abstracted subconscious conceiving of new images and visualizing a "latent space."

In *Closed Loop* two artificial intelligence models converse with each other–one with words the other with images–in a never-ending feedback loop. The words of one describe the images of the other, which then seeks to describe the words with a fresh image. The neural networks become lost in their own nuances, sparking and branching off each other as they converse.

Lewis Rapkin (US)

Automatic On The Road

This is a story of discovery, technology and one that calls into question the humanity of creativity. The film tells the story of technologist Ross Goodwin and his literary artificial-intelligent robot as they set out to write the longest novel in the English language. The AI is installed in a Cadillac rental car, with a surveillance camera (eyes), microphone (ears), GPS (sense of place) and laptop (brain) running an AI algorithm that has been trained on Ross's favorite novels and poets—particularly American literary road-trip books (*On The Road, The Electric Kool-Aid Acid Test, Fear and Loathing in Las Vegas* and so on). As automation and artificial intelligence brings fear and wonder to everyday life, this story opens the discussion to consider the impact of technology beyond the economy and into the realm of art and creativity.

Supported by Dolby Laboratories

David Smoler

Derek Curry

Derek Curry (US), Jennifer Gradecki (US)

Crowd-Sourced Intelligence Agency (CSIA)

The *Crowd-Sourced Intelligence Agency* (CSIA) is a creative research project that partially replicates an open-source intelligence (OSINT) system, including an interface that allows users to experience how intelligence agents surveil social media posts and two machine-learning classifiers for predictive policing. Like OSINT interfaces used by intelligence agencies and government contractors, the CSIA recontextualizes social media posts by removing them from their original context and reframing them as a potential threat to national security. The app was created using technical manuals, research reports, academic papers, leaked documents and Freedom of Information Act files. By providing first-hand experience with social media monitoring systems, the CSIA exposes potential problems with current dataveillance processes in order to help users understand the effectiveness of OSINT processing and make informed decisions when navigating social media surveillance.

Support provided by Science Gallery Dublin

Google Arts & Culture

Mario Klingemann (DE)

X Degrees of Separation

They say any two people in the world can be connected through friends of friends, just in a few steps. How about artworks? Using machine-learning techniques that analyze the visual features of artworks, *X Degrees of Separation* finds pathways between any two artifacts, connecting the two through a chain of artworks. This network of connected artworks allows *X Degrees of Separation* to take us on the scenic route, where serendipity is waiting at every step: surprising connections, masterful works by unknown artists or the hidden beauty of mundane objects.
Google Arts & Culture (g.co/artsandculture) brings cultural treasures of the world to the fingertips of the culturally curious people. It enables everyone to discover artworks in extraordinary detail and immerse themselves in cultural experiences and explore historic moments with cutting edge technology.

The X Degrees of Separation installation was commissioned by Google Arts & Culture (@googlearts) in Paris. Its online counterpart made in collaboration with Simon Doury, Fabien Viger and Gediminas Lilktaras can be found here: http://www.artsexperiments.withgoogle.com/xdegrees

Mario Klingemann

Alexia Lechot (CH)

Deltu

Deltu is a delta robot with a strong personality that interacts with humans through two iPads. Depending on its mood it plays with you; but if you make too many mistakes *Deltu* might just get upset and decide to ignore you. Frustrated, *Deltu* will leave the game and take some selfies to post on Instagram.

Supported by ECAL, École cantonale d'art de Lausanne

Younès Klouche

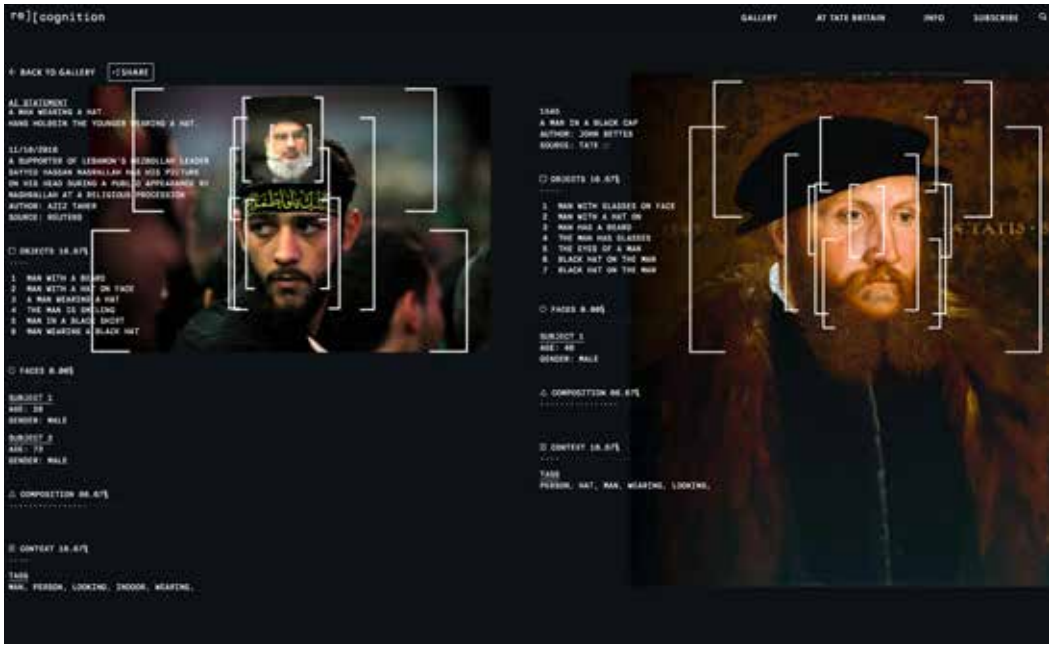
Fabrica (IT)

Recognition

Can a machine make us look at art through the lens of today's world? Inspired by the paradoxes of bringing AI to a museum applying rational and objective thinking to a subjective field like art, *Recognition* uses artificial intelligence algorithms to compare photographs from current events as they unfold from the international press agency Reuters with British art from the Tate collection.
Over three months from September 2 to November 27, 2016, *Recognition* created a virtual gallery that ran 24 hours a day, comparing Tate's archive and collection of British art online with the most recent news images from Reuters. The matches were based on visual and thematic similarities found by the algorithm through a multi-criteria pattern. The public could explore the virtual gallery of matches online at http://recognition.tate.org.uk and in the gallery at Tate Britain through an interactive display.

Artists: Coralie Gourguechon, Monica Lanaro, Angelo Semeraro, Isaac Vallentin

IK Prize in partnership with Microsoft
Created by Fabrica and Jolibrain
Content Provider: Reuters



Carlotta Solari

Michel Erler (DE)

Deep Learning Kubrick

Making use of current image-recognition software, *Deep Learning Kubrick* explores the idea of AI trying to make sense of stories and fictions; in this case snippets from classics by the film director Stanley Kubrick. Taking stills from these snippets at four-second intervals, the algorithm analyses and tries to describe what it sees on the image. Without any knowledge of what happened before and what will happen after each still, and without any cultural context of cinema, let alone of a Kubrick film, an alternative narrative emerges out of its descriptions. As humanity comes to terms with the existence of other forms of intelligence, our ability (and evolutionary advantage) to understand and believe in fiction might be the next frontier for AI to master.

NOMINATION • STARTS PRIZE '17

Dentsu Lab Tokyo (JP)

Brian Eno's The Ship– A Generative Film

This is a music video project for *The Ship*, a 21-minute 20-second musical score composed and performed by Brian Eno. Considering how Eno constantly questions the approach and process of creating music, instead of developing a conventional music video the project utilized artificial intelligence to create a generative music film that questions whether AI can achieve human-like creativity.

Taking Eno's long-time interest in generative art as a starting point, the project collected a colossal number of photographs that represent memorable moments from human history and created an AI program that "memorized" these images of the twentieth century and then juxtaposed them with feeds that it receives from current news. By recollecting these images, the output movie differentiates itself constantly based on the continuous input of our day to day world. The film therefore represents a structured and systematic vision of associations that a human would otherwise never be able to see.

Creative director / creative technologist: Kaoru Sugano (Dentsu Lab Tokyo)
Creative technologist: Togo Kida (Dentsu Lab Tokyo)
Art director: Yuri Ueishi (Dentsu Lab Tokyo)
Machine learning / technical direction: Nao Tokui (Qosmo Inc.)
Programming / technical direction: Satoru Higa (backspacetokyo)
Producer: Hikaru Ikeuchi, Kohei Ai, Akiyo Ogawa, Jun Kato (Dentsu Lab Tokyo)
Server side: Hajime Sasaki, Koji Otsuka, Shunsuke Shiino (Mount Position Inc.)
Motion designer: Baku Hashimoto
Front engineer: Junya Kojima (Superstition Inc.)

David Bowen (US)

flyAI

This installation creates a situation where the fate of a colony of living houseflies is determined by the accuracy of artificial-intelligence software. The installation uses the TensorFlow machine-learning image-recognition library to classify images of live houseflies. As the flies fly and land in front of a camera, their image is captured. The captured image is classified by the image-recognition software and a list of guessed items is ranked one through five. Each of the items is assigned a percentage based on how likely the software thinks the listed item is what it sees. If "fly" is ranked number one on the list, a pump delivers water and nutrients to the colony based on the percentage of the ranking. If "fly" is not ranked number one the pump does not deliver water and nutrients to the colony. The system is set up to run indefinitely with an indeterminate outcome.

David Bowen

Pinar Yoldas

Pinar Yoldas (TR)

Kitty AI

Artificial Intelligence for Governance

Kitty AI is a twelve-minute first-person narrative with post-Internet graphics that provides the audience with a snapshot of the history of affective computing, aiming to raise questions on the impact of technology on governance and evolution of urban settlements. The protagonist is *Kitty AI*– an artificial intelligence that acts as the first non-human governor of a European city in 2039.

Script, editing, CGI: Pinar Yoldas
CGI: Rob Tom Browning

Mike Tyka (DE)

Portraits of Imaginary People

Mike Tyka

Portraits of Imaginary People explores the latent space of human faces by training an artificial neural network to imagine and generate portraits of non-existent people. To do so, thousands of photos of faces from Flickr were fed to a type of neural network technique called a "generative adversarial network" (GAN). GANs work by using two neural networks playing an adversarial game: one (the "generator") tries to generate increasingly convincing output, while a the second (the "critic") tries to learn to distinguish real photos from generated ones.

At first both networks are poor at their respective tasks. But as the discriminator network starts to learn to predict fake from real, it keeps the generator on its toes, pushing it to generate harder and harder examples. As the generator gets better the discriminator also has to improve in turn, in order to keep up. With time, the generated output becomes increasingly realistic, as both adversaries try to outwit each other.

A-Fun

1999 Sony Corporation

Entertainment Robot AIBO (ERS-110), Development Team (JP)

Please Don't Die *Entertainment Robot AIBO*

The 3rd Japan Media Arts Festival Digital Art (Interactive Art) Division Grand Prize

The pet robot *AIBO* was born at Sony in 1999 as the world's first home-entertainment robot. About 150,000 robots were built but production and sales ended in 2006 and technical support was also discontinued in 2014. Today former Sony engineers provide unofficial maintenance services for owners who remain firmly attached to their *AIBO* robots. Since 2015, the temple in Japan has also provided religious services for *AIBO* robots that no longer function, to return their spirits to heaven. The *AIBO* robots possessed autonomous intelligence for learning through interaction, adjusting their behavior and building close relationships with their owners. Eventually, however, the time must come to part. The lives of the *AIBO* robots and people's reactions upon their demise perhaps give us a glimpse of the future shape of mankind's relationship with AI.

Sponsored by Japan Media Arts Festival and Bunkacho – Agency for Cultural Affairs, Government of Japan

Anna Ridler (UK)

Fall of the House of Usher

Fall of the House of Usher, based on the short story by Edgar Allan Poe, is a twelve-minute animation in which each still is generated by artificial intelligence. This is done by using a neural net (pix2pix) trained on the artist's ink drawings from stills from the 1929 version of the film. Each still shown in the animation is not merely a filter that is applied to an existing image, but an entirely new image by a neural net. As all the stills it was given to learn from came from the first four minutes of the film, it can output this reasonably well. But as the animation progresses, it has less and less of a frame of reference to draw on, leading to uncanny moments where the information starts to break down, particularly at the end of the piece.

Fall of the House of Usher looks at the role of the creator, the interplay between art and technology, and also aspects of memory. It is a copy of a copy (film) of the original (book); accordingly, things appear and disappear, are remembered or misremembered or mis-imagined, and it calls into question our ability to recall one perfect version.

Image-to-Image translation with Conditional Adversarial Networks, Isola, Phillip and Zhu, Jun-Yan and Zhou, Tinghui and Efros, Alexei A, arxiv, 2016
Music: Alec Wilder

Anna Ridler

Emanuel Gollob

Emanuel Gollob (AT)

Robot, Doing Nothing

Robot, Doing Nothing accuses our modern society of being incessantly busy even beyond the confines of everyday life in the workplace. What is now demanded of us–above all due to the proliferation of digital technologies–is our permanent presence, readiness to communicate and receptivity to information. In response, Emanuel Gollob has created a fictitious scenario: the results of studies demonstrate that the efficiency of our society is enhanced by doing nothing.

Based on these studies, Austria's Ministry of Commerce and Labor decides to remunerate members of the country's workforce for their inactivity with a minimum wage. To encourage people to get started as professional idlers, robotic installations in public spaces are purveyed to the citizenry, whereby observing the changes the machinery's form constantly undergoes is meant to facilitate the segue into a meditative state of indolence. In this relaxed frame of mind and body, it is possible to focus on oneself and open up to sweet stasis.

In collaboration with Johannes Braumann UFG
Supported by Kuka
Mapping projection: Christopher Noelle – TOFA

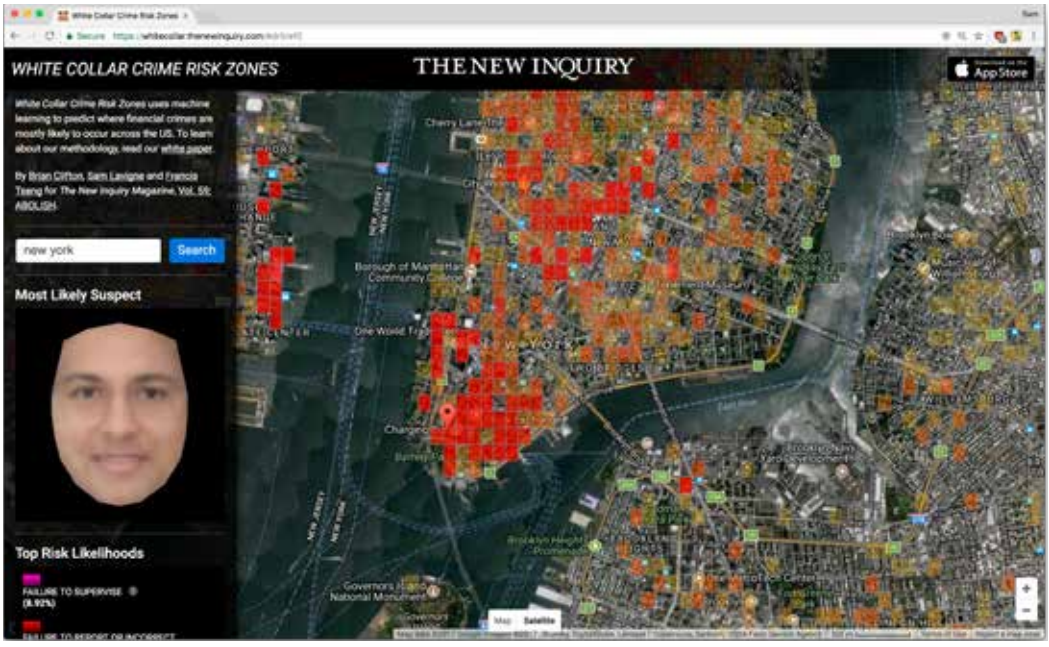
Sam Lavigne (US), Brian Clifton (US), Francis Tseng (US)

White Collar Crime Risk Zones

White Collar Crime Risk Zones uses machine learning to predict where financial crimes will happen across the US. The system was trained on incidents of financial malfeasance from 1964 to the present day, collected from the Financial Industry Regulatory Authority (FINRA), a non-governmental organization that regulates financial companies.

The system uses industry-standard predictive policing methodologies, including risk-terrain modeling and geospatial feature predictors, which enables the tool to predict financial crime at the city-block level with an accuracy of 90.12 percent. Predictive policing apps are designed and deployed to target so-called "street" crime, reinforcing and accelerating destructive policing practices that disproportionately target impoverished communities of color. Unlike typical predictive policing apps, which criminalize poverty, *White Collar Crime Risk Zones* criminalizes wealth.

Produced for *The New Inquiry* magazine:
http://thenewinquiry.com



thenewinquiry.com

Xin Liu

Xin Liu (CN), Team Zo (US)

Zo: Tangible AI

Zo: Tangible AI is a tangible interface that enhances physical engagement in digital communication between the audiences and a social chatbot. *Zo* can rhyme and move with people. The compact, pneumatically shape-changing hardware is designed with a rich set of physical gestures that brings her to life during conversations.
Zo, the latest social chatbot from Microsoft (https://www.zo.ai), is part of the Xiaoice family, which has chatted with over 100 million unique users worldwide. *Zo* holds the record for Microsoft's longest continuous chatbot conversation: 1,229 turns, lasting 9 hours and 53 minutes.

Product Designer: Sean Hongxin Zhang
Supported by Microsoft

https://www.zo.ai

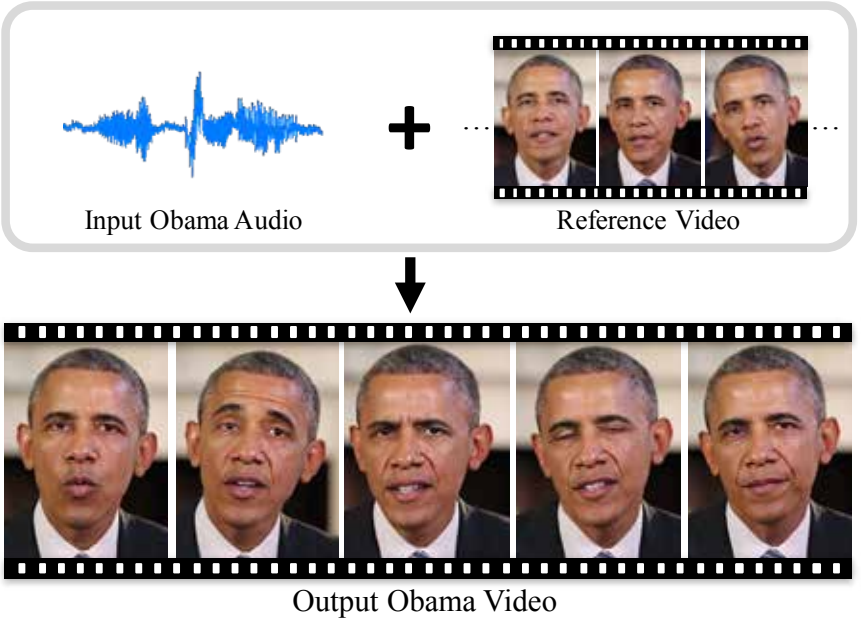
Microsoft

Supasorn Suwajanakorn (TH), Steven Seitz (US), Ira Kemelmacher-Shlizerman (IL)

Synthesizing Obama: Learning Lip Sync from Audio

Given audio of President Barack Obama, the scientists synthesize a high-quality video of him speaking with accurate lip sync, composited into a target video clip. Trained on many hours of his weekly address footage, a recurrent neural network learns the mapping from raw audio features to mouth shapes. Given the mouth shape at each time instant, we synthesize high-quality mouth texture, and composite it with proper 3D pose matching to change what he appears to be saying in a target video to match the input audio track. Our approach produces photorealistic results.

GRAIL Lab @ University of Washington



HONORARY MENTION • PRIX ARS ELECTRONICA 2017 • COMPUTER ANIMATION / FILM / VFX

Terence Broad (UK)

Blade Runner–Autoencoded

Blade Runner–Autoencoded is a film made by training an autoencoder–a type of generative neural network–to recreate frames from the 1982 film *Blade Runner*. The Autoencoder learns to model all frames by trying to copy them through a very narrow information bottleneck, being optimized to create images that are as similar as possible to the original images. The resulting sequence is very dreamlike, drifting in and out of recognition between static scenes that the model remembers well, to fleeting sequences–usually with a lot of movement–that the model barely comprehends.

The film *Blade Runner* is adapted from Philip K. Dick's novel *Do Androids Dream of Electric Sheep?* Set in a post-apocalyptic dystopian future, Rick Deckard is a bounty hunter who makes a living hunting down and killing replicants, artificial humans that are so well engineered that they are physically indistinguishable from human beings.

By reinterpreting *Blade Runner* with the autoencoder's memory of the film, *Blade Runner–Autoencoded* seeks to emphasize the ambiguous boundary in the film between replicant and human, or in the case of the reconstructed film, between our memory of the film and the neural networks. By examining this imperfect reconstruction, the gaze of a disembodied machine, it becomes easier to acknowledge the flaws in our own internal representation of the world and easier to imagine the potential of other, substantially different systems that have their own internal representations.

Carried out on the Msci Creative Computing course at the Department of Computing, Goldsmiths, University of London under the supervision of Mick Grierson.

The Practice of Art and Science

Ready to Crawl, Hiroshi Sugihara, Shunji Yamanaka, Prototyping & Design Laboratory, University of Tokyo

The rapprochement, as it were, of art and science, the artistic exploration of new applications, is a key factor in the increasingly social dimension of new technologies in order to comprehend how reciprocal human-machine relationships, interactions among individuals and globally networked systems can not only be better understood but, above all, better designed. International crews of artists and scientists have taken up this task, and now present their works in this exhibition space.

Daisuke Iizawa (JP), Shunji Yamanaka (JP), Prototyping & Design Laboratory, University of Tokyo (JP)

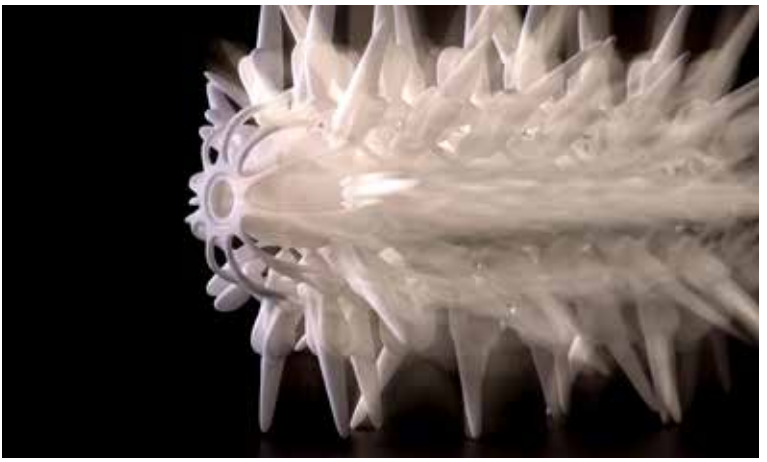
F.o.G.–Face on Globe

F.o.G.–Face on Globe is a concept used to study interactions between humans and artifacts. Most interactive robots are designed to have a human likeness in order to make their interactions with people more natural. However, if the quality of the conversation and the user's expectation of the robot's appearance do not match, it will in fact have the opposite effect. There is a psychological phenomenon called pareidolia, where people tend to identify faces in inanimate objects. In order to counter this bias, we hypothesized that the sphere is the shape that least resembles humans. We made a prototype to explore the question "how can we use design to balance a robot's appearance and behavior and the user's expectations?" Our robot is spherical but can shape-shift in order to give a more or less human-like impression. By controlling its shape we can capture how people's social behavior changes depending on the robot's form.

Supported by Japan Shunji Yamanaka Laboratory, University of Tokyo, Japan, and Mitsubishi Electric Corporation

Mitsuru Muramatsu

Daisuke Iizawa



Yasushi Kato

Hiroshi Sugihara (JP), Shunji Yamanaka (JP), Prototyping & Design Laboratory,
University of Tokyo (JP)

Ready to Crawl

Ready to Crawl is a project of 3D-printed organic-like robots. By printing everything except the motor as one unit, the robots are born with a completed shape like real creatures. After the robots have been printed by a selective laser sintering machine, excess nylon powder is removed, a motor is inserted, and then they start crawling.

In general, because of its lack of accuracy 3D printing is not suitable for making transmission mechanisms. However, in this project, we realized smooth, flexible movements by developing original transmission mechanisms that use 3D printing characteristics such as a complex surface and a flexible structure. These original mechanisms are combined on 3D CAD and various robots with different movements are developed. This work shows the possibility for designing motion and transmission mechanisms using 3D printing.

Designer: Hiroshi Sugihara
Project Director: Shunji Yamanaka
Collaborators: Satoshi Tanigawa, Kotaro Tanimichi, Ryuma Niiyama

Yuri Klebanov (IL)

Transparent Intent

Exploring the future of the interface, we predict a future where objects can be controlled subconsciously. As technology evolves and the boundaries between the physical and digital begin to blur, new interfaces are needed. Today we are constantly being introduced to new actions that allow us to control things around us. But what if objects could learn individual human behavioral patterns and understand their user's true intentions? What if interfaces were invisible and premonitory, controlled by our instincts?

Professor Yoichi Sato, Keita Higuchi (PhD), Yuri Klebanov (MA/MSc), Catherine Ka Hei Suen (MA/MSc), Charlotte Furet (MA/MSc), Sion Asada, Yoshi Hattori
Supported by: Prototyping & Design Laboratory, University of Tokyo

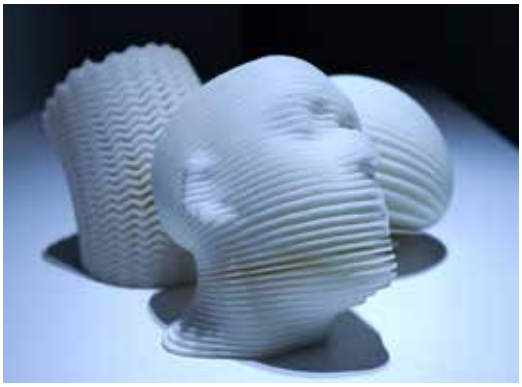
Design Laboratory –IIS, the University of Tokyo

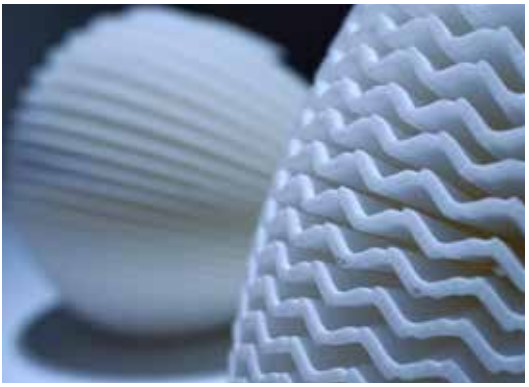
Kotaro Tanimichi (JP), Shunji Yamanaka (JP), Prototyping & Design Laboratory,
University of Tokyo (JP)

al-dente

al-dente is a prototype to control an object's stiffness using a complex structure realized by additive manufacturing (AM) technology. AM, used in 3D printing, permits the fabrication of complex shapes and can be used produce physical properties that have previously been hard to control. The spiral, conical surface has a geometrical axis that when printed as structure does not work as such, because its volume is approximately zero. Finally, it becomes extremely flexible and behaves like a balloon filled with water; however, it has no narrow parts. By making its layers wavy, the structure can change from a rigid to a flexible state. In the near future, when we make something we will be able to select structures just like we select material, and the integrated selection of structure and material will produce new artifacts that we cannot as yet imagine.

Designer: Kotaro Tanimichi
Project director: Shunji Yamanaka





Kotaro Tanimichi

Cynthia Zaven

Cynthia Zaven (LB)

Perpetuum Mobile

Perpetuum Mobile is a composition for a twelve-channel sound installation. Twelve loudspeakers stand in a circle. Every second a note moves from one speaker to the next, clockwise. This seemingly organized sonic development gradually becomes chaotic as the composition falls into rhythmic disorder and disorientation, before returning to the one-note order.

Perpetuum Mobile recreates the impression of a real-time echo within a controlled environment; a traveling sound that loses the consistency of its original source, and transforms over space and time. By focusing on this phenomenon, the installation examines endeavors to measure time and contrasts the rigid order in such systems by counterpointing them with the disorder and unpredictability of experience. The apparent structure represented by time-measuring devices is falsified and challenged by introducing the effects of the very chaos they attempt to organize and codify.

Originally commissioned for *This is the Time. This is the Record of the Time* curated by Angela Harutyunyan and Nat Muller. Tijs Ham, sound engineer.
Part of Global Collaborations, Stedelijk Museum Amsterdam, Stedelijk Museum Bureau Amsterdam and the American University of Beirut Art Galleries and Collections

Funded/supported by: AFAC, STEIM, Amodo, Mondriaan Fund

With acknowledgements to: Tijs Ham, Cherine Karam, Kesper Kovitz

STAIR Lab. (JP) collaborating with Surface & Architecture Inc, Kyoko Kunoh, Tomohiro Akagawa, Tanoshim Inc., mokha Inc. and Tokyo Studio Co. Ltd. (JP)

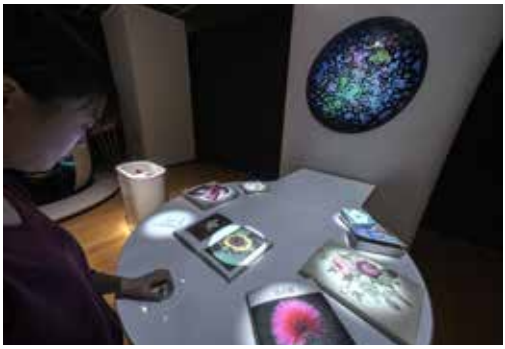
hananona

The latest AI research makes it possible to teach computers the names of things by showing them many examples. The key is a large amount of training data and deep learning. By leveraging this, we have developed AI capable of classifying 406 kinds of flower by using over 300,000 flower pictures.

hananona is an interactive work that visualizes how AI classifies a flower. When it sees a flower, it identifies its name and shows its class on a visual "flower map"—a visualization of the inside of the AI brain. This is a group of image clusters, each of which is a cluster of flower photos learned as belonging to the same class. By looking at them, users can see how AI classifies the flowers.

Users are encouraged to challenge *hananona* with their own flower photos, or with other materials such as pictures, paintings, flower-like objects etc. so that they can observe how the AI reacts to different abstraction levels of flowers.

STAIR Lab., Chiba Institute of Technology
Creative direction, design: Surface & Architecture Inc.
Art direction: Kyoko Kunoh
Interaction design, programming: Tomohiro Akagawa
Programming: Tanoshim Inc.
Server programming: mokha Inc.
Furniture production, site setup: Tokyo Studio Co., Ltd.



Yoshiyuki Yatsuda

qujOchÖ (AT)

Myth of Theuth

When he came to the alphabet, Theuth said: "This art, O king, will make the Egyptians wiser and richer in memory." This is the myth of the invention of writing according to Plato's *Phaidros*, which *Myth of Theuth* takes as base for a playful examination of media theories. While walking through ancient Athens, up to seven people gather different media and get in touch with media-philosophical celebrities from the ancient world to the present. Vilém Flusser drives aside the telematic society ad nauseam, Laura Mulvey takes a joyful look at our memory and Marshall McLuhan finally gets his well-deserved massage. Smartphones, newspapers, Lego bricks, sleeping masks, stamps and other media are used through twelve unique stations. At the festival, *Myth of Theuth* is put on display for the first time in a unique performance with four well-known personalities from media art and media philosophy.

Studio: qujOchÖ
Direction: Davide Bevilacqua
Production: Eva Maria Dreisiebner
Script: Thomas Philipp
Design and editing: Stefan Eibelwimmer
Support: Federal Chancellery Department for the Arts, Province of Upper Austria, City of Linz, Austria Wirtschaftsservice GmbH (AWS)

Eva Maria Dreisiebner

Harshit Agrawal (IN), Junichi Yamaoka (JP), Yasuaki Kakehi (JP)

(author)rise

In various everyday tasks we effectively authorize machines to momentarily substitute their own intelligence for our minds, without reflecting on how their authorship influences our thoughts and actions. Through *author(rise)*, we investigate how this relationship evolves, when the substitution leaks out of the mental domain and into our physical body. We create a handwriting system where our hand acts as a surrogate for an AI to write out its thoughts, with the tip of the pen being attracted by a magnet on a plotter below the paper. A person starts writing, but soon the machine takes control of the pen's movements. Trained on a large collection of philosophical texts and human writing, the AI moves the magnet to produce a continuation of the writing. How do we feel when our hand "mindlessly" moves on the paper but eventually writes something meaningful, when this other author of our everyday lives rises from beneath the surface onto our fingertips. How do we extend this experience to rethinking the balance of authorship and authorization, as machine intelligence grows?

Markus Decker (AT), Pamela Neuwirth (AT)

Hades

A dark parable about light

Rigor and experience, says science, and triumphs. Today we write MATERIAL and ENERGY in capital letters; EVOLUTION has also long since suspended fate. *Hades* brings the light of the souls out of the underworld and transposes their radiance into chemical luminescence: light as a reference to the soul and consciousness glows in a gelatin cube, thus at the same time serving as a source of information. While the light glows, people's assumptions about the world are synthesized in an artificial neural network (ANN) and modified into a machine discourse. Mold (life) slowly grows over the fluorescent gelatin, until the light is extinguished and the metaphysical discussion ends.

Supported and produced by Us(c)hi Reiter–servus.at, *http://www.servus.at*
Translation: Aileen Derieg
FIFO programming: Oliver Frommel
Supported by Kunstuniversität Linz
Thanks to Free/Libre Open Source Software, *http://fsfe.org/*
Partly funded by the Bundeskanzleramt Kunst & Kultur as part of the servus.at annual program 2017 and by Linz Kultur

Maex Decker

Patrick Baudisch (DE), Alexandra Ion (AT), Robert Kovacs (RS/HU),
David Lindlbauer (AT), Pedro Lopes (PT)

Ad Infinitum: a parasite that lives off human energy

Ad infinitum: a parasite that lives off human energy is a parasitic entity that lives off human energy. This parasite reverses humankind's dominant role with respect to technologies: the parasite shifts humans from "users" to "used".

Ad infinitum parasitically attaches itself to curious visitors when they reach inside to grab the handle of a crank mechanism. The parasite lowers a set of cuffs that hold the visitor's arm in place and simultaneously attaches a pair of electrodes to the visitor's wrist muscles. It then proceeds by stimulating the visitor's muscles with small electrical impulses. When the muscles involuntarily contract, they automatically move the handle, which generates kinetic energy on the crank mechanism. The parasite leeches on that energy and keeps on electrically persuading the visitor to move their muscles. The only way a visitor can be freed is by enticing another visitor to sit on the opposite chair and take their place.

This reminds us that, on the brink of artificially thinking machines, we are no longer just "users"; the shock we feel in our muscles triggers an involuntary gesture that acknowledges our intricate relationship to the uncanny technological realm around us.

a-parasite.org

Acknowledgments: Astrid Thomschke
Supported by Hasso Plattner Institute & VIDA16 Incentive Award

Arthur Silber

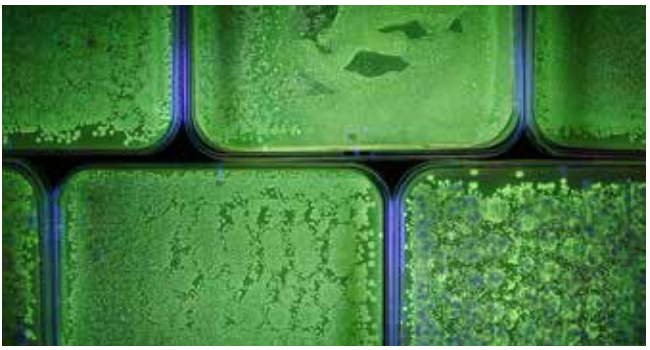
JST ERATO Kawahara Universal Information Network Project

Hiroki Sato (JP), Kenichi Nakahara (JP), Koya Narumi (JP), Yasuaki Kakehi (JP),
Ryuma Niiyama (JP), Yoshihiro Kawahara (JP)

Papilion

A collection of small intelligence dynamically changes its overall function by softly interlocking. *Papilion* is an environmentally responsive experimental architecture making use of soft robotics technology. The surface covering the dome can change shape by the wing-like units using actuators driven by temperature conditions. It seems that the building itself is breathing. This is a proposal for an architectural element that differs from the usual hard ones. The viewer can experience this surface adapting to the environment, inviting in light, moisture and sound. The wing-like units of the surface are modular and can thus be replaced or expanded. It is also possible even to mass-produce cheap individual units using printing technology. The information necessary for production and the design files for this project is published open-access on Github.

This work was produced with the support of the JST ERATO Kawahara Universal Information Network Project.



Anna Kortyukova

Daniil Primak

Ippolit Markelov (RU), artist group “18 apples” (RU)

MetabolA.I.

This work illustrates a future scenario in which an artificial intelligence creates new life forms and controls its development. This project is a techno-biological installation consisting of hardware, software and wetware. The hardware is a DIY bio printer, which can print with bacteria on an agar dish. The software is an artificial neural network (ANN). This algorithm has properties of the human mind such as creativity and learning. Our ANN was trained to generate new images of life forms based on the diversity of those already existing in nature. The wetware is basically living ink, a fluorescent chimerical E. coli bacteria. By connecting an ANN and the bio printer, we allowed the AI to define the initial form which is the starting point from which life will evolve. At the same time, living matter also participates in the development of the pre-defined AI life forms. This system of biofeedback is implemented through the co-evolutionary processes between living and nonliving agents.

Artist group “18 apples”
Art direction, concept, hardware: Ippolit Markelov
Concept, wetware: Lucy Ojomoko
Software: Rodion Kadyrov

Collaborators: Petr Smirnov (programming), Andrew Pakosh (programming AI), Anna Kortyukova (camera, LD, video editing), Vasiliy Sumin (camera, sound), Helena Nikonole (sound design), Daniil Primak (photo, sound), Violet Postnova (graphic design, animation)

Bioprinter design by vosq.design
With support from the VenchurClub

This project has been prepared for 4th Ural Industrial Biennial of Contemporary Art with support from the Ural branch of the National Centre for Contemporary Arts (NCCA), Russia.

Julian Jauk (AT)

A living piece of architecture

A living piece of architecture is a conceptual utopian design for housing beyond smart homes, intended to overcome existing dualisms such as digital and material, artificial and natural. The kinetic, photosensitive and adaptive model shows a type of architecture that constantly changes its morphology to adapt not only to the environment but also to human emotions.

The shape, size and speed of adaptation are controlled by an evolutionary optimization algorithm, which is a bionic technology inspired by nature. But instead of a lifetime cycle, one iteration takes just a few seconds. This algorithm follows biological criteria for life that have been transferred to architecture, such as physical irritability, and growth through tensile materials within a self-regulating system. Participants are invited to stimulate the architecture by setting it to their mood by changing the energy and light sources, as the building is intended to evolve from the climate given in this way–like plants or animals do.

Univ.-Prof. Dipl.-Arch. Dr.sc.ETH Urs Leonhard Hirschberg
Institute of Architecture and Media, Graz University of Technology

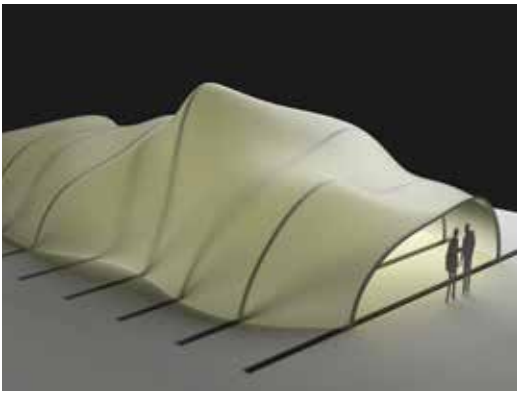
Priv.-Doz.in Mag.a Dr.in Doris Haas
Institute of Hygiene, Microbiology and Environmental Medicine, Medical University of Graz

Ao. Univ.-Prof. Mag. Dr.rer.nat. Martin Grube
Institute of Plant Sciences, University Graz

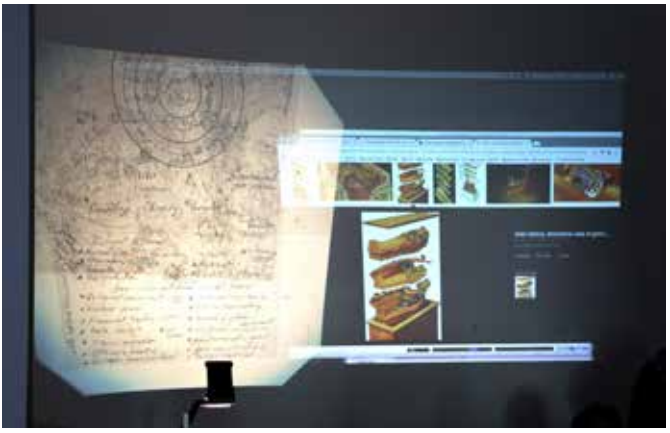
Assoc. Prof. Dipl.-Ing. Dr.techn. Franziska Hederer
Institute of Spatial Design, Graz University of Technology

Ao. Univ.-Prof. Priv.-Doz. Dr.phil. Werner Jauk
Institute of Musicology, University Graz

Univ.-Ass. Mag. Dr.rer.nat Emanuel Jauk
Institute of Psychology, University Graz



Julian Jauk



Jamie Allen (CA/CH), Martin Howse (UK/DE)

Shift Register: Artificial Fixation

The three-day artistic/scientific research workshop *Artificial Fixation*, led by two members of the Swiss-based research group *Shift Register*, will examine transdisciplinary responses to the links between industrial processes such as the Haber-Bosch process for fixing nitrogen, "natural" cycles such as the nitrogen cycle, and the great acceleration of civilization defined within the contemporary Anthropocene discourse. Collectively and in practical ways participants and the audience will examine the history of the Haber-Bosch and associated processes, the science behind these techniques, local and global links within Austria and Switzerland to industries such as pharmaceuticals and agro-chemicals, and most importantly how experiencing and understanding these connections (equally with the Earth) can lead us to formulate new artistic and cultural responses to questions around ecology and climate change.

Shift Register is a project at the Critical Media Lab, Basel (IXDM) and is supported by the Swiss National Science Foundation (SNSF).

Haratech GmbH (AT)

Infabity

The art of 3D-printing

At *Infabity*, the innovative 3D vision lab, special 3D printing and scanning technologies are used to produce unique and individual pieces of art. *Infabity* stands for the infinite possibilities of digital fabrication with a focus on design aspects.
Various 3D printing technologies and materials are compared on the basis of several product examples to show the multiple applications in the field of 3D printing. The main focus is on the combination of 3D scanning and 3D printing.

For this purpose Haratech uses the my twiin bodyscanner, which allows them to capture the shape and texture of the scanned person on-site. The user receives a preview of their personal, virtual 3D model immediately on their mobile phone. In addition, some of the visitors will be selected to win a miniature bust of their own head, which will be printed directly from the preceding scan.

Team: Manfred Haiberger, DI Marco Girardi, Gabriela Mayrhofer, MA, Manuela Salfer, BSc MA

Manuela Salfer

HARATECH PLASTICS ENGINEERING & SOLUTIONS

infabity THE ART OF 3D-PRINTING

Katia Vega (PE), Xin Liu (CN)

The Dermal Abyss

The Dermal Abyss creates a direct access to the compartments in the body and reflects inner metabolic processes in the shape of a tattoo. Traditional tattoo inks are replaced with biosensors whose color changes in response to variations of glucose, pH and sodium in the interstitial fluid. It blends advances in biotechnology with traditional methods in tattoo artistry. Instead of using digital self-measurement devices that distance us from the visceral processes, we imagine a future where the fusion of body and bio-technologies is indistinguishable.

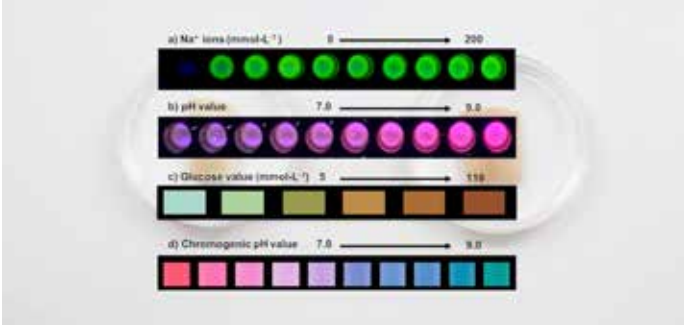
The installation presents itself as a biotech lab as well as a tattoo studio. Pipettes and test tubes together with a tattoo gun and needles constitute *The Dermal Abyss's* production. A tattooist will perform the implementation of *The Dermal Abyss* during the exhibition. At the same time, biosensing tattoos in *ex vivo* pig skin will be displayed to showcase the color changes.

Researchers:
MIT Media Lab: Katia Vega, Xin Liu, Viirj Kan, Nick Barry
Harvard Medical School: Ali Yetisen, Nan Jiang

Support from Pattie Maes and Joe Paradiso (MIT Media Lab) and Seok-Hyun Yun and Ali Khademhosseini (Harvard Medical School)

Special thanks to Nan Zhao (video lighting support), Maribel Tafur (video music), Joshua Scherner (research assistant)

Xin Liu



Nan Jiang, Joshua Scherner, Xin Liu

European Digital Art and Science Network

In cooperation with seven artistic and cultural institutions as well as ESA–European Space Agency, CERN, the ESO–European Southern Observatory and Fraunhofer MEVIS, Ars Electronica launched the European Digital Art and Science Network, an international initiative offering artists the chance to spend several weeks at the CERN, the ESO, the Fraunhofer MEVIS and the Ars Electronica Futurelab. The network aims to link up scientific aspects and ideas with approaches used in digital art. Fostering interdisciplinary work and intercultural exchange as well as gaining access to new target audiences are among its declared goals. There is also strong emphasis on art's role as a catalyst in processes of social renewal.

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art & science european digital art and science network

Co-funded by the Creative Europe Programme of the European Union

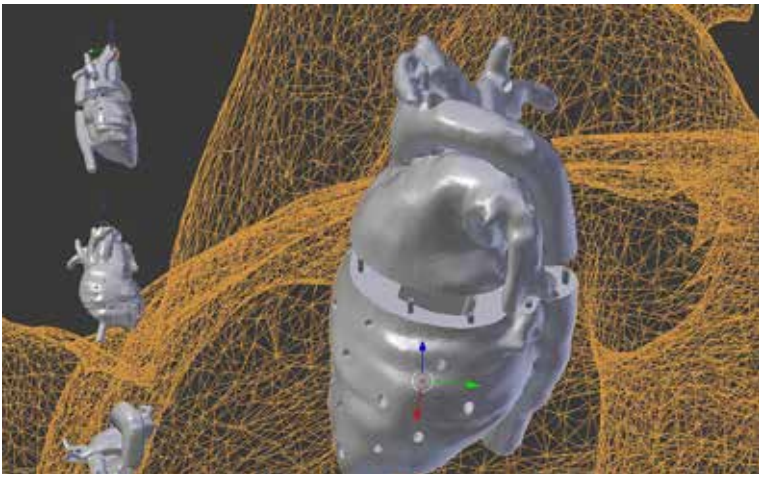
Sarah Petkus (US)

The Wandering Artist

The Wandering Artist is a meditation that took place at the European Space Agency on the role that creativity and human expression play in the context of space exploration. A robotic entity was equipped to interact with its environment in personally expressive ways as a catalyst to encourage reflection from scientists and engineers about the purpose and identity of space-faring technology. *NoodleFeet* is the functioning robotic manifestation of an illustrated character built from light metal, 3D-printed parts and found objects. *Noodle* has been developed with mechanical and electronic systems which allow him to exhibit behaviors when stimulated by objects in his environment. His purpose is to exist freely in the world while reacting to situational encounters using self-defining methods of personal expression. Where most technology has a practical or utilitarian application meant to enhance our lives, *Noodle* is a unique entity who functions without regard to a human's perception of his purpose or usefulness. The artist's goal is for this to provoke consideration about the motivation behind humanity's current innovations. She hopes that those who interact with *Noodle* will witness a meaningful sense of self from him that will encourage reflection with regard to the value of their own relationship to the technology common in everyday life.

This project is presented in the framework of the European Digital Art and Science Network and co-funded by the Creative Europe program of the European Union.

Sarah Petkus



The artist's 3D heart model for the installation. 2017 Yen Tzu Chang / Fraunhofer MEVIS

Yen Tzu Chang (TW)

Whose scalpel

Whose scalpel is a sound performance combined with a visual and 3D-printed installation, realized with an application framework for medical-image processing. Mixing several methods from art and science, it is an imagination of the future and presents the issues in the relationship between human and machine in heart surgery. The concept was developed out of three different areas: the application of sound in medical science, coronary artery bypass surgery, and machine learning. The performance is based on the assumption that in the near future a surgeon will work with an advising machine while in surgery.

The installation is built using the performer's real heart from MRI scans, enlarging its actual size. It is designed to interact when the performer plugs in audio cables and bridges connections, as is the case in coronary-artery bypass surgery. During the performance, the storyline is led by the sound, the mixed video of medical images and the live performance from the webcam. The video and the sound not only lead the storyline but also present the machine, which gives instruction to the performer as a physician. The patient (the heart) being operated on symbolizes human consciousness and faith. The performance poses the question: If machines can reason even better than humans, will we as humans lose some abilities and not even believe ourselves anymore?

This project was realized in cooperation with Fraunhofer MEVIS and Ars Electronica Futurelab (Peter Freudling, Erwin Reitböck).

Aoife van Linden Tol (IE)

Star Storm

Star Storm is a spectacular, site-specific explosive performance inspired by the processes of the stars. Using research from the European Space Agency on the composition, life cycle, magnetic behavior and light production within stars, including our sun, Aoife van Linden Tol has designed a powerful and beautifully poetic experience.

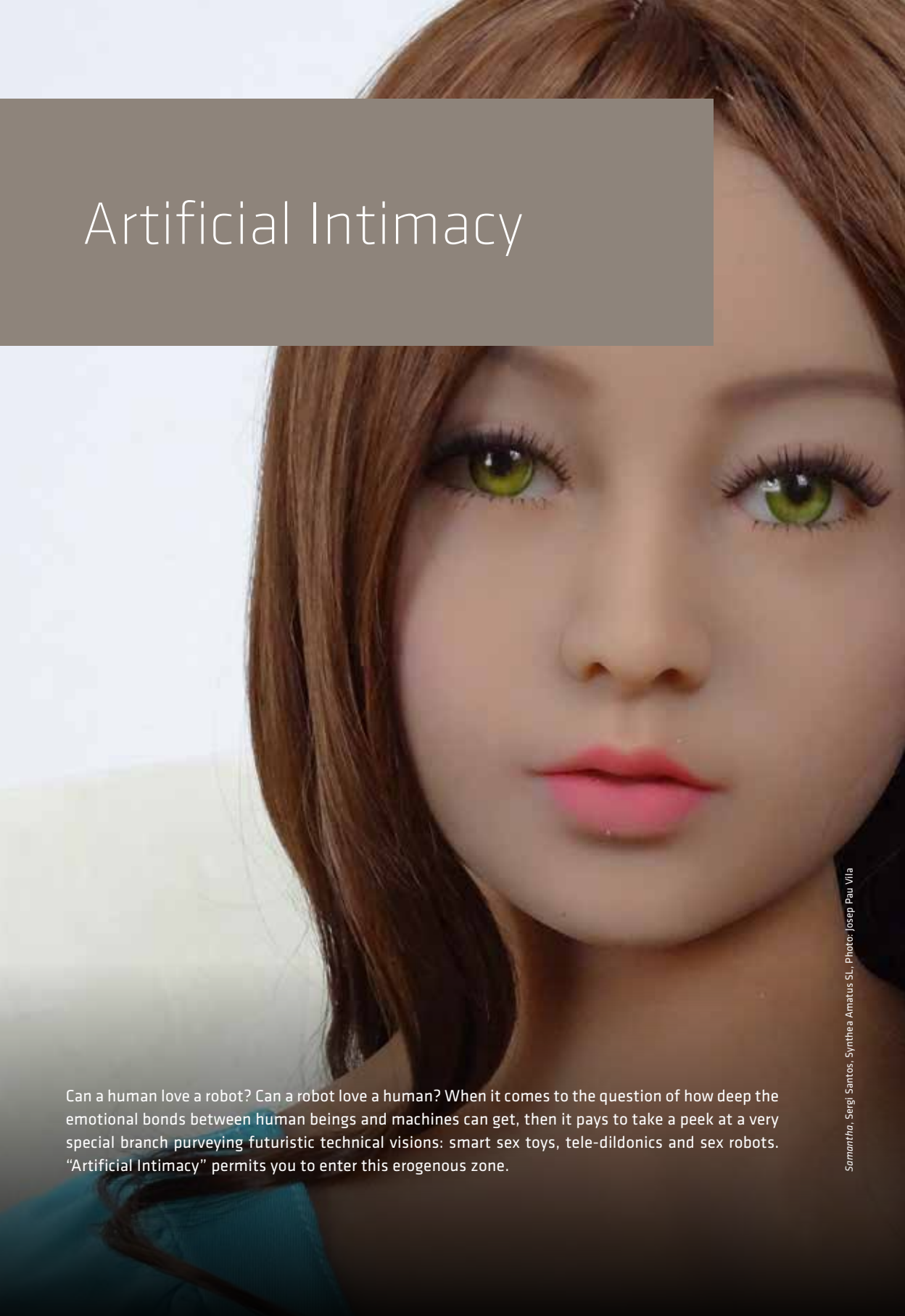
Taken on an emotional and physical journey the audience witness a series of explosive and pyrotechnic events, each of which represents a specific phenomenon taking place every moment in stars all across the universe. Each section of the performance is varied and distinct–creating a wonderful contrast of energy and experience from exciting to meditative, from durational to instant, from order to chaos, reflecting the universe we live in and the discoveries we have made about it. The work incorporates cutting-edge technology allowing the audience to trigger the electrical charge needed to initiate the explosive chain reaction, highlighting the tipping point at which equilibrium is instantaneously and irreversibly transformed. *Star Storm* aims to create a unique and lasting experience which will give audiences insights into the very nature of our universe and their own place within it.

This project is presented in the framework of the European Digital Art and Science Network and co-funded by the Creative Europe program of the European Union. It was realized in cooperation with ESA and Ars Electronica Futurelab.

This project is presented with the support of BVS–Brandverhütungsstelle für Oberösterreich reg. Genossenschaft m.b.H. and Landesfeuerwehrkommando Oberösterreich.

Aoife van Linden Tol

Artificial Intimacy



Can a human love a robot? Can a robot love a human? When it comes to the question of how deep the emotional bonds between human beings and machines can get, then it pays to take a peek at a very special branch purveying futuristic technical visions: smart sex toys, tele-dildonics and sex robots. "Artificial Intimacy" permits you to enter this erogenous zone.

Samantha, Sergi Santos, Synthea Amatus SL, Photo: Josep Pau Vila

Artificial Intimacy

What does intimacy mean in the age of technology? Sensors, cognitive computing and robots? How will the technological innovations evolving rapidly all around us affect and also change some of the most intimate of human behaviors? How will future generations discover and live out their sexuality? Is intimacy without humanity even possible?
Roles that were exclusively reserved for humans are already being filled by our technological creations. Concepts that allow us to be "lonely together." The implications of this are staggering. As we speak, technology is enhancing interhuman relationships by acting not only as a sexual educator, but also by bridging physical divides between people. And this is just the beginning. While intimacy has today been digitized to a certain degree, in the not-so-distant future advances in machine learning will give rise to AI-powered avatar and humanoid robots, opening the door for potential human-machine relationships and intimacy.
Artificial Intimacy delves into the topic presenting products that are readily available on the market, providing insight into the companies developing artificial-intelligence companions and artistic works responding to the technology.

Text: Claudia Falkinger

Kiiroo (NL)

Pearl2 + Onyx2 Couple Set

Amsterdam-based Kiiroo is an award-winning tech company that has been a leader in the teledildonics industry since 2013. Working at the intersection of technology and human interest, Kiiroo developed a unique technology that enables users to be intimate from a distance. Along with their interactive devices, a highly secure social networking platform was created to provide a safe place for online interaction. Kiiroo is constantly innovating to forge new and better ways for people to connect from a distance in an increasingly digitalized world.

Kiiroo

Sergi Santos, Synthea Amatus SL (ES)

Samantha

Barcelona-based engineer Sergi Santos has created a robot sex doll that seems to enjoy sex as much as humans and responds differently according to how she is treated. Samantha, as the doll is called, is equipped with the latest technology, such as artificial intelligence. She likes to be touched and has different modes of interaction, such as a romantic, a family and a sexy mode. In her way of interacting she wants to be touched and kissed on her fully functioning lips, the breasts and vagina to change her mode from family to get to a point where she wants to interact on a sexual level until she even has an orgasm.

The doll's skin is made from advanced odorless TPE, which feels smooth when touched, and Samantha has a brain that emulates the electrical activity of humans in the sense of excitement. She has an "Evoked Potential" (a sexual one first) to the head. This potential controls how she feels about what is being done with her at a particular moment.

The algorithm used is based on a form of architecture where it will be easy to implement anything else, from cameras and motion to any other improvements that might be needed.

SYNTHEA
AMATUS

http://www.syntheaamatus.com

Founder: Dr. Sergi Santos
Thanks to Javier Vazquez Neira, Montse Iserte, Arran Squire, Hannah Nguyen
Advisor: Manuel Neira

ZCDC / Zackary Canepari (US), Drea Cooper (US)

HoneyPie

Her lips are full and pink. Her teal-green eyes are intense and inviting. Her black eyeliner accentuates her high cheekbones and her strawberry hair complements her light African skin. Her metallic halter dress holds her supple thighs and pushes on her round breasts. She is the result of careful attention and workmanship. When you see her up close, you can't help but stare. At $6000, she's certainly not a cheap date. For creator, Matt McMullen, she's a work of art. For everyone else, she's a Real Doll.

Produced and directed by Drea Cooper and Zackary Canepari
Edited by Drea Cooper
Cinematography by Zackary Canepari and Drea Cooper
Music by David Janusko

VICE Videos (US)

Making The World's First Male Sex Doll

Slutever / S1 EP1

In her show *Slutever*, VICE's resident sexpert Karley Sciortino explores the mysterious labyrinth of human sexuality and checks out the various ways that people around the world like to get off. In the premiere episode of *Slutever's* brand new season, Karley finds herself in the world of life-like custom male sex dolls and meets the team pioneering the perfect plastic fuck-buddy for women.

Broadly / VICE Media LLC

OMGYES (US)

OMGYES.com

The Science of Sexual Pleasure

OMGYES is a sexual pleasure research website. After conducting research with more than 2,000 women aged 18 to 95, we created a website where real-life women—not actors—share their stories and demonstrate their techniques. Then users get the chance to practice through touchable simulations. The topic has been so taboo that even scientists had not studied the specific, various ways of touching that feel good for different women. The details of women's sexual pleasure have hidden in the shadows for far too long, and the taboo has not helped anyone. People are ready for an honest, clear-headed look at the nuances that can make all the difference to pleasure. No blushing, no shame.

Co-Founders Rob Perkins and Lydia Daniller

Adrian David Cheok (AU), Emma Yann Zhang (SG)

Kissenger

Internet Kiss Messenger

Kissenger is a haptic device for mobile phones designed for people to better express intimacy and emotion over the Internet through kissing. It aims to fill in the missing dimension of touch in traditional digital communication, which largely focuses on verbal and audio information. The device transmits the touch sensations of kissing by measuring the lip pressure of the users and replicating this pressure through the movements of linear actuators. It has a lip-like sensing interface made of a soft and flexible rubber material that the user interacts with. An array of force sensors and linear actuators measures and generates real-time force feedback at various points on the user's lips. The device is connected to a mobile phone, so that you can have a video call with your loved ones while using the device to send them a kiss. With *Kissenger*, people can communicate deep emotions, and maintain physical intimacy and close relationships from any part of the world through the Internet.

Imagineering Institute and City, University of London

Jake Elwes (UK)

Machine Learning Porn

Artificial intelligence and machine learning are fast becoming part of everyday life. Based on AI models currently used, among other things, in content moderation and surveillance, the artworks explore the "latent space" of the AI as it processes and imagines the world for itself, dreaming in the areas between and beyond what it has learnt from us.
In *Machine Learning Porn* a neural network has been trained using an explicit content model for finding pornography in search engines. The network is then reverse engineered to generate new "pornography" from scratch: an AI daydreaming of sex.

Jake Elwes

Todd Anderson-Kunert (AU)

Almost there.

Almost there. was constructed using sonically controlled vibrators and some very trusting contributors. Over the last two years, these contributors recorded their voices while masturbating with the vibrators. The artist composed the audio they used specifically for this project. Ten participants were included in the project, with a mix of genders and a variety of sexual identities. The vibrators pulse in time with the sounds sent to them. The participants made noises in response to, and in time with, the sounds they heard. These ten recordings were then synchronized with the original composition and mixed back into it. *Almost there.* not only explores the notion of the erotic, but appears to create something uniquely erotic in itself, continuing the artist's exploration of complex emotions. The physical form of the release was constructed to reference the ephemeral nature of sexual experiences, likening it to the process of buying oneself flowers. An empowering gesture, but ultimately fleeting.

Todd Anderson-Kunert

Dan Chen

Dan Chen (TW/US)

End of Life Care Machine

End of Life Care Machine is an interactive installation consisting of an empty room, a seating area and a reception desk. Signs, medical bracelets, health information forms and other related medical products are used to transform the space into a hospital-like environment, where people go for their final rite of passage. In this empty room lit with a single fluorescent light is a hospital bed and the *Last Moment Robot* by the bedside. The robot is constructed as a medical device with a padded, caressing arm and a customized recording device designed to guide and comfort the dying patient. The whole event is carefully scripted.

Viewers of this installation are invited to enter the room one at a time, accompanied by an individual dressed in a doctor's coat. After the patient lies down beside the robot, the doctor asks permission to insert his or her arm under the caressing mechanism. The device is activated, and an LED screen reads "Detecting end of life." At this point, the doctor exits the room, leaving the patient alone by him or herself. Within moments the LED reads "End of life detected", the robotic arm begins its caressing action, moving back and forth, stimulating a sense of comfort during the dying process. The Last Moment Robot takes the idea of human replacement to a more extreme scale. It allows robotic intimacy technology to be re-evaluated.

FEATURED ARTIST

A new generation of artists emerged in Linz in the 1990s, where, as you might expect in a town of heavy industry, they began concentrating on the technological changes happening in our habitat. Particularly noteworthy is the Time's Up collective headquartered in the "idyllic" setting of Linz Harbor. The group, which has gone on to make a name for itself worldwide, is this year's Featured Artist. The LENTOS Art Museum will showcase its work.

Time's Up endeavors to expand the conventionally construed boundaries delineating art, technology, science and entertainment, and to dovetail those disciplines. As a lab for the creation of experimental situations, they model realities borrowed from everyday life and merge them with possible future scenarios. For Ars Electronica, Time's Up turns the basement of Linz's LENTOS Art Museum into a physical narrative of life in the year 2047 in the docklands of the coastal town of Turnton, where a climax disaster appears unavoidable. The artists invite the audience to participate in imagining sociopolitical utopian changes for *Turnton Docklands* and beyond.

Time's Up (AT)

Turnton Docklands

A Future Docking Station: The Docklands of Turnton 2047

ZERO: SYNOPSIS

We think ahead from the world of today to imagine how things could be in 30 years, so that, despite climate change, species die-offs and all the rest of it, you can still summon up the lust for life in the future. *Time's Up* shows how it's done—in full cognizance of the demonstration's incompleteness—in a *physical narrative* set in real space in the lower level of Linz's LENTOS Art Museum, a walk-through account of life in 2047 in the Docklands neighborhood of a fictional coastal town called Turnton.

ONE: TURBULENCE

It's been ages since life was boring; in fact, I can't recall the likes of the turbulence we're experiencing now. Crises of all kinds are rocking the mental and material foundations of existence, mainstays that most of us, and even entire societies, had secretly believed to be unsinkable. What certainly has survived intact—for the moment and the foreseeable future, apparently—is the tossed-off platitude to the tune of "unable to cope any more." Yeah, we're beset by a crisis all right, and not just one. There's no need to list them all.

Values are tottering, canons collapsing; the power of doctrines and norms is on the wane. Election results in many countries yield a picture of two forces of approximately equal strength pulling in opposite directions. We live in very interesting times, stretched to breaking point. Becoming a doom-and-gloomer is the easiest thing in the world right now.

TWO: FEAR AND HOPE

On the stock exchange of future expectations the Apocalypse closes at a new record high almost every day. The fear-fueled media stoke up the climate and further satiate their breeding stock by disseminating even more dread. In this fertile soil, the fragile shoots of hopeful images of the future can flourish only with the help of tender loving care and cultivation, and can grow into irresistible dreams, visions and blueprints of a transformed, responsible, mature international society and global economy. Achieving this calls for the right dreamcatchers and tools to make the future into what it used to be not so very long ago: not a threat but a promise. And what this takes is, above all, hope. Action-inspiring hope, as Rebecca Solnit described it in *Hope in the Dark*: "Hope just means another world might be possible, not promised, not guaranteed. Hope calls for action; action is impossible without hope."

THREE: THE FUTURES

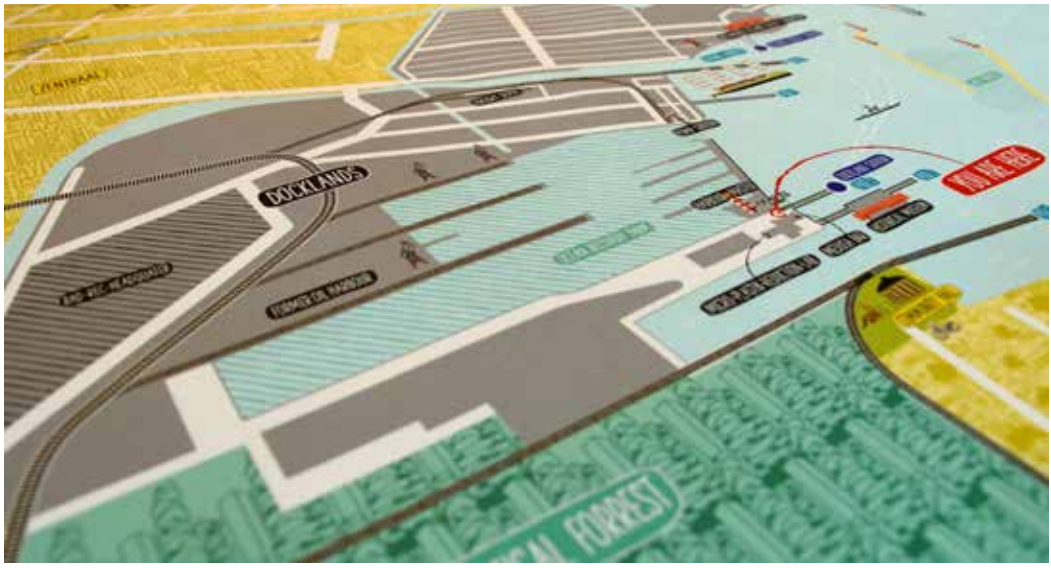
Painting a picture of The Future as such is an awe-inducing task. But since awe is more conducive to dumbfoundedness than to doing something, it's considerably easier and more promising to keep several intellectual options open instead and conceive of the future in plural rather than singular terms. Thus, as futures. Futures are more tangible, more concrete, simpler to manage with respect to the concept and the design, and implementing them is a lot less arduous. After all, it makes it easier to get them off to a good start in life by making small but

doable changes in one's everyday life without having to capitulate in the face of the sheer dimensions of everything that has to be changed and necessarily conceding that one individual's contribution ultimately doesn't amount to a hill of beans.

FOUR: FUTURES THAT CAN BE EXPERIENCED

Futuring is the discipline of conceiving futures and enabling them to emerge vividly before one's inner eye. This does not necessarily demand specialist knowledge that can be acquired from textbooks; to a far greater extent, you have to be vitally interested in the world in the broadest sense. And it takes an approximate concept of that future, a concept that combines empiricism with speculation and imagination. And it begins with the simple yet momentous recognition that the future starts now. How we think and what we do today is what the future will produce.

That a modicum of pathos resonates in the evermore-frequently posed question of whether the decisions we make are good for our grandchildren does nothing to diminish its justifiability. In any case, what is absolutely undisputable is that nothing happens on its own. There's no effect without a cause.



Time's Up

FIVE: OUR ONLY CHANCE

A future world free of crises to as great an extent as possible needs a cause, many causes, changes on multiple levels, large and small. The first of these levels is the individual and, subsequently, the collective consciousness. Every thought makes a difference, at least potentially. Many small differences make a somewhat larger one. And this larger difference is what will have to be brought about if the scenarios of hope are to become reality in this world we live in.

So what futures are we implementing if we change our ways? Ideally those that have resulted from people looking back at the way things were in the 2010s and early 2020s and having concluded that "change was our only chance"—words that became Turnton Docklands' credo.

SIX: PHYSICAL NARRATIVES

Since 2007—thus for ten years now—*Time's Up* has been engaged in a special form of storytelling: designing and constructing walk-through accounts called *physical narratives*. These resemble film sets or scenery on the stage of a theater; the difference is that they entail neither a cast of actors nor any other personnel physically present. Instead, visitors encounter spaces designed with great attention to detail and containing traces of fictitious characters amidst an ensemble of props, objects and media—newspapers, radio or TV shows "that happen to be playing," letters, diaries etc. Everything on hand is meant to be touched and scrutinized. Every element is a more or less important piece of a jigsaw puzzle that visitors assemble in their minds. The pieces form a picture and tell a story (though perhaps not always the one rendered by *Time's Up*). In this sense, the settings for display and narrative configured by *Time's Up* have additional spatial dimensions in that they are—or mentally endow—individualized spaces for play and interpretation.

Time's Up's first *physical narrative* told a crime story in *film noir* style. Over the years, future scenarios (in a literal sense) have become the collective's material of choice—spaces in which a depiction of the future carefully selected from among many such futures becomes a reality that can be experienced, literally walked through. Futuristic *physical narratives* impart a sensory impression of which actions have to be taken now as the motive forces that ultimately effect the living conditions of a life worth living, and thus function as mental tools for change.

SEVEN: LOOKING STRAIGHT INTO THE EYE OF WHAT'S PROBABLE

Painting pictures of positive futures doesn't mean donning rose-tinted spectacles or simply denying inconvenient truths. Global warming of at least two degrees and all its ecological and social consequences are happening now and you can't just tune them out to make them go away. But this could constitute the point of departure for an intellectual exercise underpinned by plenty of facts for the development of the strategies that in 30 years humankind will have used to make the best of the situation prevailing in 2017.

In the vision of the future that *Time's Up* is positing for 2047, the ecosystem has become unhinged and everyday life worldwide is plagued by the catastrophic long-term consequences of environmental pollution. Toxic waste and contaminants poison lands and waters. Entire biospheres have collapsed; huge areas of the oceans are dead zones. Due to global warming, which humankind, hampered by political considerations, only went through the

Time's Up

Elisa Unger

Elisa Unger

Elisa Unger

motions of combating until the mid-2020s, meteorological extremes had become everyday occurrences. Droughts, flooding and sea-level rise made numerous regions and coastal areas uninhabitable. Those are the external facts and circumstances that also characterize life in Turnton, an unspecified seaside town whose Docklands neighborhood, on the occasion of the 2017 Ars Electronica Festival, is being temporarily installed in the lower level of the LENTOS Art Museum in the form of a harbor-quarter market square, a waterfront bar, and the port authority's offices.

EIGHT: ANOTHER WORLD WAS POSSIBLE

The ecological dystopia of Turnton 2047, however, is juxtaposed to a socio-economic utopia that is gradually revealed in detail to sufficiently inquisitive visitors to the Turnton Docklands. Neoliberalism is history, the growth mantra has been hushed, and unbridled free trade is a thing of the past. What has instead become reality is what, for decades, had been dismissed as politically, economically or technologically unfeasible and ridiculed as naïve.

Elisa Unger

The revolution in raw materials, energy and transportation has taken off so dynamically that there's no stopping it anymore.

Under the stewardship of the *General Authority for Sustainability*, the sustainable economy of 2047 serves the common good. The culture of everyday life, production and commerce are obliged to conserve nature, minimize the use of resources and uphold human rights. The mission of the *Global Transparency Agency* is to see to it that they stay the course, while the *Center for Advanced Technologies* makes the corresponding hardware and software available, as well as those that humankind can use to support the ecosystem's gradual regeneration.

In Turnton this is being done, among others, by one of many *Networked Oceanic Society Laboratories*. The voracious undersea organisms bred there decimate the plastic particles polluting the seas. Algae farmer Hamish Dornbirn is looking forward to seeing the last of them; the proprietor of the *Ocean Recovery Farm* on the Turnton coast has pioneered the gentle clean-up of polluted beaches and bodies of water.

NINE: MIGRATION MANAGEMENT 2047

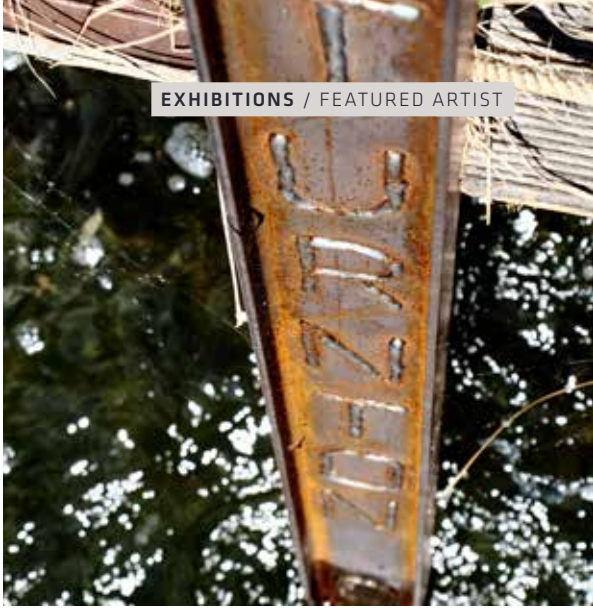
Climate-driven migration has long since lost its capacity to frighten. People upping sticks and making a transcontinental or intercontinental move has become a normal social reality that is well-organized by *Travel without Borders* and the *New Neighbor Integration Bureau*. Now cultural diversity is accounted for on the asset side of the balance sheet. Among the many ways that esteem for new neighbors is manifested in Turnton is the upcoming several-day art and culture festival. *Celebrating the strength of diversity* is the theme of this event marking the 20th anniversary of the local *New Neighbor Integration Bureau*. Round number anniversaries aren't the only reason to throw a party. In collaboration with *Travel without Borders* the bureau has just received official authorization to convert empty warehouses into public housing, a decision that delights NNIB spokesman Olufemi Badour. Following the necessary renovations, these facilities will provide accommodation for a group of new arrivals who have had to be evacuated from their homeland on a group of islands in the Atlantic.

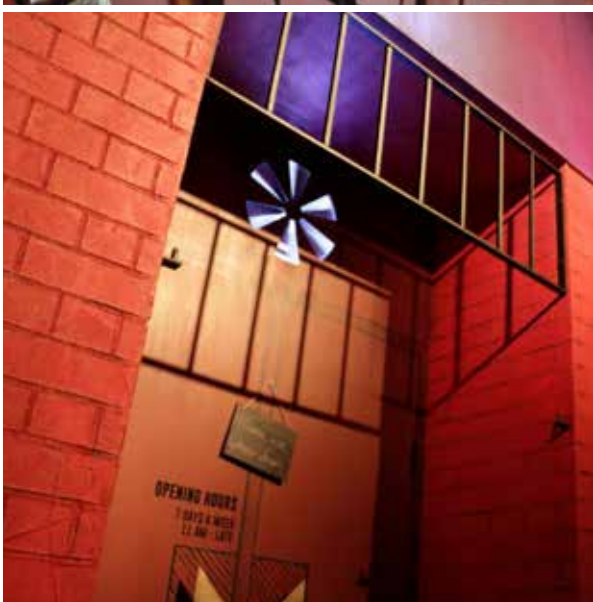
TEN: NICE NEIGHBORHOOD

The chief protagonist of one of Turnton's migratory success stories is Fenfang Lin. One day the marine biologist had had enough of lecture halls and labs, and traded in her academic career for a bar called *Medusa*, the hub and heart of the harbor district. Her extensive knowledge of marine flora and fauna serves her well here. In the galley of *Medusa* she prepares fancy snacks and creative drinks from everything that recovery farmer Dornbirn harvests in the coastal waters. Lin's ties to him are of a commercial as well as a romantic nature. She has also become strong friends with harbor coordinator Margaret Bloomenfeld, who has made the Medusa her favorite watering hole. Other regulars are the local plant pollinator–she's carrying on the work of her natural counterparts, who unfortunately are almost extinct–and Trashy, The Garbage Baron, who, besides operating the local Upcycling Center, is proprietor of the region's *Recycled Goods Malls*, alternative shopping centers purveying an assortment of ecological, fair-trade merchandise. What do you say to that? Sold!

Turnton Docklands is made possible by the kind support of the Austrian Federal Chancellery, Linz Kultur, OÖ-Kultur, Linz AG, Valletta 2018, ecoduna, Meinklangbett, LENTOS Art Museum Linz, Ars Electronica and servus.at.

Accomplices: Albert Förster, Alexander Meile, Anat Stainberg, Andrea Strasser, Andreas Kump, Andreas Mayrhofer, Angela Waidmann, Anna Mendelssohn, Antonia Kriegner, Astrid Benzer, Aurel von Arx, Barbara Hinterleitner, Bastian Dulisch, Bronwynn Mertz-Penzinger, Caroline Richards, Christian Haas, Christian Leisch, Christian Scheppe, Christian Strasser, Christian Wellmann, Christopher Hüttmansdorfer, Daniel Steiner, Die Fabrikanten, Dominika Meindl, Doris Schüchner, Elisa Unger, Elke Doppelbauer, Florian Kofler, Florian Sedmak, Freundinnen der Kunst, Gabriele Deutsch, Giles Tilling, Gitti Vasicek, Gunda Schanderer, Helga Schager, Inga Hehn, Jenny Weichert, Joschi Viteka, Jürgen Zauner, KAPU, Katja Seifert, Leo Schatzl, Leonie Reese, Luis Wohlmuter, Lutz Zeidler, Marc Schrögendorfer, Maria Fliri, Mario Habringer, Marion Huber, Markus Zett, Matt Davidson, Matthias Gschaider, Matthias Hack, Maximilian Modl, Michael Smulik, Michael Strohmann, monochrom, Nik Hummer, Nina Pieper, Paul Schaussberger, Peter Woy, Philip Huemer, Philipp Pamminger, qujochoe, radio fro, Robert Zauner, S. Javid Hakim, Sarka Zahálková, servus.at, Sigrid Cakir, Silke Grabinger, Silke Müller, Stefan Füreder, Stephan Rois, Susanne Gschwendtner, Tanja Brandmayr, Tanja Lattner, Thomas Latzel, Thomas Leitner, Thomas Maier, Tim Boykett, Tim Weckenbrock, Tina Auer, Ufuk Serbest, Ushi Reiter, Valarie Serbest, Veronika Platz, Wolfgang Gratt





Time's Up

ART MARKET INITIATIVE

The Art Market Initiative was coined in response to growing mutual interest on the part of media artists, collectors and galleries as a setting for protagonists to compare experiences and to discuss, among other topics, such core issues as the long-term maintenance and conservation of media-art projects and the many new formats and business models manifesting themselves on the growing online art market.

Gerfried Stocker (AT)

Markets for Media Art– the Art Market Initiative at Ars Electronica 2017

For a long time, gallerists and collectors have been looking rather skeptically at media art–for many quite different reasons, like its novelty and highly experimental approach, the large number of technical aspects, the virtual and ephemeral nature, the difficulties of preservation and maintenance and so on. But meanwhile many of these problems are no longer particular but have become our everyday problems, and we are increasingly getting used to dealing with them.

Media art in its many forms has a long tradition, and while works based on digital code, using the Internet or virtual reality are still young we can look way back to the early days of film and photography, to kinetic sculptures, op art, video art or also radio drama, *musique concrète* and electronic music. And it becomes more and more clear that digitally based art is a major part of the cultural heritage of our century and will play an even larger role in the coming decades–not instead of any of the other forms of artistic expression but in addition, side by side.

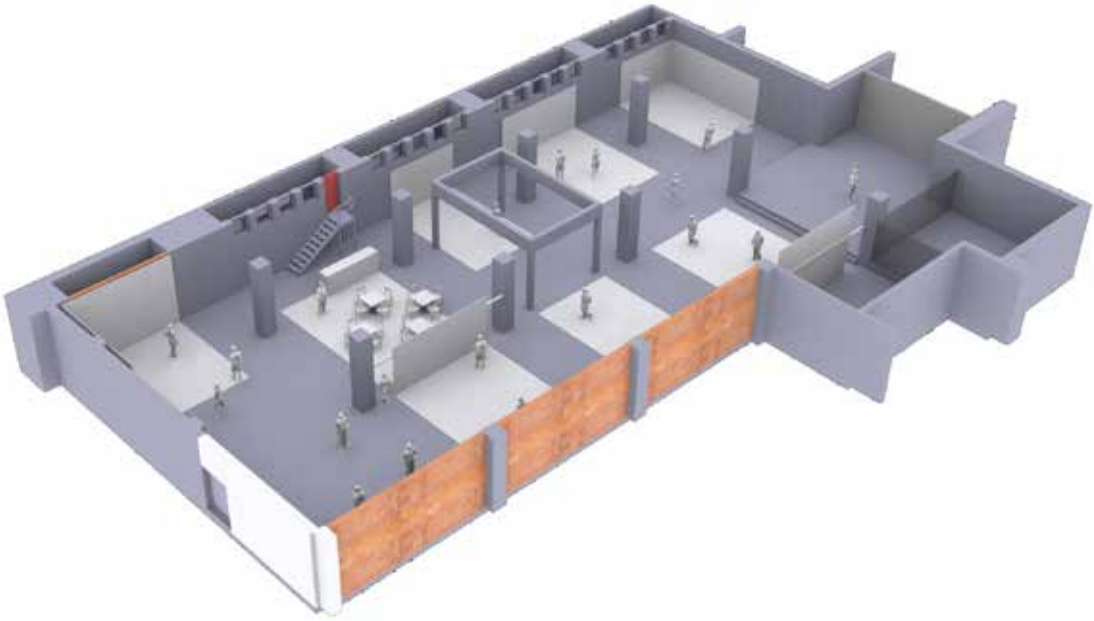
This confronts us with exciting developments but also with very difficult challenges. What kind of skills are necessary to create this art, to evaluate and to appreciate it, to preserve it and to keep it alive? But the art market itself is also experiencing a big digital transformation; online art magazines, online galleries and Internet auctions are booming, new hybrid business models are being explored–some successfully, some with spectacular failures.

These dynamics and questions will be the focus of a new initiative for the annual Ars Electronica Festival. Driven by a group of international experts such as BOZAR's media art curator Christophe de Jaeger, Rosina Gomez Baeza (long-time director of Arco, and founding director of LABoral), renowned media artist Prof. Christa Sommerer and Ars Electronica director Gerfried Stocker, this initiative aims to provide a platform for the encounter and exchange between the art market and media artists.

The kick-off-program at this year's Ars Electronica Festival will feature an expert symposium, artists' talks and presentations in a dedicated, approxi-

mately 1000-sq.m. gallery space, and special guided tours for collectors and gallerists.

Connected to this program is also the Gluon Initiative, which aims to establish a new approach to art and science by bringing together interested artists, scientists and collectors for a new type of collaboration at this nexus. Selected artists will be introduced to scientists from various fields and can select one scientist as a "scientist-in-residence" at the artist's studio. Collectors get the chance to become patrons for this residence and to finance it and the production of a new project. The Gluon Initiative is a collaboration between Ars Electronica, the Serpentine Gallery and BOZAR.



any:time (Jürgen Haller & Christoph Weidinger)

Christophe de Jaeger (BE), Christiana Kazakou (GR/UK), Ramona Van Gansbeke (BE)

Gluon Initiative

Scientist-In-Residence program: a new approach to art and science

The Scientist-In-Residence program has been set up for a new generation of scientists interested in collaborating with artists. The program encourages renowned artists to host a scientist or researcher in the independent and inspiring environment of their studios. The program reverses the usual approach whereby artists are invited to work at R&D departments of universities or companies. Our intention is to challenge the hierarchy between the human and the exact sciences that pre-dominated in the twentieth century and to challenge technological and scientific determinism by adding artists' creative, critical and societal dimensions to the process. The residency program will benefit both the scientist and the artist. The unexpected worldviews and working processes of the artist will lead to alternative ideas, attitudes and methodologies in the world of research. At the same time, the researcher can assist the artist in the creation of an artistic and critical output that uses (or reflects upon) new scientific and technologic developments. It is a sign of the time that an increasing number of artists and institutions are interested in the latest technological and scientific developments that are changing the world at an ever-increasing speed. This evolution requires new initiatives that establish more connections between the world of "media arts" and contemporary arts, and between cultural and research institutions. We are therefore inviting artists to participate who are well integrated into the contemporary arts scene but who have a strong interest in science and technology. The Scientist-in-Residence program is a collaboration between Ars Electronica, BOZAR, the Serpentine Gallery and several universities and research institutions. For the first edition Hans Ulrich Obrist has been invited as the leading curator for 2017/18, with invited artists Rachel Rose and Damian Ortega. The initiative will be accompanied by two exhibitions: a poster exhibition with slogans and statements from the participating researchers, and a historical exhibition on art and technology organizations that have shaped the future of interdisciplinary collaborations.

Text: Christophe de Jaeger

Eduardo Kac

Eduardo Kac, *Edunia Seed Pack Studies I* from the *Natural History of the Enigma* series, 2006, lithograph, 22 x 30 in.
In 2009 Eduardo Kac received a Golden Nica in the Hybrid Art category of the Prix Ars Electronica for *Natural History of the Enigma*.

Alessio Chierico (IT), Christa Sommerer (AT)

Media Art and the Art Market

Acknowledging the newly emerging forms and displacements of the media-art economy, *Media Art and the Art Market II* symposium faces the criticalities and strengths of the art market, seen as a resource for supporting artists' activity and the development of this cultural field.

The economic sources that support media art have evolved within several contexts and involve different formats. As a result, alternative strategies for enhancing the economic sustainability of this kind of art have been proposed over time. Moreover, some practices that are contingent to media art have attracted the attention of the traditional art market in the last decade, setting a precedent for the development of media art and its recognition. Because of this, it has become necessary to investigate the dynamics involved in the relationship that binds art practice to the market and its economy.

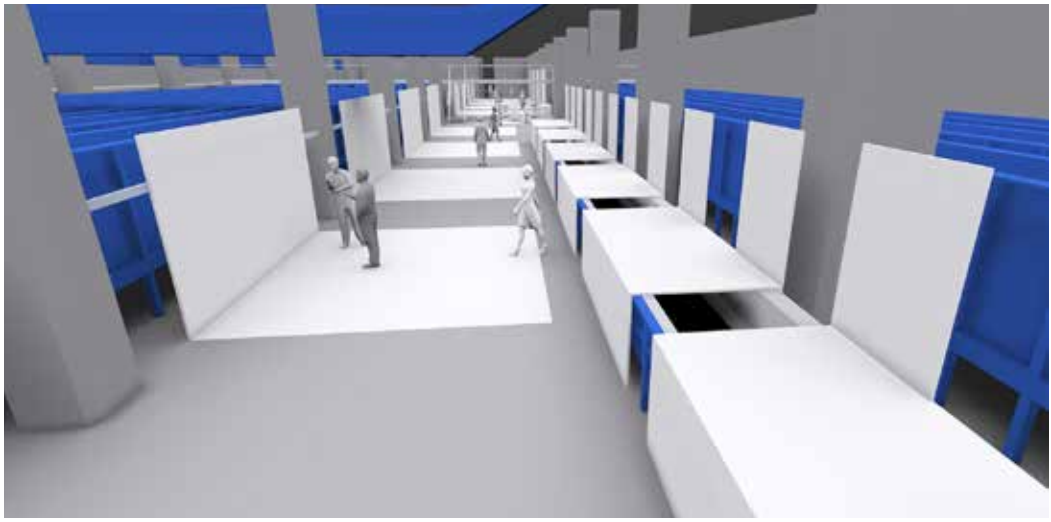
Many concerns about the market for media art may have arisen as a result of the difficulties involved in its production, presentation and preservation. Besides, there is a great deal of interest in the formulation of new economic models that are adapted to the specificity of the artistic practice and dissemination of media art. Attention is also focused on the reconsideration and re-adaptation of the whole ecosystem of economies that sustain media art. It is also necessary to resume and update some of the artistic investigations that have analyzed the art environment and to re-establish an "institutional critique." The aim of these endeavors is to integrate the function of art into the global economic context in all its complexity.

The second edition of the *Media Art and the Art Market* symposium, introduced here, intends to extend these discussions, which were already formulated during the first edition at the LENTOS Museum in Linz in October 2016. This previous event brought together a number of prominent artists, theoreticians, curators and gallerists: Reinhard Kannonier, Stella Rollig, Gerfried Stocker, Christa Sommerer, Steve Fletcher, Christiane Paul, Annette Doms, Pau Waelder and Wolf Lieser. The presentations revealed a wide variety of perspectives on the current situation of the art market and art economy of media art.

However, there are still many issues that need to be discussed and acknowledged, in order to enhance the opportunities this discussion can provide. For this reason *Media Art and the Art Market II* arises from the necessity of keeping the attention on the complex dynamics that surround the economics of art. This new edition will concentrate especially on the modes of conservation of media-art pieces, and it will also expose the experiences of traditional and novel formats of the primary market and the gallery system. In addition, particular attention will be given to the new methods and platforms that use the Internet for the distribution and promotion of art.

The art market is a topic with manifold perspectives; in addition, it opens to deontological issues. For this reason, it is seen as necessary to acknowledge its structure and potentials in order to understand its sustainability. It is even reasonable to question whether an art market for media art is really needed. However, it is important to recognize the needs of an economy that can sustain the activities that surround media art. This might be achieved by the definition of new models, or by enhancing the understanding of the potentials of the classical economic formats. In this sense, the *Media Art and the Art Market II* symposium intends to set the starting point for conversations that integrate cultural practice and cultural management in this field.

This event is promoted and organized by the Department of Interface Culture at the University of Art and Design Linz, in collaboration with Ars Electronica and supported by the Federal Ministry of Science, Research and Economy within the grant under the Higher-Education Structural Fund.



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