



INTERSPECIFICS

ONTOLOGICAL MACHINES

INTERSPECIFICS - CV

We are a nomadic multispecies collectivity experimenting in the intersection between art and science. We embrace hybridized practices among different disciplines and living organisms, open knowledge and precarity as a challenge.

Our current lines of research are based in the use of sound to understand the bioelectrical activity of different bacterial consortiums, plants, slime molds and humans using DIY and custom-made sets of hardware we call ontological machines.

Our work has been supported by International Cities for Advanced Sound, Laboratorio Arte Alameda, Fundación Telefónica, Fundación BancomerBBVA and Fundación Alumnos47 in México, National Council for the arts in Mexico and National Found for the arts Mexico. Bauhaus-Universität Weimar and Universität der Künste Berlin in Germany. And shown at FACT Liverpool, European Congress for Artificial Intelligence in York, Spektrum and Acud Macht Neu in Berlin, ICAS Festival in Dresden and TJINCHINA in Tijuana México. Recently awarded by the Waag Society Amsterdam in its last edition of Hackthe-Brain. Currently in the process of publishing the book Ontological Machines edited by Tierra Adentro.

Our work has taken part at festivals in collective and individual exhibitions in spaces such as Media Lab Prado, Museo de Arte Reina Sofia, O1SJ, Museum of Latin American Arts, Píksel Festival, Ars Electronica in México, Centro Cultural de España, Public Art Lab de Berlin, NOMAD Center for media research, Museum of Contemporary Art in Szczecin, Museum of Latin American Art, Transitio_mx, LabSurLab2, Hip3rorganicos, Nuvem estação de arte y tecnología, ISEA, Mutek_MX, Transmediale, CTM Berlin, NIME 2014 London, Sight & Sound Montreal among others.

We have conducted workshops at international organization such as Federal University in Rio de Janeiro, Maker Space in Santiago de Chile, Madrid Media Lab Prado, Nuvem estação de arte y tecnología in Visconde de Maua, Brazil, TodaysArt

Festival in Netherlands, CTM Berlin, ICAS Festival Dresden, Novas Frequencias Brazil, FabLab Berlin among others. In Mexico at spaces such as Protolab; Tijuana Media Lab; Centro for design, cinema and television; UNAM botanical garden; Oaxaca ethnobotanical garden, MUAC Contemporary Art University Museum in Mexico City, Tamayo Museum, Mexico City Multimedia Centre, Digital Culture Centre, Vasconcelos Library, Border Culture Centre.

Leslie García

Leslie García works developing electronic art and digital media projects. She's the co-founder of media electronic collective DreamAddictive, Astrovandalistas and Interspecifics. Former researcher associated at the Nucleo Laboratorial Nano de la Escola de Belas Arte - UFRJ Rio de Janeiro. She is currently the coordinator of the MusicMakers Hacklab_DF and Bio art educational program B10S, and artistic researcher of the Media Environments department at the Bauhaus University in Weimar under the direction of Professor Ursula Damm.

Paloma López

Paloma López is a poducer and researcher. She holds a master degree in Creative and Cultural Entrepreneurship from Goldsmiths University of London. She has been part of several production teams such as Mutek Mx and Distrital Film Festival. She's the coordinator of the MusicMakers HackLab_DF and Bio art educational program B10S, and a European Cities for Advanced Sound Fellow.

RELATED WORK



PULSU(M) PLANTAE

Pulsu(m) Plantae empirically analyses the mechanisms plants use to communicate and how their own biological processes are a manifestation of communication seemingly intangible to our senses. The project proposes the design of a sound prosthesis based on the principle of biofeedback -a technique focused on gaining awareness of an organic body physiological functions- using instruments to gather information about the operation and cycles of these living systems. The prosthesis transduce the readings obtained in to a sound synthesis process conferring an abstract voice to plants. Patterns obtained from the study in different specimens of plants would be a basis for a future design of a coded communication sound system.

The aesthetic conception of Pulsu(m) Plantae is based on the idea of *chaosmosis*, coined by Italian philosopher Félix Guattari, who proposes aesthetic subjectivity as a method for generating referential links. Pulsu(m) Plantae provides a series of interactive experiences where the technological application gives the subjects a tool to increase its capacity of perception. The project seeks to analyze the non-tangible processes of communication in networks composed of biotic elements, amplifying electrical signals that serve as channels of transmission between the different types of specimens that conforms the plantae kingdom.

In collaboration with Juan Carlos González biologist specialized in botanics from the National Autonomous University of Mexico.



In collaboration with the National Autonomous University of Mexico and the ethnobotanical garden of Oaxaca, Mexico.

More info

<http://lessnullvoid.cc/pulsum>

<https://vimeo.com/62232734>

<https://soundcloud.com/lessnullvoid/pulsum-plantae>

bit.ly/1P3WziU



Funded by the National Fund for Culture and Arts (FONCA) and the National Council of Culture and the Arts (CONACULTA) Mexico.

Presented at

ISEA 2012

Mutek_Mx 2013

Transitio_Mx 2013

Universidad federal Rio de Janeiro 2013

New Musical Interfaces 2014

New music festival Vancouver 2014

Upgrade San Diego 2014

Museo Tamayo

Fonoteca nacional



ACTION POTENTIAL

Action potential is a research project on Neuroesthetics, a recent sub-discipline of empirical aesthetics, that studies the possible relationships existing between art perception and the bioelectric signals produced in the brain in terms of active listening and observation.

The first experiments took place during the commemorative exhibition of poet and art critic Octavio Paz at Palacio de Bellas Artes in México. The experiment consisted in recording the bioelectrical activity of 20 volunteers of different ages and backgrounds under active observation of one of the art pieces, active listening of a text by Octavio Paz concerning the piece of art and the two stimuli simultaneously, using a wireless brain-computer interface. Once the sampling was completed we converted the signals in to sound using the OSC protocol in Pure Data, and

in to computer graphics through Processing with the design of an algorithm for data interpretation. Action potential is a multidisciplinary approach intended to assist the exploration of patterns during the data analysis under the aesthetic experience.

In collaboration with Erick Fernando González Castañeda and Alejandro Antonio Torres García directed by Luis Villaseñor Pineda Ph.D and Carlos Reyes García Ph.D of the National Institute of Astrophysics, optics and electronics (INAOE) for interpretive advice and spectral analysis of the recorded samplings.



In collaboration with the National Institute of Astrophysics, Optics and Electronics (INAOE). México



Funded by Museo del Palacio de Bellas Artes and Fundación Alumnos47. México.

More info

<http://interspecifics.cc/potencial>

<https://vimeo.com/119816309>

<https://soundcloud.com/interspecifics>
bit.ly/1P3WziU

<https://github.com/Lessnullvoid/PotencialAccion>

Presented at

Waag Society Amsterdam
Fact Liverpool



DIMENSIONS

Dimensions is a brain activity sonification and visualisation system using topographic values from energy pointers. The main technique is programmed in OpenFrameworks, Supercollider and Puredata to map every electrode from an EEG headset and represent the dominant frequencies searching for possible power, phase or trigger correlations.

This system enables the user to be aware of the displacement of energies moving on the brain. One can notice correlation such as symmetry on electrodes of the same order, same frequency domains in all electrodes, or asymmetrical correlation on left and right side of the brain.

The project is presented as an augmented reality installation using principles of neuro-feedback in which the viewer experience the performative materialism of his own brain.

Awarded with the second prize at the HackTheBrain meeting 2015, organized by Waag Society and Donders Institute in Amsterdam. In collaboration with Thömas Beelen and David Goedicke from the University of Twente, Netherlands and Clemens Bast from Bauhaus University Weimar.



Funded by TodasyArt Festival, The Hague.

More info

<http://interspecifics.cc/dimensions>

<http://interspecifics.cc/downloads/htb.pdf>

<https://github.com/Lessnullvoid/PotencialAccion>

Presented at

Waag Society 2014 Amsterdam
TodaysArt Festival The Hague 2014

Awarded

Second prized. HacktheBrain @ Waag Society 2014 Amsterdam



ENERGY BENDING LAB

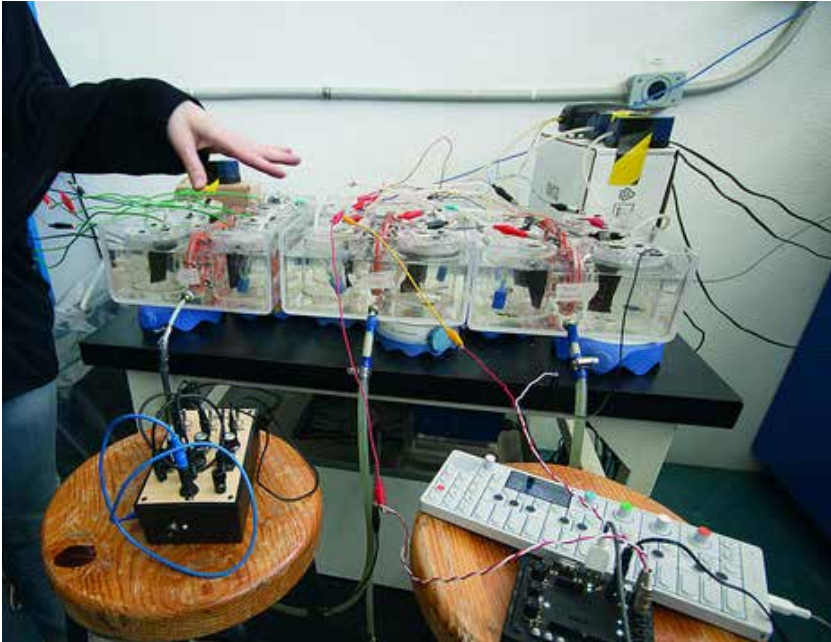
The Energy Bending Lab is an instrument comprised of a set of custom-built modular synthesizers and transduction tools that creates a real-time sonification from the electric properties found in bacteria.

Conceptualized as a DIY interspecies system, the interface amplifies the microvoltage produced by these microorganisms transducing their oscillatory features into raw electronic signals tuning the internal clock of the whole system and producing an unexpected array of sound patterns.

The object explores the relationship between waveforms, matter, and the physical form of frequencies, seeking a pattern-based understanding of our context to illustrate

the underlying order within the universe and human consciousness that appears to be intimately related to vibration.

The ENL was conceived during the course of a 2-month residency program granted by ECAS and hosted by festivals Cimatix in Brussels, Today'sArt in The Hague and Insomnia in Tromsø; and built while traveling using different fabrication laboratories across Europe.



In collaboration with Thiago Hersan from Carnegie Mellon University.

More info

<http://www.interspecifics.cc/>-

<http://www.interspecifics.cc/-/category/modules/>

bit.ly/1nv7M4D



Funded by ECAS European Cities of Advanced Sound, Bauhaus University Weimar and PhyChip project.

Presented at

Bauhaus University, Weimar.

Today's Art Festival 2014, The Hague

ICAS Festival, Dresden.

Laboratorio Arte Alameda, Mexico.

Artificial Intelligence Conference 2014,

York.



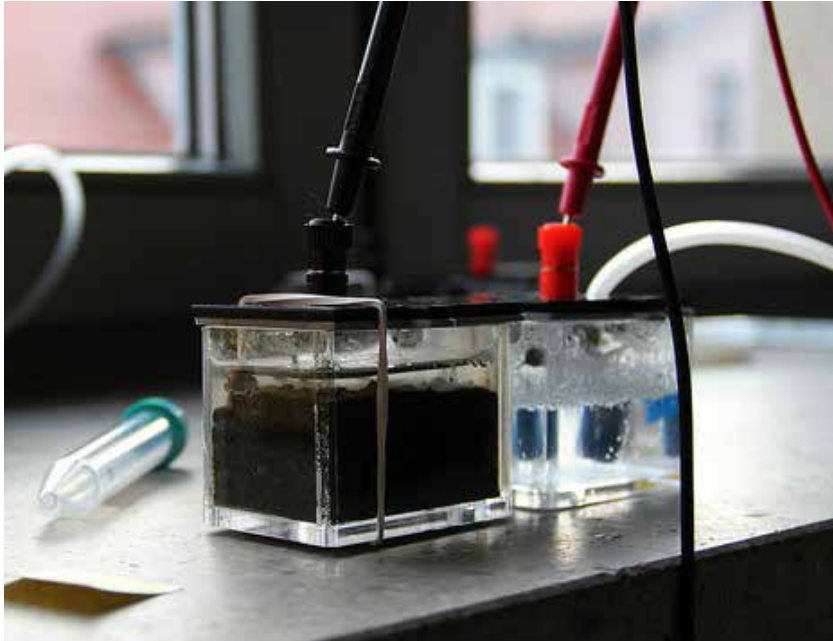
NON-HUMAN RHYTHMS 1 : GEOBACTER

Non-Human Rhythms 1 is the first of a series of live recordings featuring different micro-organism and their bio-electrical activity translated in to sound, 30 minutes of signals originated in a DIY bacterial fuel cells containing different bacterial consortiums.

Microbial fuel cells harness the power of bacteria and convert energy released in metabolic reactions into electrical energy. The cell consists of two electrodes separated by a semi-permeable membrane submersed in an electrolyte solution. The bacteria break down food wastes and sewage to generate an electric current and continue to replicate producing power indefinitely as long as there is a food source from which get nourished. The cell is divided into two halves: aerobic and anaerobic. The aerobic half has a positively charged electrode and is bubbled with ox-

xygen, much like a fish tank. The anaerobic half does not have oxygen, allowing a negatively charged electrode to act as the electron receptor for the bacterial processes.

In collaboration with Juan David López Hincapié and Adrián Rodríguez García Ph.D from the Technological Development in Electrochemistry México (CIDETEQ).



In collaboration with researchers from the Center of Research and Technological Development in Electrochemistry (CIDETEQ).

More info

<https://soundcloud.com/lessnullvoid/nonhumarrhythms1>

<http://thecreatorsproject.vice.com/blog/dirty-beats-hear-music-generated-from-bacteria>

http://www.vice.com/es_mx/tag/musica%20de%20las%20bacterias



Funded by ECAS European Cities of Advanced Sound. Today'sArt Festival, The Hague. Cimatics, Brussels and Imsomnia, Tromsø.

Presented at

Spektrum, Berlin.
Acud Macht, Berlin.
Fact, Liverpool.
TJinCHINA, Tijuana.



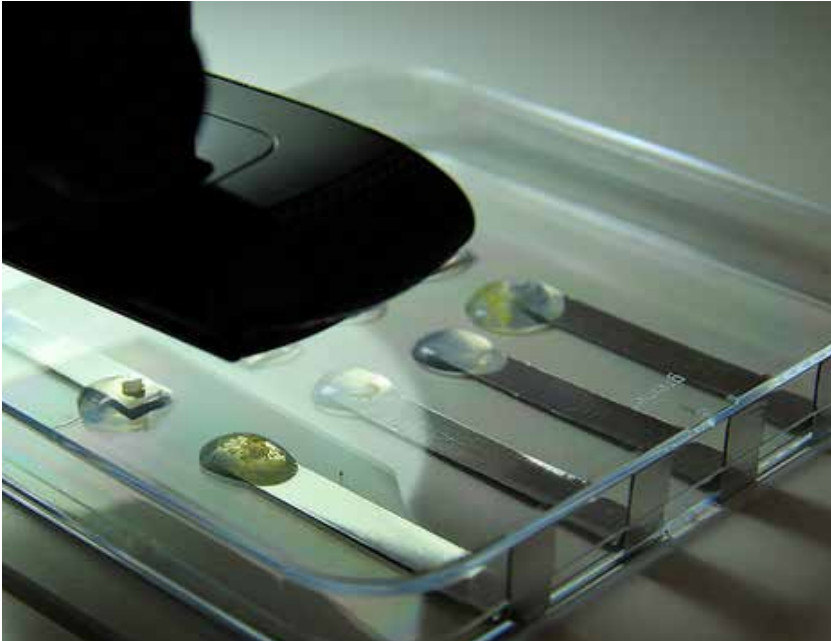
NON-HUMAN RHYTHMS 2 : PHYSARUM

Non-Human Rhythms 2 is the second release of a series of live recordings featuring different micro-organism and their bio-electrical activity translated into sound, 4 tracks of a slime mould sonification developed at Bauhaus University as part of the Phychip project

Physarum polycephalum is a unicellular organism, an amorphous yellowish mass when in the plasmodial phase of its life cycle that can propagate on a large range of surfaces such as plastics, metals, glass and agar. This multi-headed slime mould feeds on bacteria, spores and other microscopic particles. During its foraging state the plasmodium shift its shape sending out protoplasmic tubes with cytoplasm flowing inside rhythmically expanding and contracting in response to simple favorable conditions.

Two main approaches were developed for the sonification of Physarum. The first one is focused on the analog behavior of the organism - bioelectrical activity - and the second one in an optical based pattern recognition software both are Open source hardware and software available on virtual repositories. These two systems enable the creation of a bio-controller for auditory display purposes where common musical structures like texture, rhythms and phrasing can be selected, using the feeding of bioelectrical activity as the system actuator.

In collaboration with Theresa Schubert from Bauhaus University Weimar and the Phychip project team.



Bauhaus University Weimar as part of the PhyChip project.



Funded by the Seventh Framework Programme (FP7) by the European Commission within CORDIS and the FET Proactive scheme.

More info

www.phychip.eu

<https://soundcloud.com/lessnullvoid/slime-mould?in=lessnullvoid%2F-sets%2Fphychip-slime-mould-music>

<http://www.wired.com/2015/10/listen-slime-mold-sing-song/>

bit.ly/20ewhVE

Presented at

Spektrum, Berlin.

Acud Macht, Berlin.

Bright Collisions Symposium, The Hague.

Inoculum@CLB, Berlin.

Cultural Center of Spain in Mexico



NON-HUMAN RHYTHMS 3 : RIO DE JANEIRO

During the fifth edition of the festival Novas Frequencias in Rio de Janeiro we were invited to facilitate a collaborative laboratory focused on the sonification of bacteria present on different beaches in Rio de Janeiro, Brazil.

For this we made an expedition to three of the most polluted areas: Flamengo, Arpoador and Lemi. In these areas we collected samples that we later cultivated in our microbial fuel cells.

In the laboratory, 10 local artists were selected through an open call and for a week we worked together building a compact version of the Energy Bending Lab with which they created an interface between the bacterial signal and their own sound instruments.

The result was a live act called the Non-human rhythms.

In collaboration with:

Biônicos

David Charles Cole

Felipe Ridolfi

Gama

Henry Schroy

Negalê Jones

peppe de souza

Re Sil.



Funded by Festival Novas Frequencias and Prince Claus Fund.

More info

<http://www.novasfrequencias.com/2015/blog/>

<https://soundcloud.com/lessnullvoid/sets/non-human-rhythms-3>

<http://blogs.estadao.com.br/link/tecnologia-traz-novos-sons-para-a-musica>

Presented at

Casa Rio, Rio de Janeiro.



B10S Artistic exploration program in Life Sciences

Beyond exploring the broad theoretical definition and origins of bio art in Western culture, we find important to analyze its origins in the emerging context of the Latin American society.

What are the implications of taking research elements inherent to science for undertaking empirical practices?

What are the appropriate tools for these explorations, and how this knowledge can be distributed into a collective experience built collaboratively?

B10S is a space to explore these questions and to analyze the epistemological scope arising from trans disciplinary multimedia DIY practices. A place where know-ledge is constructed collectively in order to expand the opportunity of both development and outreach.

During 2015 we conducted three laboratories with more than 40 participants. Labs were inspired on neuroplasticity, bioelectricity and neuroscience. All participants were selected after an open call from a wide range of ages and backgrounds, and all built their own prototype.

Lab 1

Energy culture for sound synthesis

Lab 2

Sonic interface for sensorial substitution

Lab 3

Action Potential



Funded by Fundación Alumnos47. Mexico

More info

<http://b10s.cc/>

<https://www.youtube.com/watch?v=-8JWLJG3GhdE>

<https://www.youtube.com/watch?v=h-9JI8m1ALvQ>

bit.ly/200bmQT

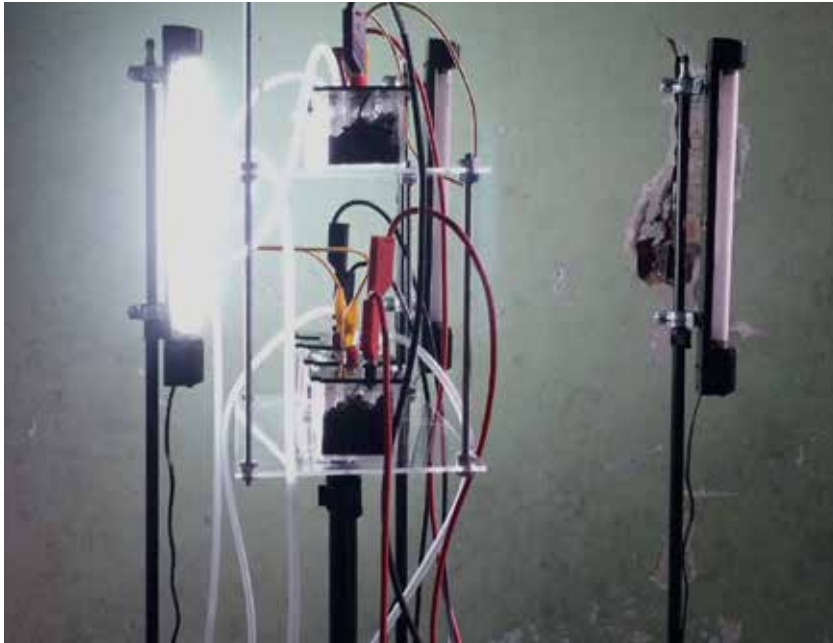
Presented at

Fundación Alumnos47 library, Mexico.
Cultural Center of Spain in Mexico.
Universität der Künste, Berlin.



GEOBACTER MICROPULSE

Geobacter Micropulse is part of a series of pieces inquiring into the possibility of interspecies communication. Bioelectric fluctuations from microbial fuel cells create light patterns that emulate the beginnings of encoded language. The cells use seawater and sediment samples from the NYC area, activating in consortium the ability of these Geobacters to produce energy when deprived from oxygen. The system creates a space where the micro-performativity of bacteria is expressed through light.



Comissioned by Platoon

More info

<https://vimeo.com/154761739>

<https://github.com/interspecifics/gfp>

Presented at

Platoon Headquarters, Mexico.



GFP-SCREEN

16-bit binary screen built with black light lamps where the fluorescence of bacteria *E.coli* is activated in response to its 440 nanometers light spectrum. Protein GFP is responsible for such fluorescence and this is the reason to be called GFPScreen.

The screen shows a piece of random poetry pretending to be written from a bacterial perspective using Google searches about the human subject.

The main results shown are organized in sequence and presented in ASCII code two character every two milliseconds. This project addresses the expression of the material agency of microorganisms through light and the capacity of light itself as a medium for information transmission.

E.coli love poem:

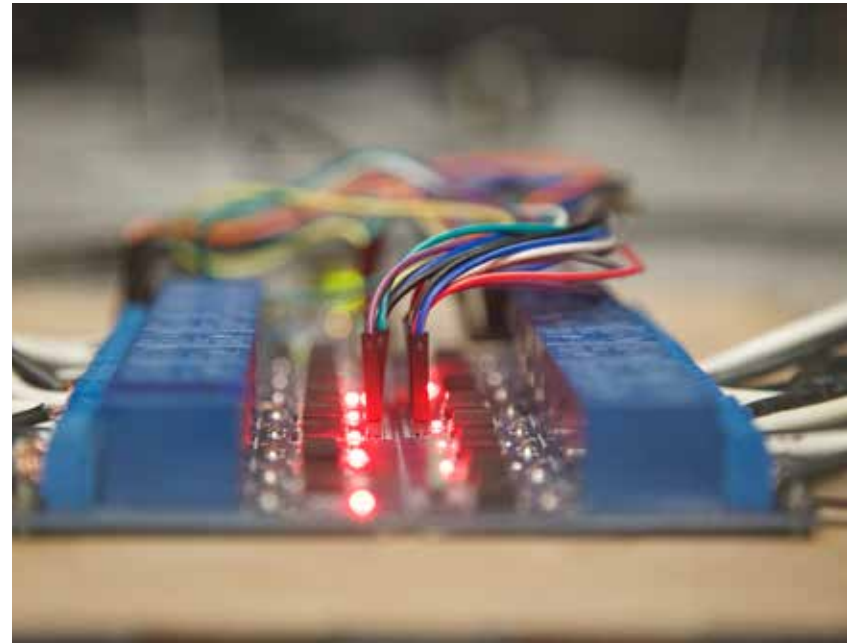
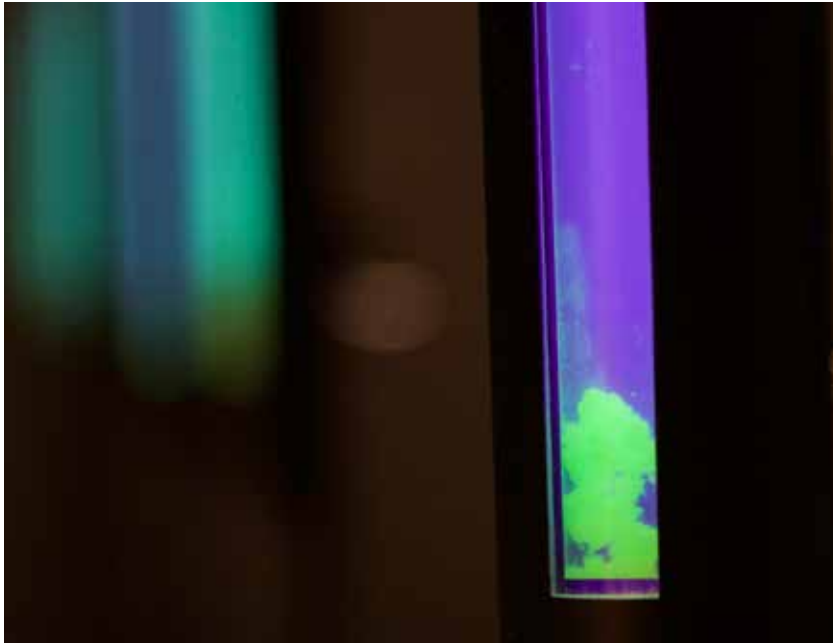
Humans: aren't real, are animals, are free, are underrated, are among us, are cthulhu, like a virus.

Humans: need air, need love, need water, need to belong.

Human: services, rights, feelings, thoughts, process, dreams.

Human: sense of smell, sense of time, sense of wonder, sent to mars, produce methane, protostomes or deuterostomes, protecting the environment, destroying everything.

Human genes: BRCA2, CFTR, MTCYB, DMD, GAPDH, HBB, HIST1H1A



More info

<https://vimeo.com/154761739>

github.com/interspecifics/gfp

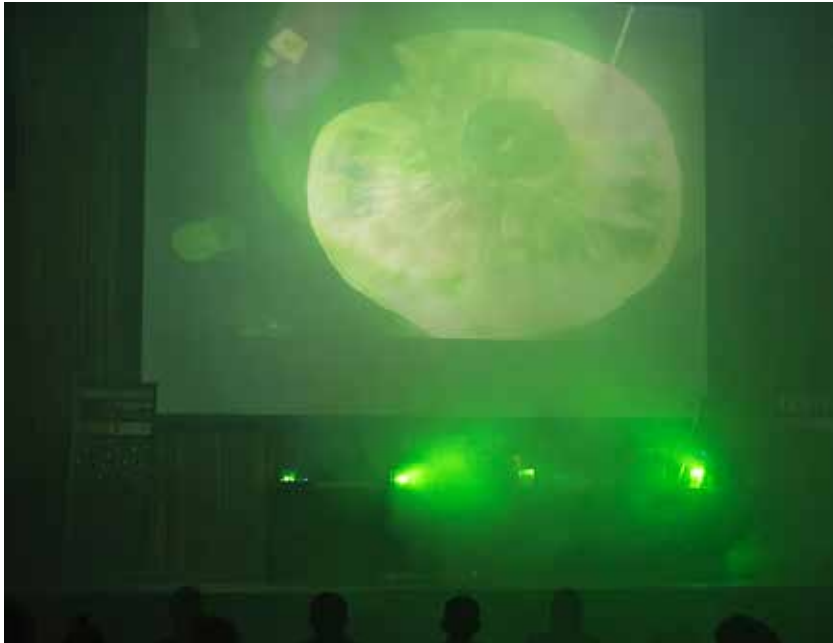
Presented at

Unesco. Flux 2015. Yucatán, Mexico.
Guadalajara International Book Fair, Mexico .



TOPOLOGIES OF DESIRE

Topologies of Desire is a technochamanistic performance created with brain readings from a group of therapist and shamans converted into three-dimensional disks. A laser system designed to scan them reads the topology on the data discs and converts them in to sound. The performance explores the psychoacoustic use of sound to provoke extrasensory experiences based on binaural rhythms and musical structures from Mexican indigenous traditions.



Funded by Fundación Alumnos47. Mexico

More info

<https://vimeo.com/178385468>

<http://interspecifics.cc/topologia/>

<http://flic.kr/p/aHskDMZX1Z>

<https://soundcloud.com/lessnullvoid/topologias-del-deseolive>

Presented at

Museo Universitario Arte Contemporáneo, Mexico City.

Spain Cultural Center, Mexico City.

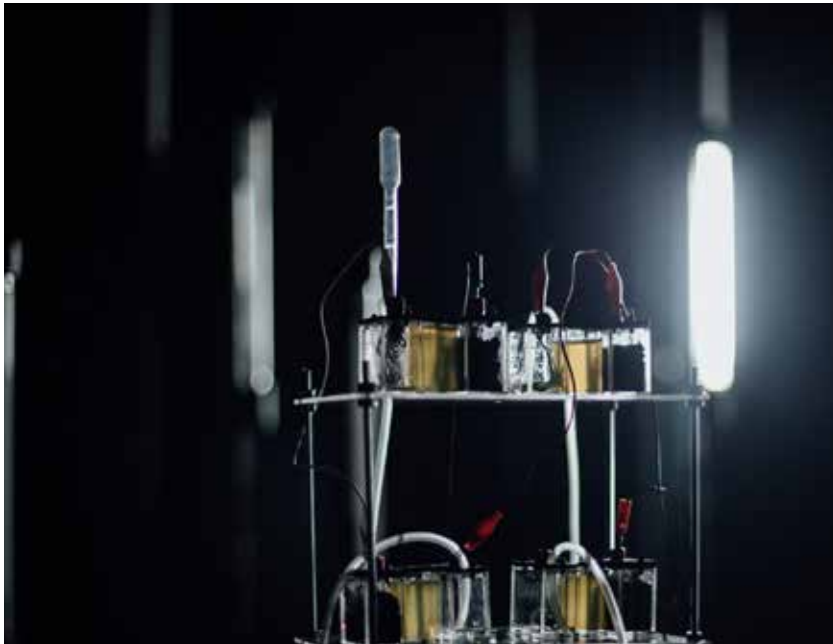
Alumnos Móvil, Mexico City.



MICRO-RHYTMS

Micro-rhythms is a bio-driven installation where small variations in voltage inside microbial cells generate combining arrays of light patterns. A pattern recognition algorithm detects matching sequences and turns them in to sound. The algorithm written in Python uses three Raspberry Pi cameras with Open Computer Vision to track light changes creating a real-time graphic score for an octophonic audio system to be played with SuperCollider. The cells are fuelled using soil samples from every place where the piece is presented, growing harmless bacteria that clean their environment and produce the micro signal that detonates all the processes in the piece. Understood as an interspecies system, the installation amplifies the microvoltage produced by these microscopic organisms and transduces their

oscillations into pure electronic signals with which they create an audiovisual system that evokes the origins of coded languages.



Funded by Fundación Alumnos47. Mexico

More info

vimeo.com/190665110

github.com/interspecifics/micro-ritmos

<http://flic.kr/s/aHskFUiDJM>

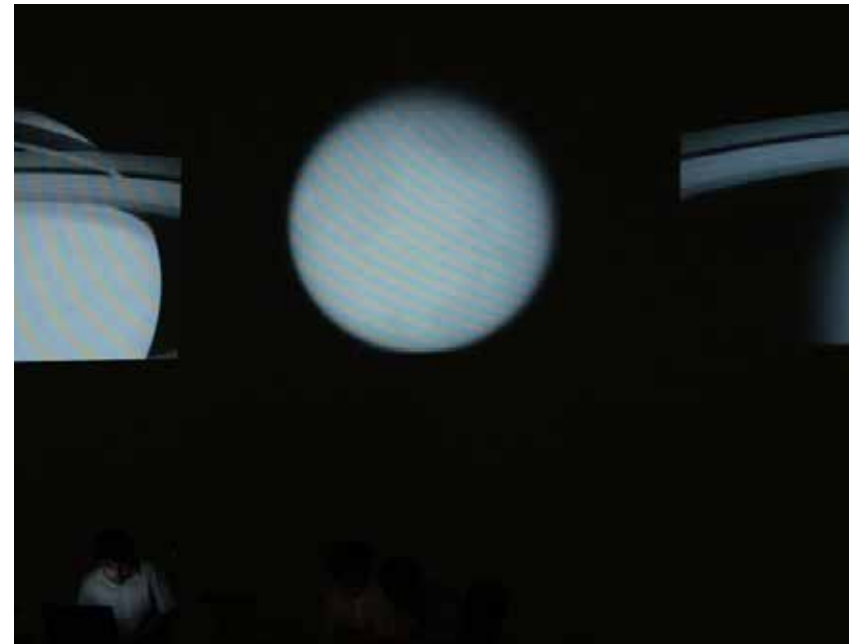
Presented at

Medellín Museum of Modern Art



SPACE, DATA & NOISE

An audiovisual performance created with open data from NASA repositories and radio communication recordings from space missions. An immersive performance inspired by the aesthetics of big data and computer noise where sound travels through an octophonic system and visuals are made with satellite images analysis.



Funded by Fundación Alumnos47. Mexico

More info

<https://vimeo.com/190128254>

<https://github.com/interspecifics/visuals>

<https://www.flickr.com/photos/micro-hom/albums/72157674326834051>

<https://soundcloud.com/lessnullvoid/space-data-and-noise-musicmakers-mutekcdmx>

Presented at

Mutek.MX 2016, Mexico City.



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