516 ARTS & partners present

ISEA2012 ALBUQUERQUE: MACHINE WILDERNESS

FALL 2012
CONFERENCE PROCEEDINGS

Re-envisioning Art,
Technology and Nature

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ALBUQUERQUE
MACHINE
WILDERNESS

18th International
Symposium on
Electronic Art

Publication Credits:

Andrea Polli	Coordinator
Julie Ruth, Loka Creative	Graphic Designer
Melissa Rinkenberger	Design Intern
Elizabeth Thayer	Copyeditor
Arlene Nide	Copyeditor

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A message from Albuquerque Mayor Richard J. Berry

It is with great pleasure that I welcome you to Albuquerque, New Mexico. It is exciting that Albuquerque has joined a group of major urban centers around the globe that have hosted the prestigious ISEA Symposium. And the timing of ISEA2012 couldn't be better. This year, we are celebrating New Mexico's Centennial and are commemorating 100 years of statehood in a variety of ways. I invite ISEA2012 attendees from around the country and the world to explore and enjoy the unique richness that Albuquerque and New Mexico offer.

Albuquerque's history has been shaped by its role as a place where heritage, culture, science and technology intersect. I am proud to say that now our city is earning a reputation as a growing center for artistic, scientific and technological innovation and a gateway to exploring New Mexico's creative and technological horizons. Albuquerque is also known as a place where environmental sustainability is acutely important. ISEA2012's focus on sustainability is an inspiration as we envision our future in the desert.

Hosting ISEA2012 would not be possible without the hard work from the staff at the nonprofit, 516 ARTS, and its lead partners, the University of New Mexico and the Albuquerque Museum of Art & History. I'd like to thank them for making ISEA2012 possible and for highlighting Albuquerque as a part of the global community that is exploring the cutting-edge intersection of art, science and technology.

Richard. J. Berry
Mayor, City of Albuquerque

Above: Bill Tondreau, *Cityview* (detail), photograph, courtesy of Sumner & Dene.

Welcome to ISEA2012 Albuquerque: Machine Wilderness

RE-ENVISIONING ART, TECHNOLOGY AND NATURE

ISEA2012 (the Eighteenth International Symposium on Electronic Art) consists of a conference, a multi-site exhibition and a season-long series of public programs around the region, all exploring the intersection of art, science and technology. We are pleased to be hosting over 100 artists and over 400 presenters from 29 countries for the exhibition and conference, and working with over 100 partners from the region and beyond.

ISEA is held every year in a different location around the world, and has a 30-year history of significant acclaim. It feels like a milestone for Albuquerque to be joining the group of host cities that has included Istanbul, Singapore, Belfast, Munich, Helsinki and major urban centers around the globe. This project is drawing a wealth of leading creative minds to New Mexico, and is engaging our local community through in-depth partnerships, putting Albuquerque on the map in a whole new way.

Organizing the expansive ISEA2012 project has been an incredible honor and challenge for 516 ARTS, a small, independent, nonprofit, community organization. It has stretched our minds and greatly expanded our network. Crossing the divide between the arts and science opens up a vast realm of collaboration and possibility. Art and science, when combined, de-mystify each other and become more mutually accessible, offering a tremendous opportunity for creativity and innovation in both fields.

The ISEA2012 conference, which kicks off the season-long collaboration, takes place in Albuquerque September 19 – 24, 2012, with pre-conference activities in Southern New Mexico and El Paso, and post-conference days along New Mexico's "Cultural Corridor" in Santa Fe and Taos. The main conference is based at the museums in Albuquerque's Old Town, with a day at the National Hispanic Cultural Center and two days Downtown.

I encourage local and regional audiences to save this guide and use it as a resource for the whole fall season. And locals, please join in the conference activities together with hundreds of national and international attendees. ISEA2012 presents a unique opportunity for our community to interact with leading creative minds in art, science and technology from around the world. The conference programs have something for everyone, including Intel Education Day geared towards teachers and youth, the Downtown Block Party for the whole family, and many ticketed performances and celebrations.

I encourage participants from near and far to join in the excitement of this momentus international gathering here in Albuquerque and the Southwest. Learn, play, connect and be a part of re-envisioning art, technology and nature.

Suzanne Sbarge
ISEA2012 Executive Producer
516 ARTS Executive Director

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ISEA2012 is organized and produced by 516 ARTS, a nonprofit arts and education organization, in partnership with The University of New Mexico and The Albuquerque Museum of Art & History

516 ARTS
516 Central Avenue SW, Albuquerque, NM, USA • tel. 505-242-1445 • www.516arts.org

UNM The Albuquerque Museum of Art and History ISEA

Note from ISEA2012 Artistic Director

I have participated in many ISEA symposia over the years, so I am especially thrilled to be part of hosting it in my home town. As I have traveled the world to these inspiring gatherings, I often imagined how exciting it could be to experience it in New Mexico. Now this dream has come true and I am thrilled to see how ISEA2012 has blossomed into such a large-scale event with many important partnerships, enriched by the unique setting of Albuquerque and New Mexico.

In creating the overall ISEA2012 theme of "Machine Wild-erness", I wanted to reference the New Mexico region as an area of rapid growth and technology alongside wide expanses of open land. As the home of not only many of the most 'wild' places in the country, but also some of the most advanced technology and scientific discoveries, New Mexico offers the world a site for reflection and inspiration. The current conditions of Albuquerque and its surroundings also offer a microcosm of the social and environmental issues facing our global communities. Through "Machine Wilderness" and our five subthemes, this year's symposium focuses on creative solutions for how we might consider technology and the natural world with a sustainable future in mind.

Today we face an urgent need to re-examine the connection between humanity and wild spaces. In the 21st century when the technologies that have become embedded in our daily lives need to be reconsidered for their impacts on our future, participants in ISEA2012: Machine Wilderness will examine not only what has happened in the past 100 years, but will collaboratively envision what we can and should make happen in the next 100 years and beyond. Collectively, we will ask what historical and contemporary elements of technology and science should we be looking at to sustain our future and examine the technologically 'appropriate' based on local and temporal conditions with an understanding that we can't use the same mindset to fix a problem that we used to create it.

The focus days of the ISEA2012 conference are especially exciting and thread through the exhibition and overall symposium. The Latin American Forum showcases innovative projects in digital culture, critical theory and media arts coming from Latin American artists and scholars. The ISEA2012 Education Program focuses on STEM (Science, Technology, Engineering and Math) education through Art, with programs for teachers and youth developed in partnership with Intel Corporation.

I would like to thank ISEA International's Board of Directors for selecting Albuquerque for ISEA2012, and everyone involved in making this project a success, especially 516 ARTS, the lead producer, The Albuquerque Museum of Art & History and all my colleagues at The University of New Mexico for helping to make ISEA2012 possible.

Andrea Polli
ISEA2012 Artistic Director
Mesa Del Sol Chair of Digital Media and Associate Professor of Art & Ecology

College of Fine Arts and School of Engineering, The University of New Mexico

"Wilderness is not a luxury but a necessity of the human spirit, and as vital to our lives as water and good bread. A civilization which destroys what little remains of the wild, the spare, the original, is cutting itself off from its origins and betraying the principle of civilization itself."

—Edward Abbey, Desert Solitaire

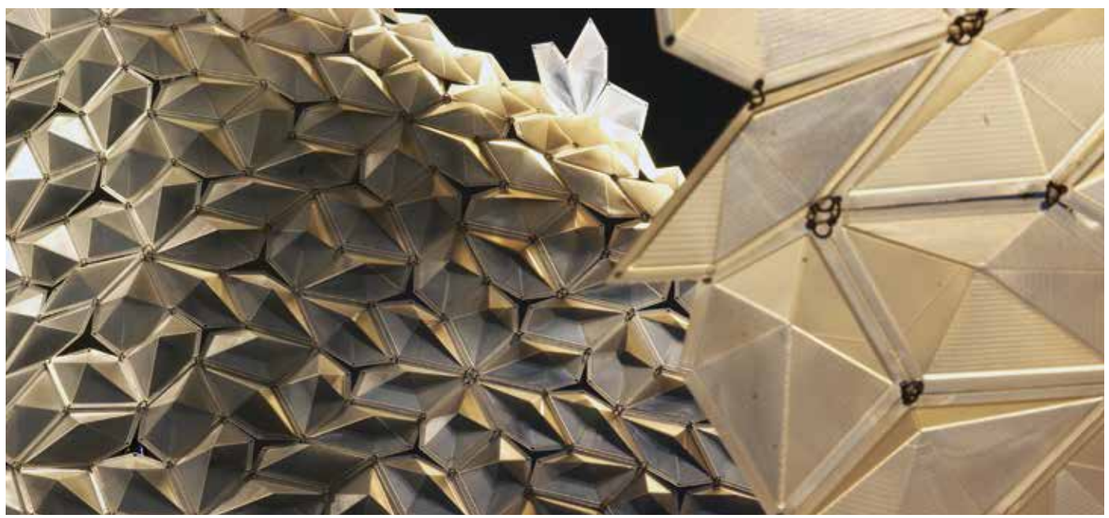
ISEA International

ISEA2012 is part of a series that started in 1988 and is overseen by the ISEA International foundation (www.isea-web.org). The International Symposia on Electronic Art have become the most important academic gathering on electronic art world-wide and aim at bringing together the worlds of art and science. ISEA is a nomadic event. The next editions are ISEA2013 in Sydney, Australia (www.isea2013.org) and ISEA2014 in Dubai, United Arab Emirates. These symposia will present their plans during the ISEA2012 General Meeting on Thursday, September 20, 11am-1pm at The Albuquerque Museum of Art & History.

MACHINE WILDERNESS

Re-envisioning Art, Technology and Nature

The title for the overall ISEA2012 project is Machine Wilderness. As part of a region of rapid growth alongside wide expanses of open land, New Mexico presents a microcosm of this theme. ISEA2012: Machine Wilderness presents artists' and technologists' ideas for a more humane interaction between technology and environment, in which "machines" can take many forms to support and sustain life on Earth. The project focuses on creative solutions for how technology and the natural world can coexist. The term "Machine Wilderness" was originally coined by cultural geographer Ronald Horvath in the 1960s to describe the transformation of the landscape of the American Southwest caused by the automobile. For ISEA2012, the term "Machine Wilderness" is being reclaimed to represent the potential for humans, animals and machines to coexist in a positive, sustainable future. ISEA2012 featured artists, presenters and organizations seek to define wilderness and our place in it in the 21st century.



Polyscape by Yulia Pinkusevich

SUB-THEMES

• POWER: Gridlocked

Flip a switch and the lights come on. Flush a toilet and waste disappears. Swipe a card and money is transferred. Sophisticated yet often invisible grids of power sustain contemporary life throughout the farthest reaches of our world, providing electricity, gas, water, sewage, finances, materials, transportation, communication and more. Rolling blackouts, economic fallout, climate change and natural disasters test the viability of this interconnected system of dependence. The Gridlocked theme aims to provide a multi-layered exposé of the structures and infrastructures of power, and make visible their origins, mechanisms, consequences and alternatives. Featured programs explore power in its simplest manifestations as well as its complex hold on global society.

• CREATIVE ECONOMIES: ECONOTOPIAS

From the local to the global, the Econotopias theme engages a critical dialogue around the challenges and excessive demands of the global marketplace and its impact on everyday life. It explores the future of creative economies as drivers of possibility in diverse communities and environments and through new technologies. By bringing local and international artists, engineers, economists, labor specialists and community organizers together, Econotopias focuses on the need for more sustainable social and production practices through programs on topics such as open-source ideologies, the gift economy, micro-credit, the culture industry and global outsourcing.

• TRANSPORTATION: DYNAMOBILITIES

The once-simple task of moving from point A to point B has become a minefield of choices and consequences. The Dynamobilities theme features artworks and presentations that ask questions about and offer possible solutions to the issue of 21st century mobility. Featured projects include new devices for moving through space, mobile media that depend on the user's movement through space, projects examining the power needed for mobility and question the need for speed, as well as theoretical presentations addressing the mobility of people, goods and ideas.

• Wildlife: Trans-Species Habitats

Coyotes, bears, peregrine falcons, many charismatic mega-species are making cities their homes. Bees, bats and other smaller animals are suffering disease and perhaps species collapse. Plant and animal communities are failing due to the control of natural cycles such as flood or fire to accommodate settled human development. However, humans are copying animal adaptations and replicating complex natural systems in sustainable design from Velcro to storm water infiltration. The Trans-Species Habitats theme showcases work that re-imagines the city as a viable space for the integration of overlapping species flowing in patterns and spatial organizations.

• The Cosmos: Radical Cosmologies

The Radical Cosmologies theme gazes at the universe and questions our place in it. It explores a wide range of creative perspectives and practices around the cultural, scientific and philosophical possibilities of contemporary astronomy. This theme incorporates various forms of media, written word, performance and installation, as well as workshops, community-based actions, lectures and online projects to offer viewers fresh interpretations and experiences of cultural myths, indigenous histories and contemporary science.

FOCUS AREAS

• LATIN AMERICAN FORUM

The Rio Grande River creates a natural conduit between the U.S. and Mexico. The path it follows has created a geographical, cultural and linguistic bridge between Latin America and the United States both historically and in the present day, providing a unique context for collaboration and the exchange of ideas with Latin America. The ISEA2012 Latin American Forum showcases some of the recent and historical production of Latin American digital culture, critical theory and media arts, highlighting fresh contributions from south of the border.

• STEMARTS EDUCATION PROGRAM

The ISEA2012 Education Program, sponsored by Intel, focuses on STEM (Science, Technology, Engineering & Math) education through Art. It centers around the Intel Education Day of the conference, and includes outreach activities such as the STEMArts Competition and the Downtown Block Party presented with Creative Abuquerque and highlighting the Transportation theme, the Visiting Artists Teaching Program, a curriculum for teachers, and an artist-scientist residency with Intel. The program demonstrates innovative ways for the arts to improve STEM education, with a special focus on culturally diverse students.

Ivan Puig & Andrés Padilla Domené, SEFT-1 (*Sonda de Exploración Ferroviaria Tripulada / Manned Railway Exploration Probe*), journey from U.S./Mexico border to ISEA2012 sponsored by Stanlee & Gerald Rubin Center for the Visual Arts at The University of Texas at El Paso.

Myth and Infrastructure
by Miwa Matreyek

ISEA2012

ALBUQUERQUE

MACHINE

WILDERNESS

PAPERS

SHORT ABSTRACTS

ARTIST TALKS

THE WILDERNESS AT HOME

Josephine Anstey

DEPT. OF MEDIA STUDY, SUNY AT BUFFALO

Abstract

In this paper I suggest that we need a complex, fractal-like intermingling of the wilderness and city in both real and virtual space in order to create a sustainable future for human beings on the earth. I discuss Mrs. Squandertime, a persistent simulation/stimulation of the slow alpha state that is conjured by watching nature without purpose, as an example of such an intermingling.

Introduction

Stewart Brand suggests that for humans to survive climate change we need to pull back into cities, feed ourselves with as little impact as possible, and leave as much of the earth alone as we can (Brand 2009). At the same time groups as diverse as eco-spiritualists and earnest social scientists suggest that the mental and physical health of much of the world's increasingly urban population is damaged by lack of contact with nature (Bird 2007; Davis 2008; Maller et al. 2006; Tzoulasa et al. 2007). A solution to this dilemma is for artists, scientists, and technologists to demand and produce the greening of the interstitial spaces of our cities, and in a complementary surge, to simulate nature so that it can colonize our virtual spaces and our indoor spaces. One obvious success in this area is the proliferation of urban farming and gardening. While I believe we need more rooftop, builder's bag, window-box, and community gardens, the strength, and ceaseless renewal of the urge to plant can be seen throughout the existence of cities. It appears as persistent as the weeds that grow in the cracks of any concrete. However in this paper, I would like to concentrate on a more fragile, perplexing, contradictory need -the need for disorder, nature as wildness, and wilderness -which is a harder thing to sustain in the city. While parks old and new may set aside small areas for "natural regeneration," people and perhaps especially children have very little access to wilder natural areas. In the same context of wilderness I would like to ask both why and what could we, should we, simulate? Section One discusses a few projects that speak to natural disorder in an urban context. Section two discusses some art projects that have simulated wilderness. There is only space here to highlight a few of projects, so I am choosing those that have most impacted me, and have therefore influenced the creation of Mrs. Squandertime, a collaboration between Dave Pape and myself, which I describe in section three. In conclusion I address some questions, problems, and obstacles that this program of "The Wilderness at Home" needs to face.

1. Urban Wilderness as Home

In 1975 the Port of London Authority (PLA) lent gardener and urban reclaimer Hilary Peters some waste land ,Surrey Docks on the south side of the river Thames,and she started an urban farm. When I visited it in the late 70s, much of the land was broken concrete, with iron bollards and metal edgings around the dry docks areas. There was a lot of scrap. There was a huge pile of grey earth for the goats to climb on. Old dockland offices were living quarters for two workers, I think their names were Bumble and Hopper. There were garden beds. There were weeds. Kids wandered in from the nearby housing projects. Hilary Peters' experience at the farm supports

the idea that urban dwellers need nature.

The dreadful alienation of people in the abandoned docks wasn't just the result of unemployment. They were alienated from themselves, each other, and their surroundings. ... When I started to dig the silt and graze my goats and poultry in Surrey Docks, I was surprised by the urgency with which everyone wanted to join in. ... The farm grew, mainly not due to my efforts at all, but to all the people who recognized that the farm met some buried need in them. (Peters)

In 1980s, as water-front dock-lands became coveted real-estate in London, Surrey Docks Farm was threatened with extinction. It was moved to a less prime location in 1986, but still thrives (Surreydocksfarm.org). The original Surrey Docks Farm was surrounded by, and part of, an urban wilderness: a self-greening industrial ruin, where unofficial activities like catching bugs, making forts, watching birds, scavenging the water line, and loitering, could take place. The current Surrey Docks farm is a great resource, a place for kids to see and work with plants and animals, but in contrast it seems tamed and cleaned up, made to fit in with the new condos, the new neighbors.

In terms of wilderness in the city, gentrification seems to be a huge threat, but is it one that can be avoided? Duisburg Nord Landscape Park (Hui 2001; Landschaftspark), in Emscher, Germany, created by Architects Latz + Partner's between 1991 and 2000, seems to attempt a different balance of the raw and the cooked. This project transformed a disused ironworks into a 180 hectares park. Instead of razing the blast furnaces, ore bunkers, gas-o-meter, and casting houses, the architects incorporated the buildings and the site's history into the new park, marrying architectural heritage with eco-green concerns, and in the process preserving some of the wildness that pervades disused urban industrial sites. They allowed nature to re-colonize the buildings, turned the blast furnace into a viewing platform, put climbing walls on the ore bunker, a high-ropes course in a casting house, have artists installations on site, all this and a farm school. That Duisburg Nord Landscape Park exists, suggests that cities can make more radical choices about urban green space. I have not visited Emscher myself, but friends tell me that climbing rusting ladders up the blast furnace is a fairly wild experience.

The USA has plenty of raw spaces ripe for experiments in Urban Wilderness. I currently live in Buffalo, New York,

a city rich in industrial history, with miles of abandoned and rusting sites. Recently a new group has taken over some of the Grain Silos, Silo City (Silo City), and are encouraging and allowing artists to work in and around them. In May 2012, five artists created installation and projection works in and around Silo City for Fluid Culture Culleton and Read , a lecture, arts, and media series on themes of local and global culture and ecology organized by the University at Buffalo Humanities Institute. In late April 2012, I went to Silo City at dusk. Like the London docklands of the 70s, the surrounding area was bleak and desolate. There was a closed gate and a sign warning trespassers to stay away. A crumbling street of blank industrial buildings led to the grain elevators on the side of the Buffalo river. A herd of deer were grazing close by, geese flew overhead and landed in the water. I was meeting artist Laura Curry to watch her record material inside the silo for a performance piece. She had set up a video camera at one end of a long dark corridor, leading under the grain chutes, and placed sound recording equipment half way along the corridor. The space echoed and was increasingly dark. Curry created a white corn starch trail disappearing into the darkness. Then I could hear her approaching, moving, scuffing the corn starch, dislodging gravel. I heard more geese flying and honking behind me. Curry moved along the trail, it was too dark to see her, until she was very close to the camera, arms raised. It was very much an experience of wilderness.

My other visits to wild urban spaces include renting a canoe on the Chicago river and canoeing downtown; taking my own canoe down the Buffalo river past the rusting Grain Elevators; watching miles and miles of New Jersey wetlands on rides from Manhattan to Newark, and wondering if anyone goes into them, are they safe are they polluted?; traveling by train out of New York and seeing boys diving into the Hudson off some half-sunken and rusting hulk, and wishing I could too. Many cities, most cities, go through declines and falls that produce these rich wild spaces, can we enter them without spoiling them? Can we maintain this wilderness? Can these spaces have anything of the same effect as natural wilderness?

2. Virtual Wilderness

Conservatives argue that wilderness, in the most negative senses of the word, already permeates existence online: it is a spiritual wasteland, a pornographic no-man's-land, where children and young people are bullied and made savage. But artists and technicians have always imported the aspects of wilderness that refresh the soul into digital media. In terms of virtual space and indoor space, I would like to consider two questions, in this section, why should we simulate nature? and in the conclusion, what should we simulate? To help answer these questions I would like first to consider three powerful simulation projects.

In 1992, Brenda Laurel's group created PLACEHOLDER (Laurel et al. 1998), a virtual reality experience for two people. The virtual environment simulated the real environment close to Banff in the Canadian Rockies. There was a sulfur hot spring in a cave, a waterfall, and a landscape of hoodoos (tall, thin rock spires). Each participant wore a head-mounted VR helmet and could communicate with the other participant with a "Goddess" (a voice played by a live performer), who also acted as a guide. The participants could explore the space and "become" smart "critters", Spider, Snake, Fish, and Crow. The landscape contained the recorded traces of stories based on Native American culture, and the participant could add her own stories to the world. At the heart of PLACEHOLDER was a consideration of the way that human beings put their own markings on landscape. We like to mark our territory, just like many other animals. In a way, narrative and story-telling are our marks. A huge part of the experience, and an idea that permeates manyhuman narrative traditions, was experiencing life through the body and perceptions of another animal. Although the team did not implement all their ideas in this area, the participants could, for example, "become" Crow, opening their arms/wings and soaring around the waterfall.

In 1995 Char Davies' group created Osmose, another virtual reality work, and perhaps the paradigm for nature simulation (Davies). Osmose was an experience for one person wearing a VR helmet and a sensor vest which detected chest movement. The participant navigated the virtual space, much as a scuba-diver, leaning her body to choose direction, controlling her breathing to move up and down. Osmose consisted of a dozen spaces, each with a metaphorical relationship to nature. The most literal evoked trees, forests, ponds, flows of water, sap, blood-cells, microbes; the most symbolic contained text and code. In a technical tour de force (given the date) the computer graphics simulated the soft, dynamic, interpenetration of light and color of natural scenes, instead of the typical, contemporary, hard edged computer graphics. Participants emerged entranced: they spoke in very spiritual terms of the space bringing them closer to themselves, to nature, to something essential.

Andrea Polli's collaborative group produced Atmospherics/Weather Works (Polli), a simulation that focuses on sound, specifically the sonification of storms. In 2003, an installation at Engine 27 in NYC, simulated two storms that passed through the NYC area, the President's Day snowstorm cyclone (1979), and Hurricane Bob (1991). These two storms had been extensively modeled by meteorologists. The size and shape of the storm was captured by data representing the wind speed at different points in an area stretching from Northern Florida to Northern New York state, and at five elevations from sea-level to the top of the atmosphere. The team mapped this wind speed

data and sampled every three minutes, to digital sounds that referenced wind whistling; mapped the whole storm area to the size and shape of the Engine 27 space; and played the storm on loudspeakers positioned throughout the space. As audience members walked through the darkened space, they were literally moving through the storm and experiencing the chaos and patterns that emerged in space and time. Again participants referred to the experiences as visceral, soothing, spiritual, essential.

The value of simulations, whether audio or visual, has always been linked to providing an experience for human beings of things that they cannot experience directly, and/or with their own perceptual equipment. The paradigmatic examples are the experiences of the turbulent forces in a furnace, the workings of a cell. Polli's simulation speaks to this aspect of simulating wildness -we literally get an experience, a geographically-scaled event on a human scale, that we cannot have in any other way, but that is analogically, very closely tied to our experience of wind and storm. Char Davies' work has been criticized for throwing so much technology at reproducing nature (Grau 2003), why not just go outside? But for populations that for reasons of physical, economic or geographical capacity cannot easily

scuba-dive or tramp in the woods, the rebuttal is simple. And if we are moving into a time when we should all be leaving nature alone, what will restrain the eco-tourists amongst us? Perhaps donning smart "critters" of various sorts, and interfacing a virtual wilderness with an alternative set of perceptions and drives?

3. Mrs. Squandertime: Wilderness at Home

These real and virtual projects, speak not only to wilderness, but to the relationship of people to wilderness. PLACEHOLDER, Osmose, and Atmospherics/Weather Works all immerse the human body into the simulation. PLACEHOLDER deals with aspects of human imagination and story-telling grounded in nature. Osmose and Atmospherics/Weather Works stimulate the sense of wonder and awe that wild nature-scapes evoke. I believe that wild urban spaces – the original Surrey Docks Farm, the Duisburg Nord Landscape Park, and Silo City – have a similar allure. There is an awful pleasure in watching hulking, man-made, structures decay: feeling both humanity's thumb-print, on the world, and its vulnerability. There's a pleasure in seeing what wild-life still goes on, in, around, and under the city. All these pieces and places push the participant towards a sense of time and rhythm that is not dictated by civilization's metrics. It is this aspect of wilderness as out-of-clock-time, regenerative, and contemplation-inducing, that we address in Mrs. Squandertime.

Mrs. Squandertime is a large, high-definition, projection-based, autonomic installation. The project consists of the persistent (24/7) simulation of an ocean view, a living room and a virtual character, all driven by real-time data. The character herself is rendered photographically in a series of slowly dissolving stills which correspond to her current behavior. Her daily routine includes many hours sitting and watching the view. She wanders into her living room with or without a cup of tea, sits, and contemplates boats on the river, the sea, clouds, gulls flying, the tide going in and out, people on the sea wall. The graphic elements that compose the view are hundreds of images taken from historical printed sources. The roughness of the waves; size shape and movement of clouds; numbers, locations and behavior of boats, wildlife and people; are all determined algorithmically. The program that assembles and animates these images is driven by weather, time, and tide data constantly updated from a real physical location.

The piece as a whole rejects a romantic notion of wilderness as a pristine space outside human being's civilizing hegemony. Pre-historic humans drained the swamps in England, turned Australia into a desert (Diamond 1999), radically altered all land, and what they missed 20th and 21st century humans have trammeled. Instead Mrs. Squandertime speaks to the long history of humans both needing wilderness and needing to survive (with) it. The project connotes a Victorian aesthetic of sublime wilderness: in this case a seascape ruled by tide and weather. In this project the same network-driven, sampled, and patchworked content techniques that usually connote the frenzied, the fast-paced, the urban, are used to produce a work inspired by the slow movement. Mrs. Squandertime is an invitation to sit awhile, stay quiet, and contemplate the view. Mrs. Squandertime invokes the mediated possibility of reassembling and retaining an ideal sense of wilderness even when we are nowhere near wilderness. Mrs. Squandertime serves as a very quiet shout against the obsessive, consumerist, self-important, always-connected, busyness of 21st century life. Instead, like Mrs. Squandertime, stay home, watch sea and clouds. This is wilderness at home. Mrs. Squandertime as a role model.

Conclusion

Assuming for a utopian moment, that we collectively agree to leave much of the earth alone, could urban and/or simulated wilderness substitute for real wilderness for humans' psychological and physical well-being? In their paper "Promoting ecosystem and human health in urban areas using Green Infrastructure: A literature review," Tzoulasa et al. conclude that before policy about green-space can be formulated, empirical research is needed to determine exactly what makes it beneficial Tzoulasa et al. (2007). Although I support empirical research, this program reminds me of the 1950s zeal to scientifically determine the goodness of food, to extract the vitamins and serve them up in pills. I believe that what funding and energy we have, should be put into making many bold and noisy experiments in the artistic sense. For real space: wild camps for girls in the New Jersey marshes, artists colonies in old silos, survival adventures in city sewers. For virtual space: as many different types of simulation that artists, scientists, and technologists can imagine in subways, schools, old-people's homes. Judgment of these projects could be multiform -aesthetic, popular, social, qualitative, and by all means quantitative. Compelling projects that meet human beings needs for wildness and wilderness, might then become part of the persuasive force to stop housing developments built around golf-courses in deserts and the kind of eco-tourism that leads to 40 land-rovers surrounding a tiger.

Perhaps a harder question is, how much wilderness will any community allow, given an opposing determination to be safe? Fear of predators lurking in the wild, provokes censorship in virtual space, and turns wild urban space into no-go areas for most people, most of the time. William Bird writes, "In the US the radius in which 9 yr old children were allowed to play in 1990 had shrunk by nearly 90% compared to 1970."Bird (2007). I see no easy answers here. But I want to oppose that paralyzing fear with powerful imaginings of restorative virtual and urban wilderness. In a study of the behavior of urban children in Portland, Kentucky, between 1900 and 1950, Louise Chawla describes urban boys playing in box cars and quarries, and riding river currents. Even groups of girls traveled the urban byways freely and swam at local beaches and lock through the 1930s Chawla (1995). What steps can we take to bring some of that freedom and independence back into our lives and the lives or our children?

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SHIFTING PARADIGMS: TOWARDS AN AUDITORY CULTURE

Leah Barclay

QUEENSLAND CONSERVATORIUM OF MUSIC, GRIFFITH UNIVERSITY, AUSTRALIA

Abstract

The global ecological crisis has become a catalyst for interdisciplinary collaborations at a time when a shift in thinking is urgently required. World leaders are now looking towards the validity and possibilities of creative methodologies as tools for change. This presents both a challenge and an unprecedented opportunity for creative practitioners to gain a critical understanding of the situation and devise new processes for a sustainable future.

This paper explores the role of auditory culture in a sustainable future and introduces the Sonic Ecologies Framework, a multi-platform methodology proposed to initiate cultural change through sound. The core of this methodology pivots on a site-specific creative project embedded in a multi-layered community cultural engagement process developed in response to a specific environment. This evolving model is implemented by the artist, acting as an agent of change spiraling between contextualized theory and practice. This research introduces the five stages of the model with examples from projects recently implemented in Australia.

Introduction

In John Cage's pivotal 1937 talk, The Future of Music: Credo, he said, "I believe that the use of noise to make music will continue and increase until we reach a music produced through the aid of electrical instruments which will make available for musical purposes any and all sounds that can be heard" (3).

In 2012, the centennial of John Cage, his visionary genius is clearly evident with a musical world of infinite possibilities aided by technology. The dramatic advancement of technology has truly cultivated a paradigm shift in how artists interact in both physical and virtual worlds. These changes have evolved and expanded our tools of expression but most importantly they have opened the ability to communicate at a higher level in an interdisciplinary context.

In a recent addition of *Musicworks,* Joel Chadabe stated that the current artistic practices of electro-acoustic composers are rooted in the idea that new technologies, unlike traditional musical instruments, can produce sounds used to communicate core messages, including information about the state of our environment. He claims that we are all participating in the emergence of a new type of music accessible to anyone, which can be used to communicate ideas that relate more closely to life than those communicated through traditional musical forms. He

believes we need to think of ourselves as "leaders in a magnificent revolution rather than the defenders of an isolate and besieged avant-garde" (6).

In a world where the catastrophic effects of climate change are rapidly becoming a bitter reality, there must be a role for sound in generating a shift in consciousness. Bill McKidden recently said; "When art both of great worth, and in great quantities, begins to cluster around an issue, it means that civilization has identified it finally as a threat". He views artists as the antibodies of the cultural bloodstream and fundamental to social change. As this social movement of creative thinking expands internationally it is worth reflecting on Attali's seminal 1985 text where he refers to music as not just simply a reflection of culture but a "harbinger of change". He states, "For twenty-five centuries, western knowledge has tried to look upon the world. It has failed to understand that the world is not for the beholding. It is for hearing. It is not legible, but audible" (3).

World leaders are now looking towards the validity and possibilities of creative methodologies as tools for change, this presents both a challenge and an unprecedented opportunity for composers to gain a critical understanding of the situation, and take action in devising new processes for a sustainable future. Electro-acoustic music, with the use of natural sounds, has a profound ability to ignite an awareness and connection to the environment. But is the role of the artist purely to comment on the crisis? To create awareness? Or can provocation extend beyond expression to create a behavioral shift in deeply engrained unsustainable ways of thinking?

This research explores these questions and introduces a multi-platform methodology that could provide a framework to facilitate the paradigmatic shift required to initiate cultural change. The core of this methodology pivots on a site-specific electro-acoustic music project embedded in a multi-layered community cultural engagement process developed in response to the specific community. The five stages of the Sonic Ecologies Framework are introduced through relevant examples of projects recently produced in Australia. These projects are ultimately acting as a catalyst and represent an unparalleled opportunity for artists taking action as agents of change in environmental emergency.

Rationale

The author's practice-led doctoral research involved conceiving and delivering seven original electro-acoustic projects for dissemination in multi-platform environments. The divergent projects were created in cultural immersion, spanning from ambitious sonic explorations in the center of the Amazon Jungle to sounding the rivers of the world through India, Korea, China, Australia, and New Zealand. The delivery and dissemination of each project was underpinned by a rich methodology that pivots on the site-specific project embedded in community cultural engagement. The concept of cultural immersion challenges the traditional notion of an isolated composer and has the ability to be profoundly influential on the composer's personal validity of their practice. For the author, it is no longer about notes on a page with a dotted bar line that finishes the project, but an entire spectrum of compositional decisions in a constantly evolving process that appears to only expand rather than dissolve. This is undeniably as a result of working directly with the communities and experiencing creative inspiration in cultural immersion.

The ambitious doctoral research began as an exploration of the sustainability of electro-acoustic music and evolved into a complex web of projects harnessing electro-acoustic music as a change agent. The beginning was fueled by an isolated intention, yet through the process of cultural immersion the author discovered a tool that not only provides a gratified language of creative expression, but also a voice for the communities and environments collaborating on these projects. The discoveries and observations from each individual project showed a clear trajectory towards a definitive set of tools to initiate cultural change through environmental electro-acoustic music. As a result, the Sonic Ecologies Framework was developed as a means to create an accessible methodology for artists interested in implementing similar projects.

Sonic Ecologies Framework

The following provides a brief overview of the five essential elements of the Sonic Ecologies Framework. The core of this methodology pivots on a site-specific electro-acoustic music project embedded in a multi-layered community cultural engagement process developed in response to a specific community. The site specificity requires that this methodology be intrinsically flexible in order to be adaptable within a diversity of environments and communities. It is in essence a practice-led creative research process, taking an ecological approach to contextualizing a project within an environment. While there is an essential degree of freedom and adaptability, the process is grounded within the theoretical contexts generated by the artists who experiment and innovate within a continual spiraling between theory and practice.

1. Site-Specific Subject Matter

In the context of this process, the site-specific nature of the electro-acoustic music project is essential. It must be pertinent to the community and grounded within a comprehensive understanding of the proposed thematic content. The sound work of Douglas Quin in Antarctica and Francisco Lopez in the Central Amazon Jungle are obvious examples. *Blue Gold*, by Australian composer Ros Bandt also provides a pertinent example in this context. *Blue Gold* is a performance installation investigating the delicate balance between wet and dry in our natural landscape. While it has been performed in a diversity of contexts, the site-specific realization over Lake Cootharaba in Australia's UNESCO Noosa Biosphere provided a platform for the local community to truly engage in the thematic of the work. As part of the site-specific performance, Ros Bandt participated in a dynamic ten-day program of community workshops, sound walks, forums, and interactive labs designed to confront and challenge a spectrum of water issues across disciplines. *Blue Gold* became a vehicle for these conversations, ideas and actions that rippled throughout the community, a community that was changed by this process as evident in their actions and enthusiastic preparations for future soundscape projects.

2. Multi-Platform Dissemination

The Sonic Ecologies Framework encourages collaboration and multiple outcomes where possible. While one core creative outcome is most likely the central intention, the adaptability of the project for a range of environments is essential. The sonic outcomes should be disseminated in a range of environments for maximum exposure; this includes harnessing the power of virtual platforms to facilitate global accessibility. This is exemplified in the *EcoSonus* project commissioned for Floating Land 2009, a multi-channel sound installation with regional site-specific performances, collaborative community compositions and a interactive website streaming field recordings and alternative compositions.

3. Community Engagement and Education Tools

There is undeniably a strong movement associated with environmental sound art emerging internationally. This is evident through the establishment of organizations such as Ear to the Earth, the environmental program of the Electronic Music Foundation. While this profusion of research continues to evolve, the reality is the western world is still a visually dominant society and requires education to ignite the auditory perception. If the community in question is to engage and comprehend the project, they must gain a deeper understanding of their sonic environment and play a role in the process. The community engagement and education tools will always evolve depending on the nature and accessibility of the proposed community but the standard suggestions include; community sound walks, participatory field recording sessions, capacity building workshops and providing access to the appropriate technology for the community to remain engaged in the process. This research has also indentified the necessity in engaging the younger generation in participatory soundscape experiences. As the future leaders, it is this generation who will experience the true ramifications of climate change. The *Sonic Explorers* project, commissioned for TreeLine 2012 in Australia, involved workshops, collaborative compositions, sound mapping and performances all aimed towards connecting young people to the environment through sound.

Sonic Babylon, the creation of New York based artists Nora Farrell and Bill Duckworth, is a prime example of innovative community engagement through sound. Riding local Wi-Fi networks, the Sonic Babylon sound gardens grow with music, sounds, and stories accessible on mobile devices in selected spaces within a community. The sound garden is interactive and can be both heard and manipulated by the community. As visitors move through the garden, the Sonic Babylon application tracks their position in the space and the 3D audio engine generates a real-time sound mix relative to the location of the planted sounds. Sound gardens have a diversity of positive outcomes for a community including the ability to repurpose existing digital content (such as oral history) and also the ability to observe a system, a virtual ecology, and hear what kind of voices and themes may arise. The key attraction is its accessibility and versatility, and its ability to grow within a community over time. In the context of Sonic Ecologies it can function as both the core creative work and the ongoing community engagement. The majority of the sound materials planted in the Sonic Babylon case study for this research were historic recordings, particularly revolving around the indigenous history of the region. It was extremely rewarding to see young people interacting with Sonic

Babylon and gaining insight into the indigenous history of the area, particularly considering these soundscapes are not traditionally accessible to the community.

4. Interdisciplinary Partnerships and Collaborations

In order to truly attempt to create a paradigm shift with Sonic Ecologies, electro-acoustic music must be augmented from its traditionally isolated academic circles and expand into regional communities collaborating with environmentalists, conservationists, scientists and policy makers to expand awareness. Creating a support network around the project will be essential in its future viability and sustainability. The Biosphere Soundscapes project was conceived and designed with the Sonic Ecologies Framework. The partnerships and collaborations with a spectrum of international organizations from the creative, environmental, and scientific sectors will be essential to its impact and success.

Biosphere Soundscapes is a large-scale interdisciplinary project underpinned by the creative possibilities of soundscape ecology. The project is designed to inspire communities across the world to listen to the environment and re-imagine the potential of UNESCO Biosphere Reserves as learning laboratories for a sustainable future. The project will connect and inspire the communities of global Biosphere Reserves through emergent technologies, innovative creative practice and soundscape ecology. This project combines art, science, technology, and community to give Biosphere Reserves across the world a voice and a global audience to listen through virtual platforms.

5. Long-Term Strategic Vision

The artist implementing the Sonic Ecologies Framework is initiating a process within a community. The creative outcomes serve as significant milestones but ultimately it is the process that will continue to resonate and evolve over time. As with any form of community engagement, Sonic Ecologies requires time in order to facilitate change. The capacity building community engagement is designed to empower the community to continue working long after the artist has departed. It is therefore essential the artist invests critical thought into the methods in which the community will continue to engage and appropriate technology is accessible to continue working. The most obvious strategy is to leave low costs digital recorders with a key stakeholder in the community and design a web platform to enable the community to continue creating and uploading content. It should also go without saying, plans to return to the community should be instigated by the artist, whether this be a concert of future creative outcomes, workshops or simply visiting the key collaborators to maintain relationships and energy in the process.

Conclusion

The Sonic Ecologies Framework is not a complex idea, it is simple, based on logic and grounded in significant practice-led research outcomes. As a result, it is accessible for artists interested in implementing similar projects on a local and global scale. While the author will continue facilitating projects through this process, it is also hoped the

wider sound community will grasp the potential of delivering work with this methodology.

Now, more than ever, there is a critical need to listen to our environment and generate a paradigm shift that engages our auditory perception. Sound, as a creative medium, is undoubtedly one of the most powerful means to stimulate this shift in consciousness. Electro-acoustic music, with the use of natural sounds exposing the state of the world could be an unprecedented tool in artists taking action in ecological crisis. This research is ultimately underpinned by the realization that artists can play a role in creating a sustainable future, and as proposed by Joel Chadabe, think of ourselves as "leaders in a magnificent revolution" (6).

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T/ACT: PARTICIPATORY MEDIA DESIGN FOR SOCIAL EMPOWERMENT

Andy Best-Dunkley
MEDIA LAB, DEPT. OF MEDIA
SCHOOL OF ART, DESIGN & ARCHITECTURE
AALTO UNIVERSITY
andy.best@aalto.fi

KEYWORDS

MEDIA ART, SOCIAL EMPOWERMENT, PARTICIPATION, INTERACTION, PERFORMANCE, DISABILITY, ACCESSIBILITY

Abstract

This paper presents research into the social effects of a collaborative participatory design process with selected individuals who have severe physical disabilities. This process encourages and enables creative expression by the participants beyond their everyday norms. Selected individualsare able to control media such as audio and video through custom made bespoke interfaces which they help to design and develop. The research raises the following questions: Can a disruption of institutionalised conditioning according to class, education, gender, and physical abilities be orchestrated by careful design and presentation of interactive artworks? Can the new media artwork become a culturally significant tool for social empowerment leading to long lasting changes for the individuals involved?

Introduction

Our current lifestyle is reliant upon media technologies. Our lives are organized through and by technology, such that we can easily forget the importance of physical social interaction rather than that mediated by online social networks. Instead of being empowered by technology, humans are enslaved to its seductive powers. Is it possible to move away from this focus on the technological and rather discuss the act of using the interface and the product of that action, the content? Does access to media technology in itself empower the participant, particularly if that person is herself on the margins of society?

In the research described in this paper the author attempts to answer the following question: Can the use of media technologies enhance the possibilities for people with disabilities to express themselves creatively on equal terms with able bodied people through a design process in which they are deeply involved?

Contemporary art can be a driving force for change: already in the 1950's, Yoshihara Jiro, founder of the Gutai (literally "embodiment") art movement in Japan stated: "It is our deep-seated belief that creativity in a free space

will truly contribute to the development of the human race" [1]

It is the author's contention that, in contrast to traditional visual arts, interactive art, and participation in media performance demand an embodied experience. The physical act of *doing* and *being* in a *public* space leads to an empowering cognitive experience with long lasting consequences for the active participant.

Participatory Design

Participatory Design has at its core the principal that the end users should be involved in the design process from the outset. This is in contrast to genius design where the process is led and controlled by design professionals who "instinctively" know what is best for the users. Participatory design itself has come under criticism for the imbalance of power amongst the design stakeholders. One of the responses to this is Participatory Action Research (PAR) where the motivation comes from within the community itself, with the academic researcher taking the role of facilitator and compiler of the research outcomes. Rob Kitchin highlights the problems of exploitation that many people with disabilities feel when confronted by academics working with disability research.(Kitchin nd) Kitchin states that although many researchers have good intentions to "help" the subjects of their research, the "traditional theories of ethical practice failed to consider ....the imbalance of power ... and the privileged position of the researcher". The author, as an artist/researcher, has sought to deal with this problem by bringing the individuals involved into the decision making process right from the start, even though the research project is devised, directed and motivated by his research concerns.

The Active Participant

William Morris, writing in response to the rapid industrialisation of the 19th century stated that "the beauty produced by man's hand, which was once a solace to his labour, has now become an extra burden to him" (Morris 1884:21). His concern was the loss of the human touch in the manufacturing process. Similarly Ivan Illich writes, "Tools foster conviviality to the extent to which they can be easily used, by anybody …for a purpose chosen by the user.." In his discussion of contemporary life he continues "the majority of people were certified as unfit for higher grades of enlightenment and had to be discarded as unprepared for the good life in a man-made world" (Illich 1973:22). For people with disabilities this is the situation they face every day – they are given little choice in where or how they live, what they do, or even if they can work. Susan Schweik has researched the so-called Ugly Laws which sought to forbid disabled people to appear in public in various cities in the USA – thereby in many cases restricting their ability to earn a living.[2] The categorization of ability according to visual appearance is deep-rooted across society. Arthur Franklin Fuller, who was afflicted with chronic illness which confined him to a lying position, wrote in his autobiography: "The pianist could not play nearly as well as I, even in dance music. But these folks have well, normal bodies, and that makes all the difference in the world." [see 2] In the 21st century, the cult of celebrity makes physical beauty even more of a social currency, yet for some, media technologies help to address the balance and empower otherwise marginalised individuals.

The Eye Writer project is a superb example of media technology being used to empower a specific individual (Tempt One) with a disabilitating disease (ALS). [3] As Tempt One himself states: "Art is a tool of empowerment and social change, and I consider myself blessed to be able to create and use my work to promote health reform, bring awareness about ALS and help others."

It is clear that the act of empowerment for Tempt One comes through a combination of access to the technology, the ability to once again create graffiti art, and his possibility to have a presence in the public city environment through the large scale urban projections of his tags. As Rancière illustrates, emancipation can arise through actions and activity which question the roles allocated to us by society (Rancière 2009: 19-21). For this research the social and political implications are as important as the technological and artistic outcomes.

Although focusing on people with physical disabilities, the research adds to the discussion of reactions to interaction stimuli and control in the average adult human. Just as the blind person's sense of hearing is amplified, so it may be that someone with severely limited movement can actually have an acute sense of control over a range far too limited for the normal person to perceive. Saranjit Birdi, working with special needs patients in the UK, has found evidence to support this proposition (Birdi 2010).The bespoke device or environment designed for the individual also acts as a window into their world, as we are able to experience the physical or virtual world through their interface, their experience. In particular Merleau-Ponty's discussion of the body schema illustrates how examination of a unique individual helps us to understand the wider landscape (Merleau-Ponty 1962: 112-177)

Can a disruption or disturbance of institutionalized conditioning according to class, education, gender, and physical abilities be affected by careful design and presentation of the interactive artwork? It is vital that the interactive experience invites and encourages SOCIAL interaction amongst the participants, as it is only through social activity that the self-image can be positively developed. The physical artwork (performance, installation) becomes a point of focus for social interaction AND empowerment, as the normal rules of engagement within public space are temporarily ignored in favour of those created by the participants themselves. The role of the artist or designer changes to become that of facilitator or producer. In fact, the artist creates the situation, possibilities for others to bring to life. Curator and theorist Nicolas Bourriaud regards that we have passed into a new "altermodern" era where artistic production is concerned with the weaving of "relationships" between people and thing (Bourriaud 2002 & 2009). The discourse, the social activity, becomes the work itself.

The Design Process

The aim has been to develop personal interfaces or bespoke electronic musical instruments. The author is currently working closely with two individuals, Susanna Tuomminen and Santeri Aaltonen. They were chosen due to their personal motivation and interest in the research aims. They have had few prior possibilities to make sound or music, although Santeri is a great singer and tells fantastic jokes! The collaboration process started with getting to know

each other via "off the shelf" solutions. A midi keyboard and controller were used with Max/MSP and Reason software, so samples and sound parameters could be easily modified. Even at this basic level, the experience of hearing one's own voice played back and modified to create interesting or weird sounds was stimulating for the participants. They were excited to learn to make uploads to the internet and add them to websites such as SoundCloud and Facebook.

Susanna Tuomminen and Santeri Aaltonen – smiley people! Photo – Andy Best-Dunkley

Gradually different types of electronic sensors and interfaces were introduced, allowing the participants to experiment and play with sound in totally new ways. It was necessary to develop the electronics so that they would not restrict the users' limited physical movements. The X-Bee radio together with an Arduino Fio has proven to be a good solution. The type of sensors used range from simple flex and pressure sensors, accelerometers, and compass modules, to the 9 DOF Razor IMU which provides angle of orientation data in all directions. [4] The emphasis on hardware development had been on the novel use of existing electronic components and not the actual development of new technology per se. The exploitation of small wireless devices means that the usual restrictions caused by signal wires are removed, and any impediments to the physical body are minimized. The approach used is to concentrate on the movements that the participants are able to make, rather than design an interface that they would have to adapt to. An example is a control interface made as a cushion for Susanna – she can control media and play sounds by shifting her weight as she sits in her wheelchair. Made with Arduino and Open Frameworks, the interface is very sensitive, intuitive, and fun to use. It can be thought of as a dance mat for wheelchair users, yet it is equally useable by the able-bodied. The interfaces require SKILL to play. We are not developing toys but audio interfaces. In order for them to gain sufficient satisfaction from the interaction, there must be a challenge in learning to use the device.

Santeri Aaltonen enjoying playing prototype wireless devices attached to the gloves. Photo – Andy Best-Dunkley

Concluding Observations

The focus is on ABILITY rather than DIS-ability. The aim is to discover appropriate forms of interface and sound according to each person's physical abilities and musical interest. The core of the research is that through the development of new media interfaces for a small group of very particular people, to gain insight into empowerment through human interaction with audio visual systems in general. Even though the participants have sensory systems different to the regular population, the goal is to make this difference invisible through the medium of the art performance.

Our goal is to perform live as a group. Given Santeri's great way with words, rap with backing instruments maybe our ideal genre. To perform live in front of a regular audience will be an empowering moment for Susanna and Santeri. They become activators of their own destiny for that moment in time – they will no-longer be abject objects on the margins of society but proud individuals performing in their own right.

This research illustrates how the concept of Participatory Action Research can be utilized within practice based artistic research to facilitate emancipatory and empowering activity. The role of active participant taken up by the person with disability is truly empowering and emancipatory when the benefits of the research are felt not only by the disabled community but also by the wider public at large.

ENDNOTES

1. January 1, 1955 quoted in *What's Gutai?* Shoichi, Hirai, Hyogo: Bijutsu Shuppan-Sha 2004 Print

2. "Be it enacted, that on and after the passage of this act it shall be unlawful for any person, whose body is deformed, mutilated, imperfect or has been reduced by amputations, or who is idiotic or imbecile, to exhibit him or herself in any public hall, museum, theatre, or any public building, tent, booth or public place for a pecuniary consideration or reward, or to solicit or receive charitable relief, or to go from house to house or to stand or display themselves upon any public street or place to solicit or receive alms" A suggested draft of a city ordinance by Charles D. Kellogg c.1891 New York City ordinance, quoted in *The Ugly Laws Disability in Public*, Schweik, Susan M. New York: NYU Press 2009 Print

3. The EyeWriter Project website. Free Art and Technology (FAT), OpenFrameworks and the Graffiti Research Lab: Tempt1, Evan Roth, Chris Sugrue, Zach Lieberman, Theo Watson and James Powderly. http://www.eyewriter.org (accessed June 28, 2011)

4. An inertial measurement unit, or IMU, is an electronic device that measures and reports on a craft's velocity, orientation, and gravitational forces, using a combination of accelerometers and gyroscopes. http://en.wikipedia.org/wiki/Inertial_measurement_unit (accessed June 29, 2011)

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LANGUAGE AND MAGIC

An Archaeological Approach to Tania Candiani's *Organum*

Mariana Pérez Bobadilla
UNIVERSIDAD IBEROAMERICANA, MEXICO CITY, MEXICO
Rodrigo Guzmán Serrano
UNIVERSITY OF NEW MEXICO, ALBUQUERQUE, NM

To some extent, science and magic seem to be strongly related. For Malinowski, science is based on the reliance of men to conquer nature, thus closely akin to magic (1993: 3); in this tenor, contemporary artists who incorporate science/technology in their practices could also become magicians who generate experiences that lift aesthetics over conceptualism when encountering the artwork but, at the same time, address profound contemporary concerns on the integration and assimilation of technology in our society. *Organum*, by Mexican artist Tania Candiani, is the starting point to propitiate a discussion on various themes such as the relationship between art and technology, the extended aesthetic experience aroused upon that relation, a symbolic connection with previous experiences of technology, and a special consideration on the sonorous dimension of language. This artwork (figure 1) is part of the exhibition "5 Variations of Phonic Circumstances and a Pause" [i], that will be displayed at the Laboratorio Arte Alameda (LAA) in Mexico City in 2012 ("Cinco Variaciones" 2012) [ii] , and its development is the result of an intense dialogue with the exhibition curator Karla Jasso.

Figure 1. Tania Candiani, Organum, 2012, variable dimensions. Computer render. Courtesy of the artist.

Tania Candiani, a voracious reader, is an artist who does not adhere herself to a single technique nor a unique way to proceed. Her quests are as diverse as the reality she faces. She aims to generate aesthetically and conceptually readable artworks that confront audiences with magic and amusement (Candiani 2011). Her work *Organum* is symptomatic of a particular way of understanding science as a resource to create technology of *magical* and *amazing* effects. This idea, however, is nothing new and 17th-century Jesuit scholar Athanasius Kircher is the key to understand this relation. His work allows us to know how mechanical artifacts are understood, especially in relation to music, and the specific concerns on create *magical* experiences with them.

This way, *Organum*, reveals symbolic relations between today's society and 17th-century European society in terms of the uses and experiences with media. This statement is linked to an approach followed by some theorists like Siegfried Zielinski, the so called *Media Archaeology* (Archäologie der Medien) that inquires on the discursive load

human objects and devices have had throughout history. The Foucauldian term *archaeology* differs from other forms of historiography for it is based on a "systematic description of the discourse-object" (Zielinski, 2006: viii). In other words, objects (i.e. media, artifacts, devices) are conceived as products loaded with discourse that determines the way we experience the real through them. For Huhtamo, Media Archaeology's aim should be to analyze the cultural/political content reflected in media, for "the reality of media history lies primarily in the discourses that guide and mold its development, rather than in the *things* and *artifacts*" (1997: 222). We approached *Organum* based on this archaeological standpoint in order to reflect on the relationship we establish with technological means.

The work consists of an electronic instrument that resembles a musical organ. Although, strictly speaking, not a musical organ itself, the piece refers to this instrument, hence inserting itself in the historic relation to organ production and its experience. It was created to be placed at the former choir of the San Diego church, today Laboratorio Arte Alameda (LAA) in Mexico City (figures 2 & 3). The instrument has two keyboards: one is musical (black and white keys) and the other from an old typewriter, both connected to a computer that transform the input into language, words, and phrases. The organ is to be performed by an instrumentalist who reads texts about automata and robots that are first translated into musical notation as scores after a period of time without activity, the texts' archives are *read* automatically by the machine without a player (Candiani 2011).

Figure 2.Organum being mounted at LAA's choir. Photograph by Mariana Perez Bobadilla, 2012.

Figure 3. Organum's tubes falling into LAA's main nave. Photograph by Mariana Perez Bobadilla, 2012.

Organs symbolically unfold power, for they are expensive and imposing devices. They are to be placed, generally, at parishioners' backs in a temple thus creating an environmental experience with by occupying the whole space with their potent sound. They are not mobile instruments, but built site-specific, joined organically with the architecture (Snyder, 2002: 4). The relationship between instrument and player is worthy of notice; organists are not supposed to stand out, but create a sensation of the organ being played by itself (Davidsson in Snyder 84). In this sense, *Organum* brings the automaton property to a new level by *talking*. Organs, Davidsson (in Snyder 2002) stresses, were extremely symbolical in 17th-Century Europe and they were often related to the cosmos and Creation (78). Kircher's name appears again; a plate from his *Musurgia Universalis* (1650) [iii] shows the world being created by a musical organ (83). At the bottom of the illustration a legend reads *Sic ludit in orbe terrarum aeterna Dei Sapientia* [iv] .

However, even when *Organum* is a participant of this historical relationship with organs, its experience is given via the use of new technologies, thus placing it in the discourse of new media art production. The term *new media,* as observed by several authors (Graham & Cook 2; Zielinski 32; Paul 67; Kanarinka in Graham & Cook 35; Manovich, 2002; Krauss, 2000) is, nonetheless, ambiguous and inconsistent. We do not attempt to reconstruct the term and offer a list of features that new media art should have; however, we do stress the importance of the deconstruction of the term, and for the purposes of our analysis of *Organum* we opted to state that this artwork is part of a production tradition of art practices that incorporate art and technology in its creation, distribution or operation [v] . In this sense, we agree to say that the primacy of these art practices does not lie on the "newness" of the media but on the maturity of the work (Graham & Cook 2) and that, in general, these artworks not only are, but *do* (34).

Artworks that incorporate new technology in their operation expand the aesthetical and political possibilities when experiencing them. We have already stated a symbolic *co-incidence* of feeling towards technology as a parallelism between 17th-century European society and the present; magic, as we shall see, is a constant in both moments of humanity. We have not attempted to do an absolute and total parallelism between contemporaneity and the 17th century, but to highlight timeless characteristics of the former that have been present in humanity among different historical periods and that found convergence in our times. *Organum* makes evident a close relation between art and science. Until the 17th Century (especially during this period), an intense and narrow relationship between art and science occurred. It was a period when art could have benefited out of scientific explorations, and science could have been shown in artistic and poetic ways.

Organum operates in the limit between the scientific and the magical, as an artifact that amazes for doing the unexpected, the unusual. It is an inventor/magician's creation that erases the distance between cause (playing the keys) and the extraordinary effect: the speech. However, its concealment lies in the inaccessible complexity to the general public towards technology. In this sense, magic is possible because it does not show its mechanism, but only renders the amazing results of a talking machine.

Eco (2002) states that magic is found in technology for it tightens the path between cause and effect. Technology is not adhered but integrated to culture; in other words, technological production is generated from and for particular social and cultural needs (Eamon, 1983: 172) and it is ecologically assimilated in society. Astonishment towards technology could be lost in the quotidian; however, the latter always retains its magical component of hidden process, unknown. The sense of immediacy between input and outcome is, for Eco, where magic found its way; in other words, magic simplifies the complexity procedures and makes the difficult seem easy, it delivers the mechanical processes with *sprezzatura* [vi] , that is to say, simplicity, immediacy, grace, nonchalance.

Circumventing language itself when analyzing *Organum* would be a mistake. The work is loaded with sound software that enunciates all the possible syllables in Spanish. It connects us again with the acoustic component of language and, moreover, it reflects on its graphic representations for texts are translated into scores that are later interpreted in the musical keyboard by an organist. The shift between representational systems is done in the same way Kircher related music to the balance of cosmos and the Creation, and in the same way he invented musical algorithms for automatic composition, i.e., the equivalences were made arbitrarily, equaling a syllable to a single note or chord. At the same time, they follow a systematic operation that codifies, for example, more common syllables with easier notes and less common ones as complex triads (Candiani 2011); this way, syllable "de" (common) is represented with note A from fourth octave, whereas "cuer" (less common) with chord Abm7.

The work explores the validity and arbitrariness of translation and equivalence between signic systems given all forms of representation are conventional. This is an exercise of *ekphrasis*. Traditionally, ekphrasis was conceived as the textual description of a visual work; however, following Gabrieloni (2007), we focused on how this translation operates between different media, i.e., translate between forms of experience.

Organum renders language in its oral form; it brings text back to sound. In addition to this, it tells us about our own approach to language: fragmented, partitioned, just like we learn to talk by sounds of letters and then syllables. The machine articulates sounds to form words just like humans articulate organs through their body to create sound. Furthermore, language as sound propitiates the reflection on temporality of the text; that is, when it is enunciated as sound, language acquires the variable of measurable time that affects its meaning; hence medium (mechanical sound) and time determine the content and reception of text.

To conclude, contemporary artistic practices use resources of science and technology to broaden the span of aesthetical experiences. The way in which they are integrated in the 21st Century is similar as it was in the 17th Century. The ideas of the machine, temporality, the multisensory experience, and magic, as well as the tight relationship between science, technology, and art, are also point of coincidence between these two periods. These bonds serve to question the newness in new or electronic media, and their relation to art. Quoting Mexican artist Rafael Lozano-Hemmer:

> In the frenzy of many of my fellow artist colleagues who talk about "new media," I precisely dislike talking about it in terms of "new" […] because I do not believe that what we are doing is something original, but it is exactly the connection that it can have with precedents what enriches the artwork. ("Arte y ciencia I" 2009)

Tania Candiani does not participate through her work in this *frenzy* of technological development. In her Latin-American specific context, she does not invent great new technology nor does she use the most recent advances available; conversely, through reflection on the artifact, the machine and the medium, she offers beauty, a poiesis of the technological in its magical possibilities. Candiani, with *Organum*, tries to make possible the impossible, making real our illusions in a time when everything is achievable, and at the same time holds a critical posture by questioning the insatiable desire for the new.

ENDNOTES

[i] In Spanish "5 variaciones de circunstancias fónicas y una pausa."

[ii] This text was written several months prior to the exhibition.

[iii] Plate XXIII from book X.

[iv] "Thus plays the wisdom of the everlasting God in the earthly orb."

[v] The root of this idea is *Laboratorio Arte Alameda* curator Karla Jasso.

[vi] The term is borrowed to Baldessare Castiglione from *Il libro del Cortegiano* (1528).

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(RE) SHAPING AND (RE) ARTICULATING TRADITIONAL ECONOMY

Ron Bull

OTAGO POLYTECHNIC, DUNEDIN NEW ZEALAND

ABSTRACT

Native peoples participation in modern and post-modern practices is often viewed as outside of what is considered traditional and therefore, when choosing to participate, questions around authenticity rise.

But many of the Kai Tahu people of Southern New Zealand would argue against this. Generations of *whanau* (family) have participated in traditional practices of food gathering, particularly with the *Titi* (muttonbird) harvest. Elements of this have evolved. These have been managed through the adoption and adaptation of new technologies by the *whanau* involved in the practice.

Underpinning all this are core concepts that inform practice: concepts centered around identity politics. While the 'what' and the 'how' of practice may change, the basic concepts remain stable.

Practices such as altered political economies, alternative transactional economies, and electronic art; all play their part in how the Kai Tahu people define themselves as traditional, at the same time being active agents for change.

Introduction

New Zealand is a nation at the bottom of the world. It comprises principally of two main islands with many small outlying islands. It is often described as a very young country and the last country on earth to be settled.

The indigenous peoples, now known collectively as Maori, arrived in New Zealand from Eastern Polynesia over a thousand years ago and settled in various parts of the country. They consist of many distinct groups, structuring themselves, socially and politically as *Iwi* (tribes). They often share geographic boundaries and certain understandings regarding creation stories and associated customs but consider themselves to be independent socio-political entities, akin to Clans in the Scottish high and lowlands or even nations, if we were to consider the North American experience. The *Iwi* that this story refers to is known as Kai Tahu.

Kai Tahu Economic Theory

Kai Tahu economies, pre-European contact, were based primarily on a migratory hunter-gatherer system that relied on sets of social norms and controls or political economies.

One of the corner stone philosophies is *whakapapa* (genealogy). Broadly speaking this describes the ancestry of individuals as a part of an interlinked history that includes the genetic profile as well as socio-political interconnectivity of individuals to groups and of groups to each other. It refers to relationships that bind people, places and events, which in turn underpin understandings around actions, rights (rites), and responsibilities. These are not based on an ideal of race, but around the construct of lineage and familial connection.

The concept of *whakapapa* is central to Kai Tahu understandings of identity as part of a larger narrative that stems from creation stories [i]. The creation stories of our ancestors, tell of the innate connection of people and the environment both being progeny of the relationship between the land and the sky [ii]. This builds the base for the eco-political connection from which a related set of rights and obligations arise.

These can be articulated as *Mana Whenua* (integrity of the land). Often the term *takata* (people) *whenua* (land) is used literally to describe the people of the land. The (now) common, and widely accepted articulation of this concept in referring to people with a relationship to a particular geographic area is *mana whenua*. This provides acknowledgement of the responsibility to ensure that the *Mana*, the integrity [iii] of people and land stay intact. As an extension on *whakapapa*, *mana whenua* relies on significant connectivity between people and landscape. This relies also on mutually beneficial relationship between the two, which can be articulated *as ahi kaa* (*ahi*, fire and *kaa* burning).

This metaphor is used to articulate the undisturbed connection that people have to a certain geographic area. This connection goes on through time so long as the metaphorical fires are kept burning. Once those fires are extinguished or left to die on their own, then the individual or group no longer has access to that area or the resources that are held there.

An interpretation of this could be economic and cultural sustainability. 'Resources', tangible (economic), and intangible (cultural) need to be maintained with a view to sustain people here and in the future. People sustain the land and land feeds the people. This leads to food harvesting concepts like *mahika kai* (food gathering), which culminate in trading and feasting traditions *kaihaukai*.

As a specific concept, *kaihaukai* is often used to describe a feast where members of different *hapu* (sub-tribes) come together to share the specialty food of the area. It can also include the economy of trading food and/or related

products between *whanau* (families) and *hapu*. This trading allowed for a variety in diet as well as the building and subsequent strengthening of relationships. In the days prior to contact with Europeans and the introduction of an agrarian cash economy, *kaihaukai* the trading economy as well as understanding of the interconnectedness that the notion of *mana whenua* depended on.

Mixed Marriage People

New Zealand was 'discovered' and charted by Europeans in the mid 1600s by the Dutch, but it wasn't until the 1770's, with the arrival of the English through Captain James Cook, that a period of sustained European contact and colonization occurred.

The first wave of this, particularly in the Southern regions, was an economic colonization via the global sealing industry. This started in earnest in the 1790s, with a number of ships making contact with Kai Tahu, particularly on the South/South-Western coastline

One of the peculiarities of this industry was its shore-based nature. Gangs of *takata pora* [iv] (people of the boats) would be dropped off in remote areas or islands to be picked up again, at times after two to four months. Occasionally ships would go missing at sea and gangs would be left for extended periods of time [v]. During this time, the European sealers would interact with the native population [vi]. There are individual stories of these interactions [vii] and by the 1820's, mixed 'marriage' [viii] communities started to arise such as that on *Whenua Hou* [ix] Island [x]. As opposed to some stories of colonization, 'mixed blood' [xi] marriages and offspring were viewed as a strategic advantage by Kai Tahu. This was due to the perception of *whakapapa* (genealogy) being the key to self-identification, and that by having shared *whakapapa* individuals and their families enjoyed the rights and privileges of both lineages. While the island itself is now a wildlife sanctuary, the progeny of these marriages still live in the area today [xii].

The sealing industry in New Zealand collapsed by the 1830's and was replaced with shore-based whaling. This saw the eventual disintegration of 'satellite' sealing communities like that on Whenua Hou and the establishment of other 'European' influenced townships. These townships were located on the site of *hau kaika*, Kai Tahu villages and at first were reliant on the inhabitant native communities for labor and food [xiii].

Both of these sets of communities became what Richard White (1991) would term, the "Middle Ground [xiv] ": not European and not native, out of which came new systems of meaning and exchange. Kai Tahu, and conversely their visitors, was interacting with new knowledges, rituals, and ideals.

The native economy, both transactional and political, was changing. The adoption of technologies such as pigs, potatoes, and whaleboats [xv] by Kai Tahu had seen a shift from reliance purely on the seasonal hunter-gatherer, to more permanent settlement in and around these townships. The model of *kaihaukai* (trading food) was supplemented by cash economy and land became viewed as a commodity. Kai Tahu enjoyed the opportunities and threats of the new world. This is not to say that there was a wholesale movement away from traditional *mahika kai* (food gathering). Many practices were continued, for example the collection of *titi* (muttonbird). This will be expanded on later.

In 1840 New Zealand's 'founding document' the Treaty of Waitangi was signed. This legitimized the processes of colonization by formalizing a relationship with the British sovereign and allowed for mass migration and settlement from Europe, especially but not exclusively, from Britain. The result of this was a change in the balance of population, and subsequently power, in New Zealand. This power differential resulted in the systematic alienation of Maori from the economic base and the destabilization of culture and language.

This time in New Zealand history reflects many similar colonizer/aboriginal encounters. But the retelling of these national narratives can the regional responses to change. In this instance, the 'Northern' Maori experience of this era differs significantly from that of the 'Southern', Kai Tahu [xvi]. The northern was a story of conquest and the forceful removal from land by the agents of the state. These agents included native conscripts from other tribes, co-opted partially by the promise of favor from the settler forces of the time. This along with other mechanisms of colonization led to a general feeling of mistrust between natives and colonizers and added to the historic ill feeling between *Iwi* (tribes).

The early interaction between the *takata pora* (people of the boats) and Kai Tahu meant that by 1840 the south had a considerable percentage of population that were "half-caste" or mixed breed. The question of 'what race' was therefore answered with 'which whakapapa'. This is where we will turn back to the practice of *mahika kai* (food gathering), and in particular, the *titi* (mutton bird) harvest.

Traditional Harvest

Titi are harvested off two distinct groups of islands south of the mainland. The most remote being 8 hours by boat. The rights, and obligations to participate in this economy are reliant on *whakapapa*, if your family has associations *(ahi kaa*) with an area, then you have the rights of sustainable access to the resources of that area (*mana whenua*).

Our family has had constant contact with a particular area on a particular island. Like many *Kai Tahu whanau* (families), ours' largely live an urbanized lifestyle, and we are keen adopters (and adapters) of technology. For two months of the year, we persist with our continuous contact with the last remaining parts our pre-historic economy, the harvesting and trading of *Titi* (mutton bird). These two months spent on small off shore islands form the core of our self-identity and quite often our economy. The remaining time on the mainland, can often be perceived as the 'alternative' economy.

As long as I remember, the trip to the 'Island' was a year round preoccupation building materials, lengths of timber, old doors and windows, sheets of corrugated iron were hunted and collected. In February and early March, the final details were put in place and the week before the 15th of March, [xvii] was engaged with packing the stores and getting everything for the right tide on the night of the 14th.

This preoccupation was not isolated to our whanau. Many others in the South filled in the other 42 weeks in the year with mundane tasks (occupation on the mainland) that allowed for the annual harvest. Some would only work in seasonal occupations that would allow time for the harvest. This pattern is in itself, a continuation of older practices around the seasonality of tasks.

Technology has changed the practice over time. From travelling in double-hulled *waka* (canoes) to clinker rowing boats to diesel motor boats and now helicopters. Birds were once preserved in their own fat; this was superseded when sealers brought with them the practice of salting, and now many 'birders [xviii] ' use generators to run freezers. The deliberate adoption (and adaption) of these types technologies, by us and for us, has kept our traditional practices current, relevant and authentic.

A conversation with a cousin displayed the importance of the Titi islands on his self-identification. On the Island he made the statement to me "… Down here I'm a billionaire, I wouldn't even sell this for a billion dollars! I'm a 'Birder'. That's what I am" [xix] .

This was a profound statement. My cousin and many like him don't speak the Maori language, don't do *karakia* (ritualistic prayer) in the morning or live in a house surrounded by carvings. But he has a very strong sense of identity that is informed by the landscape of the Island and the practices that have been headed down to him through *whanau* and *whakapapa*.

Electronic Art

Contemporary Kai Tahu artists such as Rachael Rakena and Simon Kaan are involved in the harvest and collection of narrative and use electronic media that allow for other of our *whanau* (families) to participate in practices that they may have been alienated from. They also invite people to virtually share in the philosophy of *kaihaukai*, ritualistic sharing of food. The essential text of their work is around native peoples and their undisturbed connection to landscape and identity, engaging in and with technology to (re)shape and (re)articulate traditional economies. In doing so guaranteeing participation in the future of tradition making that is informed by traditional practice, using all the tools of modernity.

ENDNOTES

[i] See Tau, T. (2001). The Death of Knowledge: Ghosts on the Plain. New Zealand Journal of History, 35, 2.

[ii] This is told in the Rakinui (Skyfather)/ Papatuanuku (Earthmother) creation story.

[iii] This is my understanding of the term Mana. Dictionary definitions see mana as being pride or prestige but these terms merely touch the surface of this concept

[iv] This was our name for those that came on the boats.

[v] One story tells of a gang dropped on Solanders Island in 1808 and not retrieved until May 1813! McNab, R. (1907). *Murihiku*. William Smith Printer, Invercargill Pg. 150

[vi] For example Begg, A.C. and N.C. Begg. (1979) The World of John Boultbee. Wellington.

[vii] See "Jimmy The Boy" in McNab (1907)

[viii] The concept of marriage could be debated here. However there is evidence of Maori women living with European sealers. Several of these were to be recognized as marriages by the church.

[ix] Whenua Hou literally translates to New Land.

[x] This was a community established especially for the families of those relationships noted above.

[xi] See Raibmon, P. (2005). *Authentic Indians*. Duke University Press.

[xii] The progeny of Wharetutu and sealer George Newton numbers well over 5000 today! Anderson, A. Newton, Wharetutu Anne- Biography, from the Dictionary of New Zealand Biography. Te Ara-The Encyclopedia of New Zealand, updated 1 – Sept- 10

[xiii] Kai Tahu farms, based on the new technologies of the agrarian economy, were supplying potatoes and pork to the whaling ships and a growing export trade.

[xiv] White, R. (1991). The Middle Ground: Indian Empires and Republics in the Great Lakes Region, 1650 – 1815. Cambridge press. New York.

[xv] This comment comes from Tipene O'Regan Hocken Lecture University of Otago, May 2002

[xvi] The writer can see the irony of arguing a homogenizing national narrative in favor of a semi-homogenizing North-South divide.

[xvii] This is a self-imposed regulation. The Islands are managed by committee elected by the beneficiaries who hold the whakapapa.

[xviii] A term used to describe members people who participate in the harvest.

[xix] Personal communication.

GENERATING MOBILITY AND POWER THROUGH ART

Justin Carter

SCULPTURE & ENVIRONMENTAL ART, GLASGOW SCHOOL OF ART

ABSTRACT

This paper explores the ideas of mobility and power using the case study *Pedal Power for Bybrua*, commissioned for 'Stavanger 2008' – Capital of Culture. Three pedal powered generators were made available to the community of Pedersgata. During daylight hours these devices were located in a number of public sites and situations. During nighttime, the stored energy was released as part of a pedestrian lighting system installed beneath the City Road Bridge 'Bybrua'. This paper will focus on the only mobile generator; *Bridgit* known for its capacity to offer transit from one side of the bridge to the other.

In an oil rich nation what would it mean to introduce more modest forms of energy production? How would the installation of a human powered lighting system change the way people perceive the underpass space? How might 'human power' change human behavior? What might the social, economic, and environmental benefits be?

This project demonstrates a number of practical interventions inspired by the critical writings of Ivan Illich and Henri Lefebvre. These sculptural devices allow the problems of contemporary mobility to be seen as generative opportunities; both in terms of dialogue and energy.

Context

Throughout the World the number of large-scale wind and solar projects is proliferating. Such schemes dwarf their surroundings and often face opposition from local communities. Whilst this drive towards a more sustainable energy mix ensures a bright future for renewables, the 'passive energy gain' offered (embodied by solar, tidal, and wind power) also has the potential to reinforce a public malaise in terms of consumption. "The energy crisis cannot be overwhelmed by more energy inputs". (Illich, 1974: 22) The fundamental question then, has to be that of confronting the public with their levels of consumption and reducing those levels to a point where they are sustainable.

In response to these issues this paper describes the results of a temporary public intervention commissioned for 'Stavanger 2008'. In August 2008 a variety of pedal powered generators were made available to the community of

Pedersgata in Stavanger, Norway. During daylight hours these devices were offered for use in a number of public sites and situations. During nighttime, the stored energy was released as part of a pedestrian lighting system installed beneath the City Road Bridge. This paper focuses on one of the three generators *Bridgit* – so called for its mobile capacity for transporting users/producers from one side of City Bridge to the other. This intervention methodology paid homage to Henri Lefebvre's Rhythmanalysis: "Works might return to and intervene in the everyday. Without claiming to change life, but by fully reinstating the sensible in consciousnesses and in thought, [the Rhythmanalyst] would accomplish a tiny part of the revolutionary transformation of this world and this society". (Lefebvre, 1992: 26) How might 'human power' change human behavior? What might the social, economic and environmental benefits be? Would this intervention help reinstate a sense of communal ownership and sufficiency?

Background

Although no specific brief was given, it was evident that my invitation had come on the back of previous art works using alternative energy in socially engaged forms. During a period of research and development involving site visits and extended dialogue, a focus began to emerge – one that explored Norway's rich cultural heritage and landscape, probing the complexities of Stavangers position as European 'Oil Capital'.

A pedestrian underpass beneath the main city road bridge, 'Bybrua' became the focus for this research. The bridge itself had been built in the early 1970's when Norway struck 'black gold' in the North Sea. Essentially this was a fairly nondescript pedestrian walkway situated between a park and a residential street. However, what made this space unusual in the context of Stavanger were its various problems. The space where the bridge meets the ground was regularly covered in graffiti and constantly shrouded in darkness, both physical and psychological. The stench of urine and the sight of intravenous syringes and household rubbish was fairly constant. What had been designed as a crossroads space linking a network of paths and communities had become a place of conflict (1). Human traces were a confusion of signs ranging from territorial claim, to that of abandonment. This lack of ownership existed despite the close proximity of neighboring houses. (see figure 1).

Figure 1. Sitting with the owners of the house next to the bridge. (bridge structure is visible through trees).

Method

My initial proposal involved creating a new lighting system for the underpass, powered by wind turbines and photovoltaic panels installed on top of the bridge. The rationale was simple: replace the reduced level of natural light with artificial light to see what impact this intervention had in social/environmental terms. Make the design renewable and parasitic – using the bridge as host. On reflection however, and after discussion with locals, this initial concept was modified on the basis that such a technological or mechanical approach might be overlooked and dismissed as municipal. A stronger intervention was needed - one that encouraged human engagement.

The revised strategy borrowed much from Bybruas history: The bridge had originally been conceived as a toll bridge, but increased revenue from the oil boom rendered this levy unnecessary. Oil financed the bridge, cars used it, but the poorer working-class inhabitants of Pedersgata continued to pay the price in social/environmental terms. My revised proposal therefore adopted the concept of a toll, but aligned any 'profits' to the problem space beneath. Instead of money, the currency for this new toll system would be human energy and time. The intended outcome: to augment a real physiological connection between people and place based on communal effort. But would city residents be willing to contribute?

On August 20th the lighting system (consisting of eight LED units) was installed in the pedestrian underpass linked to a small bank of 12v batteries in the bridge storage space. The batteries required 'topping up' on a daily basis, so in daylight hours they were disconnected from the bridge and linked to three pedal powered generators located around the city. For nine days from 22nd –30th August, these portable devices were made available to the public in a range of different settings. Each generator had its own name, linked to its abilities and characteristics: *Jim* was designed for the street, and to infiltrate popular spin classes at the Gym. Pedro could be safely rowed with hands or pedaled with feet – ideal for use in schools. Finally, *Bridgit,* capable of operating as a bicycle - provided transit from one side of Bybrua to the other. These names suggested potential use, but in reality donation venues ranged widely, from schools, streets, shopping precincts, museums, galleries, cultural centers, shop fronts, door to door, parks, cafes, and even the Oil North Seas conference centre.

Figure 2. The Artist inviting participation from passers-by - offering free transit across the bridge using 'Bridgit'.

Observations

The most difficult place to occupy, with any hope of meeting willing volunteers, proved to be the underpass space itself – such were the problems of that environment. This raised an interesting question about the willingness of donors to contribute their energy - and their relative distance to, or awareness of the donor site. This relationship between distance and effort was dependent on the individual participant and the device used. Anecdotal evidence suggested that if the energy contributed would have otherwise gone to waste (in the gym for example) then donors didn't seem to care what the batteries were going to be used for. Conversely, when contributions resulted from a specific request (ie. when going from door to door) donors wanted to know exactly what their efforts would be used for.

This need to explain the work in terms of its aims and function diminished somewhat when operating *Bridgit* on City Bridge(see figure 2). Here volunteers could experience the personal benefits of the work in terms of it providing an unexpected 'gift' of transit. They could also reflect on the energy they were contributing to the lighting system in the time it took them to cycle the full length of the bridge. A high proportion of participants in this context were immigrant workers on temporary contracts – most other commuters being bike owners.

In different contexts, with a wide range of participants, the generators took on new meanings: In the gym for example the generators became conscientious devices mopping up and illuminating waste energy. In schools they became educational tools for activating the curriculum in subjects as diverse as science and technology, ecology, and physical education. In other situations they oscillated between toy and conversation piece. They were often met with curiosity bordering on suspicion, but pedaled enthusiastically with a sense of fun. This sense of humor, rather than social obligation, was often the hallmark of participation and exchange. With the 'Bridgit' generator, which transported riders from one side of the bridge to the other, trust became another interesting question: Where would riders put the bike once they reached the other side? Would the bike be safely returned? Some participants discussed the project in relation to the Norwegian tradition of Dognad or 'community service' (2) where small groups of volunteers would co-operate in an attempt to make physical improvements in the local environment. In an increasingly affluent country where collective traditions are perceived to be under threat, this observation seemed poignant.

Even before the project began, a recurring question had been: Would individuals be able to see how much energy they had contributed to the battery? Some enthusiastic cyclists had even suggested arranging competitions between schools or cycle clubs. In public situations when the generators were not entrusted to an institution, facilitators engaged with the public by asking if they had a minute to spare. Once volunteers began cycling, conversations and pedaling usually continued well beyond the minute mark. On one occasion in the market square outside the Cathedral, a male participant willingly gifted one minutes pedal power and then returned fifteen minutes later (complete with tracksuit) to perform a full forty-five minute workout on *Jim*. It transpired that he had been on his

way to the gym anyway, and so decided to perform his usual workout in public. When asked why he had been so willing to gift his time and energy, his response was simple: "My energy would have gone to waste otherwise". In the case of *Bridgit* where some of the energy was effectively siphoned off from potential movement, the concept of individual effort and communal gain was kept in perpetual balance.

Conclusion

Pedal Power for Bybrua was never established as serious competition to more conventional forms of energy production. Instead it was devised as a temporary experiment to test the willingness of the public to commit to human powered alternatives. How would people respond when they were implicated directly in energy supply? Would the demands of a public space warrant their physical efforts? The reality of the experiment would be clear for all to see - If they failed or refused to pedal, the lights would simply go out.

The lighting system did function successfully for the duration of the project. In fact, the success of the design actually created an unforeseen problem. Because the lights required relatively little power input (and estimates had erred on the side of caution) the volunteer schedule was twice abandoned due to fears of damaging the batteries through overcharging. Instead of collecting energy, project facilitators were forced to return to the art centre to dump surplus energy by running domestic appliances off the batteries using an inverter. This action released enough storage capacity to allow harvesting of human energy to resume. This situation suggests a genuine potential for combining untapped human energy, with efficient, hi-tech appliances such as LED lighting.

During the nine-day period of this project almost one thousand people agreed to contribute their energy to this system and almost every institution approached agreed to take part in the scheme. In addition, project facilitators were also urged to visit new venues unsolicited - stretching the projects modest resources in the process. On Nedre Dalgate (the street connecting the bridge to the art centre) where door-to-door calls were carried out, only three households refused to participate. This combined generosity from all donors resulted in all eight lights being successfully powered for the duration of the project. Beyond this straightforward question of lighting, it is also apparent that dialogue about renewables, energy, and community was made possible through social interaction. Dialogue also extended beyond local exchanges after entering the mainstream media - evidence of which can be found on websites and in the press (3).

It's difficult to gauge people's precise motivation for participating in such a project. Did participants want to address the design problems of the underpass, or were they simply burning off unwanted calories? Were people contributing in order to be part of an art project, or was it an urge for social (inter)action? To unpick these questions is often a thankless task, but in the case of Bridgit participants seemed grateful for the use loan of a bike and were happy to see some of their pedal output going to the lighting system – a payback of sorts.

Significantly, local people asked if the lights were going to stay. This too might be interpreted as some kind of measure of success: As Anthony Dunne suggests '[Design] must not just visualize a 'better World, but arouse in the public the desire for one.' (Dunne, 1999: 68) In this instance though, the lights were never meant to stay. They weren't conceived as a long-term solution to that particular problem. Instead, they were installed to make people ask questions, and to generate debate. If, in these times of recurrent 'energy crisis', energy becomes synonymous with power, then surely the ethical and creative response is to encourage a wider sense of participation and ownership? In the specific case of Bridgit a case was made for the mobile user to become producer. Tomorrow's technology will increase our capacity for even greater invention around ideas of mobility and power generation, but the key to successful implementation will be empathy, imagination, and perhaps even a sense of humor.

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ENDNOTES:

(1) Between the date of the first written proposal and the actual project going live, three rape incidents were reported in the local area by the Stavanger Aftenbladet – one of which happened in the early hours of the morning a short distance from the underpass. Tore Renberg, local author of 'The Heat' describes his memories of this area in the article 'The Road to Hell'. http://www.touscene.com/nb/prosjekt/tou-works/artikkel/veien-til-helvete

(2) In the UK the closest English translation of Dognad is 'Community Service', better known as a form of legal punishment rather than a voluntary contribution to the local environmental.

(3) The dialogue went much further addressing audiences all over Norway via National radio with an audience of one Million listeners. http://nrk.no/programmer/radio/nitimen/1.6196534 It also featured on the K & GT blog: http://kandgt2008.blogspot.com/ as part of an informal arts review of the capital of culture events. The project was also followed up by the Storhaug School website following our visit. http://www.linksidene.no/minskole/Storhaug/pilot.nsf/vindex?Opennavigator&count=8 In addition there were two features in the Rogalands Avis newspaper 23/8/08 & 26/8/08 and a front page article on the local Storhaug Bydelsavis newspaper.

UNFOLDING AND UNWINDING, A PERSPECTIVE ON GENERATIVE NARRATIVE.

Miguel Carvalhais

ID+, FACULDADE DE BELAS ARTES, UNIVERSIDADE DO PORTO, PORTUGAL

Abstract

Aesthetic artifacts produced by computational systems are characterized by how their computational traits and procedural nature become conceptual foundations and aesthetic focuses. These artifacts are strongly multimodal. The sensorial modalities through which they are formed and conveyed are more than aesthetic or communicational resources; they also mediate the logical and mathematical structures of the artifacts' processes. The methods through which human cooperators in the aesthetic cybernetic aesthetic experience build an awareness of the processes within the artifacts depend on human perception and on processes of simulation that we can describe as an added, procedural, modality. This complements and expands those sensorial modalities on which it is dependent, but unlike them it is a fundamentally intellectual process. Reception happens sensorially, while perception is a cognitively developed epiphenomenon. The sensorium mediates the experience of the artifact and the brain fabricates perception, developing simulations of varying accuracy that through processes of "patternicity" and "agenticity" try to reduce the sensed complexity and to anticipate the outcomes of the witnessed processes.

When we experience an artificial aesthetic artifact, we watch it perform while we simultaneously perform it. We probe its structure and draw the connections needed to participate and comprehend it. Even if unwillingly, we simulate its processes and create our own parallel sequences of probable events as the artifact unfolds. In the interaction with these systems, anticipation, the validation of simulations and the eventual violation of expectations, play a significant role in the creation of narratives or of narrative-like experiences. As with other aesthetic constituents of these systems, narrative and drama may either be hard-coded, much as they are in traditional or non-procedural media, or they may be emergent and procedural. This paper proposes an approach to how the creation of narrative can be understood in the context of performative or interactive generative systems, in an attempt to integrate in our analytical model of procedural systems the *perspective* variable, originally proposed by Espen Aarseth in his study of ergodic texts.

The outputs of artificial aesthetic artifacts fundamentally differ from what we find in most non-procedural media because, much as nature, they weren't necessarily created or even shaped by humans. These artifacts are rich with generative potential and have their own aesthetics, their unique patterns of desire, their ways of giving pleasure and creating beauty. They are inevitably mediated but also hyper-mediated, constantly confronting us with signs of what may be happening behind their modal expressions. It is this layer that marvels and allows the experience of the artifact as a symbolic drama in which we are the central protagonists.

1. Computational media

Computational artifacts are ubiquitous in many aspects of contemporary life, including cultural creation and consumption. When used as tools, they allow the discovery or invention of whole new work processes, but also in the simulation of previously existing tools, as universal machines, they are able to reproduce or embody any process that can be reduced to algorithms (Dyson 2012). Through this simulation they allow gains in speed and cost, often replacing many of their analog counterparts. They are also able to simulate any conventional medium that can be digitized, leading to the computerization of the media of the arts, and to their ultimate absorption by computational devices. Media become virtual, shed their materiality and go through a phased transition from matter to bits.

When computational devices act as both media and as distribution networks, their capacity to remediate (Bolter and Grusin 1999) promises unprecedented fidelity in reproduction, safety in archival and extreme portability. As a consequence, it may be no exaggeration to claim that very often media largely benefit from the transition to the computational domain.

This shift in distribution technologies is but a first stage in the transition. Computational media must not necessarily abide by the traits or limitations of conventional media. They are of a fundamentally different nature and ache to be released from those constraints, allowing non-linearity, indeterminacy and random access to be developed in scales that non-computational media are unable to achieve, due to their capacity for various degrees of autonomy (Carvalhais 2010), from their creators, contexts of creation, *readers* (Rau 2000), hard-coded information or external data-sets.

We, as creators with these media, should guide their usage with the awareness that even when acting as media, they are still capable of simultaneously becoming tools that operate on their media layers and of reshaping experience, form, content and expressiveness in runtime. They are able to transform the operational space of the arts, expanding it well beyond the field of possibilities offered by conventional media, pushing it further, breaking out and constructing new spaces. Being able to exert some judgment over the products of their operation and to reconsider past choices in deciding upcoming steps (Boden 2004), they are able to act creatively, becoming a new form of artificial aesthetic artifact.

Our work has been focused on how these artifacts propose a set of new aesthetic experiences that are fundamentally different from those of mass media, and that in many ways bring them closer to the experiences enabled by somatic message production. To this effect we developed an analytical model (Carvalhais 2011) trying to expand Espen Aarseth's textonomy (1997) for the study of multimodal computational artifacts, accounting for visual, sonic, kinetic, and other nonverbal signifiers (Hayles 2005:36). We were able to use or repurpose six of the seven original variables, but were unable to integrate the aspects depicted by the "perspective" variable, a descriptor of the reader's "strategic role as a character in the world described by the text" (Aarseth 1997:63).

2. Amodality and Multimodality

Before becoming sets of sensorial stimuli, computational artifacts are built from code and software. Following the MDA formal approach, we may describe this state as that of the "rules" of the artifact's *mechanics*, of its "particular components (…) at the level of data representation and algorithms" (Hunicke, LeBlanc and Zubek 2004). When the system is set in motion, a second level of *dynamics* emerges from "the run-time behavior of the mechanics acting on inputs and (…) outputs over time." Finally it follows a level of *aesthetics*, where we discover the experiences that are the goal of the system's designer and that frame the reader's point of view on the artifact.

At the levels of mechanics and dynamics, artificial aesthetic artifacts most often operate in an amodal space of possibilities, a 'proto-sensory' flux that preconditions the differentiation of the sense modalities (Hansen 2004). It is on the verge of aesthetics, when the processes are transcoded, that they are brought to physical reality and expressed through concurrent modalities. These are directly linked to the human sensorium (Whitelaw 2008), but we may expand the definition to include, as proposed by Stephanie Strickland (2007), the perception of mathematics or mathematical structures, of rhythm and harmony. We may suggest the description of a *procedural* modality, which should not be understood in the Pythagorean sense, but rather as the intuitive intellectual understanding of structure and process. We may further link it to the identification of a *design stance* in inanimate objects, or an *intentional stance* in animate objects (De Landa 1991), the first trying to discover a purpose, the later motivations or emotions.

Sensorial modalities are crossed, combined or reinforced. They aid to communicate the internal processes of the artifact and contribute to the emergence of the *procedural modality.*

3. Senses, perception and simulations

On the human side, reception gathers inputs and perception deduces meaning. The sensorium mediates an experience of the exterior (Bateson 1979) that is an illusion and a simulation. Perception is an epiphenomenon (Hofstadter 2007:93), a large-scale illusion that never exists through sensory channels, but is *fabricated* by the brain (Damásio 2003; Eagleman 2011) from an external world from which it is forever isolated.

The procedural understanding contributes to yet a further simulation of causal procedurality, of the processes or algorithms that originate the phenomena (Dehaene 2009). Drawing from sensorial clues, the brain tries to reconstruct the external processes, to build simulations that anticipate them. It tries to reduce the perceived complexity and to make "unfamiliar, complex patterns made of many symbols that have been freshly activated in concert to trigger just one familiar pre-existing symbol (or a very small set of them)." (Hofstadter 2007:277) It tries "to look for and find patterns" in a process that Michael Shermer calls "patternicity" (2011:5).

A simulation is, in principle, unable to tell us anything we do not already know, being no better than the assumptions built into it (Simon 1969:15). It is however, plausible that a simulation based on an incomplete or even an erroneous set of data may provide new knowledge; by abstracting the details from a set of phenomena, it may find a faster way towards a simulation, not needing to know "all the internal structure of the system, but only that part of it that is crucial to the abstraction." (16) Therefore, incomplete or abstracted simulations can provide relevant data to be integrated in models, contributing to a continuous process of refinement. If and when simulations can be compared between/among themselves and with the external phenomena, the process can be accelerated through the selection of models that produce better predictions. The external phenomenon is used as a fitness function, with correct anticipation taken as proof of successful simulation, and corroboration of the acquired knowledge.

Furthermore, simulations may produce seemingly accurate results despite being based on false assumptions, developing processes that although dissimilar to the originals, happen to produce similar patterns of outputs. If the results are accurate and frequent enough, they may therefore be judged as correct. This is what we find in the so-called "Eliza effect", caused by the susceptibility to read far more understanding than is warranted in the sensorial manifestations of computational devices (Hofstadter 2007:157).

4. The Eliza effect

The Eliza effect was named after a program written by Joseph Weizenbaum in the mid-1960s (Hofstadter 1995), an artifact where reportedly it was often experienced (Goffey 2008:133). It is caused by erroneous simulations that lead to the projection of traits like sentience and personality onto systems that are unable to develop them, because these traits are often the best and most readily available models for the phenomena.

The effect can be understood as the outcome of: 1) the anthropomorphization of technology (Reeves and Nass 2002); 2) the concealment of the artifact's inner processes; 3) the strong effect of surprise (Barratt 1980) in interaction with computational systems; and, 4) the development of *theories of mind*.

We frequently resort to this last strategy when trying to interpret humans or other beings endowed with a mind (regardless of its perceived complexity), and we naturally fall back to the same approach when facing complex systems like some computational artifacts. Upon finding patterns, the brain adds meaning to them, developing a process of "agenticity" (Shermer 2011). It tries to understand how a system behaves by trying to get "into [its] mental shoes" (Metzinger 2009:176), to 'think' as it does, to operate along the same lines, i.e., to simulate it.

5. Reversing MDA: From the Viewpoint of ADM

The high processing speeds of artificial aesthetic artifacts, their procedural complexity and their opacity, create strong barriers to their comprehension. During interactions with these artifacts, their behaviors are simulated and

predicted. Originally encoded as *prescriptive* rules at the artifact's mechanical level, as the processes unfold, the human interactant predicts outcomes by elaborating *descriptive* rules and builds anticipation as to whether these will be proven correct or not be confirmed. The intellectual tension that results from this process is the foundation for the emergence of narrative, aesthetic pleasure and even drama, as defined by LeBlanc (2006), and it is from this perspective that the reader starts reversing the MDA framework. (Hunicke, LeBlanc and Zubek 2004)

As with any other message, narrative and drama may be hard-coded and reproduced, with predefined acts, arcs, stable situations and accidents, events, goals, protagonists, antagonists and hosts of other characters (Bartle 2004), but when this happens, the artificial aesthetic artifacts are used as conventional media, not taking advantage of their added capabilities but also resigning their potential for procedural authorship (Murray 1997).

Where elements of a conventional narrative do not exist and simulations are developed, a narrative experience may emerge from the tension between simulation and validation, from probing and mapping the logical depths of the artifact (Gleick 2011). Artificial aesthetic artifacts can therefore be 'flat', failing to grow, change or significantly develop during their experience, or they may be 'round', able to react to conflict or other stimuli, allowing themselves to be changed and, in doing so, frequently violate our expectations.

This 'roundness' and the creation of large patterns as a result of many smaller effects is one of the singular attributes of living systems (Murray 1997:93). Throughout human history, these were found in the natural world, not in the realm of the artificial, which was for the most part characterized by predictability, stability and repetition. Artificial aesthetic artifacts, however, often behave less like conventional media and more like people, animals, or other complex natural systems that cannot be understood solely through the study of their mechanical components. Therefore, they force us to develop convoluted simulations that also need to take into account the levels of referential information surrounding a system.

6. Drama and narrative

Emerging from an amodal space of possibilities, processes are mediated by and through the artifact. After reception and perception, they once again become amodal or metamodal (Morbey and Steele 2009) and are found in a new abstract domain. The procedural capacities are the key to our identification of amodal characteristics in the perceived phenomena, as they are at a later stage fundamental in the process of simulation.

This understanding of processes and their simulations is not always straightforward, because there isn't necessarily a direct mapping between the mechanical level and its aesthetic manifestations. Morphogenesis is generative (Carranza 2001), hence there is no blueprint, only constraints (De Landa 1997), and the reader is thus left with sensations, perceptions and symbols below which s/he is unable to peer.

Artificial aesthetic artifacts fundamentally differ from conventional media because they aren't necessarily created or even shaped by humans. They are rich with generative potential and have their own aesthetics, their unique ways "of giving pleasure, of creating beauty" (Murray 1997:94). They are inevitably mediated but also hyper-mediated (Bolter 2001), constantly confronting us with signs of what may be happening behind their modal expressions. It is this layer that truly marvels and that allows the experience of the artifact as a symbolic drama in which we are central protagonists.

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DOUBLE VISION INTERMEDIA PERFORMANCE:
Impossible Blueprint of Territorial Collisions

Sean Clute & Pauline Jennings

DOUBLE VISION

05672, STOWE, VT, USA

DV@DOUBLE-VISION.BIZ, HTTP://WWW.DOUBLE-VISION.BIZ

1 Introduction

DOUBLE VISION, an intermedia performance company, has been exploring innovative methods of combining ideas, art forms, materials, and spaces since 2003. In particular, the group has emphasized these topics by producing a series of performances, *Evolutionary Patterns and the Lonely Owl (EPLO)*. The series was bound by incorporating multiple art forms like dance, video, sound, sculpture, and installation in a defined space for a specified duration. The series eliminated the use of the proscenium, enabling audience to move freely amongst performers and installations, while triggering artistic responses.

The first incarnation, *EPLO (Byte #0)*, was presented at WORKS/San Jose, September 24, 2005. This presentation applied mathematician John Conway's Game of Life to performance. Through physical proximity, audience, artists, and sculptural elements triggered the life and death of nearby performers, thereby creating a complex and evolving performance.

On November 19, 2005, DOUBLE VISION presented EPLO *(Mutation #1)* at Madhorse Loft (Oakland, CA). In *EPLO (Mutation #1)*, attendees were given colored glow necklaces representing DNA strands. DNA combinations incited mutations in individual performances. Audience members experimented with trading their necklaces and using them collectively to evoke unique responses.

The third incarnation was performed May 16-17, 2006 at CELLspace (San Francisco, CA). *EPLO (Mutation #2)* strove for increased freedom from rule-based performance with a shift to anarchistic methodologies. Artists could collaborate, make their own rule-based systems, or completely disregard the other performers and audience members. The collaborative result ebbed between unity and chaos. In this paper, we analyze the performance of EPLO (Mutation #2), by examining individual content and resulting forms. By doing so, we will demonstrate how complexity in simultaneous audiovisual experiences can collectively lead to inventive approaches in the creative process.

2 Content

The following section describes examples of individual works created for *EPLO (Mutation #2)*, which will be useful for considering the event's form.

2.1 Ample Autonomous Accumulators

Ample Autonomous Accumulators was a choreographed piece by Pauline Jennings where three dancers combined references to popular culture and sports with abstract, contemporary movement. During the three-hour performance, dancers competed against each other in an ongoing race, the winner was determined largely by audience participation. Placards were hung in the space bearing a variety of directives like: slow motion, instant replay, fast forward, and rewind. When an audience member placed a placard on a dancer, the dancer had to obey the command until someone either removed it or replaced it.

In *Ample Autonomous Accumulators* rule-based systems allowed for audience control of movement while adding a layer of chance, complexity, and chaos. The work took advantage of the body's natural mobility and juxtaposed it with more static mediums like stationary video and allowed for a sophisticated level of interaction between artist and audience.

2.2 Bouncing Off the Walls

Bouncing Off the Walls was an interactive installation created by video artist and programmer Tim Thompson. Two steering wheels were used to control graphical bouncing balls inside an elaborate video-projected maze. As an audience member steered the movement of the balls, they were able to knock down walls of the maze and created intricate visual patterns. Each ball also had a distinctive pitch and percussive sound associated with its graphical representation which was diffused spatially through four speakers that surrounded the audience.

As in many of Thompson's installations, the viewer was a vital component to his work, without which the piece could not exist. Unintentionally, the work *Bouncing Off the Walls* started a chain reaction that provided content for the next work discussed. Thus, while Thompson's piece was stationary, the effects of his work reached beyond the confines of the installation's home base.

2. 3 Audio Transmission Landscape

Audio Transmission Landscape was a sonic component created by composers David Holton and Sean Clute. The work utilized a variety of sounds diffused through discrete speakers. The compositional form was improvisatory, while the content was generated from multiple sources including algorithmically generated material, a library for FM transmissions, and live-sampling.

The algorithmically generated material came from networked computers. Each computer was running software

that processed a variety of sounds including samples of environments, people, and animals. Using transmitters and receivers, audio signals were routed to localized areas in the venue. The audio signals transmitted came from computers, performers, or audience members. In essence, a completely anarchistic music library could be accessed and updated by anyone present with a computer or wireless personal digital assistants (PDA). .

While other works included audience participation, the *Audio Transmission Landscape* did not (with the exception of the radio library). Instead of utilizing user feedback, the piece focused on having an effect on the user. "Audio Transmission Landscape" directed audience attention to different places by what sonic material was being diffused into the space.

2.4 *Name Games*

Name Games was a video and performance piece by Jessica Gomula. The video, a "blizzard of sexualized slang" [2] and animated cowgirls, featured large-scale projections across hanging, semi-transparent fabric strips. Gomula's use of language and light delivered a vivid visual component while its enormous size affected the viewer's sense of space and time. In addition to the video, Gomula cyclically transformed the space with an interactive performance component.

Three times during the event the audience was rounded-up by a number of cowboys and cowgirls wielding lassos for a hoedown. During the playful square-dancing, audience members were branded with stickers labeled with words similar to those seen on the video projection. The stickers addressed the difference between actively and passively navigating the sexually indicative slang words. *Name Games* held a dominant artistic voice during the event because of the sheer size of the projections and the demand for the audience to join the square dancers. In contrast to the other described works, the performance aspect of the piece rarely occurred during the evening. In essence, the hoedown created clear climatic episodes that dramatically altered the event's landscape.

3 Overall Form

While the previous analysis discussed individual pieces in *EPLO (Mutation #2)*, the audience did not experience them as such. It is important to note that the more-than-twenty individual works occurred simultaneously. We will now highlight the relationships and interactions between project territories, artists, and audience members. From this analysis, we will demonstrate how the overarching form of the event was achieved through processes such as negotiation and adaptation.

3.1 Form by Negotiation

EPLO (Mutation #2) was performed at CELLspace, a 10,000 square foot warehouse-like venue in San Francisco. The venue housed a ground floor gallery, large open room, and second floor balcony and loft. The space was arranged

to exclude "seating" thereby encouraging the audience to freely explore the entire venue. Prior to the performance, artists working on static projects negotiated with each other for locations within the space. Considerations for these projects included physical proximity to others, ideal lighting, diffused video, and local verses ambient sound. For mobile projects, artists determined what spatial limitations, if any, would be placed on their performances. In this manner, the venue was collectively divided to best meet the needs of individuals. Because there was no director or moderator, artists where left to their own negotiation skills to acquire ideal physical, aural, and visual territories.

The overarching physical form, therefore, appeared complex, especially when artists shared or collided other territories. Adding to this complexity was a sense of impermanence caused by an audience who further divided or connected spaces and projects by participation. When viewing the space from above, the environment could be akin to inspecting the inner workings of a city. Installations and sculptures, like the walls of buildings, housed citizens and their diverse activities within and surrounding them.

3.2 Form by Serendipity and Adaptation

Within the event landscape, multiple perspectives could be observed as artistic interactions occurred. For example, two dancers in *Ample Autonomous Accumulators* crossed into the *Bouncing Off the Walls* territory where the *Name Games* projection illuminated their bodies. Triggered by the dancers' presence in the space, the *Audio Transmission Landscape* amplified sounds in that same space. As a result, the audience may have shifted attention toward this moment and witnessed an entirely new piece forming. If the viewer was close to the action, their focus may have been on a microscopic level such as observing a dancer's leg muscles flexing. Conversely, if the audience member was watching from above, their focus could be on the pattern of the action or its contrast to another activity occurring elsewhere. For that matter, an audience member could be inside a structure like the geodesic dome, rendering them oblivious to peripheral action. Because hundreds of events like this one occurred every second, the viewer's focus was in a constant state of adjustment, exploration, and discovery.

Abstraction's Affect on Form.

The above example focuses on the division of tangible space caused by a physical source like dancers. Audio and video, however, have a quite different impact on the partitioning of space. For example, audio and video could engulf the entire space with an increased amplitude and projection size or could conversely embrace a small space with localized sound and focused projection. These elements could effectively change dimension without encroaching upon the physical space of installations. This type of space division further accentuated the complexity inherent in the event.

Like the use of audio and video, the wireless technology needed to transmit sound in "Audio Transmission Landscape" added another layer of complexity to the overall physical form. The data was transmitted throughout the space without interfering with or affecting the other pieces. Unlike the audio and video, the wireless transmissions

were another step removed from observable representation. The audience members were able to experience the transmissions and even affect what was contained in the user sound library but were not able to reach out and touch it like they could a dancer or video scrim.

Audience's Affect on Form.

The audience contributed yet another dimension to the overall form of the event. Given the freedom to explore the space, the audience altered the landscape simply by being present in it and triggering artistic events. An example was demonstrated when two individuals, unaware that they were being video broadcasted, were intimately embracing inside a covered geodesic dome. Their video feed was projected onto territories that required performers to respond to the amount of physical or video-represented people locally present. The irony in chain reactions, as seen in this example, is that the couple in the dome had no knowledge of their impact on artists, other audience members, and the form of the event. Whether intentional or not, a single participant's actions could dramatically change the event in unpredictable ways.

4 Conclusion

EPLO (Mutation #2) exhibited similarities to that of a contemporary city. A single audience member, like a pedestrian, could navigate and explore a multitude of spaces and experience unlimited perspectives. The audience could unconsciously have an impact on other individuals and events, thus reflecting their ability to affect their own city, country, and future landscapes. Artists, like the inhabitants of a city, create, adapt, transform, and contribute to the development of the environment, society, and culture.

EPLO (Mutation #2) demonstrated these characteristics, but as an artistic event, it also displayed several major differences. These differences are exhibited in the manner of experimentation, freedom, and expression of the event's inhabitants. While the event did not claim or try to be a kind of utopian environment, it inspired imagination in extraordinary ways.

4.1 Non-Systems as Methodology

By examining the individual content of the event, evidence of a number of imaginative and innovative processes can be observed. Whether by incorporating methods of audience interaction, custom-built technologies, or formats for audiovisual diffusion, each artistic project was a seed for continued exploration and development. Intermedia art permits the combination of such seeds that further the expansion of individual ideas, methods, and possibilities. A challenge posed by intermedia art therefore lies in discovering methodologies to consciously combine diverse elements into an overarching form.

While there exist many systems for organizing diverse artistic elements such as the self-organizing systems used in John Conway's Game of Life, DOUBLE VISION chose a non-organizing system or non-system. The form of the event was instead derived from the content of individual works and void of rules, regulations, and governance. The freedom within this non-system allowed for the contributing artists to be uninhibited in the development of their pieces. Additionally, with a form lacking in a central focus, stage, and direction, the audience was permitted to experience the event freely. This type of artistic environment is vastly different from the rules, regulations, mores, and boundaries established by our societies.

4.2 Transvergence through Collaboration

The process and realization of *EPLO* was quite contemporary in nature. In an age when access to ideas, materials, and perspectives is growing in scale, transvergence of these aspects presents great possibilities. Theorist Marcos Novak addresses this topic within his definition of transvergence:

> The clusters of cultural impacts and creative conditions brought about by accelerating technological change. This work articulates and explores the realization that we are not only witnessing the "convergence" and "divergence" of media, disciplines, institutions, and so on, but a much more radical "transvergence" leading to widespread epistemic speciation in practically all areas of knowledge and expression, and to the continuous emergence of entirely new fields. On a global scale, the projects we are most captivated by, and often most highly invested in, are projects that no longer progress along expected lines of development, but that are instead jumping across diverse and initially mutually alien territories [3].

4.3 Future Growth through Adaptation and Collaboration

EPLO (Mutation #2) provided a space and time in which transvergence could exist. The pieces, patterns, forms, and experiences had by those in attendance could affect future creative processes and methodologies. It is hard to imagine these possibilities being realized without collaboration and the lack of imposed formulaic structure on both the artists and spectators. By being open to discovery and sharing in the process of development and innovation, *EPLO (Mutation #2)* in the very least provided proof that form could arise from anarchy and that a community could be built and served through an adaptive, collaborative system.

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3. Novak, M.: "2004 World Technology Awards & Finalists." World Technology Network, (2004) Accessed at <www.wtn.net/2004/bio212.html>

The four rules include: (1) Each cell with one or no neighbors dies, as if by loneliness; (2) each cell with four or more neighbors dies, as if by overpopulation, and; (3) each cell with two or three neighbors survives [1]

BREAKING TRADITION: RETHINKING THE ECONOMY OF LEARNING

Nina Czegledy

ISEA2012 EDUCATION WORKSHOP

SEPTEMBER 23, 2012 3:30-5:30

ABSTRACT

The profile of education in the 21st century is going to be very different from previous models. Both institutional leaders and academics are aiming to redefine the role of higher education and invest on a large scale in new learning technologies. Consequently, higher education is expected to be a much broader enterprise in the future.

The financial crisis from 2007 to present -arguably the worst crisis since the 1930 - has widespread consequences in all walks of life including education. In addition to deep budget cuts and increased tuition fees (an unprecedented financial burden for students) numerous questions remain unresolved. Educators concerned with local and national government funding, specialists in education finance, and educational administrators need to be aware of the latest research and practice in the economics of education. The scope of the crisis is enormous; nevertheless to develop a dialogue on an international level is essential.

The workshop brings together academics, researchers, and educators to discuss the latest developments of policy research, evaluate the role of educational research, as well as existing educational business strategies, financial modeling, and risk management. It is essential to keep in mind that in addition to the long-term benefits of education, the successful future resolution of current problems will greatly influence the perspectives and potential of tomorrow's leaders.

The workshop strongly encourages interaction between participants interested in the changes of economic dimensions of education. The summary outcome of the workshop is to be published in the Leonardo Education Almanac's series on education.

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SCHEDULE

Welcome: **Andrea Polli**, Artistic Director, ISEA2012 Machine Wilderness
MESA DEL SOL CHAIR OF DIGITAL MEDIA ASSOCIATE PROFESSOR, FINE ARTS AND ENGINEERING

Welcome: **Juliana Pierce**, Chair, ISEA foundation

Introduction: **Nina Czegledy**, Workshop Director and Convenor
SENIOR FELLOW, KMDI, UNIVERSITY OF TORONTO
ADJUNCT ASSOCIATE PROFESSOR, CONCORDIA UNIVERSITY, MONTREAL

Keynote presenters: **Chaouki Abdallah**, Provost and Executive Vice President, University of New Mexico

Patricia Olynyk, Director, Graduate School of Art, Florence
FRANK BUSH PROFESSOR OF ART, SAM FOX SCHOOL OF DESIGN & VISUAL ARTS, WASHINGTON UNIVERSITY IN ST. LOUIS

International & Regional Contributors:

Australia **Ross Harley**
HEAD, SCHOOL OF MEDIA ARTS, THE UNIVERSITY OF NEW SOUTH WALES, SYDNEY

Argentina/Canada **Ricardo Dal Farra**
INTERIM DIRECTOR, HEXAGRAM, INSTITUTE FOR RESEARCH/CREATION IN MEDIA ARTS AND TECHNOLOGIES, ASSOCIATE PROFESSOR, CONCORDIA UNIVERSITY, MONTREAL, NATIONAL UNIVERSITY TRES DE FEBRERO, BUENOS AIRES

Colombia **Felipe C. Londono**
DIRECTOR OF MEDIA DESIGN, CALDAS UNIVERSITY, MANIZALES

New Zealand **Ian Clothier**
SENIOR ACADEMIC AT WESTERN INSTITUTE OF TECHNOLOGY AT TARANAKI (WITT), DIRECTOR OF INTERCREATE RESEARCH CENTRE, TARANAKI

France **Susanna Sulic**
ARTIST, PARIS

US **Suzanne Anker**
SCHOOL OF VISUAL ART, NEW YORK

Cheryl Wassenaar
FOX SCHOOL OF DESIGN & VISUAL ARTS, WASHINGTON UNIVERSITY IN ST. LOUIS

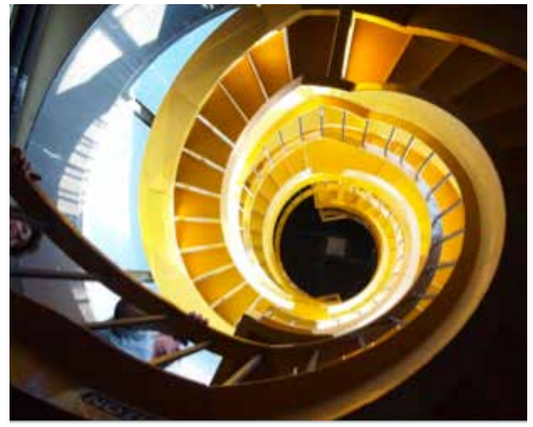
Shaurya Kumar
ASSISTANT PROFESSOR, THE SCHOOL OF THE ART INSTITUTE OF CHICAGO

A SHORT AND SUPERFLUOUS GUIDE TO YOUR NEW NEW MEDIA ART PROGRAMMER/TECHNOLOGIST

Ed Dambik
ADVANCED VISUALIZATION LAB
INDIANA UNIVERSITY

ABSTRACT

Thank you for your interest in a new technologist or programmer. While every effort has been made to bring you a defect free instrument with the latest technology, don't bet on it. Communication between new media artists and the technology minded seems like a straightforward endeavor as they presumably share the same common language but, in truth, that's not always the case. Like working with any evil genie or the devil, you will need to be very particular about how you phrase your request to the programmer or technologist. Using technical jargon can slow things down appreciably as the programmer/technologist is required to use such words with precision, and will be compelled to explain such terms at great length when they are not used correctly. Likewise, being much too specific about requirements can eliminate interesting possibilities or conversely, lead to an error condition whereby some elements will eventually found to require technology that "simply isn't possible" with current (or even possibly future) technology. Erring in the opposite direction is even worse -– using a vague or general description tends to put any development on hold until a concrete goal becomes clear. Where's the common ground then? The language many artists and technologists have in common is pictures. block diagrams, structural illustrations, charts, maps, schematics, stick figures, etc. Draw first, ask questions later. This gives way to a lengthy series of discussions and drawings, tests, fixes, and new features but expectations don't always align –- questions arise of creative input and when, for example, is the project is finally complete. This guide presents one limited perspective navigating the artist/technologist collaboration from the other side.



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THE REALITY

It would be nice to have a manual outlining a simple set of procedures in order to facilitate collaboration between an artist and a programmer/technologist but, like any human relationship, things often progress in unexpected ways. As a programmer specializing in electronic art technologies for Indiana University's Advanced Visualization Lab, I often field requests for technological assistance from artists and musicians. These requests range from simple requests for equipment to solving small scale problems, from building hardware and software tools, or devices, to full-blown collaborations within a multi-disciplinary team. Each of these tasks is fundamentally different, but each begins the same way – with a request.

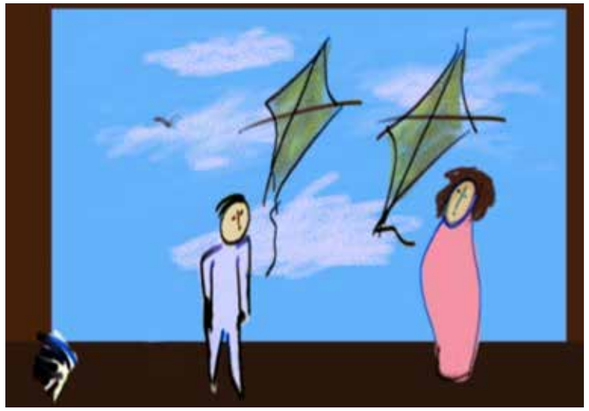
A 0000010000000000 Mile Journey Begins with Step 00000001

Put simply, requests begin with the statement of a problem. Computer programmers and technologists are used to the idea of building things based on a specification defined by a clearly defined problem. Requests can be quite specific such as, dumping a box of Arduino components out onto a desk and asking to have them put together to, for example, wirelessly collect calibrated flex and accelerometer sensor data from a dancer and send it to MaxMSP (Tip: never underestimate the value of presenting a fun technological challenge). Or requests can be something more general and bigger in scope. This is where things can get very interesting.

Since most artists and musicians don't often arrive at my door with a box containing everything necessary for building a very particular thing, there's the important preliminary matter of refining the specifics through a series of discussions, questions and answers (aside from the dreaded "can you list what can you do for me" question), and suggestions. A narrowly defined and easily described goal would make things quick and easy, but we can't always have everything. To make sure everyone is working on the same goal, it's good to start with the general idea of a finished product performing some specific, but simple and limited function. Focusing on one particular technology (one year everyone wanted Wiimotes) or jumping right off into technical aspects and jargon isn't necessarily going to speed things up.

THE REFINERY

Getting a firm grasp of that basic core idea sounds simple enough, but it isn't always so. During a set of meetings to outline the visual aspects, interactive programming, and hardware requirements of the opera Annunciation + Visitation (2009), the text for the music was provided. As a result, each team members soon discovered that we each all had a completely different idea of what was supposed to be happening during any particular moment during the performance. The director had been remotely discussing his vision with the virtual environment artist who then outlined the resulting ideas to the technical team. The communication problem was a very basic one, resulting from translating a musical concept to a visual concept into words. Once we settled on the idea of using storyboards, the artist provided an image, textual context, and dramatic vision. Then, things proceeded smoothly and came together quickly giving us plenty of time to tackle certain technical challenges.

I. The little boy was looking for his voice. The king of the crickets has it. In a drop of water the little boy was looking for his voice.	**Ancient Voices** **George Crumb**
	Both boy and soprano pick up controllers by which they fly kites. These kites are decorated with some image evoking youth, spring, birth (I'm seeing greens?).

COLLABORATIONS AND DIAGRAMS

Collaborations for a programmer/technologist aren't exactly the same as writing code and setting up hardware to perform certain functions in service of solving a problem and achieving a particular goal. Rather, collaborations involve consuming an idea and adding a certain something extra while building on and transforming the artist's idea to reach a new shared vision owned by all parties. Ultimately, it's a matter of chemistry.

Working on a creative team with a lighting designer, a videographer, and a visual artist to design interactivity for an even larger and much more complex opera was quite a technical and creative challenge. Luckily, a combination of caffeine, adrenaline, lively discussions, and a two month sleep deficit can make a potent spur for tapping into one's unconscious and creative side (although my technical nature still has the suspicion that there must be a better or at least less exhausting methodology for realizing creative potential). Even so still, there has to be a seed to start with and, fortunately, the conductor had already tackled this issue by digesting, analyzing, and condensing the opera's movements into a simpler form outlining context, symbols, etc. – your basic "Cliff Notes", but with links to the music and lyrics providing us with both compass and bible. The results (software is never completely finished, you know… unless there's a hard deadline like ticket holders wandering in to take their seats) somehow managed to combine all the different disciplines into a single whole – the lighting complimented the art, video, and the live performance while also providing cues to the software which collected data from the conductor's baton to trigger interactive effects modifying the art and video.

ONE SMALL LEAP TO CONCLUSIONS

If there's one single suggestion to be taken from our efforts in various multi-disciplinary collaborations, it's to first have someone lay the groundwork by creating visual aids for collaborators before teams from different disciplines meet en masse for extended periods. Experience has shown that storyboards, annotated diagrams, and similar visual aids can greatly speed up the collaborative process by providing a unifying vision and points of focus allowing members to spend more time working together towards clear goals. Programmers, technologists, and many other disciplines routinely use drawings, diagrams, and brief outlines of processes and concepts. So it's no surprise that something as simple as storyboards and diagrams can help to quickly build bridges between the disciplines. While a general purpose manual for collaborations between artists and technologists isn't entirely practical, there are some simple ways to enhance communications.

ENDNOTES

[I] *Annunciation + Visitation* Dir: Margaret Dolinsky, Virtual Environments; David Dzubay, IU Music New Music Ensemble; Timothy Nelson, American Opera Theater; Sponsors: Fundacion Bilbao Arte Fundazioa Bilbao Spain, IU New Frontiers Program, College of Arts and Humanities Institute, Pervasive Technology Institute Advanced Visualization Lab, Jacobs School of Music, Hope School of Fine Arts, Institute Digital Arts & Humanities, American Opera Theater, Bloomington Early Music Festival. For more information see http://dolinsky.fa.indiana.edu/A+V/

[II] The ultimate collaboration was conceived as an opera Passion with Tropes, orchestra, actors, artwork, and audience on the stage. The house seating was closed off and remained empty during the performance. Everyone there became a piece of the production. May 2011 Indiana University Ruth Halls Theater. For more information see http://www.indiana.edu/~passion/tropes/index.html

EXPRESSIVE ENERGY: THE FLUID AUTOMATA PROJECT

Angus Forbes, Tobias Hollerer, George Legrady
UC SANTA BARBARA, MEDIA ARTS & TECHNOLOGY PROGRAM

Figure 1: A high-resolution image created using the Fluid Automata system.

ABSTRACT

Fluid Automata is a series of projects involving the interactive and stylized representation of a fluid system using custom image processing techniques. Together the hardware-accelerated fluid system and image processing techniques allow the user to create expressive representations of dynamic energy. Through the use of tablet computers (tablet), one or more users interact with the fluid system via multi-touch gestures. The technique has been used in a series of projects that have been shown in a variety of environments involving one or more people: as a multimedia art installation, within a 3D virtual reality environment, as a visual instrument in musical settings, and as a standalone generative art application for a tablet computer. This paper describes the basic algorithms governing the Fluid Automata technique as well as some of the installation configurations, and moreover explores the connection between aesthetic concerns and scientific visualization.

Introduction

Fluid Automata is an interactive generative art system that explores the relationship of aesthetics and scientific visualization, and the interplay between collaboration and discovery. The Fluid Automata system invites users to create dynamic generative art via responsive tactile gestures using a tablet. The aesthetic experience includes both controlling the system through multi-touch and also adjusting a wide range of parameters to discover new patterns and visual properties. The user manipulates both the underlying system and its visual representation.

Fluid Automata has been presented in a number of different environments, emphasizing different aspects of the project. For instance, one installation emphasized the collaborative experience, inviting multiple users to participate in shaping and interacting with a single system that was projected large-scale. Fluid Automata has also been used as a visual instrument to provide live accompaniment to a dynamic musical composition. The most current iteration will be installed in the AlloSphere Research Facility, a spherical virtual reality environment housed in the California NanoSystems Institute at the University of California, Santa Barbara [8]. In this project, the multi-touch, gyroscope, and accelerometer sensors in the tablet interface are used to navigate and interact with a 3D fluid system projected on the upper hemisphere of the AlloSphere. That is, although this project was initially created as a multimedia artwork, it also functions as contributing research to virtual environment visualization and interaction techniques. Below we describe the design choices and algorithms general to the previous installations.

Figure 2: Multiple users collaborate at an installation of the Fluid Automata project.

A perennial concern of scientific visualization is the effective visualization of salient features of a vector field as indicated by the wide variety of approaches to their representation [3]. A popular technique, introduced in 1993, called Line Integral Convolution effectively indentifies detailed curvature features of a vector field. In this technique each pixel of a background image is filtered along streamlines defined by the vector field [4]. Another early technique, Choreographed Image Flow, describes using image warping to generate animations for an animated representation of flow-fields [7]. A more recent technique called Image Based Flow Visualization represents flow using the iterative deformation of texture mesh along the directions of the vector fields. In this technique, an image is blended together with the distorted version of itself at each frame [6]. While the creators of these techniques recognize and discuss applications outside of scientific visualization, recent papers more closely examine the relationship between aesthetics and visualization. For instance, [6] specifically looking at the various stylized qualities involved in painting and the possibility of brushstroke techniques for inspiring more effective scientific visualization methods.

A number of interactive art projects use Fluid Simulation as a component of the work. A method developed created by Jos Stam in 1999 to create a stable fluid system, first made it possible to represent realistic looking fluids at real-time frame rates [10]. Many interactive artworks have made use of this technique. For instance, Memo Atken has created a series of demos based upon Stam's method, showcasing them using mobile devices for interaction and making the code available for OpenFrameworks and Processing multimedia frameworks [2]. Another example project that uses Stam's method is Wakefield and Ji's Artficial Nature. This project uses computer vision techniques to allow participants to use their bodies to interact with a 3D fluid representation [5]. Other fluid simulation methods, such as [9], are optimized for real-time interaction in video games. Fluid Automata builds upon this research in scientific visualization and fluid art projects to create an engaging interactive experience.

Fluid dynamics system

Since one of the goals of the Fluid Automata project is to emphasize creativity and interactivity, we created a more robust, albeit less physically realistic, system that allows a wider range of possibilities to be explored. Our system allows users to set parameters describing viscosity, rotational energy, and various momentum parameters. Various versions of this system have been implemented in the different iterations of the Fluid Automata project, taking advantage of available hardware on different devices, but at its most basic (in the 2D version), the system distributed a flow of energy throughout the system as follows:

1: The image is divided into a grid of cells. (The resolution of the grid depends on the effectiveness of the hardware. On a first generation iPad tablet, the maximum resolution at real-time frame rates is a grid 15 by 15, on a desktop computer with a modern graphics card, the grid can run at 100x100 with no particular optimizations).

2: New energy is added into the cells in a particular direction using the multi-touch capabilities of the tablet.

3: The sum of the newly added energy and the existing energy in the system is divided into (at least) 3 streams of momentum, one forward, and two at orthogonal directions, based on a specified ratio.

4: In each of the defined directions, the energy is moved into the neighboring cell via the following process:

a. An outline of the cell is propelled the defined distance along the direction. For all cells it intersects with, a copy of the vector is places into the cell and scaled down to the size proportional to its intersection. For instance, if a vector of magnitude .5 is pushed upwards at 90 degrees, it would intersect with both the current cell and the neighbor cell above it. Since the outline of the cell would move 50% off of its current position, it would end up intersecting the current cell and the neighbor cell equally, and thus a copy of the vector scaled at 50% would end up in both cells.

b. This is done for the orthogonal energies as well.

c. The copy vectors are totaled up, and a new vector is calculated with the complete momentum and an average angle, and replaces the current vectors in each of the cells.

5: A small amount of energy is removed from the system specified by a dampening factor.

6: Steps 2 through 5 are iterated for each frame until there is no energy left in the system.

Other parameters can also be adjusted to create different fluid characteristics. These include: controlling the "jitter", or randomness of the system, specifying a deviation from orthogonality or an asymmetry of orthogonality, and clamping the maximum outflow of any particular cell. We experimented with a toroidal representation of the system where fluid energy wraps around the edges of the screen, instead of bouncing off the edges. The maximum outflow parameter creates the sense of ice cracking and melting when a particular threshold is exceeded. And different settings of viscosity and orthogonality can create more or less turbulent behaviors. While it may seem as though such a simple heuristic could not mimic the complexity of fluids, the iterative nature of the system in fact creates

a wide variety of fluid-like structures, including the creation of eddies and waves (e.g. see Figure 3).

Just as simulations for realistic films and videogames do not feel constrained by a perfect representation of the physics of a visual effect, artists should not feel constrained by a perfect representation of existing algorithms and equations for a particular kind of effect. In our case, by creating our own fluid system with a wide range of parameter adjustment we were able to extend the use of the fluid system to make use of various image processing techniques. That is, we wanted the system to feel realistic, but at the same time to emphasize interactivity, expression, and experimentation.

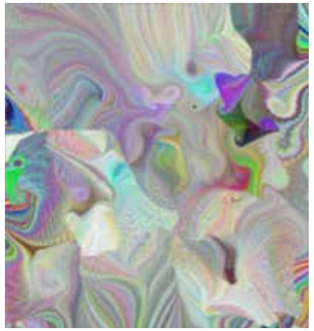


Figure 3: Screenshot of the standalone Fluid Automata application.

Image processing system

Figure 4: An example using a live video feed as the base texture for the image processing.

The main image processing scheme is based on a feedback loop whereby a high-resolution background image is perpetually blended together with a distorted version of itself. The characteristics of the distortion are based directly on the current state of the fluid system. This system is similar to Image Base Flow Visualization, which has been extended for use in a variety of scientific visualization applications, including animated and 3D flows [1]. Again, since the focus of the application is aesthetic exploration, we provide the user with a variety of tools to alter aspects of these blending operations. In addition, introduce an image processing layer whereby the user can change a variety of parameters, including: the rate and amount of blending, the type and quality of the background texture, and the brightness, contrast, and saturation of the blended image.

The default background texture is a black and white noise texture at a resolution exactly matching the display size. However, we have experimented with various textures, including lower resolution textures, static colored textures, static image textures, and using a live video feed (see Figure 4).

Interaction

The main interaction is through multi-touch using a tablet. Much experimentation went into making the reaction of the fluid feel responsive and inviting. By touching the screen the user adds energy to the system. Moving a finger across the screen overrides the fluid dynamic system by forcing the vector to move in the indicated direction. Multiple fingers can be used to push energy around in a more complex way.

Other gestures can also be enabled to cause changes to the fluid system or the image processing parameters. For instance, pinching with all five fingers simultaneously causes the entire noise texture is scaled up or down, causing an immediate zooming in or out. Similarly, a five-fingered panning gesture causes the entire noise texture to be translated in the direction of the pan (as determined by the centroid of the five fingers), shifting all vectors to move in that direction. Other types of interaction are specified for the different iterations of the project, described in the next section.

Configurations

The main components of the Fluid Automata system involve the multi-touch interaction using a tablet, the fluid dynamics system, and the image processing scheme. However, the system has been extended into various configurations which introduce new elements to the project.

Mobile version – A standalone version of Fluid Automata has been created for the iPad and is available via Apple's AppStore. In this version both the interaction and the visualization occur on the same display. This version has an expanded user interface that allows the user to adjust parameters that define both the fluid system and the image processing system.

Audio-visual composition – A version of Fluid Automata has been created for use as an instrument in an audio-visual composition. In this configuration the application is to be mirrored onto large display. In addition to being controlled by multi-touch, the system can respond to Open Sound Control (OSC) messages sent by the composition computer, for instance, to respond to musical events. Additionally, fluid data can be transmitted wirelessly via OSC to influence the composition. We have also experimented with attaching piezo sensors to the iPad itself in order to directly input data into the algorithmic composition engine.

Figure 6: A participant uses the iPad to explore the virtual fluid space.

Multi-user version – In this version, the tablet is used as an interface only. Multiple users can use different tablets to collaborate on a single fluid environment. Each interface tablet shows the underlying vector system of the entire fluid system and also the current touches of the other users. The actual visual output of the fluid system and image processing in projected large-scale on a wall.

3D version – In this version the tablet is again used as an interface, and operates as a "magic lens" showing a portion of the full fluid system at a given time. The fluid system is placed on a virtual sphere, projected onto an OpenGL cube map, and the user can think of as be thought of as being placed inside a sphere of fluids. Through the gyroscope sensor on the iPad, the user rotates around the system to see parts of the system at different orientations. Touching the screen at a certain point casts a ray to the cube map and updates the vector accordingly.

Conclusion

The Fluid Automata project exists at the crossroads of visualization and art, using scientific visualization methods as the basis of interactive art. Although the work is presented primarily as an interactive art piece, we hope that going forward some of the implementation ideas and extensions to IBFV may prove useful to the 2D and 3D visualization of interactive and/or dynamic vector fields.

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RADIO CHIGÜIRO: MAKING COMMUNITY RADIO

Esteban García
PURDUE UNIVERSITY

Abstract

Radio Chigüiro was a social platform for the distribution of Lafayette, Indiana's "glocal" culture. It operated as a community radio, exploring youth practices associated with parties, live music shows, and free radio workshops by using a web site as a medium for contact, production, and participation.

Radio Chigüiro studios in west Lafayette, Indiana. December 2007. (photo by the author)

Introduction

Radio Chigüiro emerged from the idea of making a participative radio station. The first reference is Bertolt Brecht's essay from 1932, *The Radio as an Apparatus for Communication* (Brecht 1964:51). In the early development of radio culture and broadcast, he envisioned using radio as a participatory medium. He proposed it as a bi-directional medium as opposed to one-way broadcast, a model in which the listener could participate and potentially become a broadcaster himself. Much of the research on radio revolved around topics like media activism because some media activist tactics were studied and later adopted by Radio Chigüiro. Even though Radio Chigüiro had no activist content on its programs, the use of free wireless networks and the airwaves without official permission or mass media channels to promote non-mass-media content are methods that have been used by media activist groups in the past.

This project explored the use of technology for community purposes. I approached this Idea by experimenting with it and doing it myself, networking with a local group of people. I was motivated to work on this project because I wanted to understand my ethical disagreement with copyright and the current model of culture production and

distribution. When I think of the current context of culture production and distribution, the first thing that comes to my mind is a pop record that is specially designed for mass consumption.

The massive success of an artist is not based on talent, but on the economic power of the corporation behind it: the more wealth there is, the larger the consumer trend. This rule also applies to the range of a radio broadcast: The most powerful economic conglomerates will build the strongest and tallest antennas to cover the largest audience.

In his essay *The problem with music*, Steve Albini states that the possibilities of becoming a rock star are comparable to a narrow passage door, through which only one band can pass. The rest of the thousand bands will never make it into the mass media circuit. Furthermore, Albini argues that even when the artists make it so far as to sign a contract with a major record label, they achieve no sustainable income because they must pay for their own recordings. The band receives a very small percentage of the record royalties and will have to pay for all the expenses, often getting into debt with the labels (Albini 1992). At a symposium, the performance artists Chicks on Speed commented on their experiences after signing a deal with EMI . They explained how it took them about four years fully pay their multi-million dollar debt to this major record label. In the end, they opted to start their own record label, showing better results while keeping their creative freedom (Influencers 2006).

Consumers of music have also been affected by today's music industry. Labels in the United States are represented by what is called the RIAA (Record Industry Association of America). All of the major record labels in this country participate in it, and their business is based on copyright law. A handful of students at Purdue (and other universities across the country) have received a letter from the RIAA stating how they could face a lawsuit of up to $500.000 in copyright infringement for using peer to peer (P2P) file sharing. In an interview for *The Exponent*, Purdue's student newspaper, one of these students said: "I got nailed for Vanilla Ice," even though Vanilla Ice is not the one that is directly suing her (Thomas 2007: 1). As human beings we are culture consumers, but it seems that we cannot have ownership of the culture that is imparted to us.

The current model of distribution is based on an industry that operates as an intermediary between the producer and the consumer, but none of these last ones is benefiting from it. Copyrighted productions that favor globalized mass markets want to homogenize the world and are counter-productive to local culture, people and artists. A possible solution to this problem might be that artists have a direct connection to their fans without intermediaries. It is simple: the art product is made independently and distributed to the consumer's hands.

Creating an independent radio station in Lafayette, Indiana was ideal because an active, independent music scene exists. The music scene in Lafayette consists of individuals that cooperate to book shows, bring in touring bands, and play and promote their own music. This community is based on the principles of friendship, fun, and solidarity. There is usually not significant profit from the live shows, but it does not seem to matter because local musicians use this methods to promote their music and network with other bands.

Community Networks

When I first moved to Lafayette, I was interested in doing research about internet radio and podcast technologies. I had been working on a net radio project in Bogotá called *Radio Cápsula*, and I wanted to learn how to do it on my own. Initially, I programmed a website that had a podcast embedded. It had the possibility to archive and play sound files, but it did not have any content.

That was when I had the good fortune of meeting Chris Toliver, a local electronic musician who introduced me to people with similar ideas and interests in the area. We started talking about collaborating in order to make a free public event with visual art and music. In conjunction with a local record store, *Downtown Records*, we organized the first Radio Chigüiro event on January 21, 2006.

Our idea involved holding an event with local musicians to record live shows to add content to this early Radio Chigüiro site. The event was well attended and the community was supportive. In a certain unexpected way, the success of the first event laid out the method, strategy and channels for the development of the rest of the project. For example, the use of handmade posters, web 2.0 bulletins and word of mouth to promote free shows.

The sense of building community through shows and events began to grow gradually as I started to cooperate more with *Downtown Records*, a small independently run used vinyl record store on 10th Street in downtown Lafayette. This record store slowly became the principal venue for the local music scene. A sense of community and friendship emerged from that space, bringing together music aficionados and performers. Shows occurred frequently and in 2006 to 2007, three to four local and touring bands would play on any given week. I collaborated with *Downtown Records* by making flyers and zines, or playing visuals for the hip-hop and electronic music shows. I also documented the audio of their concerts for Radio Chigüiro. This was indeed my opportunity to meet people and promote the Radio Chigüiro project within this music community. It was a great time for local music production and it seemed that everybody was working with various bands or projects simultaneously, such as/including: *The Minivans, The Mans, The Half Rats, Trent and the Rippers, Bastards Choir, The Leather Scandals, Bossman & His Bad Habits, The Romance Novels, Toliver, Atarilogic, and Analog Zebra. Touring bands that interacted with the Lafayette community included: CoCoComa, The Turpentine Brothers, Black Lips, Times New Viking, Black Sunday, King Kahn & BBQ, Mind Controls, Demons Claws,* amongst others. These bands where appealing to me because of the channels of the distribution that they used. Much of their promotional materials (T-shirts, tapes, zines, buttons, and patches) were self -produced. These products were always inexpensive, had a handmade aesthetic, and could even sometimes be free or traded

The Sweet Sixteens at a Radio Chigüiro event in 2007. (photo by the author)

for other DIY merchandise.

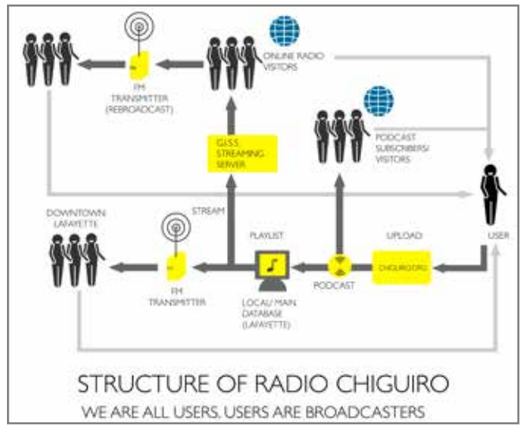
In March 2006, Temporary Services, an art group from Chicago, gave a workshop at Purdue's Visual and Performing Arts Department through initiative of Rosanne Altstatt a visiting scholar, and curator. Altstatt proposed an event in Lafayette for *Audio Relay*, a Temporary Services project (in collaboration with Brennan McGaffey). *Audio Relay* is a portable and autonomous radio station that can broadcast within a mile radius. The *Audio Relay* was showcased on Main Street presenting a collection of sounds curated by Altstatt. The event used the *Audio Relay* to broadcast live music for the first time, with the performances of *Atarilogic* and *Analog Zebra*. This public event allowed visitors to submit demos and CDs they wanted to be played on the radio. Temporary Services agreed to let the *Audio Relay* continue to be used for Radio Chigüiro two years following the event. Radio Chigüiro turned from being simply a podcast-internet radio station to an actual radio station on the FM dial and acquired more tangible means of approaching the local community. The *Audio Relay* transmitter was created to allow different groups to broadcast radio independently, and in December 2008 it returned to the Temporary Services.

Parallel to a 24/7 radio broadcast that covered the downtown area of the city of Lafayette, Radio Chigüiro frequently took the radio transmitter to public spaces to focus in the community use of the station. Such is the case of the events *Radio Chigüiro Reclaims the Airwaves* (May 25, 2007) made at the Chauncey Hill Mall parking lot and the *Radio Chigüiro Grill* (April 9, 2006) on a sidewalk in front of the old Downtown Records.

During this period, I had unlimited access to a screen print press through Mine-Us, an independently run local screen printer. I was able to make patches, posters, sweatshirts, and T-shirts with Radio Chigüiro-themed prints for advertising purposes. Screen-printing is an easy and inexpensive way to make large quantities of merchandise. Mine-Us designed and printed many of the sweatshirts and T-shirts for local bands. The owner of Mine-Us, Aaron Zernack, was a collaborator with the Radio Chigüiro project through his participation in several shows as the electronic performer known as "Analog Zebra."

Technology Tools

Developing Radio Chigüiro involved at it's very beginning much research on RSS feeds and podcasting technologies through XML. Dynamic content management, sound archiving, and subscriptions were important topics to understand to be able to develop a 2.0 Web. In 2005, there were few web applications for writing a podcast file or RSS feed. Updating files was a complicated process that had to be written manually in code each time. It was impractical for a Web 2.0 site to have to be updated in this way. With this limitation, the radio archive grew slowly. During this research period, in order to make the uploading process easier, I found an open source tool, Podcast generator, and installed it on the Radio Chigüiro web site. Podcast generator contains an HTML interface that allows any user to upload media files into a podcast feed in a very simple way. Once this tool was implemented, the archive began to grow rapidly with submissions from the local community as well as from all over the United States. By August 2008, there were 65 original radio programs and mixes, averaging two or three new uploads every week.



Conceptual flow of information between listeners and broadcasters (image by the author)

Another important development for the Web site was having a live internet radio stream, which made our public events available to remote listeners in real time, allowing live interactions with other communities outside the range of the radio transmitter or in other cities or countries. This live web stream was made possible through the *Global Independent Streaming Server (GISS)*, a project by the media activist group *Hackitectura*. Both the Podcast Generator and *GISS* projects share the same open source and Copyleft principles with Radio Chigüiro. Making a project like Chigüiro would have been impossible to be this free and independent if it were not for the Copyleft license and the wide amount of communities that share all the information and documentation necessary.

There is a sense of community and cooperation among some web communities providing a channel for human interaction and exchange of information. Danah Boyd defines these virtual communities as glocalized networks because the internet allows individuals to interact on a global scale (Boyd 2005). It also allows them to communicate and participate with their immediate local context. The use of digital 'flyering' in Radio Chigüiro was efficient means of spreading the word: it was free, easy and quick.

Radio Chigüiro studios at Lugar a Dudas in Cali, Colombia in July 2008. (photo by the author)

The combination of old and new technologies allowed listeners to become broadcasters. All the material uploaded through the website's interface played on the radio. When the user uploaded a file, it became part of a digital archive, that made it available to the podcast subscribers. The same file became part of the radio playlist that was being broadcasted through the radio transmitter on the airwaves (88.9FM), and in the internet simultaneously.

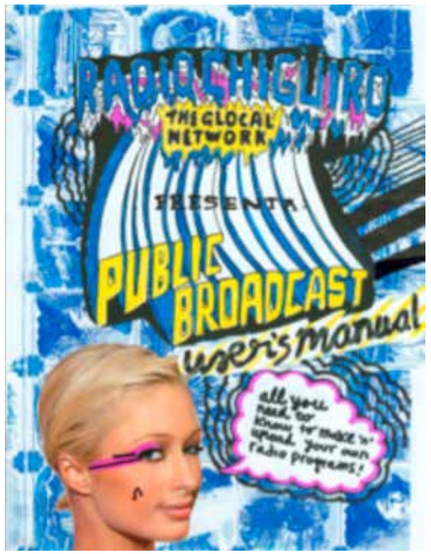
From 2007 until 2009, Radio Chigüiro broadcasted local live recordings and mixes collected through the Web site's (www.chiguiro.org) uploading system or turned in person as a hard copy. The radio station had weekly live shows, free public events with live music, and recording workshops.

Radio Chigüiro is interested in making radio technologies available

to people. For this reason, users of the website can download digital-analog recording instructional manuals or participate in different activities such as the amateur DJ sessions or the Mini-FM transmitter workshops to learn how to make small-range radio transmitters with very simple electronics. Aside from the community work in Lafayette, the project has created workshops and shows in varied places like Bloomington, IN, Chicago, IL, Cali, Colombia ,and most recently in Albuquerque, NM through the ISEA 2012 symposium.

Teaching Radio

The goal of Radio Chigüiro was to undermine the structure of power behind the current music industry and the massification of the cultural product through the use of copyright. Making a radio station with a local community revindicated the use of technology for social purposes, but it cannot easily become "established." The impact of a small radio transmitter will never be as big as the ones run by larger corporations. The music and radio programs we played would not likely have the mass appeal of mainstream culture. Radio Chigüiro is simply a temporary symbolic sabotage of the music industry.



Digital recording and podcasting manual
(image by the author)

The intent with Radio Chigüiro is to diffuse and share knowledge and experiences through the workshops, zines, and manuals to create and inspire new community radios. The idea is to deliver a message of autonomy and a multiplicity of visions that occur in small local communities. Rather than to having a big budget to start your own radio station, you need the information, and it is available and free. Working cooperatively within our immediate contexts will be more beneficial for individuals who make part of communities which have similar interests.

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RESEARCH 360 - Environment Interaction in Virtual Reality: Analysis of Interaction Patterns and Functional Prototyping Methodology

Mario Humberto Valencia Garcia
Elizabeth Granados Salgado
DOCENT ASSOCIATE OF CALDAS UNIVERSITY

360 AMBIENTE DE INTERACCIÓN SEMI - INMERSIVO DE REALIDAD VIRTUAL

Abstract

This document discusses creation environments of virtual reality, understood as temporal and spatial constructions that assemble objects, sounds, and images mediated by digital technology, in a habitable environment interaction. In general terms, relates the formal and functional structures between the perceptual, sensory, and cognitive with the object, space, and body, these being the new field of digital interfaces. In summary, the research explores how the use of technology platforms enables the ownership and development of fields of interaction and interface design, the development of different virtual reality environments was planed, so it allowed a glimpse of how the analysis for formal and digital structure today is not only happening by the ratio of feedback, but by the interface, gesture and control supported in virtual media spaces. 360 poses the evolution into a new type of environments, of synesthetic character, to examine these hypotheses in the research there were a series of prototypes that corroborate and rethink some of the ideas these parameters were developed under functional prototyping methodology which is described briefly at the end of the document.

Basic Concepts

In analyzing the relationships found when designing interactive systems, we find the problem, for other appellant, which is the point of view from which this analysis is done, i.e. which of the many possible ways of analysis and relationships are traversed when starting analytical work, which is why this paper begins by specifying the point of view from which is generated by this analysis and research "360 - interaction environment of semi-immersive virtual reality "which is reported in this paper. It is therefore necessary to place ourselves on two concepts: The Interaction Design and User Centered Design. We understand the first as the field trying to create user experiences to improve and expand the way we work, communicate and interact, Winograd (2001) describes it as "the design of spaces for human communication and interaction." In this sense it is to find ways to support people. This contrasts with, for example, software engineering that focuses mainly on the production of software solutions for specific applications. And the second is addressed from the perspective of Donald Norman confining itself to the design based on user needs, let alone what he considers secondary issues like aesthetics, user-centered design involves "the simplification of the structure tasks, making visible only the important things "Norman (2007), this is a mental model, inherited from cognitive psychology, used in systems development processes of interaction with the user. By clarifying these concepts in the research process, appeared two questions that were the founding germ of the proposed research.

1) When designing new media, as well as the user and interaction, what other processes are involved, and what is the location of these concepts in the design process?

2) While the concepts of Interaction Design and User Centered Design arise from the emergence of so-called new media, what are these so-called new media and how are these from their advances and developments influencing the design itself?

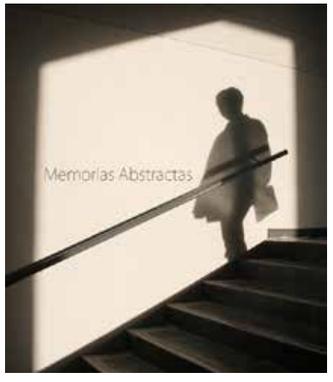
In attempting to answer these questions different ones appear in a couple of concepts that help understand the problem of the evolution of design in the areas related to the digital. The metaphor understood as a "conceptual model has been developed to be similar in some aspects to a physic entity (or entities), but also has its own behavior and properties "(Preece, 2002, p.55) and the technologies embedded in the interactive processes.

Proposals, Prototypes & ANALYSIS

Thus, from the thematic and conceptual clarification, the research went to analyze, both in theory and in practice, how technology based communication systems evolve and the models that link human beings with devices designed for it, addressing areas and topics of study leading to rethinking and designing communication or knowledge systems that adjust to these developments, and the need for man to appropriate the new technologies that are the basis of new communicative structures. That is 360 proposes the construction of prototypes of semi-immersive and immersive nature, linking various virtual reality dynamics, because this type of environment allows us to analyze and design systems for communication or knowledge to fit these models and technologies enabling us to make a detailed observation of the use of these technologies in various fields, analyzing, and observing how it evolves. These prototypes are described below.

Fat Brush interactive installation

Space of immersive and interactive video and audio that allows visitors to edit images projected from the use of physical objects such as brushes and rollers. These objects can transform the shape and color of images, creating an enveloping space after a proposal audiovisual powered by a soundscape from the everyday sequences on different rhythmic structures. The project will seek to offer the visitor a visual and auditory response depending on their specific exploration, location, and interaction with different spaces and objects proposed. The prototype was intended to observe and analyze the intrinsic ability that each user gives to meet the different interactive communication system proposed.



Abstract Memories interactive installation

Abstract Memory is a work where visitors transform and feedback the digital memory and space only with their presence. The assembly of *Abstract Memories*, is based on the construction of images by reading the visitors neural impulses, the interactor puts on a neural impulses sensor and generates on-screen images that are stored and projected to the other visitors. This installation explores and analyzes the postWIMP interaction paradigms considering the concept of interference that occurs when the memory of a particular material is damaged by prior learning or a subsequent one. The interference effects occur when trying to recall previous learning, this generates a series of responses, which drive the control system of the installation generating a feedback-controlled model controlled but not structured by the visitor.

Urban Perspectives interactive installation

Urban Perspectives is an installation in which, through media such as tele-presence and virtual reality, we present a look of urban spaces from different perspectives to everyday. Thus, *Urban Perspectives* allows users to alter the visual routine in which they are involved because of the dynamic city. In this, activated areas within the city allowing knowledge or recognition, accessing the exploration of landscapes that are usually ignored, creating memories of these places, *Urban Perspectives* is articulated from three perspectives:

1. The transmission of video in real time.
2. Tele-presence.
3. The tele-control.

In this interactive installation naturally and synesthetic metaphors arise that address gesture and movement control elements, three-dimensional projection, and audio holophonic as system answers.

Facades interactive installation

Facades offers an immersive interactive video space where visitors explore Republican architecture facades from Manizales (Colombia) through the use of streaming technologies and natural interaction. The project gives a new look to spaces and places that for the everyday roam become invisible to our eyes, the installation creates a visual copy of the facades through the use of remote cameras, placed in this case, in the city of Manizales, images, initially static are revealing the events that occur at sites remote from the movement of the participants of the installation, as participants move through space the online video and audio capture is most evident not only allowing a better view in the details of the facade, but also the everyday passing around on the same, explores the gestural interfaces and proxemic because the specific movements (say painting a wall) allows the interaction system to control sound and visual responses.

Collage interactive installation

Collage is a project where two research are joint, NODES multimedia event of Collaborative Creation, and 360 Interaction Environment of Semi-Immersive Virtual Reality, carried out in Sensor Laboratory of the University of Caldas. This installation is an interactive and collaborative creation, where form an open call intended to visual artists (designers, artists, photographers, etc.). images and sounds of cultural coffee landscape are collected. The images must be captured so as to cover a 360 º view of the place taken as reference, then Sensor laboratory turns them into panoramic images and makes them part of a database that is used in the installation, where attendees can control the display of pictures and sounds, through the application "collagepaisaje360" developed for Android, giving users the choice of images and audio control of the installation from a mobile device, with response to their interaction in a panoramic projection system and surround audio.

The analysis of interaction of the prototypes presented above is based on four aspects:

1. Technology: constant exploration of different possibilities in interactive technology applied to concrete achievements
2. Creation of digital communication systems: appropriation of information by the user through the conscious application of different types of metaphors and interactive tours.
3. Creation of algorithmic image and self referenced.
4. Proposing sound-spaces and surround sounds.

The system concept is also an important component in this project since the notion of immersive navigation and the proposed shift of the interface or even the disappearance of it, in the field of digital, powers the purposeful and explorative possibilities of the project. In addition, it raises the possibility to propose the installations as laboratories that analyze interaction and usability. Since the development, evaluation, and analysis of these prototypes is studied in how the use of technology platforms allow the ownership and development of fields of interaction design and new media, is how to develop different virtual reality environments, and evaluate them from the sampling and analysis of usability (a process that is part of the investigation but not described in this paper). We conclude that the analysis and formal structure of the digital is happening today not only by the ratio of feedback, but uses of the interface, gesture and space control supported by virtual mediation aided by analysis and interface design. This way of creating content generates an evolution in metaphors that have been transformed in terms of its structure

and communicative intent, these new structures have generated new grammars, where significant elements pass through our various senses (picture, sound, and haptic in a broad sense) expressions, intentions, emotions, and all flow of information reaching the brain via the sensory organs and experiences that generate new grammars that affect, ultimately, our knowledge.

The study of these communication models can be categorized into three areas that appear in every creation of this type, namely: interactivity, interface and code.

1. The possibility of interactivity and user involvement by responding to the actions and reactions in open space or made possible by digital technology.
2. The interface or set of grouped physical devices as an instrument for such interaction.
3. A code or set of rules that defines the behaviors and emergent events that occur during development in the life of a digital, interactive project.

Structure of Functional Prototyping

To achieve the development of specific applications based on the analysis and development of systems of interaction raised the functional prototyping methodology, which is structured from the recognition of new types of technologies and possibilities for action on these. Therefore new methods of design for construction of structures and digital environments appear. According to the interaction designer Bill Verplank, appears a structure within the interaction design that is based primarily on the question "How do you ...?" Spread on the triad of how it is, how you feel and how it's done (Verplank , 2003). This approach provides insight into the problem not from the GUI, but from the possibility of the complete system from the user and the creator. How would the problem be analyzed from what the system itself looks (is perceived)?

This reconfiguration of the problem is a reformulation of the interaction models proposed in the first instance as a system of parallel inputs and outputs in a continuous bygone of space-time, i.e. a representation of the analog world (continuous), but evolves into a representation of reality from the parties, their peculiarities, and the relationship that each party has with the whole. In this sense and support on the general methods of prototification (Londoño 2006) where the prototype is understood as a simple concept recognized and used in engineering and other disciplines. Bernard Board has defined it as "a specific strategy of requirements definition, where users need to extract, display, and successively refine (through the iteration of the prototype), by building a working model of an end system in context. "That is, is a working model (methodology) easily buildable, expandable legible, and finally the primary aspects of a proposed system, which recognizes the project plan, analysis and fast design, prototype construction, prototype iteration, until acceptance, refinement and maintenance.

It is clear that the implementation of prototification process is not linear but iterative (repetitive). Based on this methodology the functional prototyping arises the following stages:

User Study Scope	Device Control
Requirements model	Demo
Analysis of the information	Technical evaluation of the prototype
Collaborative	Field evaluation
Analysis of interactions	Prototype settings

Conclusions

By analyzing the changes that have occurred in how we interact in society, i.e. the transformation of communication models, we are faced with a change of paradigms generated by the actors in this model. With the emergence, evolution, and appropriation of new information technologies added to the model, condition for their understanding and subsequent development from different perspectives. Topics such as ubiquitous computing, for example, not only affects the field of technological development also affects the way we relate and communicate reconfiguring the analysis environment, the conceptual framework and the reality in which we are immersed. These changes are not beyond the discussion topics from disciplines such as design, on the contrary, give grounds to consider elements and structural alternatives.

The articulation of a vision based on the approaches of design based on the understanding of sensory and perceptual relationship, cognitive, and technological processes that occur in the transmission of data, information, or knowledge, as one of the pillars in the design study. This is how the knowledge of the sensory apparatus, technological devices, and how they influence our perception of the world, seems to be the way, in many research and development centers is considered the best for the study of new paradigms and design areas.

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ON THE BRIDGE: BETWEEN BOLIVIA AND COMPUTERS

Lucia Grossberger-Morales

Telling Personal Stories of Memory, Time, and Space

On my fifth birthday I heard a voice, "You must tell your story." I don't remember if the voice was in Spanish or English. At that moment, I promised I would never forget the pain I felt emigrating from Bolivia to the United States. Though I emigrated when I was only three, it has been one of the most profound experiences of my life. I left an extended family, where I had felt confident and safe. Emigrating to New York made our family feel alien and helpless, living in a country where we didn't speak the language. On that fifth birthday I swore that someday I would find the way to tell my story. Every year on my birthday I reminded myself of my promise.

In 1979 I found the tool I would use to tell my stories, the personal computer, but it would be years before I had the hardware, software, and computer knowledge. Finally in 1987, I was ready to begin.

Telling Stories using Multimedia

Telling my stories was a calling. Initially the voice came to me when I was five, but has continued over the years in my dreams and travels to my homeland. It was only when I saw that computer that I knew I had found the medium that could capture the emotional richness of these experiences, combining images, words, and most importantly interactivity.

By creating multimedia pieces I made the stories concrete, externalized them and better understood them. Along with different media elements, I incorporated techniques such as branching, layering, and telling the same story from a variety of different perspectives, even in different languages. In some pieces I would include a voice-over in Spanish or English that expressed a more personal thought or feeling. Often the text and voice are counterpoints to each other.

This paper is divided into my Altar *Sangre Boliviana* and installation *Khuritos Infinitos*. Within these two works are my personal stories about emigrating, as well as my experience as an adult revisiting my homeland, awakening to the social injustice, and my admiration of the indigenous cultures as stewards of the land.

Altar: Sangre Boliviana (Bolivian Blood) 1992 - 2002

Sangre *Boliviana* is a CD-ROM, which is presented as either just a CD-ROM or in the context of an altar, with a frame around the computer, on a table that looked like it belonged in a church.

Sangre Boliviana is a postmodern collage including fragments of my story of being an immigrant, growing up bicultural and discovering Bolivia's culture and worldview. Each of the six sections has its own style and interaction.

Creating *Sangre Boliviana* was an organic process. I would get an inspiration for a section, it might be a story or dream, or it might be a festival or ritual. I would let the content dictate the interactive format. I made no attempt to follow a time line or overall design. My goal was to follow my intuition. In these works I used the video and photographs I shot in the Andes, Andean music, voice-over, text in both Spanish and English, animations, clip art, drawings, and interactivity. I will describe three sections of *Sangre Boliviana.*

Palabritas (Little Words) 1994

Palabritas is one of the sections of *Sangre Boliviana*. I immigrated to the United States when I was three. Standing on the bottom of the ramp of the plane, I said, "*¡Hace mucho frió!*" My father, now with his arms wrapped tightly around me, said, "It is very cold, we are in America, we speak English now." My throat tightened and it was hard to swallow. At that moment, I felt I had lost my language, Spanish. I learned English in a few months, but I missed the sound of Spanish.

Many years later, I wrote the poem *Palabritas* in Spanglish. The poem appears on the screen written in its original form. Dragging and clicking the mouse the user has to "catch" the translation. I felt that the frustration of catching the translation reflected my frustration of having to learn English and not speak Spanish.

On the bottom of the screen is the face of a little girl. If you click on her, she appears in a surrealistic and claustrophobic room, with objects that change when you roll over them. If you drag her with the mouse she walks frantically. There is an image of lips on the wall that call, "*Cachina. ¿dónde estás? Cachina, no te veo. ¿dónde estás?*" ("Cachina, where are you? Cachina, I don't see you. Where are you?") Click on the lips and they stop calling. Roll the mouse over the trunk and Cachina, the doll, appears. Click on her and there is the story of Cachina. "*Abuelita*, friends, and *Tias* assured my Mami that in the *Estados Unidos,* there would be much better dolls. Why bother to take my old Cachina? No doll was ever the same. They didn't have the right smells."

Cholera 92

In 1992, while I was staying in Cochabamba, Bolivia, there was a cholera epidemic. The radio was dominated by news reports about the epidemic and what people should do to avoid contracting cholera. I was horrified as I learned that the reason it was difficult to diagnose cholera was because 90% of the cases of diarrhea were just normal malnutrition. The reason for cholera was unsanitary drinking water; the cure for cholera is salt water, with a little bit of sugar, and an injection of long acting antibiotic. Most developed nations had struggled with cholera in the past. The United States had three cholera epidemics until we developed sewage treatment. The game *Cholera 92* arose out of my anger and frustration. I wasn't thinking about creating a social game, I was reacting to the cholera epidemic in Bolivia and I created a dark and ironic arcade game.

The six targets include someone defecating in the river, a cholera microbe, etc. Instead of a gun with cross hairs I used a syringe to shoot the targets. When you shoot a target, there is an explosion that looks like and sounds like diarrhea. The act of shooting the syringe at the targets is more visceral than reading a static text or visual

representation. The message is presented in an action with consequences. Mary Flanagan in her essay, *Next Level: Women's Digital Activism through Gaming* (370-374) best describes Cholera 92 and the intended viewer outcomes. "The play between such text and image is ironic and disturbing; as players we begin to realize how simple education and resources could have changed the trajectory of a whole town's history. Then, after the informative moment on to the next level, which displays a different cartoon image. Here, a hybrid of game and interactive art techniques is used to subvert computer gaming tropes with political messages."

The Dream (1994)

In 1987 I had a dream which clarified my struggle as an artist. The following is the voice-over of the animation *The Dream*.

"I am at Isla del Sol, in Lake Titicaca, one of the most sacred religious sites of the Incas. Walking I meet my mother and the me when I was three. The three of us create a ritual, placing stones in a circle and starting a fire. Then I go off by myself. I trip and fall in a puddle. One side of me is totally wet and the other side is totally dry. I laugh, get up and continue walking.

I see a long, very narrow bridge between two mountains. The bridge is made out of concrete and cobblestones with no handrails. I know I must cross the bridge, so I begin. Halfway over the bridge, I decide to stop. I lay down with my legs hanging over the edge. I hear a voice. I look up and there I see the little girl who is me at three, dancing on the bridge, speaking in English about computers! I say goodbye and finish crossing the bridge. I feel a new sense of wholeness."

My art straddles the narrow bridge between my passions for computers, Western Technology, and my Bolivian cultural heritage. My art arises from that conflict. The goal of my art is to find balance on that precarious bridge, balancing these two conflicting passions; I am forced and inspired to find my own path.

Installation *Khuritos Infinitos*

In 1998, I began to create installations inspired by Bolivian weavings. Weavings are the most important artform of the Andes, the voice of a culture that refuses to disappear. Andean weavings, since pre-Hispanic times are woven by women, and carry the stories and myths of the community using their visual language of symbols, designs, textures and colors. The weavings are the tangible expression of a worldview that is distinctly non-Western. It is impossible to understand these weavings without understanding the indigenous Andean worldview including religious beliefs and the way they perceive time and space.

The weavings of the Jalq'a community represent the underworld inhabited by randomly placed bizarre creatures called *khuritos. Khuritos* appear free from the constraints of gravity or size. There is no distinction between male or female, as such categories do not exist in the underworld. There are creatures inside of other creatures divorced from any idea of conventional procreation; the baby "wawa" is often of a different species than the parent. The Jalq'a describe the underworld as *chaxrusqa kanan tian* – "it must be disordered."

The *khuritos* are the Jalq'a way of externalizing their fears of caves and dark or misty places. They transform these bizarre creatures into aesthetic ones. Unlike Western society which slays the dragon and battles the devil, the Andean people incorporate the *khuritos* into their lives and weavings, believing that the underworld is also a place where the sparks of creativity begin.

In 2009, as part of the Lightbox Mãgico exhibit in Cochabamba, Bolivia, I created an installation *Khuritos Infinitos,* which included two video projectors and a large kaleidoscope in the main gallery. The videos projected different animations of *khuritos*. Against one of the walls was a five-foot kaleidoscope and not visible, behind the wall was a computer which created the images reflected on the kaleidoscope's mirrors. The combination of the colonial style, hand-pounded, metal work covering the kaleidoscope, and the moving computer imagery was compelling.

Khuritos Infinitos was the most popular installation of the exhibit. Several of the viewers personalized it. For example, the little girl who danced with the animation of the *khuritos* or the young woman who took photographs of the inside of the kaleidoscope with her cell phone.

The Book: On the Bridge Between Bolivia and Computers

In 2005, I wanted to write about the cultural background of my artworks and the technology I used to create them. I believe books can enrich the art and the context in which the art was created. I could only imagine a book that was full color and no publisher I spoke with was willing to accept it. I decided to self-publish using Print-On-Demand, available on Amazon. To upload the book PDF to the publisher the file was limited 100 megabytes and the pricing depended on the number of pages. The images had to be 300 dpi even though some of the early images didn't require that resolution. I wanted the book to be inexpensive. My first version was about 400 megabytes, so I spent many painful hours cutting and cutting, deciding what images and text to leave in and what to cut.

A friend wrote a book. It was published in standard form, but he also published it on his website as a PDF file that anyone could download. I decided to put my book on my website.

The last few years, I was well aware of the availability of readers including the Kindle and Nook, but I felt that it just made books easier to carry and didn't begin to address what was possible with the technology. When iAuthor was released as a free App, in 2012, I knew that an iBook would be the best way to present my altars and installations. iAuthor was developed to create multimedia textbooks which could include video, sound, limited interactivity, the ability to zoom into an image and document the zoom, and of course, gorgeous resolution. Those features would be ideal for presenting my artwork. I spent a few weeks exploring the multimedia features. I realized I had to rethink much of my book. I had used words to explain what could now be shown in visuals. For example, I only included a couple of pictures of the pieces I created of the *khuritos,* but in the iBook I am including animations (figure 1). In *Cholera*

Figure 1: Image of iBook Screen (simulated on the Mac) containing the animation and text of Digital Weaving which was created in 1996

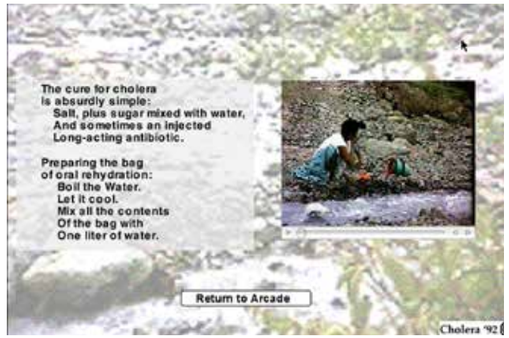

Figure 2: Image of iBook Screen (simulated on the Mac) containing the link from the arcade game of Cholera'92 including the video which was created in 1992

it is not possible to recreate the arcade game, but I included a screen that had all the targets. When you touch one of the targets, the information page appears containing the original video shot in 1992 (figure 2). In the piece *Palabritas*, the page shows the claustrophobic, surreal room with the little girl (figure 3). There are the hot spots, such as the trunk, when you click on it, the story of the doll Cachina appears. The lips still cry and you can quiet them by touching them. I did not include the animation of the little girl walking frantically. Though it is possible to include this animation, it would increase the file size. My process of editing includes deciding what media features are important enough to justify the expenditure of increase in file size.

Figure 3: Image of iBook Screen (simulated on the Mac) containing an interactive page from Palabritas created in 1994

The iBook has many features that add to an artist's ability to tell the story of their work; for example, the ability to zoom into the image, to include voice-over describing the work. I know an artist who paints while a musician plays. To listen to a fragment of the musician playing would help the reader to appreciate her process. Another artist, a photographer is inspired by nature; a short video of the area that inspires her would put her work in context. A show at a museum could contain a pan of the entire space and when you click on a work a description of the work can appear. The possibilities are endless. I am not saying that the iBook, and potentially an interactive book for the personal computer, should replace the traditional art book, but in our digital world, it can be a compelling, inexpensive format to present artists' work.

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TECHNO-INTUITION: NOTES ON USING SOUND TO RELATE TO OUR ENVIRONMENT.

Yolande Harris

www.yolandeharris.net

ORCIM (ORPHEUS RESEARCH CENTRE IN MUSIC), ORPHEUS INSTITUTE, GHENT

Abstract

Techno-Intuition embraces the combined roles of mental, physical, and technological processes in building relationships to one's environment through sound. It recognizes parallels between technological methods of making the inaudible audible and more esoteric techniques for revealing aspects of the unconscious. In many cases, relationships to environment drawn through sound are profoundly bound up with technology. In order to hear, collect, transform, study, analyze, and intervene through sound, special instruments must be designed. Such a hearing-through-technology raises questions as to how these instruments enable as well as inhibit certain forms of knowledge. These questions are addressed through examples from practitioners, including the author, who actively research the area between technology, intuition and the sonic environment. I consider an expanded notion of 'instrument' that emphasizes context and the environment it is placed in. Blending the (technological) instrument with (non-technological) intuition through physical practice, listening, and experimentation, promotes an attitude to both instrument development and artistic production that, by being more attuned to and aware of context, is potentially more sustainable and sensitive to environment.

Charging the Space Between Technology, Intuition, Sound, and the Environment

'Techno-intuition' recognizes the implicit coexistence between the creation of meaning and the technologies we use to sense and know (and navigate through) our environment. In many cases, relationships to environment drawn through sound are profoundly bound up with technology. In order to hear, collect, transform, study, analyze and intervene through sound, special instruments must be designed. Such a hearing-through-technology raises questions as to how these instruments enable as well as inhibit certain forms of knowledge.

As a practicing artist working with sound, I explore such a merging between corporeal and technological modes of perception. In these notes on techno-intuition I consider an expanded notion of 'instrument' that emphasizes context and the environment it is placed in – by context I refer to an understanding of one's place as an element within the larger environmental system. Blending the (technological) instrument with (non-technological) intuition through physical practice, listening, and experimentation, promotes an attitude to both instrument development and artistic production that, by being more attuned to and aware of context, is potentially more sustainable and sensitive to environment.

My examples involve sound as a medium that facilitates, expands, and articulates relationships between interacting elements of complex ecologies. This paper addresses these main topics: 1) the transformation of instrument from object to environment; 2) walking, sailing, and swimming as embodied ways of exploring techno-intuition in the environment; and 3) making the inaudible audible and exploring the sonic unconscious. I will map these ideas through examples from practitioners, including myself, who actively research the area between technology, intuition, and the sonic environment.

Instruments in the Environment

I think of a musical instrument in terms of energy and sonic vibration, and am particularly interested in the impact of instruments and sound technology on ways of listening and understanding environmental context. Conceptually, my own instrument design is based on facilitating techno-intuition by absorbing technologies into an intuitive way of moving through one's environment. The journal paper 'Inside-Out Instrument' (Harris 2006), describes the reconfiguration of the traditional relationship between a musician's instrument, body and technology. Since the development of the loudspeaker and electronic sound technology, sound is commonly detached from the source of the performer's body and instrument, in effect becoming dispersed in a space surrounding the musician. In this work, the traditionally intimate relationship between body, instrument, and sound production, is turned inside-out so that the instrument can in effect be inhabited rather than held. The *Video-Organ* and *Video-Walker* were instruments I designed to allow the dynamic placing of image and sound in various architectural and environmental contexts (Bongers and Harris, 2002). My *Satellite Sounders* sonified GPS data in order to provoke a re-experience of navigation and a renewed sense of embodied location in environment. This work strives "towards a hybrid between these two ways of knowing, between navigation through technology and intuitive embodied navigation – a techno-intuition" (Harris and Dekker, 2009).

Recent research into ship navigation and submarine cartography offer further examples that support a conception of an intuitive relationship between the body, instrument, and environment. Although not specifically concerned with sound, cognitive scientist Edwin Hutchins investigates group collaboration in coastal navigation on a large ship. His research emphasizes the importance and abilities of complex group interactions to develop that absorb technological interfaces when relating to one another within ever-changing environmental surroundings (Hutchins, 1995). Anthropologist Stefan Helmreich describes similar intuitive collaborations between scientists immersed in a varied soundscape of navigational aids, background music and verbal communications as they map the sea-bed in research submarine Alvin (Helmreich, 2007).

From this perspective a more expansive notion of instrument can be developed. By extending our sensory and cognitive capabilities through instruments, often in group collaboration, one can imagine the emergence of an environmental or even "submarine cyborg" (Helmreich, 2007: 627) that can experience extreme and uninhabitable environments, such as deep sea, through the extensions of technology. And by extending our perception beyond the human audible range - by making the otherwise inaudible, audible - we can, for example, learn much about the central role of sound in underwater ecologies. Alvin Lucier's *Quasimodo, the Great Lover* (1970) and *Vespers* (1968), the first inspired by the humpback whale's ability to send sound over very long distances, and the second inspired by bat's ultrasound capabilities, explore not simply the sounds themselves, but the processes by which such sounds act within the environments they inhabit. Learning more about how other species use sounds within their habitats may inspire ideas on techno-intuitive approaches for our own interaction within the environment.

Walking, Swimming, Sailing

Walking, swimming, and sailing relate one physically and mentally to the space and medium being moved through. *Swim* (2011) is an installation made up of single channel video and stereo sound. Recording from an ocean swimmers viewpoint, I capture the rhythm of breathing and physical motion as the sound and image alternate between above and below water, cutting through the surface, exploring the physicality of sound through a direct involvement with environment. The "constellation" of body-imagination-world is an experiential, first-person relationship to environment generated by walking (or swimming) through it (Solnit, 2001: 291). How can technologies expand, complement, and question such experiential relationships to the environment rather than alienate them? Could this be a way to generate techno-intuitive relationships to our environments?

Presented perhaps most emblematically in Richard Long's *A Line Made by Walking* (1967), this constellation is also a key to the 'sound walks' by R. Murray Schafer and Hildegard Westerkamp of the Acoustic Ecology group beginning in the 1970's, and subsequent generations of sound artists such as Christina Kubisch's *Electrical Walks* (2003) which make inaudible electromagnetic fields audible via a headphone instrument. In particular, Westerkamp concentrates on heightened listening to environmental sounds within the environment and to identifying group behaviors that develop out of this state of awareness when being guided predominantly by sound rather than sight. Through walking participants explore these everyday sound worlds, activating the constellation of body-imagination-world (Westerkamp, 2010).

Walking as a means of embodied experience of movement in environment has featured prominently in my own work since *Walk for an Absent Public* (1995). I also have explored other forms of motion, such as sailing and swimming. For example, *Symphony no.2: Sargasso Sail across the Bermuda Triangle* (1997), involved a week long sail through the mysterious location notorious for ships lost at sea. Compared with walking, sailing demands a more immersive, inhabited relationship between the body, instrument and environment. The boat is an extension of the sailor - in effect an instrument - and the art of sailing combines the ability to control this instrument with complex, unpredictable, and ever-changing environmental factors. These experiences laid the foundation for further experiments with the environment and, in particular, the importance of interacting with navigation technologies to build meaning via movement through an environment.

An Intuitive Navigator *Sun Run Sun: Satellite Sounders*

Traditional techniques of ocean navigation involve observation of the sun, moon and stars, weather, wave, and current direction. Historical instruments like the astrolabe and sextant could be used to calculate position in an otherwise unidentifiable seascape. Current GPS satellite navigation systems use the same basic principle of triangulation, but connect to orbiting satellites, greatly increasing accuracy, while diminishing traditional navigation skills based on observation of the environment. My work examines these different forms of navigation from a subjective, first-person perspective, asking the questions: what does it mean to navigate? What are the bodily experiences of finding one's way? And how do different modes of navigation shape our understanding of the environment we are moving through?

Rethinking walking in terms of a technological relationship to environment, I created *Taking Soundings* (2007-8) and *Sun Run Sun* (2008-9), which explore historical, contemporary, and animal navigations through sound. These projects created GPS sonifications, maps, installations, performances, and the Satellite Sounders, custom electronic instruments, designed to explore /enhance techno-intuition by conflating utilitarian applications of GPS with artistic sonic interpretations. Curator Annet Dekker contrasts *Sun Run Sun* with many locative media practices using current mobile technologies that "evolve around an interest in new tools, and without questioning them … asserting the aesthetics of the consumer market and affirming the control society." She refers to the *Satellite Sounders* as "an intuitive navigator" that "provides people with new experiences not just of space but also of body and mind. Affect of place is constituted here through technology; its relation to the body in movement is what makes its affect felt" (Dekker, 2010: 3). Media theorist Susana Zaragoza discusses *Sun Run Sun* as provoking knowledge gained through a qualitative, embodied experience of place. "In fact, a different sensitivity to one's immediate surroundings and one's position on Earth arises … A performative practice is necessary in order to understand this new logic of our current calculative world" (Zaragoza, 2010).

Field Recording and the *Displaced Sound Walks*

Field recordings often aim to audibly 'represent' environments that may be otherwise inaccessible to the listener, and in doing so neglect complex layering of spaces and times inherent in recording and replaying sounds. My *Displaced Sound Walks* (Leipzig Contemporary Art Museum, 2012) furthers the process of hyper-aware listening while walking, described above. Using a collaborative, workshop-like creative process, I play with prerecording the ambient sounds of predetermined routes. A visitor to the exhibition listens to these recordings on headphones while physically retracing the same path.

The meaning generated by a sound or 'field' recording differs dramatically depending on its placement in both place and time. If I walk down the street I listen primarily to sounds that facilitate my movement and navigation of space, working in combination with the other senses. If I play a sound recording of that same walk back to myself in a quiet space I listen in a different way, without the need to process and interpret sounds immediately for action, motion,

and understanding of my environment. However, if I play that same recording back to myself while making the same walk at a later time, I am confronted by a disjunction between my listening and my environment; my intuitions based on sonic cues conflict with the visual evidence I see before me. For example, I may recognize the road, but not see the car that I hear pass by me. I see someone walking towards me, but the footsteps are out of sync with the sound I am hearing. Through this experience I became consciously aware of my listening process and the function of hearing in orientation, movement, time, and being in that place. In her analysis of the work media theorist Marta Colpani describes perceptual shifts that generate an enhanced bodily awareness, "…mak[ing] the participant extremely aware of the functioning of his body when feeling and perceiving reality" (Colpani, 2010). The first *Displaced Sound Walks* (Orpheus Institute, Ghent, 2010) provoked diverse reactions in the five participants, ranging from paranoia, to indifference, to a heightened awareness of environment and sensory perception.

Making the Inaudible Audible and the Unconscious Conscious

Techno-Intuition embraces the role of mental processes in building relationships to one's environment through sound. It recognizes parallels between technological methods of making the inaudible audible and more esoteric techniques for revealing aspects of the unconscious, such as Pauline Oliveros' Deep Listening techniques (Oliveros, 2005). It joins these to expand our perceptual and cognitive capacities when listening to and making music or when interacting with the environment. Recognizing such a 'sonic unconscious' also has clear parallels with the treatment of inaudible sounds, in terms of how we bring what we cannot physically experience into our conscious understanding. The dual process of making the inaudible audible and of tuning in to the unconscious mind of dream states (and folding it into the waking conscious mind) is central to my approach to techno-intuition.

I addressed these issues in a solo show of combined installations and performances from my *Scorescapes* series in the Sonic Unconscious program at Issue Project Room, New York in 2012. The underwater sounds in *Fishing for Sound* (2010) include insect, fish, dolphin, and man-made sounds of engines, depth finders, and anchors collected by a simple underwater microphone. Listening via a hydrophone to the soundscape beneath the apparently idyllic surface of the video of a turquoise sea, brings into consciousness elements of the environment we otherwise would not see or hear. The electronic sounds of sonified GPS data resonate with the accompanying video looking through the viewfinder of a sextant on board a boat. All these connect in the mind, where a clicking sound moving from left to right once per second refers to EMDR treatments (Eye-Movement Desensitization and Reprocessing - a technique used in psychotherapy for treating Post-Traumatic Stress Disorder) which use sound to help a patient navigate through associations and memories. *Fishing for Sound* creates a sea of spatial connections between these disparate spatial phenomena - underwater, in the mind, and from outer-space - weaving sounds from marine environments, psychotherapy, and sonified navigation satellites. Common to each of these is a mass of background noise - of environment, memory, and information - where listening is like fishing for sounds.

Concluding thoughts

Techno-intuition builds on this approach to involvement, not only by direct physical interaction, but by a level of commitment to listening, using a first person perspective and multi-sensory video and sound, to draw one in to sound worlds that are unfamiliar. This kind of approach can, I believe, move us closer to redefining the role of composers, sound artists, and sonic ecologists as activators of a sustainable attitude towards the sonic environment, one that is less passive than the genre of field recording and more immersed and committed to the environment.

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Bio

Yolande Harris' artistic research projects *Scorescapes* (2009-2011) and *Sun Run Sun: On Sonic Navigations* (2008-2009) explore how sound relates humans and their technologies to the environment. Yolande holds a Ph.D (Leiden University, 2011); was Sound Art Fellow (Academy of Media Arts Cologne 2006); Artistic Researcher (Jan van Eyck Academie 2003-5); has an M.Phil. (University of Cambridge, 2000); and a B.A. in Music (Dartington College of Arts,1997). Her installations, performances and lectures are presented internationally in the context of visual art exhibitions, music venues, media art festivals and fellowships.

SCALE – TIME – COMPLEXITY: ENGAGING, ENTANGLING, AND COMMUNICATING ECOLOGY

Nigel Jamieson, Andrew Denton, and Stephen Reay

AUT UNIVERSITY, AUCKLAND

ABSTRACT

This project proposes a forum for discussion that questions how we engage with our ecology. The panel will be framed within an acknowledgment of scale, time, and complexity as an entry point into a conversation about our local ecology and the universe beyond. The panellists' aim to initiate a dialogue by situating the discussion around their own art and design research practices. These practices have emerged from local investigations into ecological issues that evolved into two overlapping research clusters, Art and Ecology, and Design and Innovation for Sustainability, at AUT University, in Auckland New Zealand. In our first collaborative project we explore how we might connect with and communicate 'ecology', in methods and practice that recognize and embrace scale, time, and complexity as a tactic into the subject, rather than as a barrier to engagement and the development of potential solutions.

How do we engage and communicate with the ecology in methods that acknowledge and embrace scale, time, and complexity as a tactic into the subject, rather than as a barrier to engagement with it?

The panellists approach this through diverse and divergent methodologies, from data visualisation, affective or poetic cinema, to human centred design practices. The subject of the ecology binds the discussion with the acknowledgement of no single path of interrogation into the subject. Jamieson, Denton, and Reay, have initiated a project that centers its focus on the ecology to develop overlapping pathways in and out of their distinct practices, as a method of both developing and interrogating their work, making new work that drifts across their disciplines, but also building towards an ongoing and evolving interdisciplinary teaching and research projects.

1. Digital Earth Project

The concept of a digital replica of the entire earth was first proposed by Al Gore in 1992. What then might have seemed like a scenario from science fiction can now, with scientific and technological advances in many fields, be not only feasible, but practical solutions are currently being sought to achieve this vision. The first international symposium on Digital Earth was held in Beijing in 1999 and has since been held bi-annually in Canada, the Czech Republic, Japan, USA, and Australia. *The International Society of Digital Earth* (ISDE) was established in 2006 and *The International Journal of Digital Earth* was launched in 2008. The goal of this massive project, which simulates

the surface and near surface of the earth, is to help illustrate and hopefully ameliorate, many of earth's problems -including climate change, hunger, natural disasters, and even warfare - through the sharing of scientific information and the engagement of a global public audience. It is through this global public engagement, by providing a readily accessible model of earths systems to virtually anyone with a computer, that the science and debate of addressing these problems can be shared. It is in this process of public engagement that the humanities and specifically art can play an important role. It is in this sense that Digital Earth becomes a starting point for aesthetics research and collaborative art practice.

2. Data Visualisation

Since the 1990's data visualisation has become a familiar feature of the new media art landscape. By accessing data sets from many sources – stock market fluctuations, weather and climate data, internet network traffic – artists have been able to exploit two of the distinguishing characteristics of digital computing; the ability of computers to handle large data sets and the nature of digital information to easily be mapped from one representational form onto another. Cross-representational media mapping of this kind enables media of one form to take on the characteristic form of another; this can be turning an image into a sound wave, or the other way around, creating a 3D surface from a 2D image, and so forth. This form of re-mapping of multiple representational forms onto each other, along with the computing of large datasets, creates the practical conditions for data visualisation in new media art. This relatively new cultural form of data visualisation becomes the methodological foundation for this Digital Earth project, specifically using real-time 3D graphical responses to large data sets in real-time, near to real-time and simulation time.

3. Communicating the Ecology

Denton's current research project, *Affective Moving Image and the Ecology*, works with the belief that fear-inducing documentary and media coverage polarizes popular opinion around threats to the ecology and our role in it. The project suggests a more poetic[1] or affective[2] mode might be a more feasible tactic for advancing the debates about anthropomorphic climate change. The project proposes that due to the absence or invisibility that surrounds many ecological subjects – whether they are antagonists or protagonists in the narrative – they are often seen as intangible, or unfathomable, mere data devoid of the possibilities of establishing an emotional or affective relationship with the ecology.

To reflect on this, *in praxis*, the studio work encompasses numerous moving image technologies, from consumer cameras, to professional media devices, analogue and digital, with an aim to apply pressure to these technologies in order to develop visual material that fulfils the projects aesthetic aims – To experiment with affective moving image content in order to develop connections with the viewer to the ecological subject that is emotional or even poetic.

Terminal/Traces, is a two-channel video and audio installation. The work engages with the ecology and our place in it by looking from its subject from a distance abstracted and forensically, through the application of time-lapse cinematography and composited images. The work is made up of many visual and aural layers, to present a dynamic and spectacular composition, which will engage viewers with the project's ecological subject. The images that make up the work were captured using Canon 5D DSLR cameras; set to take long exposures, sequentially, of the night sky under flight paths, or at the perimeter of airports. The cameras records images in the RAW format at extremely high-resolutions.

On channel-one, planes fly over the lens and lines of light spill from the aircraft, streaking across the sensors, as they capture the image – like scratches on a record. In the final iteration, ghost-like traces of the airliners criss-cross the sky, as they leave discarded jet stream and light.

Figure 1. A. Denton 2012

The second channel experiments with different modes of abstraction, while capturing the departures and arrivals of aircraft at various airports. In the post-production process time and space has been manipulated and composited into multiple layers, to accentuate and annunciate, the volume of air travel via traces of light across mercury lamp lit skies.

These collections of aircraft traces are layered upon each other until they build into a cacophony of visual noise. The screen speaks to the impact these machines have on our planet, an impact that is so absent or invisible from our normal experience or viewpoint, now iterated. It makes those things that we live with everyday – those things outside of sight and mind – conscious.

Morton[3] and McKibben[4] propose that rather than slip into a fugue of disengagement and inaction, due to the complexity of the ecological problem, that instead we could embrace and draw on complexity as a tactic into the subject and towards action. A complex problem requires a complex engagement – but not necessary a complex communication. It is suggested that an engagement that draws the viewer into the affective poetic potential of the subject, in order to reconnect and dispense of cynical apathy, is a rewarding tactic into the ecological subject.

In S 36° 44′ 18″ E 174° 36′ 24″, Denton and Reay collaborated to produce a two channel video installation of an exotic plantation forestry site near Auckland, New Zealand, that responds to Morton and McKibben's projects. They recorded, on video and audio, the same geographical location twice, locating it through the GPS co-ordinates. The first shoot took place in the midst of a mature pine stand, the second shoot, several months post harvest. The juxtaposition of the two dramatically different images side by side provide provocation for discussion around the ecological and social complexities of planted exotic forest ecosystems. The work aims to agitate a reaction to the before and after effect of the logging of the trees from a fixed position looking up. In addition the intention of the work was provoke a viewer to question whether or not the subject is actually a forest at all. The "here it is, now here it isn't" nature of the installation effectively communicates the sense of loss, with viewers reactions emotive and

Figure 2. A. Denton, S. Reay, 2012

contemplative. Perhaps the most resonant aspect of the work is a tiny moment of audio in the piece that penetrates the visuals. Through the birds and the sound of the wind, you can hear a single instance of a human voice calling. It is a sad sound, almost a lament, not the buzzing of a chain-saw[5], but a reminder of human presence – the ever-present human presence. This accidental moment perhaps captures what is most affective about this project.

5. Design Approaches: Communicating the Ecology through Intervention – *The Wall Project*

Attempts to engage urban viewers with ecology are being further explored through an applied ecological art project "designing walls as urban ecosystems", an inter-disciplinary approach to explore a range of potential design solutions by bringing technology and science (in particular the fields of biology and ecology) with design. A Design Thinking approach was used to explore opportunities associated with designing for urban and natural environments to increase the awareness and understanding of issues centred on sustainability, framed in the context of understanding ecological systems.

The project documents the research and design of a 3D ceramic wall tile to be used as a boundary structure, and habitat for plant and animal species. In its initial installed state the wall represented an aesthetically appealing clean and simple structure. Over time this structure will weather, and will start to 'wear' as biological entities colonize, transforming the wall into a dynamic ecosystem that supports on-going ecological activity. A section (2.4m x 1.2m) of wall has been installed along a boundary of a suburban Auckland Primary School. It is highly visible and accessible to urban people as an ecological design project to help foster a re-connection with nature and increase awareness of ecosystem processes, as well as support local biodiversity in a novel way. Ongoing monitoring of ecological activity, as well as how the local community is interacting with the installation, is being assessed. A forensic analysis of the deterioration of the ceramic tiles and the subsequent development of an ecosystem is being undertaken using a permanently mounted Ricoh GX200, with an interval setting of one hour. The images taken at were removed as being distracting, before a time-lapse sequence compresses months of activity into a couple of

Figure 3. S. Reay, 2011

minutes. The intention of the work is to provoke the viewer into contemplating the temporal scale of ecological activity, as well as consider the dynamic nature of ecosystems.

This project provides a unique opportunity to explore the potential of artificial structures to support biodiversity in urban environments. The project intends to communicate the importance of intact, fully functional ecosystems as highly complex, dynamic and unpredictable biological systems crucial to maintaining the human condition.

6. Conclusion - Locating the Discussion in the Backyard

This panel presentation provides an opportunity to engage in inter-disciplinary conversations that investigate the meaning of ecology as it relates to the panellist's urban New Zealand context.7 New Zealand is a relatively young country, however, it has a substantial natural and cultural history. There is a perception locally and internationally that this island nation is clean and green. However, as a small, dynamic, intensely free market country, we are becoming increasingly urbanized in a fashion that is rapidly changing our social, cultural, and political structures.

Rapid anthropomorphic climate change is only one tangible example of the alienation most populations have in

relation to 'natural' environments and the ecology that supports all life – not just human. As Meurk and Swaffield, and Ignatieva et al annunciate, for biodiversity to become more culturally relevant, and therefore valued by communities, perhaps requires it to be more visible and accessible to those communities. It is suggested that it is necessary for city dwellers to first engage with the vast ecological narrative surrounding them, before they can become connected to it, and ultimately care about what happens to it.

In this context are we simultaneously detached from the ecology and regard it merely as a resource for our use and exploitation? Under these conditions, how can we adjust our concept of value to include and celebrate in the temporal scale, actual scale, and complexity of the ecology? And to then acknowledge the challenges that it faces as both a method of inquiry and a proposition for designing future sustainable living. Further to this - how do we deliver effective and potentially affective communication of ecological issues, and potential solutions, that are engaging, devoid of cynicism, and ultimately encourage action and acknowledge the importance of 'natural' environments in our lives?

ENDNOTES

1. As Morton notes: "Art's ambiguous, vague qualities will help us think things that remain difficult to put into words. Reading poetry won't save the planet. Sound science and progressive social policies will do that. But art can allow us to glimpse beings that exist beyond or between our normal categories." (60)

2. As Massumi proposes in his discussion on affect in his analysis of aspects of Reagan's presidency: "Philosophies of affect, potential, and actualization may aid in finding counter-tactics.The Autonomy of Affect" (106) It is proposed these tactics of affect might be applied to communicating the ecology.

3. Please see Morton's *The Ecological Thought* for a more detailed discussion.

4. And see McKibben's *End of Nature and Eaarth*

5. McKibben contemplates in the *End of Nature* "Now that we have changed the most basic forces around us, the noise of the chain-saw will always be in the woods." (43)

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'SQUARE KILOMETRE ARRAY – LOOKING FOR GOD'

Art in the Age of Big Data

Nigel Jamieson

AUT UNIVERSITY

Bio

Nigel Jamieson is a new media artist and Senior Lecturer in Digital Design at AUT University, Auckland, New Zealand. Research in interactive real-time 3D graphics and allied screen and network technologies is a continuation of Nigel's professional, international experience in the area of 3D animation, digital video graphics, interactive digital media, and digital art practice. Nigel's current research centers on dynamic near-to-real time visualization of complex systems, where narrative replaces simulation in the exploration of metaphysical knowledge systems through contemporary science and digital technologies.

Abstract

The SKA-LFG project is a live, real-time 3D graphical response to real-time observations from deep space combining Very Long Baseline Interferometry (VLBI) - a high resolution form of radio astronomy - high speed computer networks, real-time processing of VLBI data, interactive 3D graphics software, and virtual reality presentation systems. SKA-LFG combines science, technology, new media, and metaphysics within a time based art form linking three distinct perceptions of time – cosmic, computational, and human perceptual time. Through this joining of aesthetics, contemporary astronomy, and theories of human perception and cognition, SKA-LFG explores narratives of the sublime through computational simulation, dramaturgical narrative forms, interactive digital media, and Virtual Reality systems.

Introduction

'Square Kilometre Array – Looking for God' (SKA-LFG) combines science, technology, new media, and metaphysics within a time based art form linking three distinct perceptions of time – cosmic time, computational and network time, and human perceptual time. With its ability to look deep into space and time, Very Long Baseline Interferometry (VLBI) - a high resolution form of radio astronomy – allows study of the astronomical objects such as supernovae and black holes, providing clues to the evolution of the universe. Via high speed networks systems, VLBI data can be transferred for processing in real-time with filtered data driving customised high-end real-time 3D graphics (game engine) software linked to Virtual Reality (VR) presentations systems within gallery and web based contexts. This paper will discuss the SKA-LFG project in terms of data visualization using very large data sets, narrative versus simulation, and the aesthetics of the sublime in new media art.

Data Visualization and Big Science

Over the last two decades, data visualization has become a familiar feature of the new media art landscape. Accessing data sets from many sources – stock market fluctuations, weather and climate data, internet network traffic – artists have been able to exploit two distinguishing characteristics of digital computing; the ability of computers to process large data sets and to map one representational form onto another. The latter, a form of cross-representational media mapping, enables media of one form to take on the characteristic form of another; this can be turning a sound wave into an image, generating a 3D surface from a 2D image, and so on. This re-mapping of representational forms, coupled with the computing of large datasets, creates the practical conditions for data visualization in new media art.

Since access to computing first began to become the norm - at least for those living in so-called developed or first world countries - artists have used data visualization in a variety of ways to comment on contemporary society and culture. This process of data visualization for artistic expression relies firstly on the database as its raw material. The database, in this sense, can be described as the generation and storage of large sets of discreet objects of information which can then be categorized, organized and navigated, via the application of mathematical algorithms. As Victoria Vesna states in her editorial introduction to the book *Database Aesthetics; Art in the Age of Information Overflow*

> "Databases and archives serve as ready-made commentaries on our contemporary social and political lives." Vesna 2007:XI)

From this Post-Modern vantage point, it can be said that collection, storage and retrieval of information, stands at the heart of this new cultural form, as well as the critical discussions of it - how is data collected, how is it held, and how is it used? As a result, concerns over information privacy, access, and manipulation, are themes that are often addressed in the work of data visualization artists. The narrative of the database then is a mechanistic narrative of un-freedom and control, often alienating and dystopian, redolent of Big Brother, playing on fears of the surveillance society and the inevitable reduction of all of human activity to quantified data sets and their re-mapped representational forms. Data visualization makes visible the invisible processes of the database and in this sense data stands as both form and content of the representation itself. The semiology of data visualisation can be analyzed in terms of its syntagmatic and the paradigmatic structures. This structural approach to textual analysis - developed by linguist Ferdinand de Saussure and expanded on by literary theorist and semiotician Roland Barthes - conceives the syntagmatic axis of language to be the horizontal, temporal, and distributional axis while the paradigmatic is on the vertical and integrational axis (Barthes:1977) The syntagmatic, distributional axis is that of narrative and story, ruled by the grammar and syntax of the representational form, on the other hand the integrational axis of the paradigm defines the 'storyness or non-storyness' of the representation. The narrative of the database is then a reflection of its '*databaseness*'. Here data visualization stands apart from more traditional iconic narrative representational forms

– such as photography, literature and cinema – in that there is a favoring of the system over the sign. Lev Manovich observes in his essay *Database as Symbolic Form*

> "Database (the paradigm) is given material existence, while narrative (the syntagm) is dematerialized. Paradigm is privileged; syntagm is downplayed. (Manovich: 2007:49)

One possible reason for this privileging of the system over the sign may well be that our innate connection to narrative representation in our cultural artefacts is challenged by the new computer model of the world. Narrative has always been mankind's way of making sense of the world and communicating this understanding to those that share the world with us. Narrative will not go down easily, so instead is subsumed by the database and becomes of secondary importance. SKA-LFG is concerned with restoring the aesthetics of more traditional narrative representations within the context of data visualization.

Art in the age of Big Data

As many commentators on the subjects of science, economics, business, data storage, visualization, and new media have noted, we are now truly in an age of 'Big Data'. There is near exponential growth of the generation, distribution, and consumption of data via high speed computer networks, distributed (cloud) computing, and the integration of computing into all aspects of our everyday lives. What does this mean for artists working within the context of the relatively new cultural form of data visualization? What are the challenges of the 'data deluge' for new media art practice? Or to point to a more focussed question – Does the paradigm of the deluge take preference over the content – syntagm - of the data itself? Are we describing the wood and ignoring the trees? One of the primary challenges of the SKA is how to handle massive datasets. Through the application of sophisticated algorithms and cloud computing pipelines the SKA hopes to be able to filter the data in real-time, to strip out the 'noise' of deep space, retaining what is of use for scientific analysis. SKA-LFG will then be able to make use of these real-time, or near to real-time data packets for visualization in 3D game engine software. It is in the mapping of the already filtered data that SKA-LFG will achieve its visual and narrative form.

Abstraction, simulation and narrative

An important form of data visualization is simulation. Simulation is the process whereby a real-world system is modelled using computing hardware and software. Examples of simulation can be found in all aspects of scientific investigation, modelling of weather and climate systems, simulation of vehicular traffic flow through a city for the purposes of town planning, or even in litigation scenarios where real-world events such as car crashes or aeroplane disasters are reconstructed for the purpose of persuasion. The first step in simulation is the development of a detailed computer model of the system. All relevant parameters are included to construct a model of the system under investigation and the simulation is the 'running' of the model over time. Parameter values can then be modified in order to study different outcomes based on differing input values. These simulations are then studied to better

understand the system itself under differing scenarios. Simulations are also common place within the entertainment industry, primarily in the rise of the video game but also in the visual effects of mainstream Hollywood cinema and 3D animated films. In the case of video games, particularly those that use real-time 3D graphics, places, actions, and events, real or imaginary, are incorporated into a model of the game world. The player then participates in the running of the system by playing the games and interacting with the places, characters, objects, and events programmed into the game world system. In 3D animated films, a 3D character is given a computer generated skeleton, or 'rig', that simulates the movement of a real-world human or animal. These skeletons may be modified for artistic and aesthetic reasons but the simulated skeleton should move and react like a believable creature as much as possible. Other applications that use similar technologies are found in flight simulators for training pilots and commercial warfare based video games used in military training. It is clear that these types of simulation are forms of narrative, or contain narrative. But what of scientific data driven simulations? If the new media form of data visualization can be applied to any form of data set, re-mapping it to form new representations, how does this process apply to simulations? Simulations, it could be said, are always inherently narrative, in that they attempt to tell a story of the system they represent. Through the application of data visualization techniques two choices are immediately clear; the choice between abstraction and narrative. Simulation to abstraction is not difficult to achieve in that no remnants of the original is necessary for an abstract representation. Narrative on the other hand creates an additional challenge in that the simulation will either reframe the original narrative content of the simulation or replace it with another. This process of remapping of narratives is the goal of SKA-LFG; restoring the spatial, temporal axis of narrative (syntagm), rather than the presentation of the model, or system (paradigm), under another guise.

The Sublime in (Big) Data Visualization

The concept of the sublime is central to SKA-LFG in two important ways. Firstly, the aesthetics of the sublime, the sublime as an aesthetic category, like that of the beautiful, and secondly, the sublime as it has been negatively referred to in relation to data visualization; the anti-sublime. The aesthetics of the sublime refers to the experience of awe where human perception is overwhelmed in its attempt to comprehend the object of contemplation in its entirety. It is through this overwhelming of the sensible faculties, that the mind through its cognitive reasoning demonstrates its ability to comprehend the phenomenon not only in its entirety but to comprehend something even bigger than the sensible object – God. The anti- sublime ideal in data art as set out by Lev Manovich in his essay of the same name (Manovich 2002) proposes that the current practices of data visualization in new media art is anti-sublime in that the feeling of awe and wonder, even of terror, is sanitized through data visualizations attempt to represent the masses of data at their source as being on a human scale. SKA-LFG restores the experience of the sublime through maintaining the narratives of the gods in the presentation of radio astronomical data sets. The heavens have been mapped with narratives over millennia. These narratives of creation, of the exploits, adventures, and tragedies of gods and goddesses form the narrative intent of the SKA-LFG project.

SKA-LFG project methodology

SKA-LFG is a new, long term collaborative project partnering the Institute of Radio Astronomy and Space Research (IRASR) at AUT University, Auckland, New Zealand, the School of Art and Design (AUT), the School of Mathematical and Computing Sciences (AUT), Colab Virtual Reality Laboratory (AUT), and international SKA research partners such as Commonwealth Science and Industry Research Organisation (CSIRO), Australia. With original proof of concept developed at AUT University's Warkworth based radio telescope, SKA-LFG is scalable to three exponentially higher resolutions;

- The VLA in New Mexico, USA, has 27 antennas. The data from the antennas is combined electronically to give the resolution of an antenna 36km across. http://www.vla.nrao.edu/
- MERLIN, operated by Jodrell Bank Observatory, UK, is the Multi-Element Radio Linked Interferometer Network, an array of 8 radio telescopes distributed around Great Britain, with separations of up to 217km. http://www.jb.man.ac.uk/
- The international SKA, will have several thousand antennas, working as a single lens up to 5,500 kilometres apart. http://www.skatelescope.org/

Each resolution will provide a unique set of scientific, technological, and aesthetic challenges.

Each resolution provides the opportunity to explore unique location/area specific cosmologies across a global spectrum. Such cosmologies may include, but would not be limited to, ancient Chacoan archeo-astronomical structures of Chaco Canyon (New Mexico), ancient Celtic and Druidic cosmologies (MERLIN -UK), Mātauranga Māori (NZ), and indigenous narratives of the Dream Time (Australia). SKA-LFG does not intend to speak for these cosmologies but rather seeks to provide a variable, developmental, scientific, and technological platform for engaging with indigenous cultures, to explore these unique traditions, knowledge, and understanding of the universe; a universe which inevitably we all inhabit.

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INFO/ECO

ECONOMICS/INFORMATION/ECOLOGY

What's the Matter? What's the Difference? What's the Use?

Richard Lowenberg

RADLAB

This is an updated and reworked version of a series of essays begun in the mid-1980s. Info/Eco attempts to provoke consideration of the new 'information economy' within an integrated, whole-systems understanding of 'ecological economics' and the role of the arts therein. – RL

"Words ought to be a little wild, for they are the assault of thoughts upon the unthinking."

(J.M. Keynes)

Art & Economics: Towards a Cultural Ecology (Abstract)

In this age, increasingly shaped by communications and technology, humanity is becoming acutely sensitive to its frail security. The rationalism of science continues to accelerate the conflict between global mind and local body. Energy and information are now our major exchangeable natural resources. They constitute the primary components of the value system in a newly emerging economic structure.

Within the broad framework of information theory, the arts are recognized for their communicative efficiency and transcendence. The processes of creativity, though elusive, have lead mankind through historical mazes of uncertainty. In an information-based society, cultural development may assume an economic value comparable to that of military development in an industrialized society. Having learned to recognize the complex ecological interdependence of living systems and the environment, artists ought now to produce models of a sustaining cultural ecology.

State of the Arts

The arts, reflecting the state of the larger political, economic, and social environment, are in serious trouble. Too many artists are playing it safe, today. The role of the arts in this society, is now largely shaped by confused intellectualism; selfish, vested-interest capitalism; and absent-minded, fashionably crafted artificiality. There must be more.

There is, of course. There are many artists and cultural institutions working with deep, sincere integrity and dedication. Their creative life, admittedly, is proceeding at odds with a more dominant social momentum. Their perseverance and efforts are to be encouraged.

This essay hopes to provoke thought and discussion aimed at clarifying certain issues that are at the core of our human-environment relationship; and at the heart of our valuation of culture and creative action, for a more intelligent and sustainable society. There is a need and an all important opportunity for creative people, artists, to take full advantage of the great independence and freedom inherent in their calling, to take a more active personal responsibility to be proponents of a true sense of ecology; a cultural ecology.

A DECEPTION IS BEING PERPETRATED.

IT IS NOT AN OVERT DECEPTION.

IT IS NOT A COVERT DECEPTION.

IT IS THE EVOLUTION OF MISCONCEPTION.

Economics

There is no denying the miraculous evolutionary history of our belief systems, but our current political economies, fictions of ideology, have become an unmanageable misunderstanding of life, sustaining resources and values.

Capitalism, Communism, Socialism, etc. are political contrivances; catch-phrases that deny a comprehensive knowledge of the value of human life and work on this complexly dynamic planet. They are, more directly, sophisticated systems for social control. Intellectual impositions on society-as-system, they do not adequately account for turbulence, random effects or failure. These systems are, in fact, the antithesis of true freedom and democracy; social concepts and goals that ought to carry a profound responsibility for us to be more creatively intelligent and humane.

Our cultural economy is an integral part of, and merely mimics the problems and inconsistencies of the larger economy. In assessing our circumstances, actions, and intents, it becomes clear that the socio-economic bottom line is invariably tied to 'quality of life.'

Society is experiencing accelerated, consumer-driven, global, post-industrial, technological communications development. Often labeled the 'Information Revolution', this evolutionary force is in part supported by a military-industrial power base, and by a selfishly motivated, catch-up minded technocratic elite. Though not a singular conspiracy, the results of this evolutionary tragedy-of-errors is that increasing populations of people around the world are confused and frightened by newly emerging class differences and social controls, while being torn from their sense of culture, and knowledge of place. This version of the Information Revolution is a sham.

"From a purely physical viewpoint, the economic process only transforms valuable natural resources (low entropy) into waste (high entropy). The true economic output of the economic process is not a material flow of waste, but an immaterial flux: the enjoyment of life."

(N. Georgescu-Roegen)

Ecology

The dynamic radiative information environment, the flow of information, and the sensory and communicative nature of information, have not been included in most whole-systems ecological thinking and applications, to date. It is a major error in human understanding that will have troubling consequences, as we increasingly interact with and manipulate this fragile ecosystem.

Ecology is the study of the complex relationships between living and non-living, inter-dependent dynamic systems. It describes the fragile balance in which such systems interact and by which they co-evolve. Information Ecology extends our basic understanding of ecology to include the physical, social, and economic transformations being wrought by the rapid developments in information technology, networked learning, and by our becoming an increasingly networked "society of mind".

No intelligent person can dispute what we now know about Ecology. The complexity of the chaotically dynamic processes that permeate our lives, imposes a dire need for us to reconsider economic relationships and social values. Some economists are now attempting to understand and to propose a new sense of values; new economic theories, based upon our knowledge of ecological processes.

With the Second Law of Thermodynamics, and Entropy as fundamental understandings, this new thinking is beginning to have real and immediate effect among 'green' environmental workers. It has had little broad recognition or effect outside of this interest group, however. Much of humanity, attempting mainly to survive, does not have the resources or the time to consider such 'stuff'; and many of the rest of us, unfortunately, have a very limited grasp of our human relationship to 'nature'. To a great extent, our 'myth-understandings' are the result of intellectual entrainment, induced by legacy hierarchical social systems (governments, religions, schools, companies).

Many proponents of 'ecological economics' seem not to comprehend the big picture yet, either. While their theories are 'right on the money' regarding the 'green' matter-energy environment, they have hardly considered the 'information environment' in their attempts to better manage this household.

The study and practice of Ecology must take into full account the energy-information flux to, from, and on the Earth. Information, thus considered, poses difficult questions as to its potentially increasing physical and social influence, and as to a determination of its value within the broader economic sphere. An economy/ecology of information is as critical to life as that of watersheds, air quality, forests or migrating populations. Properly considered, ecological economics takes full account of value: use value, exchange value, and inherent value.

AN INFORMATION REVOLUTION IS BEING WAGED

IT IS AN ECONOMIC AND TERRITORIAL WAR

BETWEEN POWER AND SERVITUDE,

BETWEEN HAVE AND HAVE NOT,

BETWEEN KNOWLEDGE AND CONFUSION.

CLOAKED IN DECEPTION,

IT IS WAGED BY A VESTED INTEREST

IN NEGATIVE ENTROPY;

FUELED BY A THERMODYNAMIC LIE.

Information

"A bit of information can be defined as the difference which makes a difference."

(Gregory Bateson)

All too often, in considering the environment, we think of the Earth: soil, water, air, living things, etc.; a material, tangible environment. But these material systems are bound together in a flow of sustaining energy and information: the Earth-Sun-Universe connection. It is this thermodynamic life force, this radiant electromagnetic environment, and its impacts on the human body and mind, to which a sense of ecology must be acknowledged.

Electromagnetic radiation is the propagation of energy through space by means of electric and magnetic fields that vary in time. The orderly arrangement of radiation according to wavelength or frequency is called the electromagnetic spectrum. All electromagnetic waves transport energy-information from a source to a receiver.

Human use and manipulation of the electromagnetic spectrum for communications, and the production and evermore saturating flow of energy for power, are having direct effect upon living organisms, in ways barely understood. This energy-information environment; the flows and concentrations of cause and effect in this invisible, dynamic ecosystem; and the symbiotic relationship between the evolutionary production of communications technology, with the co-evolution of the human psycho-sensory system, is considered too esoteric and unfathomable a subject for most people to involve themselves in.

Information can be considered in a number of ways. Mechanistically, information has qualities much like mass or energy. It is transmitted and received with some force or action. Information channels may be compared to the

nerves and bones in living systems. They are the web of social communications. The flow of information determines the course of dynamic social evolution. According to this view, information may be treated as a useful natural resource; a commodity that can be transported, bought and sold, and regulated.

"Capital is knowledge imposed on the physical world in the form of improbable arrangements."

(Kenneth Boulding)

Information, however, must also be considered as patterns of perception, relationships and differences. In coming to terms with an ecology of the information environment, with an ecology of the force, the message and the medium of this valued natural resource, accounting for such dynamic cognitive and sensory processes must be integral to any comprehensive formulation.

Lest we give ourselves too much credit, let us realize that all living systems are incredibly fragile. The overpowering chaos of the universe is miraculously awesome. The continuous, delicate balancing act between order and disorder involves us entirely, from molecule to mind. High entropy (chaos) matter-energy displays resistance and implasticity. It is the quality of low entropy (order) that makes matter-energy receptive to the imprint of human knowledge and purpose. We can neither create nor destroy matter, energy or information. We live on the qualitative difference between these natural resources and waste; the increase in entropy. High entropy; noise in the information environment, is constituted by ignorance, confusion, falsehood, and deception. To ignore the simple and elemental truths of the Entropy Law, is undoubtedly to promote more undesired disorder over time.

The Information Revolution, if it is primarily a technology mediated revolution, will likely result in increased consumerism, social systematization, bureaucracy, waste, and war. The more cumulatively energy consuming and less ecologically sustainable, the more fragile technological progress will become; and ultimately more disruptive in its potential (inevitable) failure.

Life's delicate balance requires greater sensitivity and perception. An ecology of the information environment; an 'ecology of mind'; would foster intelligence, creativity and inspiration as our most valued resources. Within this conceptual framework, the arts and sciences, in pursuit of truth and beauty, ought to be the ultimate exemplars of a culturally rich, sustainable community.

This would be a real Information Revolution.

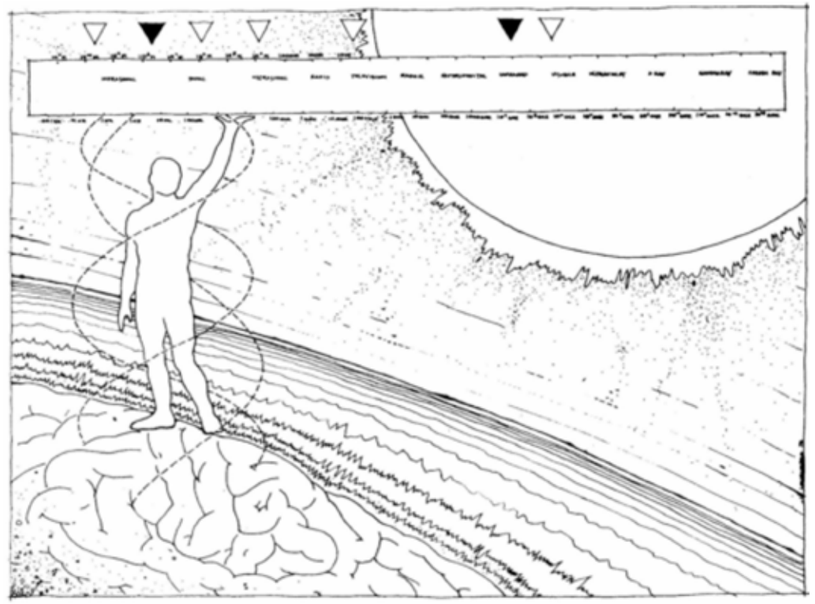
IF IT IS NOT MATTER, IT IS ENERGY.

IF IT MATTERS, IT IS INFORMATION.

IF IT DOES NOT MATTER, IT IS NOISE.

Information Ecology: The Nature of Information

- Information, like matter and energy, is a primary ecological constituent.
- Information requires life, and it endows life.
- Information is universal, with qualities and properties varying according to scale.
- Information is the difference in a state of being resulting from any interaction, macro to micro, between two or more systems.
- Information at human-earth scale may be thought of as a complex dynamic environment, with which all of life interacts.
- The dynamic flow of information tends to reorganize living systems and social constructs.
- The human brain and nervous system have evolved through cumulative genetically coded experience, unique self-referencing processes, and a seeming tendency to be all knowing.
- Human senses evolved to sense narrow visible and auditory ranges of spectral information, though we invisibly and intangibly continually interact with all information.
- Human technological development allows us to tune in to and manipulate large parts of the information environment.
- Information has value. It may be free, cheap, or expensive, based on its availability and demand, processing requirements, and ability to make a difference.
- In human terms, pollution and waste in the information environment are qualitative: ignorance, confusion, deception; as well as quantitative: sensory overload and high noise to signal ratio.



Art and Culture

Art has become an almost indefinable term. It is the irony of the 'information age', that reflecting the crisis of meaning in our lives, the arts are being relegated to the marketplace of mass-appeal superficiality; having become popularly synonymous with entertainment, fashion and commercial product. At the same time, the richness and diversity of wilderness and indigenous cultures around the world, is increasingly being valued for its scarcity and novelty, while being exterminated and replaced by the greed of progress and 'new world orders'.

The mindless pursuit by artists, of 'the good life'; of 'making it'; at a time when all humanity should be questioning the existing order, is revolting. To call oneself 'artist', is either a grand conceit, or a bold decision to assume greater individual creative freedom. That freedom ought to carry with it, a responsibility for honesty and transformative intelligence. Artists, having chosen a freedom of aesthetic and intellectual vision and pursuit, are almost always at odds or in conflict with the prevailing social norm. This is precisely the artist's value. The artist is in a way, the personification of society's means of checks and balances; the promoter of individuality and nonconformity, amid the ever increasing systematization of this information-based world.

While some artists yell "censorship" at recent reactionary assaults upon their freedom of expression, many are ignoring the larger conspiratorial censorship of the social spirit. We are in the midst of an 'information war', the ecological consequences of which may be devastating.

ART CUTS THROUGH THE CRAP

IT IS A DEVIOUS MODE OF HEALING;

THE VOODOO OF AN INFO-CULT.

IT IS THE IRRATIONAL

BECOME INSPIRATIONAL.

The Information Revolution, as it is presently evolving, is a runaway conspiracy of control. The forces of homocentric, selfishly misguided business-as-usual, living in fear of nature's wondrous dynamics, are perpetrating an undeclared eco-war; a turbulent disruption of ever increasing and threatened human populations. The volatile social waste produced in the wake of such 'progress', is contaminating our physical and perceptual environments. Our cultural bodies and minds are suffering the effects of this great thermodynamic deceit.

If we take the incentive of applying our creative talents towards an ecologically considered future, we must be comprehensive. Society is in need of clear, intelligent, inspired communication, the nonmaterial information resources that constitute the true wealth and aspirations of a culturally secure community. As technological

development shapes our concepts of the future, those artists working with new tools and processes, need to weigh the eco-cultural worth of their endeavors, against their merely being narrow-minded advocates of technological consumerism. As communications systems advance into the 'photonic era', where will we find enlightenment?

Will artists, sensate pathfinders, contemporary tricksters, lead the charge in a real Information Revolution? We may have the least to lose and the most to gain. Artists, as cultural agents, must make some difficult decisions, but have equally exciting opportunities to set examples, create models, and express simple truths. Let's be overt. Our very survival is at stake. Amid life's complex compromises, creative idealism must be part of the equation.

THE BEST DEFENSE IS A CULTURAL OFFENSE.

Richard Lowenberg rl@radlab.com

HIKING WITHOUT NATURE

Mobile Media Happenings and the Performance of Everyday Wilderness

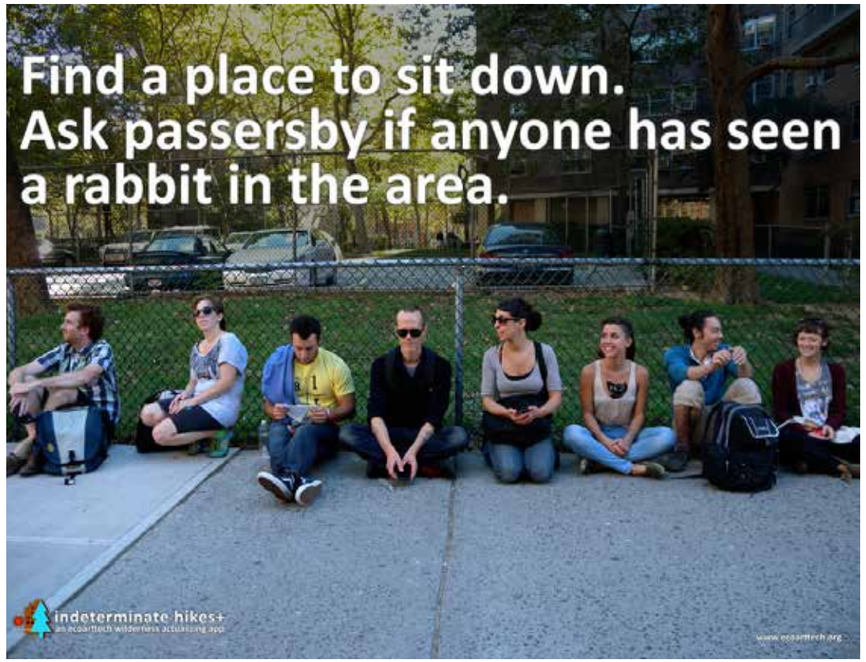
Leila C. Nadir and Cary Peppermint

ECOARTTECH / UNIVERSITY OF ROCHESTER

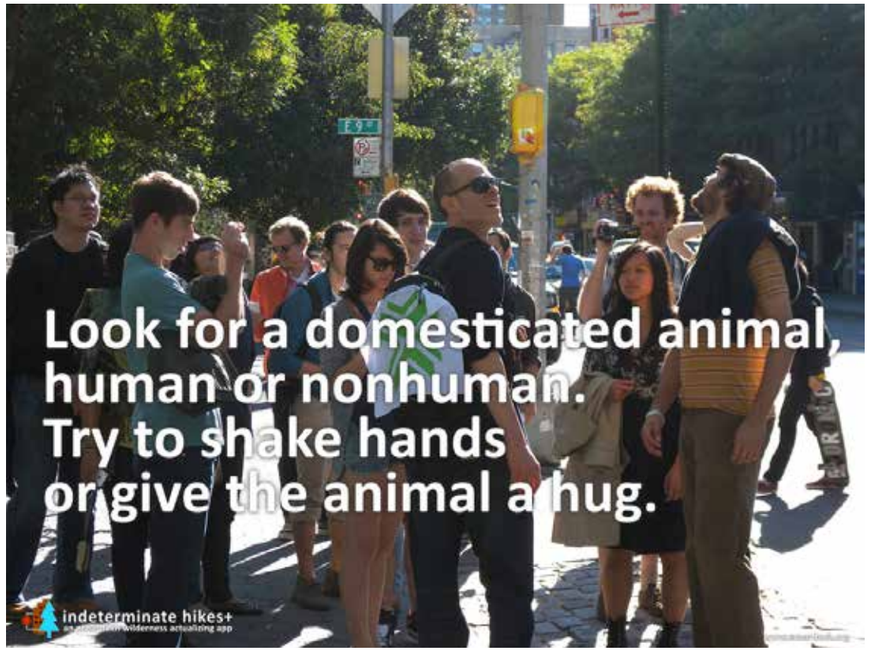
SUBMISSION TO *ISEA 2012 CONFERENCE PROCEEDINGS*

MAY 2012

INDETERMINATE HIKES +

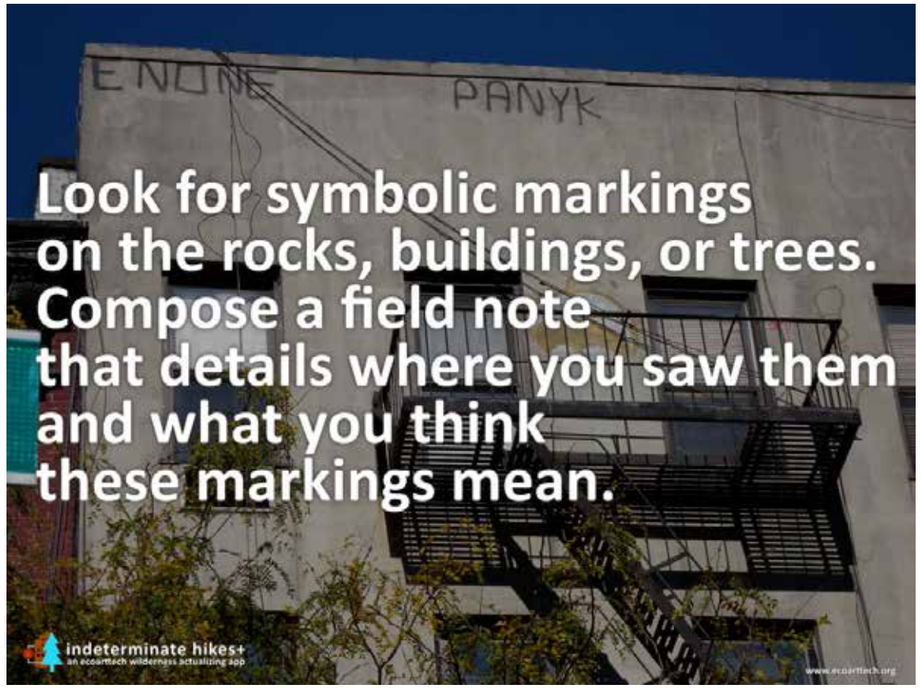


What is a waterfall? A cascade of water tumbling over boulders, brilliant in the sun, beckoning backpackers with sturdy leather boots to climb into remote, magical valleys? Or inspiring tourists to follow road signs to popular, sublime spectacles, such as Niagara Falls. Or the path taken by droplets of moisture falling to the sidewalk from an air conditioner hanging out of the window of an eleventh-floor apartment in NYC.



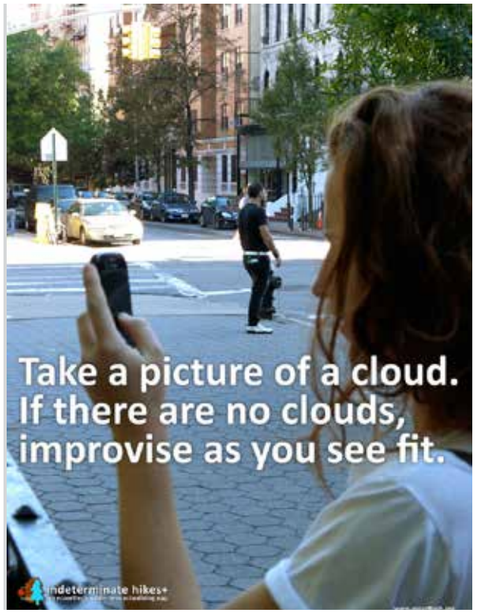
In 2011, our ecology, art, and technology collaborative launched a mobile phone app called Indeterminate Hikes + (IH+) that re-imagines ecological awareness. Ecoarttech's post-disciplinary work fuses theory with creative practice to deconstruct traditional environmental categories, showing the limits of preoccupations with wilderness, nature, and the rural and exploring the sort of ethics that might arise from cities, suburbs, the cultural commons, and even the "virtual" environments created by new media technologies. A significant part of our practice is the effort to rethink the remoteness and inaccessibility so often applied to "nature" or "wilderness" in contemporary critical theory. This separation of the social from the natural has silenced public, democratic discourse about environmental issues, according to Bruno Latour, and for Timothy Morton, modern thinking has turned "Nature" into "a reified thing in the distance, 'over yonder,' under the sidewalk, on the other side where the grass is always greener… in the wild," preventing "access to the full scope of [ecological] interconnectedness" (Latour 75). When we co-founded ecoarttech five years earlier, our aim was to create eco-art "without nature"—to borrow a new phrase from Morton's book, *Ecology without Nature*—and to examine what it means to be an ecological being in the context of convergent networked environments, biological, digital, social, and cultural, from biological systems and industrial grids to media networks and the world wide web. Indeterminate Hikes +, enters into dialogue with theories like those posited by Latour, Morton, and others by bringing nature out from its "reified," faraway realm and into daily life. However, Indeterminate Hikes holds onto the concept of wilderness—not as a synonym for an originary Nature, which is ethically and intellectually immobilizing concept, as Latour and Morton point out; but rather as otherness, the unimaginable, that is both part of and beyond the self, wilderness can call on us to see un-wild environments in bewildering ways. In the IH+ smart phone app, the discourse of sublime wilderness is imported into everyday locales, transforming chance encounters

on the street into public performances of bio-cultural diversity and wild "happenings." Inspired by the way Fluxus in particular, and early- to mid-twentieth-century avant-garde art movements in general, reinvigorated the way we see mundane life rituals, IH+'s artistic gesture refracts this ethical impulse into the contemporary concern of about the environment.



In 1961, four years after he coined the term, Fluxus artist Allan Kaprow described happenings "as events that, put simply, happen." Unlike theatrical performances, happenings are improvisational, with "no structured beginning, middle, or end." "Open-ended and fluid," they dissolve the artist-audience hierarchy through interactivity, "melting the surroundings, the artist, the work, and everyone who comes to it into an elusive, changeable configuration." Kaprow noted that happenings should take place faraway from galleries and museums and instead occupy places such as artists' studios or the "sheer rawness of the out-of-doors or the closeness of dingy city quarters." The more "un-artiness" the context, the better. Adopting a metaphor with ecological and natural history resonances, Kaprow suggests that the most "radical Happenings flourish" require an appropriate "habitat": that is, "the place where anything grows up… giv[ing] to it not only a space, a set of relationships to the various things around it, and a range of values, but an overall atmosphere as well, which penetrates it and whoever experiences it." This atmosphere of inter-connectedness produces new forms of awareness for all involved—but without any particular, intended goal: "nothing obvious is sought and therefore nothing is won, except the certainty of a number of occurrences to which we are more than normally attentive." The only assured result of such a performance is the possibility of becoming attuned to any number of vague "occurrences" (Kaprow 16-18).

New media art in general—due to its ephemerality, performativity, interactivity, and use of everyday computing devices—cannot be understood without Kaprow's concept of the happening (Wardrip-Fruin 83). Yet we would like to show how IH+ performs a particularly ecological, psycho-geographical kind of happening, adapting Fluxus guidelines for performances to the democratization and re-imagination of nature and wilderness. IH+ can be performed in two capacities: (1) as an interactive public event led by artists with audience interaction—an open-ended hiking excursion, with no clear beginning or conclusion, conducted by "guides" who facilitate an interactive, un-arty, improvisational tour; or (2) as a private event, involving a solo user and her/his smart phone. If we return to Kaprow's 1960s writings, we find that both manifestations qualify as typical happenings: there are "guided tour" performances, but with most happenings, he explains "there should not be (and usually cannot be) an audience" (64). Providing examples of such solitary happenings, art-as-life activities with no public staging, he includes "the unconscious daily rituals of the supermarket, subway ride at rush hour, and tooth brushing every morning" (87). During an age of ubiquitous computing devices, walking by oneself and using a smart phone for its guiding and mapping tools is surely a new "unconscious ritual" of everyday life.



Here is a technical description of how the app works, which we will follow with a discussion of its theoretical implications. Once IH + participants have downloaded the app, they provide their locations—whether in a mega-metropolis, a remote small town, or a traffic-jammed suburb—as long as it is identifiable through Google maps, and in turn, the app suggests a "hiking trail." As the hikers move along their trails, either alone, in a group, or as part of a designated ecoarttech performance, they are notified when they reach a "Scenic Vista," where they are encouraged to pause and contemplate the view, much as they would during a mountain climb or a national park excursion, or at one of those pull-off stops along a scenic highway. At these stops, the app asks participants to engage in three activities. First: to take 30 mindful breaths during a five-minute break. Second, the app provides a series of directives, such as "Follow the path of falling water," "Listen to the mood of the walking path," "Note the trees bursting from the ground," or "Wander the caverns on the surface of the earth." However, Indeterminate Hikes Scenic Vistas have a decidedly different character than what one might expect on a traditional wilderness excursion. Rather than the stereotypical breathtaking, sublime panorama, where cameras are inevitably pulled from pockets (often among many like-minded tourists) to document one's arrival at a meaningful landmark, IH+ is programmed to choose "Scenic Vistas" entirely at random. Therefore, these directives—many of which are provided by prior performance participants—take on meaning relative to their location.

Through backpacking terminology combined with Scenic Vistas' "chance operation"—a term associated with Fluxus performance artist John Cage, with whom Kaprow studied—the performance weds wilderness vocabulary to the most "civilized" spaces. This is not an ironic or sarcastic gesture. A "walking path" may be a nature trail or it may be a well-traveled concrete sidewalk; wandering "caverns" may require spelunking through caves or taking the stairs or elevators into the vast depths of basements or skyscrapers; "falling water" may be a brook flowing over rocks or the stream coming from an apartment supervisor's garden hose watering grass. No matter the shape of the improvisational moment, both the artist-guides and the audience-hiker are encouraged to give these chance spectacles the attention they would give a sublime natural wonder. The sense of ecological wonder usually associated with sublime, "natural" spaces, such as isolated national parks, is applied instead to often-disregarded locations, such as alleyways, highways, or garbage dumps—just as the avant-garde worked to take art out of academia and the privileged art-world and into the ordinary. What if we redirected the sort of awe and respect normally reserved for museums, art galleries, wilderness parks, and nature preserves toward the rituals and places we experience every day? What if we call a sidewalk "wild" or tooth brushing "art"? How does this change our sense of ethical imagination?

For anybody invested in the purity of wilderness or unable to see the ecological "otherness" that exists all around us, IH+ can seem to have made a wrong step, and we have had participants leave our hikes in frustration. One man who found our performance nonsensical exclaimed that there were no "wild animals roaming around" as he stood at a NYC intersection busy with human pedestrians jostling their way into a subway entrance. It is also interesting to watch some participants' agitated expressions when the app asks them to "make friends with a tree"; apparently, this directive is a bit too "treehugger-ish". As with Kaprow's happenings, some hikers "are not sure what has taken place"; however, "when something goes 'wrong,' something far more 'right,' more revelatory, has many times emerged. This sort of sudden near-miracle… [is] made more likely by chance procedures" (20). With this in mind, the app asks all participants to capture and upload an image of their "near-miraculous" environmental observation to the IH+ website. This is the app's third, and last, directive. The images are archived in the Scenic Vista database, where they are browsable by online visitors. The growing collection of indeterminate nature photography demonstrates the de-hierarchization of environments, bringing domesticated, sometimes desecrated landscapes, to the level of consideration usually accorded only to "nature."

To download the Indeterminate Hikes+ app, visit http://www.ecoarttech.org/indeterminatehikes/index.html.

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PORTABLES DEVICES

Ignacio Nieto

LATIN AMERICAN FORUM

General View of the exhibition Portables National Museum of Fine Arts. Mall Plaza Vespucio Gallery. August, 2010

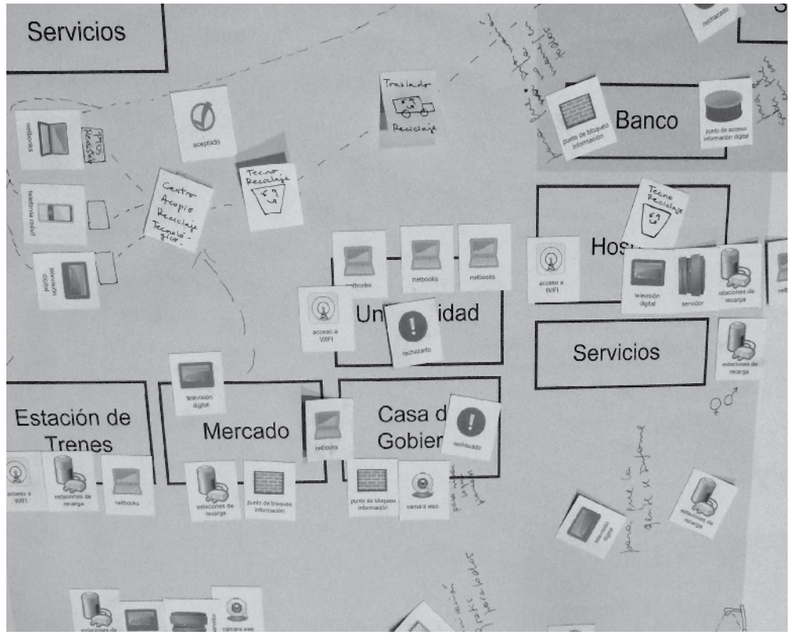
ABSTRACT

Portables, consisted of a curatorial project, which the notion of portable devices was discussed and reflected upon. Electronic devices were developed by artists and then presented. The set of activities included in the curatorial project were: a cognitive mapping session, two workshops of locative media, one in a public school and the other one in Centro Cultural Matucana 100, four presentations of guest artists, seven documentaries of the electronic devices developed by artists working in the city, and an exhibition in the gallery of the Museum of Fine Arts of Santiago.

All activities that were involved in the curatorial project, worked under a critical line of thinking assuming the notion of portable devices. This concept, derived from the Anglo-Saxon word "wearable," refers to the use of circuits or computers that have been introduced both internally and externally to a given body, usually a person. Originally, these devices consisted of health monitoring systems and performance analysis models. Since the term "wearable" has no Latin root, it became necessary to find a word to replace it and portable was chosen.

Unlike the English word "wearable", I choose the term portable, as it relates to a broader term than wearable. The word is generally used for microcomputers, or last generation circuits, overlapping in dress and tied to a new area of costume design called "fashion technology." The term portable stands apart from a fashion aspect, and opens a range of possibilities to the artistic production, canceling the consumer´s fashion priority. Not to delve into what I'm wearing, if not in what I carry with me. I wear, in addition to clothing, analog and digital technologies embedded in wireless networking, which transferred from millions of dollars per day, to millions of published comments in Facebook. Sizing the phenomenon, and to approach some issues that have emerged recently, has been the role of curatorial project *Portables*.

The artists that took part in the *Portables* exhibition were: Michelle Teran (ca), Ricardo Miranda Zuniga / Kurt Olmstead (ni/us), Chimbalab (cl), Alejandra Perez (cl), Otto von Busch (de), Carolina Pino (cl), GraphTech (mx).



Details of the cognitive map done by one of the working groups. Matucana 100 Cultural Centre, July 2010

Portable Devices

Portable Devices is an extension of the work done two years before in Santiago called Portables, which arises to make visible the artistic practices that involve appropriation, reuse, and development of tools and techniques emerged from information and communication technologies, and, as well, to generate collective experiences between artists-researchers and the community at large, who can exchange views, to determine relationships and distinctions between devices produced by these sectors and the developers made by the artists.

The presentation of Portable Devices consists of two sessions:, the first format is of a case study (conference), and the second with a work in round tables format.

The first session will last one hour and will present the exhibition curated by *Portable* shown last year at the National Museum of Fine Arts in Santiago, Mall Plaza Vespucio gallery. The case study will consist of the introduction of portable devices by artists and then submit the video recording of works operating in the public space, and the photographic record of the exhibits in the museum.

The second session will last an hour and a half, will work with Cognitive Mapping teaching tools. A map of the fictional city will be produced and stickers that represent portable electronic devices will work as the leitmotif of a game that will be played to discuss the invasion of the portables devices in different socio -economical metropolitan areas and buildings of this fictional city.

The main objective of the workshop is to serve as a meeting point for different artists who have reflected on portable electronic devices as art pieces. The workshop will exchange ideas through the cognitive mapping session. The session aims to make individual reflections, create as a tension between what 'I think I know' and what 'I can represent my knowledge', or inter-subjective confrontation, where two more people negotiate meanings from their positions of argument.

The session aims to explore the invasion of portable devices these last few years. This will work with a map of a fictional town, to plot the movement of the electronic devices within the city, how they operate and exchange information, build new subjectivities and new needs, and thus economic managers of capital.

The discussion will be recorded to prepare document of the experience done in the workshop.

Bio

Artist, teacher, designer, writer and programmer, Ignacio Nieto has been devoted to research, development, and implementation of strategies related between art and digital culture. Last year he was jury of Matilde Perez Competition, an exhibition made at Fundacion Telefonica Santiago, he has also developed a Wi-Fi intranet in a popular neighborhood in Santiago and made an art piece involving Wi-Fi portal, Arduino circuits and JavaScript programming language which was shown in Galleria Centro in the city of Talca, Chile.

Currently he is preparing an interactive robotic installation for the International Sound Art Festival Tsunami. He also belongs to a research team focused on Zerbarini Latin American net.art, directed by Argentinean artist Marina and funded by National University Tres de Febrero (Buenos Aires). It focuses on individual research of new programming platforms for tablets and mobile phones.

He teaches the programming language Processing, at the School of Arts and Photography at University of Science and Communication UNIACC and JavaScript and HTML5 in the school of Design and Communication at the Pacific University, both in city of Santiago, Chile.

ANTHROPOPHAGIC RE-MANIFESTO FOR THE DIGITAL AGE

Vanessa Ramos-Velasquez
WWW.QUIETREVOLUTION.ME

Who discovered whom?

Was it the Portuguese discovering the native Brazilians just because of the effort in building the caravels, setting them onto the ocean and embarking on the long trip?

Why not the other way around?

Just because the indigenous people were in a passive position of merely having their eyes open and seeing the foreigners arrive?

Who ate whom?

Since your discovery, you have taken our colors to brighten with a brilliant red your ecclesiastics and royals, while we contaminated you with our tireless smiles. Now let us taste you in your new garments. We'd like to see through your engorged eyes and incorporate your assimilated happiness.

It's too late to turn back and contest it. Let's accept the past, but turn the table onto the future. We ate everything and swallowed it dry, but now may we spit it out with a lot of flavor to make good for the foreigners' eyes and leave them hypnotized with so much hunger.

Our pau-brasil wood was taken away, we were left with just a name: Brazil, while getting stuck with a stick. So, cover your assets, 'cuz now it's our turn at bat'.

Pindorama is no longer! Never! No going back! Hail to the technologic indigenous of the digital revolution who wants more than a whistle blower toy.

We want more than your whites and blacks brought from faraway lands, give us thine colorful data from the virtual worlds. But we want to find ourselves without getting lost in the depths of the jungles yet to be un-clothed.

Primitive now is almost gone, but maybe there are some Canneds and Bottleds in the burned bushes. Everything has been discovered and uncovered. Will we have to revert to being children content with our pre-logic, or will we be satisfied with the logic shop of forgotten revolutions of each year as new versions dictate?

To whom will The Contemporary Primal Scream belong?

Hail to Innocence and Purity! May they never lose themselves in the post-modern emptiness of the Matrix, the new belly button of the world!

Hail to the ignorance of the infant unknown to pixeland!

This time, what will the rich contribution of all mistakes be?

Hail to the En-Tropicalism of all the Souths.

Hail to the Laptop! The True Talisman of Happiness!

If someone presses the "delete" key, will history be erased? Oh! Good Ol' times those of the Red Telephone? It was just one button of reserved access limited to just one or two crazies. Now every loony has one!

So, let's blow those whistles at all the Cabaret Voltaires of every street corner.

The mind's sweatshop does not stop; the blood, sweat and tears run infinitum while the soccer, carnival, coffee, booze, and brown-skinned beauties leave everything neon-bright and dazzling. The little boat floats at sunset as night falls and your moon fights for space with our sun.

Our neo-concretism is your concretism, let's make everything right, left, forward or backward, doesn't matter, everything's unisex, one-size fits all, made in China, imported and exported until it hurts.

Our cannibalism is your income source and pride in feeding us. Your trash is our treasure which we resell to you for twice the price. Our poverty is your window through which you feed your curiosity. Therefore, do not complain who is using whom, or who is eating whom. This is a two-way road and no one needs to get stuck in it.

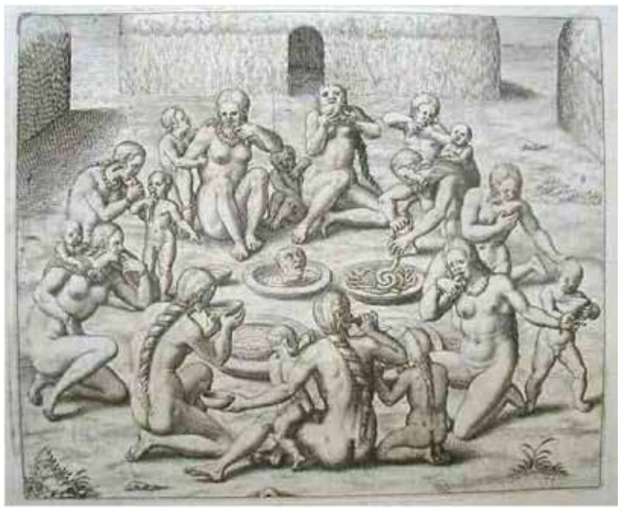
In nature, nothing is created, nothing is destroyed, everything is transformed; and now in the new era where all are one's and zero's, make your own mathematics and mixture, see what comes out of the anthropologic blender, which really has no logic.

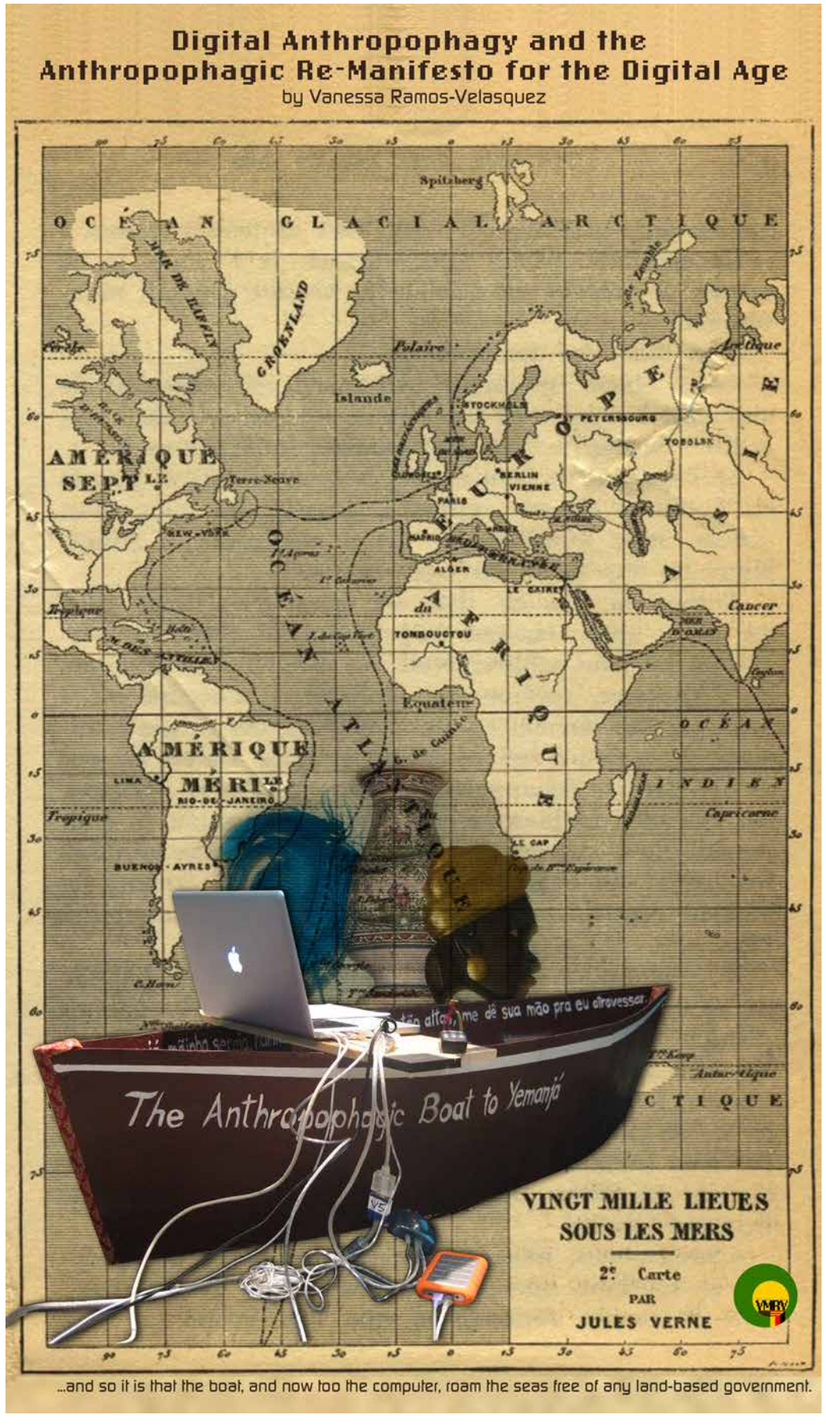
Invention is the mother of necessity.

Transfiguration is a reaction of existence.

Manifestation is the subversion of learned realities in action.

~ COR INVERSUM IN SE IPSUM ~





POST-DYSTOPIA: LANGUAGE, SOUND, AND MACHINES

Luz María Sánchez
CONACULTA / UNIVERSIDAD DE GUADALAJARA

A situation in which no progress can be made: gridlock. [i]

ABSTRACT

Post-dystopia: Language, Sound, and Machines is a larger research and creative project that I have been developing after my study of Samuel Beckett's work in electronic media; my interests in contemporary-news-organizations as the data-build-structures that do the inventory our time; and language in four of its forms: (1) as communication tool; (2) as data, spoken and/or written data; (3) as pure sound; and (4) as a social construction, one that goes from the individual to the collective.

Post-dystopia: Language, sound and machines

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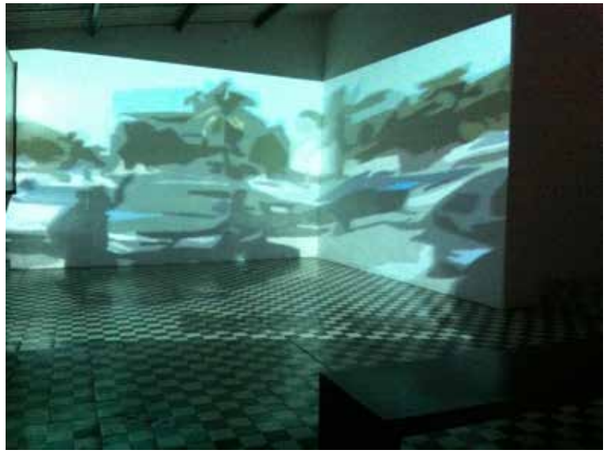
Within these interests, I developed *Dystopic Landscapes*, an artistic project that deals with concepts of altered landscapes and news-media-organizations as legitimizers of the current post-dystopia. This project deals with the subjects of Nation/State, the failure of Contemporary Nations/States, and the rise of un-legitimized violence in a specific study case: Mexico. Given the evident loss of political capacities of the Mexican State at this precise moment, I have been working with the concept of the Mexican Nation as a soft and almost useless apparatus. Nowadays we witness the eruption of parallel power structures that mimic the substance of the concept of Modern Nation/State: the bureaucracy, taxation, and legitimized violence. This is also the time when the triad *border-peace-security* (elements that justify the concept of Nation/State), is broken completely and illegal organizations emerge as perfectly efficient. The domestication of violence and its counterpart,: illegal violence, and how media is crucial in legitimizing both instances.

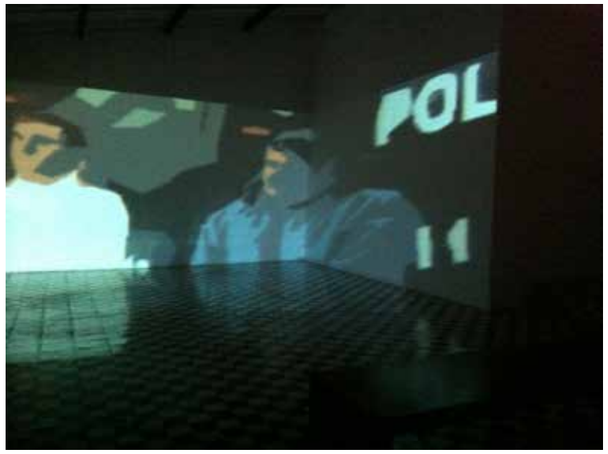
The idea of *Dystopic Landscapes* takes a more profound lecture within the United States – Mexico border region, which is a permanent theme of interest, from soundscapes of the Rio Grande suddenly broken by border patrol sirens (*Untitled* [*Rio Grande*], 2004), to the enumeration of the names of those who died trying to cross this border

(2487, 2006), or the frequencies of the police in the border town of Nuevo Laredo (*Police Frequencies*, 2012). My immersive sound and video environments challenge physical and emotional responses to sonic and visual data through dislocation, duration, and repetition. Minimal in presentation, my projects isolate and amplify politically charged frequencies to abstract and re-map the cultural space. In my current projects I continue to investigate site and language with an aural meditation on current immigration and political debates.

In the case of sound installation *Police Frequencies* [ii] (2005-2012), it captures the swelling aggression on the US-Mexico border region employing sound generated by radio frequencies used by the Nuevo Laredo police. Nuevo Laredo is a border city opposite its twin, Laredo, Texas, on the other side of the Rio Grande in the state of Tamaulipas, Mexico. Sampled together are recordings of activity registered on the regional police frequencies, provided by journalists from the Nuevo Laredo newspaper El Mañana. The main sound sample that is the focal point of the piece transcribes a fight between the Nuevo Laredo police and a criminal group not identified. The US-Mexico border region is effectually involved in an armed battle with organized crime and drug lords with a violence level that caused the US to close its consulate in Nuevo Laredo the first week of August (2005). Over the past years the violence in Nuevo Laredo has escalated to levels never seen before by Mexican authorities and civilians.

Detritus is an audiovisual installation that presents raw data on the 2006-2012 war against drug trafficking in Mexico and its devastating results among civilians, as seen by media. It includes a single channel projection, with more than 10,200 digital images taken from Mexican electronic media over the period of December 12, 2006 to November 30, 2012. Images are selected randomly, and then projected in a two-second lapse: it will take more than 8 hours to see all the images.





END NOTES

[i] Cambridge Advanced Learner's Dictionary & Thesaurus. Cambridge University Press. URL: http://dictionary.cambridge.org/dictionary/british/gridlock. Last consulted 05/25/2012.

[ii] Stereo sound sample:: http://soundcloud.com/luzmariasanchez/policefrequencies

SYNAPTIC SCENARIOS FOR ECOLOGICAL ENVIRONMENTS

Chair: Jill Scott

PROFESSOR FOR RESEARCH; UNIVERSITY OF APPLIED SCIENCES AND ARTS, ZURICH, SWITZERLAND

CO-CONVENERS: JILL SCOTT AND ELLEN K. LEVY

ABSTRACT

This panel is about how artists and scientists can collaborate with cognitive scientists to addresses environmental issues. Through these collaborations new metaphors and analogies about sensory perception might arise to cause a more pro-active discourse with the public about environmental problems. Creative Economies: "Econotopias," explicitly addresses the need for more sustainable social practices, but can new technologies and scientific methods actually help to verify embodied ecological experience or promote "citizen science"? Digital media might be a viable tool to act as a catalyst for debate and encourage us to deal with "how we might think" about ecological novel problems, rather than "what to think" about them. The raising of our bodily awareness and perception may also affect our levels of attention and force us to reconsider our denial of the sustainability problems at hand. By explicitly exploring the relationship between cognitive psychology and environmental science we claim that public engagement actually requires controversy and an opening up of scientific debates past the consensus view as well as the mainstream media view. However this level of engagement also requires that we gain a more fundamental understanding of our bodily-sense of place within the ecological environment and its complex systems.

1. "The Cognitive Underpinnings of the Denial to Act,"

Ellen K. Levy

PHD; FACULTY, IDSVA (INSTITUTE FOR DOCTORAL STUDIES IN THE VISUAL ARTS)

The biological and cognitive sciences offer compelling explanations of human behavior, which shows that human beings do not always act in their own interests.

Public denial to be pro-active in relation to CO2 emission is one example. This talk will address the failure to act or even attend to what is essential for human survival and how artists have devised works that help spectators become aware of this level of attention failure and how this failure might affect our reactions to environmental complexity.

2. "Our relationship to natural and altered environments"

Patricia Olynyk (DIRECTOR, GRADUATE SCHOOL OF ART; FLORENCE)

Frank Bush (PROFESSOR OF ART SAM FOX SCHOOL OF DESIGN & VISUAL ARTS; WASHINGTON UNIVERSITY IN ST. LOUIS)

A technology mediated world is increasingly desensitized to physical sensation, my work calls upon viewers to

expand their awareness of the worlds they inhabit, whether those worlds are their own bodies or the spaces they occupy. Through multi-media installations that that focus on modes of sensation, and offer magnified images of sense organs with macro-images of garden environments the hope is to heighten our sensate experience between ecology and us.

3. "Extending personalized experience with local engagement"

Nicole Ottiger

ARTIST AND ART PSYCHOTHERAPIST, SWITZERLAND

Our own bodily perception shapes the way we think! By using Virtual Reality technologies to locate our bodies within a specific environment we can expand and perhaps improve our environmental literacy. Therefore, technology can become an aid to locate the self within the ecological system and increase our sense of embodiment. Self-Portraiture, with its reflective analogies can then be a theme to increase this awareness.

4. "Ecological Novelty and its psychological problems"

Angelika Hilbeck

SENIOR RESEARCHER, INSTITUTE OF INTEGRATIVE BIOLOGY. GENOEK – CENTRE FOR BIOSAFETY, UNIVERSITY TROMSØ, NORWAY

As I become increasingly involved in broader issues of bio-technology development and wonder about a democratically legitimated, sustainable global future, the active debate on agro-fuels, international agriculture, hunger and poverty alleviation are becoming more urgent. This requires a trans-disciplinary perspective based on changing "how scientists think" as well as how they communicate to each other. In the European Network of Scientists for Social and Environmental Responsibility (ENSSER) we offer a support group for scientists concerned about the preservation of independent research and particularly about how to transfer these debates about biotechnology into the public realm.

5 "Working in the Experimental Forest: The Intimacy of Language"

Alison Hawthorne Deming

PROFESSOR, CREATIVE WRITING PROGRAM, INSTITUTE OF THE ENVIRONMENT, UNIVERSITY OF ARIZONA

The miss-presentation and bullying of science by climate skeptics has led many researchers to understand that climate change is not only a scientific and technological challenge, but also a challenge of ethics, aesthetics and communication. Working with researchers at the H.J. Andrews Experimental Forest in Oregon, poets, essayists, and philosophers have for several years explored new strategies for Long Term Ecological Reflection that enhance intimacy with place, nature and the desire for a sustainable and meaningful future. This presentation will focus on my work in the experimental forest and advocate for place-based trans-disciplinary practices in science, arts and the humanities.

SMITHSON'S SPIRALS, PATAPHYSICS, AND SYZYGY

Edward Shanken

ABSTRACT

Robert Smithson read about various scientific topics and applied this knowledge to his work, but he was fundamentally anti-institutional, and was as skeptical of science and industry as he was of environmentalism and the art world. His artworks and writings are brilliantly insightful, formally resolved, and logical as well as infuriatingly opaque, unresolved, and incoherent. He died at the age of thirty-five, leaving us to wonder how his work might have matured, and what clues his subsequent production might have offered to understanding his *oeuvre*.

Like the pataphysical proposals of late nineteenth century author Alfred Jarry, who died at thirty-four, Smithson seems to have been seeking out and articulating an alternate reality, a new system of values in which the "imaginary nature of things as glimpsed by the heightened vision of poetry or science or love can be seized and lived as real" (Shattuck ix). In contrast to the academicism of prevailing trends in art research today, Smithson's work seems much more aligned with the pataphysical pursuit of "imaginary solutions" that examine "the laws governing exceptions" and describe "a universe which can be – and perhaps should be – envisaged in place of the traditional one" (Harris fn 13). In this respect, the work of both Jarry and Smithson can provide a useful corrective to an overly rationalistic approach to art research, offering the field – and contemporary art in general – potentially valuable tools for forms of practice that challenge rather than adopt conventional academic models and epistemological constructs.

The copious scholarly and critical writing on Smithson has made very little of the many parallels between the inventor of earthworks and the author of pataphysics, despite the established fact that the artist read Jarry while working on the Spiral Jetty in 1970, which undoubtedly influenced the subsequent Broken Circle &/ Spiral Hill (BC &/ SH, 1971, Emmen.) This oversight can be explained in part by current trends in Smithson scholarship, which disparage readings of the artist's work that emphasize symbolic and/or mystical inferences. Nonetheless, given the insightful literature reassessing Jarry's influence on twentieth century artists including Marcel Duchamp, John Cage, and Rodney Graham, a consideration of Smithson's spiral earthworks in connection with Jarry is long overdue (Harris, Anastasi).

The spiral is a central symbolic figure for both Robert Smithson and Alfred Jarry, adorning the latter's well-known illustration of Père Ubu (1896) and serving as a recurring theme in *Exploits & Opinions of Doctor Faustroll, Pataphysician*, written in the 1890s and published posthumously in 1911. Early in the story, Dr. Faustroll bathes in "two-tone wallpaper painted by Maurice Denis, with a design of trains climbing up spirals." Later in the story the pataphysician drowns, and "the wallpaper of Faustroll's body was unrolled [another spiral form] by the saliva and teeth of the water…. Like a musical score, all art and all science were written in the curves of [his] limbs, and their progression to an infinite degree was prophesied therein." The narrative continues with the following passage, which Smithson entered in his notebook, "A Metamorphosis of the Spiral":

> For, just as Professor Cayley [British mathematician] recorded the past in the two dimensions of a black surface [chalk-board], so the progress of the solid future entwined the body in spirals" (99).

Jarry's pataphysical spiral metaphor (or rather, pataphor) holds potential for interpreting a Smithson's spiral earthworks and their relationship to each other. Following the passage quoted by Smithson, the essentially two-dimensional *Spiral Jetty* may be read as recording the past, while his three-dimensional *Spiral Hill* – an inverted vortex – may suggest a prop for envisioning the future.

Recognized as a key inspiration for surrealism, Jarry insistently joined sense and nonsense, art and science, religion, and perversion. By creating friction through unexpected juxtapositions, and by destabilizing meaning through leaps of logic, he challenged the epistemological foundations of institutional knowledge. Similarly, Smithson was fascinated by science and technology but no more so than he was fascinated by science fiction novels and B-movies, having an "almost mediumistic sensitivity to the cryptanalysis of pop culture," according to his friend, artist Carl Andre (102). Much has been made of Smithson's interest in geology, geological time, mineralogy, the molecular structure of crystals and glass, and, of course, the Second Law of Thermodynamics, known as entropy: the tendency of closed systems to lose energy or order. Similarly, Jarry, who considered a career in science and studied philosophy with Henri Bergson, gravitated toward the "eccentric brilliance" and "bizarre experiments" of Lord Kelvin, who proposed an early theory of entropy, and Clerk Maxwell, whose "Sorting Demon" thought experiment attempted to defy the Second Law of Thermodynamics in order to achieve a net gain of energy. For Jarry, "science was an adventure, domestic and transcendent." (Shattuck, xiv-xv) The same could be said of Smithson.

Following the spiral path shared by Smithson and Jarry offers further insight into some possible meanings of this dynamic form in BC &/ SH. The common meaning of spirals as symbolizing a spiritual journey is particularly poignant, given the pilgrimage required to visit any of Smithson's earthworks. Smithson's performance in the film *Spiral Jetty,* at the end of which the artist runs the length of the spiral counterclockwise from the shore to its center core, has been described as a "reiteration of innumerable initiation rites" (Lippard 225). This cinematic journey does not offer a uniquivocally transcendent moment but, in contrast to Klee's theorization, tends towards total un-fulfillment (Klee 1961). After reaching the terminus, Smithson, slightly out of breath, seen from the back at roughly

forty-five degrees overhead, looks out south-southwest (away from the shore and over the lake.) His figure recedes into the distance as the helicopter filming him pulls back and up into the sky. The ascent of the camera's eye might symbolize a form of spiritual liberation, an ascension in which the artist's eye/mind is freed from its body by following an inward-turning path. At the same time, reaching the inner tip of the spiral has an anticlimactic quality that suggests nothing particularly mystical so much as it seems to confirm, as the artist's monotonous voice-over intones, that it is all just "mud, salt crystals, rocks, water" in every direction. The film leaves Smithson at the tip of a serpent's tail, arrested in time if not history, "bound to the centre" of the spiral that, to use Klee's words, "in the end will swallow [him] up" (399) - a conclusion possible only in the fictional cinematic construction.

Smithson's earthworks elicit completely immersive experiences that are highly charged with affect. They invoke an expanded awareness of space and time and of energetic forces that elude rational analysis on the basis of science, formal qualities, and media. Notwithstanding the film's strategic defiance of the inevitable (i.e. it ends with Smithson at the center of the spiral), anyone who walks the *Jetty*'s counterclockwise spiral path from shore to core must reverse direction and walk clockwise from core to shore. Artist John Coplans noted "One enters *Spiral Jetty* backward in time, bearing to the left, counterclockwise, and comes out forward in time, bearing right, clockwise" (in Hobbs 47). This insight seems related to Jarry's own reflections on the spiral - albeit a three dimensional one - as holding the potential for embodying the future. By contrast, Smithson's film suspends the spiral journey into the future – at least as a corporeal experience - and placed in tension with the ephemeral liberation afforded by the spiraling camera, freeing the point of view-cum-spirit from the physical meat of existence.

While walking the decreasing radius of the counterclockwise spiral to its endpoint, I experienced at once a reduction and compression of energy, which was restored and released by walking clockwise along the spiral's increasing radius back to land. The diminished energetic state may offer a counterbalance to the hypertrophy of post-industrial life. Correspondingly, the compression that results from spiraling-in may be linked to a state of potential energy, which is transformed into the expansive release of kinetic energy during the process of spiraling-out. Whether or not one is transformed by the experience of walking the spiral, ultimately one returns back to where one started and heads into the future. Part of the beauty of Smithson's *Spiral Jetty* and *Spiral Hill* is that they offer fully embodied experiences of the energetic properties of spirals as architectonic forms that turn in both directions, contracting as the radius diminishes and expanding as it increases. It is I unlikely that Smithson, who rejected the occult and Gnosticism, would have attributed anything mystical to the properties of spirals. But he might have accepted their ability to generate affective responses and physical effects, physiological parallels to the "crystal steps" that wind themselves "into a spiral during growth," (Verma and Krishna 207) to quote one of the scientific sources the artist employed in the film's script.

Smithson loved nature and he loved industrial detritus, but most of all he seemed to love their co-existence: the way that entropy was inevitably manifested in each, and particularly in their combination. For just as industry contributes to the degradation of its environment, so the environment contributes to the degradation of industry.

Indeed, the dilapidated remains of an abandoned oilrig and a withering industrial jetty in the red waters of the vast Salt Lake furnished for Smithson an aesthetically ideal setting for *Spiral Jetty*. The site of *BC &/ SH* provides a very different setting: a functioning sand and gravel quarry, filled with fresh aquamarine water, in which bull-dozers and other mining equipment, including a large dredging facility, continue to operate in the background of the artwork; or, rather, *BC &/ SH* co-exists in the background of the industrial site. This play of inversions between foreground and background, of nature and culture, art and industry is suggested in the very form of the *Broken Circle*, whose alternating and continuous arms of sand and water suggest the Taoist unity of yin and yang.

Returning to pataphysics and paraphrasing Jarry's description of the drowned body of Dr. Faustroll, can we "unroll" the body of *BC &/ SH* by the "saliva and teeth" of the many agents involved in its ongoing cycle of death and rebirth? Can we play it like a "musical score" in which "all art and all science are written in the curves…. with their progression to an infinite degree prophesied therein?" More background on Jarry's concept of pataphysics and, in particular, the term "syzygy" aide this approach.

Although *BC &/ SH* is generally recognized as Smithson's only successful land reclamation project, such a contention emphasizes the autonomy of the artwork. But *BC &/ SH* can equally be thought of as an ongoing art restoration project on the part of the quarry, which periodically must reclaim the artwork from the entropic forces of nature. According to Jean Baudrillard, it is this sort of reversal, this logic of turning things back on themselves in order to demolish illusory reality that underlies pataphysics (2007). Jarry defined pataphysics as "the science of imaginary solutions, which symbolically attributes the properties of objects, described by their virtuality, to their lineaments" (22). From this spiraling, winking, bird's eye's view, pataphysics launches its assault on science and philosophy through the death-defying adventures of Dr. Faustroll.

One of the key concepts in pataphysics is "syzygy," which refers to complementary active-passive, male-female pairs in Gnosticism. For psychoanalyst Carl Jung, this archetype symbolized "the communication of the conscious and unconscious minds: the conjunction of two organisms without the loss of identity" (Webster's Online Dictionary). In astronomy, syzygy is commonly used with respect to solar or lunar eclipses, when the alignment of the Sun, the Earth, and the Moon (or a planet) is such that one blocks the view of another by conjunction or opposition. As astronomical exceptions that can be elaborated by rules, such celestial accidents correspond to Jarry's basic tenets of pataphysics and they are central to the cosmologies of many ancient cultures and their earthworks. Such correspondences are particularly relevant to *BC &/ SH*, which has been referred to by Smithson scholar Ron Graziani as a "celestial observatory or an astro time machine" (125). Moreover, in the introduction to the English translation of Dr. Faustroll that Smithson read, Jarry scholar Roger Shattuck claims that the concept probably appealed to the author "because it suggests that something akin to crystalline form may emerge at intervals out of the random movements of the cosmos" (xvii). A general principle of complementary joined pairs can be seen in Smithson's site and non-site works and in his mirror displacements, in which the randomness of piles of salt (whose uniformly ordered molecular structure is crystalline) is juxtaposed with the apparent uniformity of mirrored glass (whose

disordered molecular structure is amorphous.) The particular ideas and rhetoric employed in Shattuck's claim would have appealed to Smithson's dual obsessions with randomness (entropy) and order (crystals).

Syzygy also is a useful concept for rethinking the relationship between the two sculptural forms that comprise the Emmen earthwork. Although Smithson apparently conceived of the elements as independent, autonomous works, referring to them as *Broken Circle* and *Spiral Hill*, he specified their creation in very close proximity to each other at the quarry and conceived of the former as a viewing platform for latter. The twin elements are now commonly referred to as *Broken Circle/Spiral Hill*, almost like a hyphenated marriage, but that convention makes an interpretive leap that must be questioned, as implied in my addition of an ampersand (&) preceding the slash (/) in the title, *Broken Circle &/ Spiral Hill.*

Regarding some of the "wild" accounts of *Spiral Jetty*, Smithson noted that "the force of the twister can get so intense that it breaks into imaginative, or fairy-tale results…. you're propelled into this central image … in Technicolor" (Graziani, 119). Indeed, it is easy to get swept up in, or away by, the sublime aspects of Smithson's work and the artist might well reject an interpretation based on pataphysics and syzygy. At the same time, this approach offers a vantage not just for a rapturous reading but also for pointing out when the artist falls short of the mark. In contrast to the GSM, where the elliptical egg/eye/sun is distinctly connected by a continuous linear element through the coiled body to its spiral tail, the linear element of *Spiral Hill* begins (and returns) behind the mound, where *Broken Circle* is hidden (eclipsed?) by it. This sets up the biggest challenge to interpreting the two elements as a syzygistic pair. While ascending *Spiral Hill,* potential energy accrues as one gains altitude and is compressed by moving counterclockwise along the reduced radii. While the process and exertion of the ascent prepare one, like a pilgrim to a hilltop monastery, for the epiphany anticipated at the apex, the energy remains dormant. From the top of the hill one visually projects psychic energy to the circular altar, the intended object of one's gaze, which lies below (and to its surroundings), but one remains physically disconnected from it. While descending, the store of potential energy, combined with the desire for the circle, is released as kinetic energy. But Smithson's spiral leads nowhere. It ends abruptly at the base of the hill, slightly reversing direction and facing the woods.

How can one make sense of the energetic disconnect Smithson imposes between *Broken Circle* and *Spiral Hill*? Carl Andre, a self-professed Freudian, described Smithson as Jungian. (102). Following Jung's use of the term syzygy, perhaps it was paramount to the artist that "the conjunction of [the] two organisms [occur] without the loss of identity." Perhaps he intended to frustrate the viewer's expectations, to enforce a break between the viewer on the hill and the circle viewed below and between the syzygistic pairs that constitute the twin elements, to disrupt any Technicolor fairytale generated from the "force of the twister." Like the viewer of *Spiral Jetty*, the viewer perched atop *Spiral Hill* occupies a position not unlike that of Caspar David Friedrich's *Monk by the Sea (*1808-10) and *Wanderer Above the Mists* (c. 1818), so Smithson may have wanted to interrupt the sort of sublime reverie associated with the tradition of German Romanticism. Graziani interprets *Broken Circle* as a "disciplinary device in jeopardy … a broken clock," with political implications regarding current ecological debates in which the circle figures as a primary symbol and metaphor. Perhaps Smithson wanted to reinforce the broken state of *Broken Circle* – and by extension, the environment – by breaking the potential cyclical continuity between it and *Spiral Hill*. Andre described Smithson's writings as "incantations" that "follow like the lemmata [a subsidiary proposition] of an arcane and intricate theological argument" and he considered his major earthworks "less as signs to us than messages for the earth carved in her bosom" (102). Might Smithson have been practicing a form of artistic, pataphysical wizardry?

Smithson's work, like Jarry's "neo-scientific novel", creates a temporal lacuna in which past, present, and future seem to co-exist in the vast scale of geological time. The existence of Homo sapiens is but a blip in the course of geological events over hundreds of millions of years in the Earth's history. Perhaps it is Smithson's sensitivity to time, his awareness of continuity with ancient cultures, and his humility with respect to the planet's history that can offer the most useful insights for contemporary artists, particularly those whose work is engaged with the supreme virtuality of emerging technologies and social practices, desiring machines driven by market-driven cycles of ever more rapid development and obsolescence. Such technologies and behaviors are inseparable from the "large-scale death wish" that art historian Jack Burnham (1968) attributed to the ethos of rationalization that for centuries has dominated western civilization, all aspects of which, including science and art, necessarily were pulled into its seemingly irresistible undertow. Smithson recognized this social malady and his earthworks, including *BC &/ SH,* function as a palliative to it. In this sense, his works "shamanize us into realizing our true condition" Burnham 1974, 143). Following the logic of ancient cultural traditions, like those referenced in his earthworks, it is tempting to consider that Smithson's artistic, pataphysical, shamanic incantations "invert the evils of his tribe, and in doing so draw people away from substitute objects and back toward the ancient memories of life and productivity" (Burnham 1974, 144).

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TUNING IN AND SPACING OUT:

Notes on the Presentness of Sound

Edward Shanken
VU UNIVERSITY, AMSTERDAM
Yolande Harris
ORCIM RESEARCH INSTITUTE, GHENT

ABSTRACT

"These are underwater sounds made by humpback whales as they pass near Bermuda in the Spring. They were recorded through a hydrophone, which is a kind of underwater microphone. The water is very deep and the sounds are echoing off the under-surface of waves and from the submarine canyons and ridges on the island slope. If you listened for a long time you would hear that the sounds are organized into definite repeating patterns, so we call them songs, just as we refer to bird-songs or frog-songs. Unlike bird songs, humpback songs are very long, six to thirty minutes, and are strung together without pauses between them. They are probably the longest, loudest and slowest songs in nature" (Payne and McVay, 1970).

The first images of Earth from space and the first publicly released recordings of whale songs were widely disseminated and had a profound effect on popular consciousness on a global scale. The Earth from this perspective seems precious and coherent yet isolated if not vulnerable in space, one of many planetary bodies in the universe. The whale songs revealed these mythic beings as far more intelligent, sociable, and complex, but also far more accessible, far more humanlike, than previously recognized. This tuning in to the sound of whales and spacing out on Earth emerged at a moment of rising environmental concerns and contributed to a growing ecological awareness. Borrowing from cybernetics and systems theory, this awareness recognized the intrinsic interrelatedness of various life forms and the Earth's seas, terrestrial environments, and atmosphere. It appears that popular concern with environmentalism and ecology is cyclical in nature. And we are currently in the midst of another such cycle of heightened awareness, in which the whale returns again, as a central icon, and in which systems thinking underlies current conceptions of sustainability.

This paper purposely ambiguates the roles of the artist and theorist, flowing between scholarly writing and first-hand accounts of personal experiences. It discusses historic and contemporary research on sound by artists and scientists including La Monte Young, Alvin Lucier, Yolande Harris, David Dunn and James P. Crutchfield, and Michel André. The authors share a fascination with sounds from environments that lie outside direct human experience – under water, in the atmosphere and outer space, and at non-human spatio-temporal scales. These environments often do not lend themselves to visual discernment; rather, sound becomes an invaluable means for understanding these spaces, for experiencing a form of "presentness" in them. By presentness we mean a heightened personal

state of being – a psychical form of "tuning in" in which awareness of one's immediate or extended environment is greatly enhanced, expanding consciousness outward from the self into an infinite metaphorical space. We see this operation as underlying the power of field recordings and other forms of acoustic soundscapes. Tuning in and spacing out to the presentness of sound becomes a method for creating an expanded, systemic awareness that is key to cultivating sustainable attitudes toward the environment and to developing interdisciplinary solutions to global ecological problems.

Introduction

The first images of Earth from space and the first publicly released recordings of whale songs were widely disseminated and had a profound effect on popular consciousness on a global scale. The Earth from this perspective seems precious and coherent yet isolated if not vulnerable in space, one of many planetary bodies in the universe. The whale songs revealed these mythic beings as far more intelligent, sociable, and complex, but also far more accessible, far more humanlike, than previously recognized. This tuning in to the sound of whales and spacing out on Earth emerged at a moment of rising environmental concerns and contributed to a growing ecological awareness. Borrowing from cybernetics and systems theory, this awareness recognized the intrinsic interrelatedness of various life forms and the Earth's seas, terrestrial environments, and atmosphere. It appears that popular concern with environmentalism and ecology is cyclical in nature. And we are currently in the midst of another such cycle of heightened awareness, in which the whale returns again, as a central icon, and in which systems thinking underlies current conceptions of sustainability.

Tuning in and spacing out comprises a field in which sound enables a focused presentness that links the internal and the external, joining the individual human consciousness with a larger field of consciousness that is not anthropocentric much less geocentric. Along these lines, La Monte Young realized that "sounds and all other things … were just as important as human beings and that if we could … give ourselves up to them … we enjoyed the possibility of learning something new…." Paralleling Bachelard's (1994) assertion of an infinite world accessible through daydream, Young claimed that by submitting to sound on its own terms, one could "experience another world … [bounded only by] … the limits each individual sets for himself." (LaBelle, 79-80). Indeed, in Young and Zazeela's *Dream House* we experienced a sublime sense of presentness in a sound-space that is at once subtle and overwhelming. It induces a highly meditative state if one 'gives oneself up to it' as Young proposes.

This sense of tuning in - submitting or giving ourselves up to – cannot be controlled like a radio dial selecting precise frequencies. It is more like falling in: falling in love, when one is so utterly and uncontrollably infatuated and sensitive to another being that their reality becomes one's own; falling into the belly of the whale, like Jonah being consumed by a beast that is at once horrific, yet womblike, the vehicle of his demise but also his rebirth. Indeed, many of the narratives pertaining to ecology and to whales straddle the poles of utopian daydreams and dystopian nightmares, and parallel deep mythic structures of apocalypse and resurrection, in which the failure to tune in results in an inevitable fading out.

Surface - Fishing For Sound

Santiago, the Cuban fisherman in Hemmingway's *The Old Man and the Sea* (1952), knows his surface environment, the boat and weather. He knows the underwater environment beneath his boat by the signs he reads from the surface - birds, currents, weed, shoals of fish, the other fishing boats. As the story develops he extends his senses underwater by literally feeling the behaviour of the giant marlin, through the touch of his fishing lines on his hands, his fingertips, and later, his back as it tows him through the sea for three days and nights.

Submerging into a sea of sound, it surrounds, immerses my hearing and my being. Underwater I am out of my element, in a medium in which I cannot survive without technical aids and only for limited periods of time. What does it mean to relate to such an environment through sound?

I try to identify by listening, I listen to myself suspended, floating in liquid. The sound is like the liquid. And I can pull sounds out, fish for them.

Like Santiago in Hemingway's novel, I can catch my sounds from the surface, I can know something of what is down there, through my technology I can listen and by learning sounds and signs from the surface I can understand another medium.

In *The Pink Noise of Pleasure Yachts in Turquoise Sea* (2009-10) Harris explores the relationship between sound and image, making audible the inaudible by "fishing" for otherwise imperceptible underwater sounds, and simultaneously presenting a visual corollary. Suspended over and casting a shadow on the floor projection, a pair of headphones dangles like tackle on a fishing line, inviting the viewer to become a listener. While the sun refracts brilliant pink light that dances on the gentle, turquoise waves, high-powered marine engines under this Elysian surface generate otherworldly sounds (including pink noise). Although the sound waves generated by marine engines are literally present in the sea shown in the video (sadly, a national marine sanctuary in Spain), they cannot be heard without an underwater microphone (hydrophone) with which the artist recorded them, and a sound system to amplify and reproduce them. In *Pink Noise* we simultaneously see the sea as it visible to our own eyes from above it while we witness what dolphins and other sea animals hear beneath it, including the intense sonic impact of humans on the underwater environment.

Underwater

The assumption that underwater is silent has been turned on its head in the last decades as scientists begin to understand just how crucial sound is to aquatic life, in a largely dark environment where sound is used to detect motion, currents and prey, and to communicate. Bio-acoustic scientist Michael Stocker states, "while considerable efforts are being made to understand the auditory perception of sea animals, our understanding is miniscule compared to the vast diversity of sea animals and their adaptations to sound." (18).

It is not yet known what effect changes in the sonic ecology through anthropogenic sound (from human sources)

may have on marine organisms and the larger underwater ecology. Marine bio-acoustic scientist Michel André clearly identifies the problem and suggests that research on cetaceans offers a particularly fruitful line of inquiry into the sustainability of marine ecosystems. He considers them as "bio-indicators of the acoustic balance in the oceans" (2010, 43). Tuning in to how marine mammals perceive their environment through sound and attempting to understand their communication methods will offer crucial insights into the conservation and sustainability of marine ecosystems.

Whales are mammals that breath air, but live underwater. This connection between air and water, between whales and humans, is part of our imaginative fascination with cetaceans, almost like a mirror of ourselves, acting as a bridge between these media. Despite popular fascination with the musicality of whale "songs," the variety of sounds whales make, to say nothing of how they make them, is not well understood. Cephalopods - octopus, squid, cuttle-fish, the Kraken or Giant Squid (the 'Bloop'?) - are even more obscure to humans and yet equally mythical. However, most scientific research on cephalopods has focused on their function as food for whales, the "rock-stars" of the underwater world. André's recent research suggests that cephalopods are extraordinarily sensitive to sound, and experience 'acoustic trauma' - permanent physical damage to the hearing organ - at very low decibel levels. Exposure to repetitive, loud, anthropogenic sound may have drastic consequences for populations of cephalopods, leading André to suggest that such an imbalance in the underwater ecology may be capable of "impacting the entire web of ocean life" (André et al, 2011).

From Humpbacks to *Quasimodo*

Alvin Lucier's music composition *Quasimodo: The Great Lover* (1970) was inspired by the humpback whale's ability to send sounds over thousands of miles. Lucier transforms the "long-distance sound-sending ability" of cetaceans in water into an artwork that can "send sounds over long distances through air, water, ice, metal, stone, or any other sound-carrying medium, using the sounds to capture and carry to listeners far away the acoustic characteristics of the environments through which they travel" (Lucier, 318). In this way, Quasimodo provides an artistic model for human listeners to encounter a form of long-distance sound transmission and to experience how sound changes as it travels through various media.

Quasimodo consists of a chain of microphones and loudspeakers that passes from the first space where the sound begins, collecting sound that is transformed by each adjacent acoustic space and medium it travels through. The end result, at the final location of the chain, is a cumulative sound based on transfer over distance by means of alternating transduction of sound from electronic signal to sound waves reproduced and transmitted through successive spaces/media. Of her experiencing performing *Quasimodo* in 2009, Harris recalls that:

I was impressed by the quality of sound accumulation as one physically experiences it moving from one space into another. The work seems to simultaneously pose and answer questions pertaining to sound and space such as, what

happens when I walk across a threshold from one space into another? How do I sense that and what does it do to my understanding of changing qualities of space that would otherwise remain unconscious?

This led to the insight that sound enhances the other senses. I could see, feel and smell the differences between a room, a corridor, and an exterior space. By accentuating the acoustic properties of the spaces my attention to their specific characteristics and their differences was heightened. At the same time the directional long-distance sending of the sound through these proximate spaces enhanced an idea of continuity and forward motion, of passing thresholds, of accumulation, resonance and a relational consideration of the sounds. As I travelled through this long and varied distance, my body and senses activated by the piece, I could sound out the spaces and experience what happens between them, tuning in to the inextricable relatedness of sound and space.

Laura Cameron and Matt Rogalsky's *Transnational Ecologies 1: Sounds Travel* (2007), a networked performance of Quasimodo, set us daydreaming about the sea as an Internet for whales. But in the cetacean's underwater sonic network, participants convey their messages directly over vast distances, without any form of transduction. What is the presentness of sound for a whale? What might it be like to experience a form of direct communication over hundreds if not thousands of miles and/or across time? To intimately know one's position in space on three axes and the relationship of that position to the contours of a vast environment and to the location of others? Is this perhaps something that humans already do? Might we, as Young suggested, have a great deal to learn about this by "giving ourselves up to the sounds," by experiencing the presentness of sound as intensely as possible, and by better understanding sound that lies outside our auditory range and outside of terrestrial environments?

Satellite Sounders

In the 1970's Murray Schaffer, the founder of the Acoustic Ecology movement, was so appalled by the general inability to listen that he developed "ear-cleaning" techniques. Similarly, Harris's work strives to enhance hearing and to reveal the 'presentness' of humans and technologies within the environment. Over thirty years later, her *Sun Run Sun: Satellite Sounders* (2008) demonstrated how difficult it is for people to put everyday sound experiences into words. This work explores the relationship between the embodied experience of location and the calculated data of position. The *Satellite Sounders* are handheld custom-made instruments that allow one to listen to the changing satellite data while walking. They consist of a GPS antenna and receiver, a small Linux processor converting the data into sound, a rechargeable battery, and stereo headphones. A continuously changing musical composition is generated from signals of navigation satellites in orbit, together with the participant's coordinates on earth. By exploring the individual experience of navigation technologies through the intimate and immersive qualities of sound, *Sun Run Sun: Satellite Sounders* re-establishes and renegotiates a sense of embodied connectedness to one's environment. See www.yolandeharris.net

I was surprised and delighted by the responses to my sonified GPS data, listening to the satellites moving in and out of focus overhead while walking through the environment, any environment, city or sea. The sonification focuses attention to the terrestrial sounds of one's direct immediate environment. Tapping in and listening to a data-source that is always there, in this case by sonifying it, expands one's self-conception to join terrestrial and extra-terrestrial scales.

Art and Science

Whereas the *Satellite Sounders* enable an expanded awareness of one's local environment through the sonification of satellite data sent from the Earth's atmosphere, the collaborative research of composer David Dunn and complexity scientist James P. Crutchfield does something like the inverse. By tuning in to the inaudible sounds of an animal the size of a grain of rice, they have created an expansive ecological awareness of global proportions.

Their work theorizes how the micro-ecology of insects, the Earth's forests, and climate change are inextricably linked. Their analysis takes a cybernetic, systems theoretical approach, in which an interconnected chain of feedback loops contributes to regional deforestation, which they believe is likely to expand to a global scale. Based on extensive field ultrasound recordings of bark beetles, they claim that bioacoustics plays a central role in the complex dynamics of infestation and may be a "critical link in the feedback loop" (239). Dunn and Crutchfield demonstrate how tuning in to the micro-acoustic world of insects can provide great insight into the dynamics of regional ecology and climate change on a global scale.

Similarly, by listening to and understanding sound production in the underwater environment, André has generated innovative solutions. For example, to deter dolphins from fishing nets, rather than emit 'warning sounds' that act as a dinner bell, the release of a screen of bubbles reflects the dolphins echo-sounding, acting as a sort of wall which they cannot hear/see past. Both Dunn and André have demonstrated success by integrating an interdisciplinary understanding of sound and the way it functions in a larger contextual frame, leading to applied interventions that approach problems not as isolated symptoms but as systems that demand systemic responses.

Such work calls attention to the fine line between art, science, and environmental activism. A line that is constantly present in research on the environment, regardless of one's field. We are presently in a stage of acute environmental awareness. The enormous complexities of interlinking systems that make up ecological balances challenge our ability to find and implement potential sustainable solutions. This situation demands re-conceptualizing and negotiating the boundaries of art, science and activism. Tuning in to sound, as a highly unregulated aspect of the environment, and particularly underwater sound, which is not well understood, holds tremendous potential for expanding systemic awareness. The challenge, as Young proposed, may lie in "giv[ing] ourselves up to [sound]" in order to "experience another world … [bounded only by] … the limits each individual sets for himself."

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SAUTI YA WAKULIMA: LISTENING TO THE VOICES OF THE FARMERS IN TANZANIA

Eugenio Tisselli, Juanita Schläpfer-Miller, Angelika Hilbeck

INSTITUTE OF INTEGRATIVE BIOLOGY, CHN UNIVERSITÄTSTRASSE 16, 8092 ZURICH

ABSTRACT

This paper describes the framework and development of the e-agriculture project Sauti ya wakulima, "The voice of the farmers" in Swahili. The latest scientific findings acknowledge that in order to find a sustainable way of producing food in the future, it will be necessary to understand agriculture as a complex system which, besides economic and ecological factors, also includes the social context of rural farming communities. *Sauti ya wakulima* adopts this vision by establishing an open and participative research process, in which a group of farmers living near Bagamoyo, Tanzania, uses smart-phones and a web platform to document their environment, and create thus a collaborative knowledge base.

DEFINING THE FIELD

E-agriculture defines an emerging field in which information and communication technologies (ICT) are applied to the improvement of agriculture and rural livelihoods. The term was introduced as one of the key areas of application of ICTs in the Plan of Action of the World Summit on the Information Society (WSIS), celebrated in Geneva 2003. Mobile communication technologies are presently the main focus of e-agriculture. In Africa, where most of the development projects for agriculture are concentrated, Internet usage is still low, reaching about 13,5% of the population; yet it has grown 2.357% over the last ten years, almost five times more than the rest of the world (Internet World Stats, 2011). However, more than a third part of the population in Africa are cell phone owners, and this rate is growing fast (International Telecommunications Union, 2010).

The original definition of e-agriculture and its more recent applications, tend to consider agriculture as a merely economic-productive activity, whose purpose in rural environments is to provide food security and alleviate poverty. While these goals undoubtedly are crucial, agriculture should not be understood exclusively from an economic-utilitarian angle. The International Assessment of Agricultural Science, Knowledge and Technology for Development Report (IAASTD, 2009) argues in favor of a fundamental shift in agricultural knowledge, science and technology, towards the acknowledgment of the multi-functionality of agriculture, understood as the interconnectedness and complexity of agricultural systems within diverse social and ecological contexts. The report identifies a strong social element of food production, which includes health, gender, tradition, social structures, and culture. While improving productive efficiency and access to information in rural agriculture are certainly key areas in e-agriculture, ICTs can

also empower farmers in less obvious ways. Sharing and disseminating farmer-held knowledge, providing real-time, audiovisual evidence of practices affected by climate change, and expanding the farmers' social networks are some of the ways in which an advanced e-agriculture platform can strengthen also the social context of rural agriculture. Moreover, mobile technologies allow for a multidirectional communication throughout digital networks, thus opening the opportunity of integrating farmer-held information and observation into the local collection of expert agricultural knowledge. Given the vertiginous growth of ICTs in Africa, and the dropping international prices of smart-phones and tablets, experimenting with state-of-the-art technologies that go beyond the limitations of SMS and voice services supported by basic GSM mobile phones is a realistic endeavor that can open new, more socially-oriented areas of action within e-agriculture.

Sauti ya wakulima

Sauti ya wakulima, "The voice of the farmers" in Swahili, is an e-agriculture project which directly addresses the socio-agricultural context of rural communities in Tanzania. The project was started in January 2011, when we travelled to Tanzania to conduct a series of interviews with farmers living near the town of Bagamoyo, with the purpose of engaging them in the creation of an online, collaborative knowledge base about the effects of climate change, using smart-phones as tools for observation and a web page to gather the recorded images and sounds. Accompanied by Dr. Flora Ismail from the Botany department of the University of Dar es Salaam, and Mr. Hamza S. Suleyman, the local extension officer, we held a meeting with a group of farmers that regularly gather at the Chambezi agricultural station to explain to them the purpose of the project, and ask them whether they were willing to participate. Despite the fact that none of them had accessed the Internet before, they had all heard of it largely through the younger members of their communities. They quickly understood that the images and sounds uploaded from the smart-phones would not only be visible to them, but to anyone who visited the project's web page. After deliberating, the farmers voted unanimously in favor of taking part.

In March, we established the project's dynamics together with the farmers, and carried out the first training session on how to use the smart-phone and the project's web page. A group of five men and five women chosen by the community would take turns to share the two available smart-phones, by exchanging them on a weekly basis. Whenever a farmer's turn to use the phone arrived, he or she would have the task of using it to contribute content to the knowledge base. These contents consist of units, which we call messages, comprised of a picture, a voice recording and an optional keyword. A special application running on the smart-phones makes it easy to capture the multimedia elements. It also integrates geographical information into the message, if available, allows the addition of one or more keywords and sends all the elements to a web server, bundled together as an email message. By using pictures and voice recordings, farmers can portray a wide variety of objects, situations, and persons, and complement visual evidence with their own spoken narrations. Adding keywords to audiovisual contents is a bottom-up form of sense-making, also known as tagging. Initially, the farmers agreed on a set of fixed keywords, or tags, that would guide their process of documentation. They chose the names of their main crops: amaranth, cassava, coconut, cowpeas, maize, mango, okra, orange, papaya, rice, sesame, sweet potato, tomato, and watermelon. All of these tags appear on a multiple-choice list on the phones. However, the application allows farmers to enter a new tag when necessary. Finally, geographical information enriches the multimedia messages by locating them on a satellite map of the area. Farmers not only got together to exchange the phones but also to see and discuss the pictures and voice recordings that the group had uploaded during the week. There, they accessed the project's web page using a laptop computer with a mobile broadband connection. The design of the web page is simple and straightforward, making it easy to navigate. Pictures and sounds can be browsed by date, or by clicking on one of the tags which appear on the tag cloud on top of the page (Figure 1). The tag cloud acts as a search interface, and represents the aggregation of tags used by farmers to describe each message. Additionally, clicking on a picture will show the exact location where it was taken, on a satellite map provided by Google Maps (Figure 2).

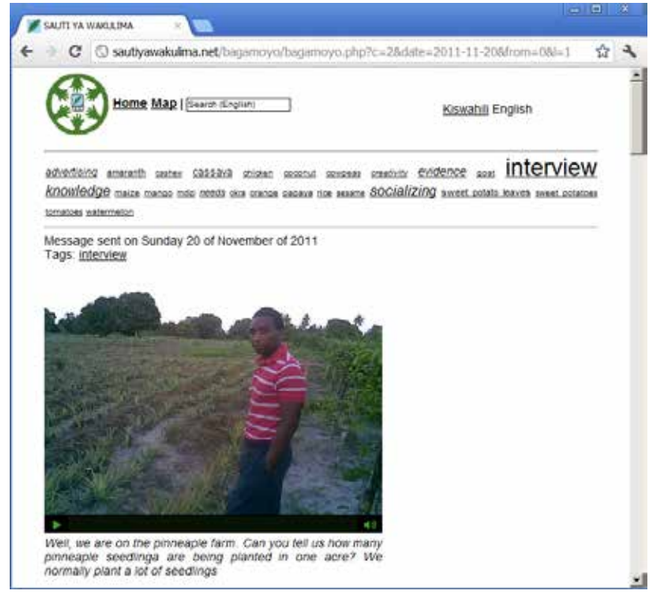

Figure 1. The main page of Sauti ya wakulima.

Figure 2. Online map interface showing the audio-image messages.

At the end of May, we made our third visit to Chambezi. We provided further technical training to the farmers, in order to strengthen their mobile and Internet skills. We also suggested to the group that they use the phones for interviewing other farmers, although they had already started to do so spontaneously. A new tag was introduced: "interview", which later became the project's most frequently used tag. Farmers, thus, began a very active period of interviews, which reached three important peaks of activity in the agricultural shows at Morogoro in August, Bagamoyo in September, and Dar es Salaam in October. On our fourth visit in September, we concluded the first phase of Sauti ya wakulima by interviewing the participating farmers, in order to make a first impact assessment and learn about their views on the project's usefulness, and their suggestions for improving it.

Discussion

Appropriation can be considered as indicator for usefulness and meeting the needs of the targeted community as it can deeply affect the politics of their daily lives. In a context where communication technologies play an active role in development, it can be seen as a starting point for community empowerment (Bar, Pisani and Weber, 2007). The farmers found that documenting their practices and problems could lead to the creation of a shared, audiovisual knowledge base, which they could use for various purposes including learning, consulting of farming practices but also for promotion of farming inputs. Farmers also saw the project's potential for reporting problems, such as pests or construction of wells, to the extension officers and/or government officials in order to get timely assistance. This can be particularly relevant to the Agricultural Office in Bagamoyo. According to them, one of the greatest weaknesses in the local agricultural infrastructure is the lack of sufficient extension officers. Currently, there is a ratio of 1 extension officer per 1,145 farmers, almost half of the ideal ratio, established by the office at 1:600 (Bagamoyo, 2011).

A positive event boosting the self-confidence of the Bagamoyo farmers, was their visit to a large agricultural fair in the month of August and early September in Morogoro. Most postings dealt with the visit of that fair where the farmers took the phones and computer with them to show them to fellow farmers and merchants.

This was very well received by their colleagues and the Bagamoyo farmers gained standing and admiration for this project. We further noticed a distinct desire by the farming community to also consult and teach fellow farmers of "best practices" and inform them about innovations – be this a new shelling machine one farmer invented from scrap material or how to grow maize plants on terraces or add value to their products be pressing oil from coconuts or sunflowers. In fact, the interviewer repeatedly also requested that farmers with visible successes (good looking stand of crops or impressive harvests) shared their knowledge. And likewise, they expressed their gratitude for advice given to them that worked well or seeds and new cultivars handed to them for further experimentation. Grafting of trees also seems to be a technique increasingly recognized as very useful and practiced and promoted by a number of farmers.

There has been a move in recent years for "Farmer led research" as for example is formulated by Fetien Abay from Mekell University Ethopia (Abay, 2012) Additionally, climate scientists recognize need for participatory research which not only values indigenous knowledge but uses knowledge which is locally based. High resolution simulations of maize growing in Brazil, the Central African Highlands, and Ethiopia show that areas with crop gains or losses are highly localized and sometimes farmers gaining are "only kilometres from those who will lose completely. This means that adaptation studies and recommendations cannot be made at regional or national level but must be essentially local". (Jones et al., 2005). "Since response to climate change is variable from place to place we cannot make overarching recommendations. The best approach is a participatory one." (Jones et al., 2005) Farmers will not only learn from their own experience but also that of their neighbours as there will be analogues of future climate at other locations. Our methodology offers a promising tool to enable exactly that – make farmers to their own reporters and data collectors with scientists connected to them.

Conclusions

The original research question was to identify the communication needs of farmers as relating to climate change and their adaptation to rapid change. By including artists on the team and artistic methods such as the rich pictures and smart-phones we allowed the farmers creative freedom to document as they chose. We contend that this creative freedom motivated the farmers to participate and to continue to post prolifically. Thus we experienced no lack of participant motivation frequently cited by similar projects. Our findings concur with those of Abay who states, "Farmers are highly motivated when they can take the lead in documenting their problems and their solutions. They appreciate their roles in making decisions about what to document. Farmers often choose different foci in their documentation than the facilitation team would have done." (Abay, 2012) We propose that this rich body of informal knowledge be integrated into formal scientific knowledge and contribute to data gathering. There is the potential that the farmers' data forms a complex picture over time (systems knowledge) and that this could be complemented by interviews, the questions of which would be informed by the farmers setting the research agenda with the researchers.

Overall, we can conclude that *Sauti ya wakulima* was effective in revealing the social context in Chambezi, and also in strengthening and expanding the farmers' social networks. The activity of the group during the first phase of the project may be characterized as that of a post-digital social network: small-scale groups of hyper-connected people appropriating communication technologies for common goals, while fostering strong links for cooperation through face-to-face interaction (Tisselli, 2010). The final interview with the farmers who participated in the first phase of *Sauti ya wakulima* showed that farmers were very satisfied with Sauti ya wakulima. The interview clearly showed that the farmers have appropriated the project, taking it beyond its initial focus on reporting about climate change and using it to engage in a process of mutual learning.

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THE PARADOX OF EVOLUTION : YES, I AM AN OBSOLETE HUMAN BEING

Paz Tornero

NEW MEDIA ARTIST AND RESEARCHER IN ART-SCIENCE-TECHNOLOGY, PH.D. CANDIDATE FINE ARTS STUDIES,

COMPLUTENSE UNIVERSITY OF MADRID, SPAIN.

TRANSLATED FROM SPANISH BY ISABEL PORRAS, PH.D. CANDIDATE CULTURAL STUDIES, UC DAVIS.

Technoscience is increasingly present in our daily lives, establishing new social rules and patterns of communication and interaction in a physical space which implements electronic devices and telematic systems in its design. In the race for scientific progress, the goal is making man a God, like Nietzsche's Superman, without determining how the new human morphology will be fitted. This paradigm is treated by artists who warn of the possible fate of humanity while the technoscientific, as if he/she was Prometheus, dares to defy the laws of nature. Art exposes the actual course of science. Some artists complain that the false promises of scientific discourse, which is dominated by male vision, fails to be aware of the impossibility that technology is going to improve the moral dimension of human being. Some artists say the science sermon does not deal with humanity and the building of our future is merely phallocentric; an excessive anthropocentric vision.

POST-CORPORAL VISIONS IN THE XIX CENTURY

In *The Craftsman*, Richard Sennett explores the literary figure of Frankenstein drawing on the experimental studies of Luigi Galvani, who utilized electric currents on frogs and various other animals. [i] These works demonstrated the existence of an "electric animal flow" that gave muscles movement. This was a groundbreaking discovery at the time given that the possibilities announced over corporal issues such as energy, life, and death were unusual. Positivism toward a scientific future was a clear symptom of Romanticism, and with said discoveries scientists were considered prophets. Science signaled humanity's progress, this being the largest common feature of the romantic understanding of nature and science through the transgression of the rules hitherto used. [ii]

Years later, in 1803, Giovanni Aldini, Galvani's nephew, published the results of similar experiments using the cadavers of criminals. At the end of the XVIII Century, Erasmus Darwin, grandfather of the theorist of modern evolution, dealt with similar questions in "The Temple of Nature." [iii]

Mary Shelley wrote *Frankenstein* in 1816 at 19 years old. The text was the product of a simple game, a pastime that led her to develop a horror story. The Creature, a being larger and more powerful than any human, was created thanks to doctor Victor Frankenstein. Curiously, this inordinate being longed to be loved by the people, but his appearance terrorized the town. Once rejected, the anguished Creature kills the doctor's younger brother, his best friend, and his woman.

The author's husband, Percy Shelley, became interested in experiments related to electricity and bodies during his university years. In her literary work, Mary Shelley reflects on Galvani's investigations via the figure of Doctor Frankenstein, which lent the story some credibility. There is no doubt that fictional theories about the relationship between life and death that defy natural laws would make readers shudder. In fact, this story's relevance persists in modern science fiction literature as being a precursor of this style. [iv]

Scientific discoveries of the 19th Century, when the understanding of Nature reigned, constitute in Frankenstein the idea of man-machine and man-monster: the man-machine is formed through the union (or the organic assemblage) of diverse bodies which give way to a new being; instead, the monster arises as a result of this corporal collage, an anthropomorphic being that despite being created via a search for power and grandiosity equal to a divine search, results in a replicant lacking acceptance. Artificial life is represented through the human body as canon, an appearance that will supposedly aid in social inclusion, but ends with rejection. A quasi-divine being, similar to a golem. The first 'Adam' of science; an animated created born of inanimate objects.

Mary Shelley's visionary imagination shows the hidden side of scientific progress, contrary to reality where it was greeted with fervor, and where the author reflects about the possible Dantesque scientific future. The work, therefore, poses the devastating consequences of not taking morality into account in scientific work, a question that remains relevant today. [v]

Currently, this divine creation is manifested through androids and cloning. The clone, a modern Creature, was born when scientist Ian Wilmut extracted a cell from an adult female sheep, named Dolly, in 1997. Later, in 2004, the Scottish scientist requested permission to produce an essay on the human therapeutic effects of cloning. [vi]

In 2006, Britain's Department of Science and Innovation published "The Robot's Rights." Henrik Christensen, director of the Center for Robotics and Intelligent Machines at the Georgia Institute of Technology notes, "If we make conscious robots they would want to have rights and they probably should". [vii]

Against this background, the exposure of scientific duality (the politically ethical or not) is found throughout contemporary literature, which is replete with tomes regarding cybernetic organisms (cyborgs) and biotechnology. Donna Haraway's *Cyborg Manifesto* not only contains a valuable thesis about the relationship between technology and feminism, it relates to technophobia and the masculine domain over the scientific world. Women are segregated from the technological sphere by the masculine figure- it contains, moreover, a critical message about scientific institutions: "Manipulations, concepts, organizing principles – the entire range of tools of the science – must be seen to be penetrated by the principle of domination." [viii] Rebellious female voices have been relevant especially in the information age and the "explosion" of technoscience during the twentieth century, as we find in the artist-performer Praba Pilar's work. What follows is a discussion of one of Pilar's most relevant performances.

FEMINIST TECHNO-ACTIVISM: THE CHURCH OF NANO BIO INFO COGNO

Praba Pilar grew up in Colombia surrounded by electronic components, a consequence of her father's work in the computer industry. [ix] She later moved to New York City with her mother, which allowed her to form part of *Los Cybrids: La Raza Techno-Critica*. [x] During this period, her focus was performative and activist, questioning the control of the human environment via war and surveillance systems. Later, she felt her participation concluded, as she was interested in gender issues not dealt with in the group. Since then, she explores the role of women in the cyber-world and the relationship this has to information technologies. In recent years, Praba Pilar has been especially active in conversations related to techno-scientific innovations, particularly the convergence of nanotechnology, biotechnology, information technology and cognitive science- understood as the relationship subject-body and subject-environment seen from a neurophysiological point of view. [xi] Pilar uses the Nano Bio Info Cogno (NBIC) term, to talk about this relationship.

Before discussing the artist's work further, it is necessary to clarify that the goal of techno-science (contemporary science) is to transform the world, be it through natural, social, or artificial means. [xii] The origin of this union comes on the heels of the four main areas mentioned above, Nano, Bio, Info, Cogno, whose origin in the year 2000 was thanks to the convergence of nano and bio-technologies. [xiii] Praba Pilar argues that technology is strongly linked to the political, military, entrepreneurial, and even religious spheres. She demonstrates this through the creation of numerous performances such as The Church of Nano- Bio- Info- Cogno, which was created in 2006 and remains active. [xiv] The performance is presented as a catholic ceremony celebrating the arrival of the new millennium. [xv] Pilar represents the church's priestess (or guru), and irradiates excessive enthusiasm and positivism regarding

Cross design utilized in The Church of Nano Bio Info Cogno, Praba Pilar, 2006.

technoscientific prophecies, all through a liturgy designed to commune with new technologies.

The artist reflects on obsolete anthropological theories: cultural, social, and biological human relationships are transformed by the arrival ofNBIC. Praba Pilar exposes the links (and tensions) between the human and the post-biological human; the cyborg, automaton, and robot; between the macroworld (globalized technology) and the nanobit, incarnation, and informatics. [xvi]

"As I began to look into the NBIC field more deeply, I read Eric Drexler, learned of the Foresight Institute and began to attend their conferences on the convergence, ultimately becoming a member. The sharing of technological advances at these conferences is rapturous: in descriptions of immortality promised by information uploads; in prophesies of the end of material want promised by nano manufacturing; in the promise of the end of illness brought about by nano medicine." [xvii]

According to Claudia Giannetti, in the biotechnological and digital age the artist assumes the difficult task of constructing new conceptual tools out of materials. [xviii] In Praba Pilar's case, posthumanism is the representation of a hybrid, electric, and biological morphology that gives way to artificiality. The Cartesian divide between mind and body leads to the 'dematerialization of the body' due to scientific and technological progress. [xix] As Vilem Flusser states, "the human mind is incapable of comprehending (much less taking advantage of) the progress it has triggered so lightly." [xx] Likewise, Roy Ascott exposes the urgent need for a techno-ethic aesthetic as a possible solution to post-biological cultural questions, and for this the artist is vital. [xxi] Globalization not only means being connected, but also that our identities are in constant flux—something analyzed by numerous artists. Ascott goes even further to postulate that the artist will intervene in the construction of a new reality, in the creation of evolution, which he understands as the definition of the human being and its reconstruction. In contrast to Praba Pilar's thought, he sees technology as a vehicle that brings us closer to nature, in what he calls cyberbotanics [xxii], sees the possibility of totally eliminating the real world from the virtual, which is quickly disappearing: "Telematic space makes actors of us all. There can be no outside observer." [xxiii] Ascott assures us that the artificial is already part of nature and that nature is to some degree artificial.

Roy Ascott's futurist theories, are similar to the general thought of Romanticism: a better future thanks to Science (Technoscience in the 21st Century.) This is antagonistic to Praba Pilar's artistic trajectory given that she exposes the danger inherent in believing that technology will solve the world's economic, social, and political problems. [xxiv] Her work is a critique of the way technological discourses are developed.

In The Church of NBIC, the religious institution boasts of being able to perform miracles through the use of technology, thereby addressing these problems. This Church is not opposed to technology, but, through satire, articulates a mythic-religious speech, highlighting the lack of ethics in technological development dominated by Western governments, multinational corporations, military weapons industries, advanced robotics, and universities that promote their laboratories. Praba Pilar's argument is to question whether the interests of these institutions include addressing the poverty, disease, and hunger related to technological progress. The NBIC Church encourages the implementation of new technologies throughout the world while showing their inconsistencies.

One of the decisive influences in this work was the argument put forward by historian and activist David Noble who says that technology is the product of the Christian impetus because it relies on the divine, which now means the opposite of human welfare since it is a threat despite the promise of immortality. [xxv]

Praba Pilar's performance begins with praise for the Techno Holy Spirit: Google. [xxvi] Later, she invites parishioners to confess their sins and blasphemy against technology and science while offering penitence and absolution. After the technological sermon, the performance's conclusion depends on the artist. [xxvii] Sometimes she simulates sexual intercourse with a rudimentary machine rented for the event. The phallomorphic machine is attached to her pelvis. The artist remains standing throughout the performance, evoking a male position attached to a suction machine. Meanwhile, someone sings a live technological version of Amazing Grace. Other performances have ended with Pilar and the audience singing together.

CONCLUSION

Praba Pilar comments on the technological domain:

"I am deeply interested in appropriate and sustainable technologies and in pointing out the interconnections between technology, the military, and the socio economic and environmental spheres. (…) Rather than reinventing a new world where all of humanity will benefit, as is claimed, only a narrow band of the population that will be 'uplifted' in beneficial ways." [xxix]

Praba Pilar in a performance The Church of Nano Bio Info Cogno (left) and installation of the same (right) at the Center for the Arts at Yerba Buena, San Francisco, California. 2006-2008. Photography by Myles Boisen.

The Prometheus myth repeats itself. From Frankenstein or Modern Prometheus by Mary Shelley to now, when technoscience governs global hegemonic discourses, the human being works with (excessive) devotion in the search for progress in the hands of NBIC. If in Romanticism the scientist sought truth, the origin of the human race, and the Universe; today those efforts are directed toward the modification of nature in favor of humanity. [xxx] Many Gods scattered across laboratories promise eternal life, a perfect world; benefactors of the human being like Prometheus. Perhaps the Hope contained in Pandora's box is now represented by artists who construct their works in response (and resistance) to a society under panoptic trans-human control.

ENDNOTES

[i] Luigi Galvani's experiments were based on the electrical nature of nerve impulses made in 1774. See Richard Sennett, *El Artesano*, Barcelona, Anagrama, 2009, p.253.

[ii] J. Montesinos y J.Ordóñez, *Ciencia y Romanticismo*, S. Toledo, Canarias, 2002.

[iii] Erasmus Darwin declared that various life forms, including humans, began evolving in water and later moved to dry land. *The Temple of Nature* is a relevant text, the product of grand literary imagination that combines poetry and science. It contains extensive prose notes on various topics such as biological evolution and Egyptian hieroglyphics. See Erasmus Darwin, *The Temple of Nature*; or, *The Origin of Society: A Poem With Philosophical Notes*. J. Johnson, London, 1803.

[iv] See Isaac Asimov, *Lo mejor de la ciencia ficción del siglo XIX (I)*, Barcelona, Martínez Roca, 1983, p.5.

[v] "Mary Shelley's goal, therefore, is to consider the consequences of the lack of humanity in scientific progress which coincides… with the first moments of the industrial revolution." in Susana Gala Pellicer, "'Perder un tornillo': una imagen simbólica en el contexto de la Ilustración", Culturas Populares, Revista Electrónica 8 (Jan-Jun 2009), p. 21. In http://www.culturaspopulares.org/textos8/articulos/gala.pdf, accessed on 31 March 2011.

[vi] In a 2001 interview Wilmut explains how imprecise cloning techniques give rise to "defective" clones, i.e. with serious physical abnormalities.

[vii] Salamander Davoudi, "UK report says robots will have rights", Financial Times, London. December 19, 2006, 22:01. In http://www.ft.com/cms/s/2/5ae9b434-8f8e-11db-9ba3-0000779e2340.html, accessed on March 29, 2011. Recall that in 1950 Isaac Asimov published I Robot which included the three laws of robotics (previously published in 1942 by the author in the story "Runaround").

[viii] Donna Haraway, "Animal Sociology and a Natural Economy of the Body Politic, Part I: A Political Physiology of Dominance", Signs, Vol. 4, No. 1, Women, Science, and Society (Autumn, 1978), p. 35.

[ix] Praba Pilar, *Cyber.Labia: Gendered Thoughts & Conversations On Cyberspace*, California, Tela Press, 2005. In http://www.prabapilar.com/, accessed on 30 March 2011.

[x] Activist group composed of artists Praba Pilar, John Jota Leaños y René García. 1999-2003.

[xi] "This new perspective on cognitive theory has deeply affected the belief postulated by the philosophy that the subject, or his/her system of perception, is in direct contact with the world." ["Esta nueva perspectiva de la teoría cognitiva toca profundamente a la creencia postulada por la filosofía de que el sujeto, o su sistema de percepción, está en contacto directo con el mundo."] In Claudia Giannetti, "Metaformance – El Sujeto-Proyecto", en: *Luces, cámara, acción (...) ¡Corten! Videoacción: el cuerpo y sus fronteras*. Valencia, IVAM Centre Julio Gonzalez, 1997. In www.artmetamedia.net/pdf/Giannetti_Metaformance.pdf, accessed on 31 March 2011. Recall that neurophysiology is born from Luigi Galvani's studies of the nervous system.

[xii] "Technoscience emerged from WW II and in its initial phases was funded by major research programs funded by the U.S. government, conforming to *Big Science*." In Javier Echeverría, "Interdisciplinariedad y convergencia tecnocientífica nano-bio-info-cogno", *Sociologías*, Porto Alegre, year 11, no. 22, July/Dec. 2009, pp. 22-53. In http://www.scielo.br/pdf/soc/n22/n22a03.pdf, accessed on 31 March 2011.

[xiii] "When Lucent & Bell Laboraries and Oxford University created the first DNA engine using the NTS (nanotechnosciences) in 2000, a new possibility of convergence emerged (…) With the previous steps plus the approval of the National Nanotechnology Initiative, conditions were ripe for the National Science Foundation (NSF) to design and make public a macro research proposal named Converging Technologies for Improving Human Performance (CTIHP), and commonly known as NBIC Convergence in 2001." In Javier Echeverría, "Interdisciplinariedad y convergencia tecnocientífica nano-bio-info-cogno", *Sociologías*, Porto Alegre, year 11, no. 22, July/Dec. 2009, pp. 22-53. In http://www.scielo.br/pdf/soc/n22/n22a03.pdf, accessed on 31 March 2011.

[xiv] Next shows during 2011: Multispecies Salon, City University of New York Graduate Center and Cosmopolitics Conference, City University of New York Graduate Center, New York. For more information, visit the artist's website http://www.prabapilar.com/

[xv] The artist calls this Neotheric Millenium: a new era complete with many changes based on technology. However, this new millennium is named "technoapocalypsis" in the documentary trilogy about transhumanism that explores the ethics and metaphysics of technology, *TechnoCalyps*. Directed by Frank Theys and written by philosopher Michel Bauwens in 2006.

[xvi] Ray Kurzweil, added that in the year 2045 humans will live eternally. See Ray Kurzweil, "When man a machine merge.", Rolling Stone, February 19, 2009, pp.57-61.

[xvii] Praba Pilar "Praise the Lord & Pass the Critical Theory: An Interview with Praba Pilar of the Church of Nano Bio Info Cogno", H+ Magazine, March 15, 2011. In http://hplusmagazine.com/2011/03/15/praise-the-lord-pass-the-critical-theory-an-interview-with-praba-pilar-of-the-church-of-nano-bio-info-cogno, accessed on 31 March 2011.

[xviii] See Claudia Giannetti, "Metaformance – El Sujeto-Proyecto", en: *Luces, cámara, acción (...) ¡Corten! Videoacción: el cuerpo y sus fronteras*. Valencia, IVAM Centre Julio Gonzalez, 1997. En www.artmetamedia.net/pdf/Giannetti_Metaformance.pd, accessed on 31 de Marzo de 2011.

[xix] Ibid.

[xx] Flusser, Vilém, "Sobre arte, aparatos y funcionarios", Arte y Técnica, Artefacto/6 – 2007, in http://www.revista-artefacto.com.ar/pdf_notas/162.pdf, accessed on 31 March 2011.

[xxi] Ascott understands technoetics as the transformation of consciousness because of technology. See Roy Ascott, "Moistmedia, technoetics and the three VRS", Acts/Proceedings ISEA2000 – 07/12/2000 – Auditorium.

In www.isea-webarchive.org/mmbase/attachments/36393/01_ascott.pdf, accessed on 04 April 2011.

[xxii] According to Ascott, cyberbotanics "will cover a wide spectrum of activity and investigation into artificial life forms within the cyber and nano ecologies, on one hand, and into the technoetic dimensions of consciousness and cognition on the other." Ibid.

[xxiii] Ibid.

[xxiv] Interview with Praba Pilar at the event "Bay Area Now 5" del Center for the Arts at Yerba Buena, San Francisco California, 2008. See http://www.youtube.com/watch?v=ZofD0xOBfzU&feature=related, accessed on 04 April 2011.

[xxv] Referring to nuclear arms, space travel, artificial intelligence and genetic engineering.

[xxvi] Other times, Twitter.

[xxvii] A fragment of this sermon states: "Oh my brethren, I warn you, we are coming upon the great Nano Bio Info Cogno rupture of the year 2012. It is the Zero Point of the Singularity. We will enter the multidimensional supra human mind system within time wave zero. We will reach the zenith of mutational super intelligence and surpass the technocalypse. (…) Praise be to Ray Kurzweil the father of spiritual machines!!"

[xxviii] Christian hymn.

[xxix] Interview with Praba Pilar at the event "Bay Area Now 5" del Center for the Arts at Yerba Buena, San Francisco California, 2008. In http://hplusmagazine.com/2011/03/15/praise-the-lord-pass-the-critical-theory-an-interview-with-praba-pilar-of-the-church-of-nano-bio-info-cogno, accessed on 31 March 2011.

[xxx] "Nietzsche posits for the future the "struggle between small farmers and large farmers of man- one could also say- between humanists and superhumanists, friends of man, and friends of the superman." In Adolfo Vásquez Rocca, "Sloterdijk, Agamben y Nietzsche: Biopolítica, Posthumanismo y Biopoder", Nómadas. Revista Crítica de Ciencias Sociales y Jurídicas I 23 (2009.3). In http://www.ucm.es/info/nomadas/23/avrocca.pdf, accessed on 04 April 2011.

MEDIA ARTS IN SUPPORT OF SCIENCE EDUCATION

Daria Tsoupikova
UNIVERSITY OF ILLINOIS AT CHICAGO, IL
Julieta Aguilera
ADLER PLANETARIUM, CHICAGO, IL
Helen-Nicole Kostis
NASA GODDARD SPACE FLIGHT CENTER, MD.
Tina Shah
THE FIELD MUSEUM OF NATURAL HISTORY, CHICAGO, IL
Brenda Lopez Silva
UNIVERSITY OF ILLINOIS AT CHICAGO, IL

KEYWORDS: MEDIA ARTS, STEM, SCIENCE EDUCATION, ART-SCIENCE, VISUALIZATION, INTERACTIVE APPLICATIONS

ABSTRACT

This paper examines the role of media arts in the development of interactive learning environments for science, technology, engineering, and mathematics (STEM). The use of technology-mediated interactive environments already provides greater access for science learning to wider, more diverse, and especially younger audiences. Since children typically enjoy playing computer games and interacting with new technology, media art provides a motivating setting for science education. The movement to integrate science and art to examine convergence points, and how the fields can empower each other, has already begun. However, the role of arts and artists in the design of advanced applications for STEM education has yet to become subject for research and implementation in mainstream cultural institutions and educational programs. Collaborative, interdisciplinary teams of artists, technologists, and scientists developed novel interactive learning projects that educate the public on fundamental science (STEM) disciplines. Five interactive educational applications were designed based on the leading art and design concepts with a focus on user engagement, interactive design, and aesthetics principles. With these principles at their center, these applications and their educational content were designed to create interactive and engaging learning experiences. We describe the role of art in the development of these projects and examine how artists can cross disciplinary borders to collaborate in the development of innovative educational STEM learning applications.

Introduction

Interactive 3D applications and visual storytelling are of increasing relevance in our dynamic contemporary culture. Results of art, science, and technology collaborations can directly affect educational and pedagogical practice and society at large. In the last few years, there have been a number of meetings that studied art and science convergences supported by efforts of the National Science Foundation (NSF), National Endowment of the Arts (NEA), the Association for Computing Machinery (ACM), the Conference on Human Factors in Computing Systems

(HCI), as well as other institutions (Comer 2011; STEAM 2011). Despite these efforts, the integration of arts in science education has yet to become subject for research and implementation in mainstream cultural institutions and educational programs. To date, little research has been conducted to investigate the role of art, aesthetics, and creative storytelling in the design of advanced technologies for education. In this paper, five professional artists involved in contemporary practice examine how media art applications influence informal science education. Each of the authors led the artistic development of independent interdisciplinary interactive learning applications that educate the public on fundamental science disciplines. We describe our case studies and the role of artists in the design of STEM educational projects.

Case studies

The Cryptoclub: Cryptography and Mathematics Afterschool and Online, is an NSF funded interdisciplinary research project introducing cryptography and mathematics to middle school students across the country through the encryption and decryption of codes. Project objectives include increased awareness of cryptography as a STEM topic with connections to mathematics, as well as a greater understanding of effective strategies for integrating and supporting online and offline activities within informal learning settings (Beissinger). The project's team is from the University of Illinois at Chicago and includes two mathematicians with extensive experience in math education; one artist, whose research is in visualization, interactive animation, and educational multimedia; a cognitive psychologist with extensive experience in research, development, and evaluation of multimedia mathematics and science materials for middle schools; and expert teachers who pilot the project materials. Project partners include the Young Peoples Project (YPP), a national afterschool program; Eduweb, an award-winning educational software design and development firm; and American Institute for Research (AIR), an evaluation firm with experience in afterschool evaluation. The artist's role focuses on the development of the art and design portion of the project. Artist collaborates in the design of the website, the online games and other digital activities, and develops concept designs for 3D environments of the computer games. The artist leads the development of historic cryptography comics. As part of this effort, the artist is responsible for researching historical information about the environment, architecture, clothing, and other details in order to achieve convincing and historically accurate visualizations. Project materials include afterschool and online activities that will enable students to learn and apply cryptography and mathematics skills. This includes a *Cryptoclub* website, challenges, treasure hunt clue generator, cryptography adventure games (2D single-user games and 3D multi-user games), offline games and activities that involve active participation, a leader's manual, and training workshops for afterschool leaders. In addition the project is developing historic crypto comics, a series of stories in graphic-novel format that are based on historical events related to cryptography (Fig. 1).

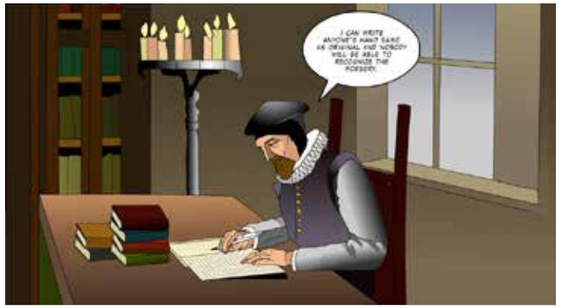

Figure 1. Mary Queen of Scots graphic novel: Queen Elizabeth's cipher secretary analyzing Mary's encrypted message.

The project materials were developed and tested in afterschool programs in Chicago and will be field tested in approximately fifty sites around the country. *The Gravitational Simulator* was part of the exhibit gallery "Gravity Shapes the Universe" at the Adler Planetarium. It used embodied interaction as degrees of power and intensity in force gestalts (Johnson, 1987) and as a means to bypass the "representational bottleneck" by reducing the cognitive workload (Wilson, 2002) through visual and proprioceptive senses in order to explore the complexity of multi-body gravitational interactions in the Universe.

Figure 2. The Gravitational Simulator.

The Gravitational Simulator was developed by Mark SubbaRao. It was enabled by a Microsoft Kinect, which allowed users to create their own n-body simulation of gravitational dynamics. Interaction originally happened in two phases: first, visitors could set up the initial conditions of the simulation, and second, the simulation run the full n-body calculation in the two dimensions of a projection screen. Aesthetic aspects such as active free-drawing and color served to focus the attention of visitors. Software used was Processing, OpenCV, and Dan Shiffman's Kinect Library. When hands were still, clusters of particles were created, and when moving, they would input an initial velocity for the particles. As their gravity and speed interacted with other particles, clusters of them accumulated and exerted greater gravity, similar to how galaxies form and interact.

The exhibit was open for several months during which we assessed its effectiveness. We experimented with a continuous particle generation state that supported quick gallery engagement. A series of video tutorials were also presented to visitors and they showed how to draw simulations at different scales such as star clusters, galactic mergers, and the Cosmic Web. Finally, a version on a display was placed next to the projection and Kinect system. This version allowed for more control but was found to not be as good in emphasizing the initial speed that would allow or prevent particles to orbit clusters of particles. In conclusion, these simulations seem to be better understood in real time for museum visitors, and the aesthetic and embodiment aspects support the exploration. Projects like the *Gravitational Simulator* suggest interesting questions in the area of informal science education, where we can learn about physics within representations we can aesthetically inhabit today.

NASA Visualization Explorer (NASAViz), is an intuitive and interactive free iPad application available via the iTunes store that delivers bi-weekly science stories about NASA's exploration of the Earth and its moon, the Sun and its planets, and the Universe. The app was released to the public on July 26, 2011 and as of May 2012 has achieved more than 600,000 downloads by users worldwide. The stories emerge from produced and visualized satellite data (animations and images) with the purpose of educating the public about NASA's science research in an informal

and visually rich environment. Sample stories include hurricanes, ocean currents, daily snow cover, solar eruptions, discoveries of new planets, and the orbits of satellites of NASA missions. The app is an in-house production of the NASA Goddard Space Flight Center and the broader team is divided into three groups: the Editorial Board, the App Development Team, and the Content Development Team. The Editorial Board and the App Development Team make up the core multidisciplinary team of the NASAViz project where members include science writers, data visualizers, software developers, producers, and interactive designers. The roles and skills required in each of these groups are described in the following diagram:

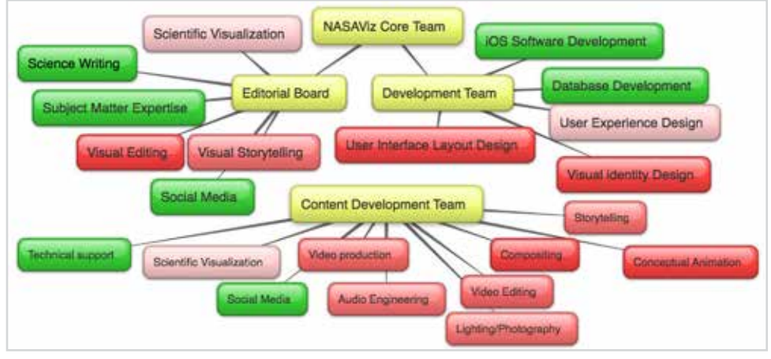

Figure 3. Skill sets available in the teams involved in the production of NASAViz stories. Skill sets in red hues signify a higher proportion of media arts.

Even though the app is developed for the general public it is also used by teachers in the classroom as an informal education medium for curriculum support. For this reason the NASAViz team is working closely with the NASA Office of Education and plans to launch the NASAViz Teacher Pilot project in September 2012. The purpose of this effort is to: 1) learn more about how teachers use the app in the classroom by creating a virtual community for the teachers to share their lesson plans, story playlists and tips, 2) receive input on new features which may assist the teachers and 3) receive feedback from teachers about the content, especially about stories on hard-to-explain scientific and natural phenomena that are part of the curriculum.

Create Your Own Mosaic: Creating engaging and educational experiences is quite a challenge no matter how shiny or new your platform is. For example, we knew we wouldn't have much trouble attracting people to the Create Your Own Mosaic multi-touch table interactive, part of the *Natural Wonders: A Roman Mosaic from Lod, Israel* exhibit at The Field Museum in Chicago. Visitors were able to design their own mosaic using digital versions of the drawings they saw in the real mosaic positioned near the interactive table. It was already an engaging experience - one person (or more) was able to select/touch a graphic from the bullpen, and then drag, rotate, and scale it on a blank canvas, beginning their creative process. Just like painting or any other craft, you eventually became immersed in the experience. Teaching the history behind the various drawings of birds, fish, and other animals and objects was the bigger task. Scientists at The Field Museum wanted to tell the story behind the imagery and its relationship to Roman culture, and eventually, that's exactly what they did. When a visitor selected an icon, a short video of one

of our scientists appeared, sharing interesting facts about the object. The visitor/creator of the mosaic and the audience around were able to either pause, watch and/or listen to the scientist, or just listen as they manipulated their object. The video clips were kept short, about 20 seconds, in order to provide easy to digest information. User experience and design were also key in the ability to educate. We wanted to make sure the creating of a mosaic was not disrupted by a playing video, but enhanced with learning. Small things like fading in the video and its placement made for smoother absorption. Placing smaller versions of the icons in the top right corner of the videos reinforced what the scientists were speaking about. The ability to replay the video made sure you could watch and listen again in case you missed it the first time. Text was also provided in case reading was preferred. The whole experience was not happening only on the multi-touch table, but in the larger space, with speakers and a large projection on one of the walls. This way you could interact or just observe, either way walking away with some new bit of knowledge.

Figure 4. Create Your Own Mosaic at the Field Museum.

A Mile In My Paws is an interactive 3D application designed to raise awareness of the affects of climate change for the Polar Bear population. It introduces zoo visitors to concepts of ice melting in the North Pole by giving them the opportunity to traverse and explore a visualized area of the Beaufort Sea – a terrain based on historical data, and on projections of ice coverage in the future. The main goal is to teach that the longer the polar bears swim, the more energy they consume for hunting. The navigation and interaction requires users' physical effort and embodiment to support learning. For swimming, users wear a pair of polar bear paws with an embedded iPod touch that sends the acceleration data to the system. For walking, users step on a step-pad with pressure sensors connected to the system. The virtual environment is complemented with an iPad application that displays real-time information related to users' performance and climate change facts. Our research looks at factors related to user experience, embodiment and learning outcomes about climate change. At this point we have done formative studies about system calibration and user experience/interaction (Lyons, 2012) that includes: 1) judgments about different levels of efforts; 2) attention focus and degree of immersion; 3) degree of personalization of the experience; 4) individual approach to using the embodied controls. The design process included a series of discussions with experts in climate

Figure 4. Create Your Own Mosaic at the Field Museum.

science, education, computing and design. The purpose of the group's research has been to accurately inform the general public about current research on climate science and to make it engaging through graphics, immersion, and embodiment. The first revisions in the design process were content driven –guided by science experts. The latest phases were influenced by the results of the formative studies, resulting on the redesign of the system interfaces –replacement of wiiMote for iPods, weight addition to the globes; and changes to graphic elements. They also led lead to the creation of an additional iPad interface to display users' progress, performance graphs, and to showcase facts triggered by the user's location in the virtual environment. The development team fueled the creative process, and it has driven content changes, visuals, and aesthetics of the virtual environment. It has been an informed design that perhaps without the team's feedback, could have introduced misconceptions and led to undesired results.

Conclusion

The process of identifying elements of a successful art/science development that focuses on creative engagement and incorporates practices and theories from media arts and STEM education is just beginning. There are growing opportunities for artists for innovative ways of collaborating with scientists in the design of interactive learning applications. The differences and similarities of art and science research methods, creative discoveries, evaluation methods, and the challenges in the development of STEM applications will be covered in future research of this group.

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THE SOCIETAL IMPLICATIONS OF ENERGY ABUNDANCE

Scott M. Tyson

AUTHOR OF *THE UNOBSERVABLE UNIVERSE*

ABSTRACT

Major technological change affects the way we live and the way we interact in society. Few inhabitants of this planet in 1890, who traveled to town by horse and buggy, could have imagined that in 60 years time, people would travel the World in jet planes in the span of a few hours. Likewise, in that same time period, the World developed a dense grid of instantaneous telecommunications, first over wires, and then even without the wires to provide greater mobility. In this same timeframe, mankind has sent machines into outer space, studied far away galaxies, gained an entirely new understanding of the Universe, and cured many diseases thought incurable. Today, we live in a time when we need to consider that many things previously thought impossible might indeed be possible, and that these changes profoundly affect what we can do technologically, and how we live as individuals and in society. This panel will investigate the implications of these possibilities.

Panel Description

The prospect of abundant or unlimited energy is a real and growing possibility. Unlimited energy was nearly achieved through a nuclear production scheme during the 20th century but the high costs and risks tempered the effort.

During the mid-20th Century, research and development into nuclear energy offered society its first plausible opportunity of abundant energy. A sufficient set of reactor designs combined with radioactive raw materials offered to the world for the first time the plausibility of unlimited or abundant energy that could be produced at special facilities and then shipped to consumers nationwide through a complex distribution grid. Yet, there were serious practical limitations that tempered and ultimately curtailed these nuclear energy plans. True enough, nuclear power approaches appeared poised and capable of providing virtually unlimited amounts of energy to fuel all facets of society, but the approach carried risks and costs that were ultimately deemed too high. In short, the potentially devastating side effects included two serious problems: the generation of copious amounts of highly dangerous radioactive waste that would require storage and/or "disposal" and the increasing and ever-present threat that these dangerous radioactive waste materials could or would be weaponized. Ultimately, the appeal and practicality of a 20th Century nuclear energy panacea was greatly reduced with improved appreciation of the extraordinary drawbacks. Unfortunately, recent events around the world continue to remind us of the terrible costs and risks to society posed by nuclear energy, especially when combined with the powerful and unforeseen forces of nature in a world experiencing global climate and atmospheric changes.

The Computing and Information Age of the 21st Century made possible by advancements in microelectronics represents another example of energy abundance when viewed from an alternate perspective. A review of computing machinery of the mid to late 20th Century and the subsequent portrayal of this technology in popular literature provided a certain impression to the society of that era. Based on projections of technological trends, computer scientists believed that computers would continue to grow physically into monstrous contraptions with dramatically increasing computational capability. It was believed that the evolution of room-sized computers would lead to super-computers of ever-growing size to accommodate new capabilities that were envisioned over time. Expectations developed that supercomputers of the future would occupy massive buildings or even special cities. These expectations also included the need for huge energy supplies to operate the machines upon which society would increasingly depend. Movies and books especially during the 1960s and 1970s often captured these visions of supercomputers. The power demands of such devices would have been enormous and added an additional burden to the energy production needs required by the rest of society. Interestingly, however, supercomputing technology developed along a path far different from what was envisioned earlier as the result of miniaturization. This previously unanticipated miniaturization, enabled through integrated circuit manufacturing methods, quickly reversed the trend of physical supercomputer growth while providing staggering improvements in power consumption and computational performance. In contrast to the early trends and portrayals in literature of that era, today's supercomputers occupy only a small corner of our working space and consume ever decreasing amounts of power. Needless to say, many of the computing devices upon which we increasing rely are now portable, handheld devices that we store within our pockets or purses as we go about our day. Our computing technology has nearly reached the point at which we can operate any of these devices for a full day by the charge we store on a modest sized battery embedded within the device. Our computing devices are interconnected with one another through wired and wireless schemes to access a cloud computing infrastructure with the potential to provide each consumer with a virtually unlimited amount of computing capability. So, from the computing perspective and the benefits derived from miniaturization and interconnection, technology has already achieved a form of energy abundance with sweeping global societal implications. This perspective needs to be tempered by the fact that even though advancements in miniaturization and battery technology continue at a quickening pace, the proliferation of computing devices places a substantial demand for power from the power distribution grid, but this demand is far less than had previously been considered.

Finally, let's look to the future and make some bold and speculative but not entirely unreasonable projections. A scientific revolution leading to a new physical understanding of our universe and a radical new cosmology may occur, and there are indications that such a revolution may be imminent. A radical new cosmology might involve the unification of the fundamental forces, the unification of quantum physics with relativity, and insights into the precise nature of the relationship between individual observers and their external universe. This new view of physics might therefore provide humanity with its deepest glimpse and understanding yet into the innermost workings of the universe, as well as the natures of void and the seemingly inexhaustible quantum fluctuation energy. Such a revolution may lead to the knowledge and means by which to tap into the universe's vast potential energy reserves to produce a new, cheap, and inexhaustible power production paradigm that may be benign and free from costly and dangerous side effects.

A variety of new power paradigms have emerged over the past century and new ones are expected to emerge over a timeframe that may be difficult to predict. How will new power paradigms alter human society and the path of human civilization? Which facets of society are more likely to be affected and over what timeframe?

Panel members will share their particular views on how prospects for abundant energy will alter various facets of society. Various aspects of society and segments of the economy will be considered and addressed during the session, which might cover city and space planning; personal and public transportation and mass transit solutions (sea, land, air); manufacturing and factory design; consumer products and communication; food production and clean water generation; building design and construction (residential and commercial); medicine, healthcare, and public health; government and politics (municipal, state, federal, and world); and impacts to power production schemes and distribution to consumers.

Questions with which the panel might grapple include:

- What changes to the physical appearance of society might result?
- What changes might we make to the design of basic infrastructure?
- What changes might we expect in the field of transportation?
- Will there be a shift in balance between personal and mass transit modes of transportation?
- Might new forms of personal and mass transportation emerge?
- What might be the impact to city design and the migration among urban, suburban, and rural living?
- What might be the impact upon highway design, as well as the role of rail and air modes of transportation?
- Will there be an impact upon social appearance and organization?
- How might the role of government be impacted?
- Will the role of national, regional, and local boundaries be affected?
- Will the architecture of power production become more centralized or more decentralized? In other words, might power production occur increasingly at or near the consumer?
- How will the significance and/or need for a national distribution grid be affected?
- What might be the impact upon reliable access to power?
- What will be the impact upon the nature of man?
- What might be the impact upon international relationships, conflicts, and war?
- How might free or cheap, abundant energy affect the employment based economy and what might the impact be the traditional work week?

- Will the prospect of energy abundance lead us toward or away from utopian society?
- How might a new, benign, abundant power paradigm impact upon public health issues and the future efforts of the life sciences industry?
- What might be the hidden dark side and harmful side effects of abundant energy, even if it's considered to be of a benign nature?

The panel session will begin with an opening statement from the moderator followed by statements from each panel member speaking from within their respective fields. During the panel session, the moderator will pose questions to panel members and solicit questions from the audience. The panel will conclude with closing remarks from each panel member.

Moderator and Panel Member Biographies

Scott M. Tyson has devoted much of his 31-year career to developing new technological approaches at IBM's VLSI Laboratory, Johns Hopkins University's Applied Physics Laboratory, and Sandia National Laboratories. Long-recognized as a pioneering problem-solver and "big picture" futurist, he served as an advisor to the Office of the Secretary of Defense on space computing technology development and planning. Tyson's landmark innovations have accelerated the advancement of space electronic solutions while distinguishing him as a change agent in his field. He has fifteen patents in space technology and multiple awards—including a 2011 "Who's Who in Technology" award recognizing him as a key leader of scientific innovations in New Mexico's technology sphere. His work continues to have a profound impact on the way scientists and laymen alike view themselves and the world around them.

Col. Steven C. Suddarth is the Chief Research Officer of the Configurable Space Microsystems Innovation and Applications Center (COSMIAC) at the University of New Mexico and a private consultant through Transparent Sky, LLC. A retired Air Force Colonel, Dr. Suddarth has overseen several substantial computer engineering/embedded systems projects. These include the development of a first-ever three-dimensional mixed analog/digital image processor which advanced the State-of-the-Art by three orders of magnitude, several airborne optical sensing systems, unmanned aerial robotics, and software systems for large military space programs, as well as the development of miniature spacecraft systems and components.

Russell Brito is the Manager of the Urban Design and Development Division of the City of Albuquerque Planning Department. Over his eighteen-year tenure with the City, he has worked with development review of current projects, metropolitan redevelopment in distressed areas of the city, and long range planning for specific sectors, areas, and the larger metropolitan area. This type of Planning involves the coordination of land use, transportation, and infrastructure across multiple jurisdictions, in concert with elected and appointed officials, business owners, neighborhood associations, and other interested parties. Consensus is not always the result, but collaboration has resulted in successful projects and partnerships that benefit individual communities and the city as a whole, such as the redevelopment of Old Albuquerque High School, the Downtown 2010 Sector Development Plan, and the Nob Hill/Highland Sector Development Plan.

Lt. Gen. Tom Goslin (ret.) is Director for Business Development of Strategic Systems for Raytheon Company. Gen. Goslin served as the Deputy Commander of U.S. Strategic Command where he was a key command link for the U.S. nuclear resources involving both power plants and weapons. He brings great experience in terms of the sociological and strategic challenges imposed by systems that involve large amounts of energy applied to a variety of applications.

Michael D. Shaw is executive vice president and director of marketing for Interscan Corporation, a Los Angeles-based manufacturer of toxic gas detection instrumentation and related software. Michael has developed an international reputation as a straight-talking, scientifically-grounded commentator, and writes a weekly column for Health News Digest, a leading supplier of content to the life sciences industry. Michael performed undergraduate biochemical research at UCLA under Professor Roberts A. Smith and Nobel Laureate Willard Libby and performed graduate studies at MIT. Michael is keenly interested in all aspects of wellness, health care, and life sciences, including rational approaches to so-called environmental hazards, as well as complementary medicine (combining the best of alternative, allopathic, and natural hygiene).

CASCADING MEMORIALS: URBANIZATION AND CLIMATE CHANGE IN SAN DIEGO AND BEYOND

Ruth Wallen

GODDARD COLLEGE

ABSTRACT

Cascading Memorials, http://www.ruthwallen.net/cascade.html, offers a public space to mourn the devastatingly rapid changes to terrestrial environments due to the combined effects of climate change and urbanization. Memorials to specific sites are designed to capture the viewer's attention, ignite curiosity, and provide questions for reflection. The work provides a vitally important public space to grieve the immensity of our losses. Having opened our hearts, this grief can inform the values by which we design technologies and build socio-political institutions for sustainable futures where all species may flourish.

In indigenous Africa, one cannot conceive of a community that does not grieve. In my village, people cry every day. Villagers believe that Westerners are afraid of emotion because they are afraid of a loss of control. Until grief is restored in the West as the starting place where the modern man and woman might find peace, the culture will continue to abuse and ignore the power of water, and in turn will be fascinated with fire." -Malidome Some, The Healing Wisdom of Africa

Forests are dying throughout the western United States and Canada, and throughout much of the world. In the mountains north of the conference site and beyond, drought bark beetles are devastating Lodgepole, Pinon, and Ponderosa pines. Many forests are not only brown, but blackened in the wake of huge fires.

Cascading Memorials offers a place to grieve the astoundingly rapid changes and losses of wild spaces brought about by climate change and urbanization. Memorials focus memory. The work calls viewers/participants to attentiveness, to appreciate the splendor of their surroundings, to listen to the wisdom of scientists and the memories of elders, and to contemplate the rapidity at which the environments in which we live are changing.

The initial focus of *Cascading Memorials*, developed as an installation and web site, is San Diego County, my home for many years. Characterized by diverse habitats and extremely rapid population growth, from 60,000 to over three million inhabitants in the last one hundred years, San Diego is home to more threatened and endangered species than any other county in the continental United States.

The installation consists of memorials to particular sites indicative of habitats that are rapidly changing or

disappearing due to the present and potential effects of urbanization and climate change. Each memorial presents layered text and image designed to capture the viewer's attention, ignite curiosity, and provide questions for reflection. Immediately visible upon entering the space are large elaborate photomontages. Like memory, these montages fragment and recombine images, compressing or expanding space to evoke a feeling sense of each locale. Simple poetic questions along the gallery wall, above or below the montages, invite contemplation about the images on view. These questions are amplified in the sketchbook pages that combine text, drawings, and photographs, providing scientific and historical context and more detailed questions for consideration. In the web site and future installations, I also plan to add audio, mixing ambient sound and interviews with those intimately familiar with the sites.

A Closer Look: *How do we fully nurture each seedling?*

Let's take a closer look at some of what I've found in San Diego. Huge fires devastated San Diego County in 2003 and 2007 burning most of the conifers in the county. Overzealous fire suppression in the past was a major contributing factor, but drought and bark beetle infestation, brought about at least in part by climate change, made trees more

Figure 1 "Cuyamaca Forest" archival pigment print, 42"x24"

Figure 2 "Cuyamaca Forest" archival pigment print, 40"x24"

vulnerable. All of these events foreshadow even more perilous future conditions.

As I explain in the sketchbook pages, some believe that the 2003 fire burned so hot that it destroyed conifer seeds, even though they are adapted to sprout after fire. Arguing that the only way that the forests can be restored is through clearing the underbrush and reseeding, private foundations are raising money to support this activity. Other scientists contend that the forest is best left alone, that the nitrogen-fixing ceanothus now covering the hillsides a necessary first step in regeneration. Regardless of how foresters now intervene, except for one mountain in the northwest of the county that was sparred in recent fires, most of us who were adults at the time of the fire won't experience mature conifer forests again in San Diego County during our lifetimes.

Can we contain human influence?

In San Diego County, wild lands are concentrated in the border region. Otay Mountain, the subject of the sketchbook pages below, is home to approximately twenty threatened and endangered species. Here, I try to communicate the complexity of factors leading to the decline of wild places.

Figure 3 "Otay Mountain Sketchbook," archival pigment prints, 23"x10"

Are we willing to heed the cry of the dying oaks?

Oaks are more common in San Diego County than conifers, and are capable of regenerating after fire, as the entire tree is rarely killed. But in recent years oaks have begun to die, mysteriously. The culprit has been identified as the Goldspotted Oak Borer, probably introduced on firewood from Arizona or Mexico. While in its former range, populations were held in check by predators or climate, borers are rapidly spreading throughout San Diego and potentially northward. Meanwhile sudden oak death, another introduced pathogen, is moving southward through forests in northern California and Oregon. Drought, pollution, frequent fires, and other stressors increase the susceptibility of oaks. To slow dispersal, in the southlands visitors are admonished not to move firewood, and in the north to be careful to clean their shoes. In sketchbook pages I ask, are we willing to think more expansively and address all of the underlying conditions that make trees more susceptible to new pests and diseases?

Figure 4 "Pine Creek 1," archival pigment print, 80"x30"

Figure 5 "Pine Creek 2," archival pigment print, 78"x30"

A Public Space to Grieve

I realize that haunting images and disturbing information alone simply leads to mind-numbing hopelessness. Such is the case, I believe, with many photographic exhibitions addressing environmental devastation. Instead of invoking passivity however, I invite the viewer/participant to actively reflect and respond. Instead of sinking into despair, I encourage viewers to open their hearts, to share personal experiences, and read those of others. At the center of the installation and prominently placed on the web site, is a place to grieve. In installations the place to grieve might consist of a pile of leaves, or a low pedestal with cushions, always accompanied by journals where participants can share their personal recollections of places or particular plants, birds and animals that have perished. On the web viewers are asked to contribute to a blog.

I believe that public grieving is an essential step in acknowledging the current ecological crisis, and working toward a future where all species may flourish. In the process of grief, when the flow of life feels temporarily halted, and one

faces the ache of loosing loved ones, hearts open. Compassion arises. Sense perceptions are heightened. One is touched by the full poignancy of the living world. In this opening it is possible to feel not only heartbreak, but also the vital interconnectedness of the living world.

Unfortunately, there is little place for mourning in a fast-paced consumer society that constantly offers new aids towards the quest for continuous pleasure. Furthermore, there is no space for mourning losses of non-human beings, save perhaps pets. Moreover, in an increasingly globalized society, where human technological prowess is ever more evident, we are bombarded both by images of trauma from around the globe and of apocalyptic warnings of wartime or ecological disasters brought about by the very technology that has in so many ways improved human standards of living. For many, the extent of losses to real or imagined trauma feels so overwhelming that grief seems impossible.

In contrast, in *Cascading Memorials*, I make the subjects of grief tangible and manageable, offering memorials to specific places. I begin in my community, in San Diego, where I have lived for years. Having moved away for the current year, I am now extending beyond only to other places where I have also lived or visited repeatedly. So as not to objectify places, in addition to the visuals I provide complex and sometimes contradictory information about the changes occurring and their many probable causes, while also raising unanswered questions. Just as I have formed my personal relationship with the places I share, I invite viewers do the same, sharing their personal feelings about the places they've lost or their interactions with plants and animals that are disappearing.

In a public space of grieving, one is not alone. While Aldo Leopold writes that the consequence of ecological awareness is living, "alone in a world of wounds," collective sharing breaks this isolation (Leopold 165). It has the potential to offer not only solace, but greater possibility of meaningful action.

In her essay, "Melancholy Natures, Queer Ecologies," Mortimer-Sandilands describes the lack of grieving, prevalent in the postmodern or anthropocene age as living in a state of suspended melancholia. In this state grief is internalized. Objects of loss are displaced or fetishized. She contends that this process of displacement gives rise to "nature-nostalgia," manifesting in such activities as ecotourism and even campaigns to preserve a particular species or wilderness area. Such practices, although well-meaning, tend to deify a mythic-idyllic view of the natural world. Nature becomes a commoditized fantasy. In such actions environmental destruction is incorporated "into the ongoing workings of commodity capitalism" (Mortimer-Sandilands 333).

Similarly, I worry that the title of this conference, "Machine Wilderness" could be interpreted as reinscribing, a problematic dichotomous thinking that idealizes both machine and wilderness in irreconcilable opposition. As William Cronon explains in his influential essay, "The Trouble with Wilderness; or, Getting Back to the Wrong Nature,"

dualistic perspectives that idealize wilderness create an irresolvable conundrum, placing humans outside of the desired state: "If we allow ourselves to believe that nature, to be true, must also be wild, then our very presence in nature represents its fall. The place where we are is the place where nature is not" (Cronon 80).

While my work does include images of wild spaces, instead of the heroic sublime, I present a fragmented, layered perspective, not of an idyllic, static wild, but of dynamic systems undergoing unusually rapid change. I try to share not an idealized aesthetic but an intimate personal expression of the rich and wondrous experience of these places.

A Place to Imagine

Fear of grief, fear of facing the immensity of environmental devastation, fear of unending despair, is understandable. But not meeting this fear has significant consequences, a psychic numbing, or as Richard Anderson asserts in a widely circulated op-ed piece in the *Los Angeles Times*: "the alternative is a sorrow deeper still: the loss of meaning" (Jan 7, 2001). Instead, allowing sadness to flow can reawaken our empathic relationship to all living systems, human and non- human, and reignite imagination. My work not only offers a place to grieve, but "A place to envision a future where all species may flourish." While Kubler-Ross's well-known five stages of grief may end with "acceptance," a better term might be integration. Part of the process of grieving is to make meaning or sense of the loss. Just as many who've lost loved ones to cancer or senseless violence support organizations or research designed to address the causes of their loss, so to grieving for losses of wild places can lead to ethical action. In the installation of *Cascading Memorials*, I not only offer a place to grieve publically but I invite participants to share their images of the future by responding to several prompts, including those asking for visions of individual and collective responsibility, on leaves to be placed on bare trees painted on the wall.

To turn to the conference title again, it is important to interrogate not just the meaning of "wilderness," but of "machine." Modernist mythology is based on the assertion that machines will somehow emancipate humans from the drudgery and capriciousness of nature, but just as postmodern insight suggests that humans are embodied in the natural world, so too it implies that technology and nature are increasingly intertwined. Technology and "nature" are both integral and interrelated parts of the systems within which we live. As human beings we must take responsibility for how we employ and care for both plants and animals, our fellow beings and the technology we produce.

I assert the importance of grief in the context of this conference because I feel that it is vitally important to mourn the rapidity of change of natural ecosystems of which we are part. The experience of grief must inform the development of technological alternatives so that we can create sustainable futures based on empathy and compassion. The language of sustainability is largely written in human reference points: "Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs" (United Nations General Assembly Mar 20 1987). While this language is a necessary reminder that ecological responsibility must include social justice, experiencing grief over the rapidity of diminishing populations

of non-human creatures and devastation of habitats affirms the sanctity of non-human life and compels one to re-imagine a future where all species may flourish. Many scientists have stated that we possess the technology to make changes to quell global warming, but lack social/political will. Touching our grief can help mobilize that will. Our sorrow demands an ethical system, economy, and technology based on sustaining all life forms.

The title of my work, *Cascading Memorials*, echoes the present day realities, where stories of current and potential ecological devastation seem to mount with each news report. The title is intended as a call to attentiveness, to place in public memory the rapidity of present day changes. However the title is also meant to be a call for hope, to offer the possibility that instead of sinking into despair and resignation, through the public sharing of grief, we can generate new vision so that memorials of the future may look very different than those I am creating in the present day.

ENDNOTES

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Leopold, Aldo. *Round River*. New York: Oxford University Press, 1993. Print.

Mortimer-Sandilands, Catriona. "Melancholy Natures, Queer Ecologies." *Queer Ecologies: Sex, Nature, Politics, Desire*. Eds. Catriona Mortimer-Sandilands and Bruce Erickson. Bloomington: Indiana University Press, 2010. Print.

United Nations General Assembly. "Our Common Future: Report of the World Commission on Environment and Development." Mar 20, 1989. Web.

Junkspace
by Lynn Cazabon & Neal McDonald (Maryland, USA)

Junkspace is a time and location sensitive video installation and corresponding iOS App that highlights two forms of waste. Earth-bound (electronic waste) are the remnants of the many devices that fill our lives, transformed from objects of desire to trash through a self-perpetuating cycle of obsolescence. Celestial (orbital debris) consists of the millions of pieces of junk currently circling the earth, left behind by decades of satellite and space missions. (this page)

SHORT ABSTRACTS

P = full corresponding paper

EDUCATION FORUM

Chaouki Abdallah, Nina Czegledy, Ricardo Dal Farra, Sam Fox, Patricia Olynyk, Juliana Pierce and Andrea Polli Ross Harley, Felipe Londono, Ian Clothier, Cheryl Wassenaar, Susanna Sulic, Suzanne Anker, Shaurya Kumar

The workshop brings together academics, researchers and educators to discuss the latest developments of policy research, evaluate the role of educational research, as well as existing educational business strategies, financial modeling and risk management. It is essential to keep in mind that in addition to the long term benefits of education the successful future resolution of current problems will greatly influence the perspectives and potential of tomorrow's leaders. The workshop strongly encourages interaction between participants interested in the changes of economic dimensions of education. The summary outcome of the workshop is to be published in the Leonardo Education Almanacs" Series on Education.

DIGITAL DIVIDE

Juan Abeyta

Studies have shown that minority communities are less likely to have access to techno-logically advanced resources. Created by deeply ingrained social and economic disparities, this "digital divide" has already led to underrepresentation of minorities in science, technology, engineering and mathematics (STEM) fields, with the consequence that these students may be less prepared to compete and participate in the 21st century workforce. This panel discussion addresses issues of technological accessibility within minority communities, and proposes ways to make technology culturally relevant. Panelists include: Sandra Begay-Campbell, Tameka Huff, Henry Rael and Juan Abeyta.

EXPERIMENTAL SHORTS

Trish Adams, Stephen Ausherman, Peter Bill & Bruce Bennett, Peter Bill & Anna Kaneko, Angus Carlyle & Rupert Cox, Gair Dunlop, Linda Duvall, Brian Evans, Hans Gindlesberger, Volker Kuchelmeister, Stephen Pope, Sergio Romero and Jim Scott

In this selection of experimental films, filmmakers stretch the limits of form, subject and technology. From various camera techniques and post production experiments, to appropriating footage from Google Street View, these works live in the edge of contemporary filmmaking.

MEDIA ARTS IN SUPPORT OF SCIENCE EDUCATION

P

Julieta Aguilera, Helen-Nicole Kostis, Brenda Lopez Silva, Tina Shah and Daria Tsoupikova

Our presentation examines the role of media arts in the development of interactive learning environments for science, technology, engineering, and mathematics (STEM). Collaborative, interdisciplinary teams of artists, technologists and scientists developed novel interactive learning projects that educate the public on fundamental science (STEM) disciplines. Five interactive educational applications were designed based on the leading art and design concepts with a focus on user engagement, interactive design, and aesthetics principles. We describe the role of art in the development of these projects and examine how artists can cross disciplinary borders to collaborate in the development of innovative educational STEM learning applications.

CORPUSELECTRIC FASHION SHOW

Johnny Alvarez, Daniela de Angeli, Mary Basler, Nick Cassados, Gabe Garcia, Elizabeth Gomez, Miriam Langer, Stephanie Marcus, Tatyana de Pavloff, Stacy Romero, Shanoa Leigh Rosby, Nina Silverton, Deanna Threadgill, Matthew Threadgill, Daisy Trudell, Siah Trudell, Tara Trudell and Shawna Yambire

CorpusElectric is a tech-fashion collaboration between Media Arts students from New Mexico Highlands University, the Taos Runway Vigilantes and students from the ISEA2012 Visiting Artists Teaching Program. Workshops are being held in Taos and Las Vegas, New Mexico. Focusing on girls and technology, participants develop STEM skills through integrating technology into wearable costumes and accessories, and in production of multimedia backdrops and lighting. The project is lead by artists Megan Jacobs, Miriam Langer, Stacy Romero, Nina Silfverberg and Tatyana de Pavloff. The CorpusElectric collective presents a fashion show during Intel Education Day.

DIRTDAY!

Laurie Anderson

The legendary Laurie Anderson, icon of the electronic art and music world, performs her brand new show at ISEA2012. DIRTDAY! looks at politics, theories of evolution, families, history and animals in a riotous and soulful collection of songs and stories. The third and last in her series of solo story works, which includes Happiness and The End of the Moon, DIRTDAY! is the culmination of Anderson's ground-breaking work in this genre.

RADICAL COSMOLOGISTS IN TRANSIT (RCIT)

Laurie Anderson and Tom Lesser

Laurie Anderson is a renowned American performance artist, composer and musician who plays violin and keyboards and sings in a variety of experimental music and art-rock styles. She is a pioneer in electronic music and has invented several devices that she has used in her recordings and performance art shows. Anderson will speak in conversation with Tom Leeser, co-leader for The Cosmos: Radical Cosmologies theme. Sponsored in part by AMP Concerts.

THE WILDERNESS AT HOME

P

Josephine Anstey

In this paper I suggest that we need a complex, fractal-like intermingling of the wilderness and city in both real and virtual space in order to create a sustainable future for human beings on the earth. I discuss Mrs. Squandertime, a persistent simulation/stimulation of the slow alpha state that is conjured by watching nature without purpose, as an example of such an intermingling.

MEDIOS DE COMUNICACION CULTURAL INDEPENDIENTES ESCANER CULTURAL Y COMUNIDAD ABIERTA ACT

Yto Aranda

Open Community Arts, Science and Technology is a space and a resource for the diffusion, formation and analysis of the daily themes and practical uses related to art and new media. Our objective is to gather and collaborate using tools with a large quantity and quality of relevant information gathered and supported by the community. Creating a shared space for content and relationship development for individuals interested in the intersections of not only art and science, but also science, philosophy, the environment and the corresponding responsibilities that new media presents our society. Housing a community comprised of artists, theorists, educators, managers, engineers, researchers, programmers, sociologists and/or any person involved with the mentioned roles.

BRAZILIAN ARTISTS AND CURATORS

Priscila Arantes, Giselle Beiguelman and Simone Osthoff

This talk features women artists and curators from Brazil. Giselle Beiguelman (PhD in History from the University of São Paulo) and curator Priscila Arantes (Adjunct Director of the Museum of Image and Sound in São Paulo), mediated by Simone Osthoff (Associate Professor of Critical Studies in the School of Visual Arts at the Pennsylvania State University) speak on the international art scene, offering the public a chance to see dynamic dialogues about contemporary media art from first-hand experiences.

MEXICAN SPACE COLLECTIVE

Marcela Armas, Arcangel Constantini, Juan Jose Diaz Infante, Gilberto Esparza and Ivan Puig

Juan José Díaz Infante and the Mexican Space Collective are building a satellite called Ulises I. Inspired by and in response to Mexico's drug war, Infante wanted to illustrate the idea that the future varies for different generations. The project involves launching the satellite into space, after which it will play an algorithmic opera, making the satellite a musical instrument. An art installation about this project is displayed in the ISEA2012 exhibition at The Anderson- Abruzzo Albuquerque International Balloon Museum. Sponsored in part by the Mexican Consulate, Fonoteca Nacional de Mexico, Laboratorio de Arte Alameda and Arts Catalyst.

MAPPING WITH BALLOONS AND KITES

Lucas Bambozzi, Danny Bazo, Andrés Burbano, Felipe Fonesca, Rodrigo Minelli and Bruno Vianna

Regarding the history of technology in Latin America one remarkable fact is related to the first pioneers of balloons and lighter-than-air devices in Brazil, that is the inspiration for this panel. Panelists include Bruno Vianna, Rodrigo Minelli, Andres Burbano and Danny Bazo. The moderator of this panel is Lucas Bambozzi who is the head of Arte.Mov Festival in Brazil. Sponsored in part by Instituto Cervantes.

SHIFTING PARADIGMS

P

Leah Barclay

This presentation is about a pedagogical experiment involving students in the digital arts, landscape architecture and architecture and the conclusion they reached in response to the country's "largest green development" The South Waterfront in Portland, Oregon. In the fall of 2009 an Intel sponsored studio called The Machine in the Garden: Rethinking Urban Gardens in the 21st Century was taught by Tad Hirsch, Liska Chan and Colin Ives, at the University of Oregon. The course took Marx's text as a "playbook" but in this case not gleaning signs of the pastoral in literature but rather using creative practice to examine the current movement of "green" urbanism. This speculative studio concluded that "green" was synonymous with Marx's pastoral — that in its' clear simple nomenclature conceals the unresolved tensions and conflicts that, like the pastoral, it harbors.

FROZEN MUSIC ENSEMBLE

Rene Barge, David Dunn and Gustavo Matamoros

An extended performance/installation (24 hours) of electro-acoustic sounds that respond to and interact with the emergent acoustical behaviors of the Duck Pond Bridge at the University of New Mexico in Albuquerque through a sonic redrawing of its aural landscape.

MOTION AND POWER BETWEEN THE PHYSICAL AND VIRTUAL

Danny Bazo, Miwa Matreyek, Marco Pinter, Scott Snibbe and Lisa Wymore

Much of new media work explores some interaction between the real and the virtual worlds. Some of this work may require the viewer to balance conflicting messages coming from different parts of the brain, and challenge the perception of what is real and what is virtual. Other works utilize virtual partners or dopplegangers, which both react to and create reactions in live performers, which may be dancers, actors or robotic structures. The panelists span the areas of dance performance, theatrical performance, robotic installation and interactive media installations, and will discuss how their work intersects these questions of technology and perception.

MEDIA LITERACY PROJECT

Hakim Bellamy, Jessica Collins and Andrea Quijada

For twenty years the Media Literacy Project has been creating programs and campaigns that ensure our communities can access, analyze, and create media. This interactive multimedia presentation will provide an introduction to media literacy, share success stories of media production for community engagement, and offer best practices for curriculum development. The first twenty participants will receive Media Literacy Toolbox, a DVD with over 100 media examples that can be used in organizations and classrooms alike.

HIP HOP & TECHNOLOGY

Hakim Bellamy, Tahir Hemphill and Kwende Kefentse

Since its emergence in the mid 1970s, Hip Hop culture and music have been transformed by technological innovations. Through the research of Tahir Hemphill, creator of the *Hip-Hop Word Count: A Searchable Rap Almanac,* an ethnographic database built from the lyrics of over 40,000 Hip Hop songs, users can analyze and track this evolving language. Kwende Kefentse's focus on urbanization has led him to explore parallels between the emergence of Hip Hop culture and the built environment on a global scale.

VISIONS AND FANTASIES

Gregory Bennett, Lucy Davis and Anne Morgan Spalter, Reese Inman, Cynthia Brinich-Langlois and Joseph Mougel, Chia Yu Chen

This selection of new animations highlights both manual and digital modes of production as well as hybrid forms. The films cover a variety of themes and subjects, from examining contemporary issues of international deforestation to fantastical visions of our futures on other planets.

SMARTLAB/CATALYST: CATALYSING TRANSDISCIPLINARY CREATIVE TECHNOLOGY INNOVATION FOR REAL SOCIAL CHANGE

Steve Benton, Tara Boath-Mooney and Lizbeth Goodman

With the onset of cloud computing and the increasing ubiquity of our technology we are increasingly consuming electricity and natural resources, with the relationship between our gigabytes of storage and our carbon footprints easily overlooked. Is the cloud the green alternative or a dark storm brewing? With avatars in Second Life generating a carbon footprint up to three times that of an individual in the developing world then perhaps it's time to take a closer look at The Matter of Technology. The panel convenes artists, technologists and activists to present their practices and consider our complex relationship with technology.

T/ACT: PARTICIPATORY DESIGN WORKSHOPS FOR SOCIAL EMPOWERMENT

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Andy Best-Dunkley

This paper presents research into the social effects of a collaborative participatory design process with selected individuals who have severe physical disabilities. This process encourages and enables creative expression by the participants beyond their everyday norms. They are

able to control media such as audio and video through custom made bespoke interfaces which they help to design and develop. Can a disruption of institutionalised conditioning according to class, education, gender and physical abilities be orchestrated by careful design and presentation of interactive artworks? Can the new media artwork become a culturally significant tool for social empowerment leading to long lasting changes for the individuals involved?

STEMARTS ROUNDTABLE

John Bishop, Scott Laidlaw, Anita McKeown and Karin Moulton

Taos Academy (TA) is a state chartered school for grades 5-12. Our vision is to be a model 21st-century learning community developing strong leaders who have the academic and social skills necessary to succeed in the modern world. The STEM Institute at TA, instructs middle and high school students in STEM concepts through project-based courses. Partners such as Los Alamos National Laboratory, UNM, Northern Arizona University, local and national artists and businesses allow students to collaborate with professionals in the field and ensure sustainability of long term goals. By providing real world applications students expand their understanding of the possibilities for a career in the STEM field.

AUTOMORPHOSIS

Harrod Blank

Join documentary filmmaker and art car artist Harrod Blank for a screening and Q&A. Blank is the co-founder of ArtCar Fest, one of the largest annual art car gatherings in the country, held every September in the San Francisco Bay Area. His most recent film *Automorphosis* looks into the minds and hearts of an inspiring collection of eccentrics, visionaries and just plain folks who have transformed their autos into artworks.

BURNING MAN ART VEHICLES, ART CARS & THE CAMERA VAN

Harrod Blank

Harrod Blank will present a visual history of Art Cars at Burning Man, how and why these vehicles have evolved from personal totems into large scale fantasies on wheels called mutant vehicles. Over the years Burning Man has inspired folks to bring more "wow" factor, larger scale interactive works featuring cutting edge technology integrated into virtually all expression such as contemporary art installations, sculptures, theme camps and especially mutant vehicles. Blank will also highlight and introduce Doc Atomic, a local ABQ nuclear scientist and visionary art car artist, along with other art car artists from New Mexico.

LEARNING FROM THE LAND: EXPERIMENTS WITH AMERICAN AGRICULTURE

April Bojorquez and Matthew Garcia

This presentation will explore site-specific work lead by Phoenix-based desert ArtLAB. Informed by history and native ecology, the interdisciplinary team engaged local residents in dialectic performative ecological interventions in urban desert space. Participants engage the environment, confronting the ecological and social realities of place, through the planting of the autochthonous prickly pear cactus. desert ArtLAB has orchestrated the planting of over 150 cactai throughout Phoenix. Monitored over the course a year, the cactai reveal the idiosyncrasies of place, politics, and identity. desert ArtLAB is composed of artists, activists, and social and natural scientists, who's collaborations apply an interdisciplinary lens to social issues creating spaces for relevant dialogue.

THE SOCIETAL IMPLICATIONS OF ENERGY ABUNDANCE

Thomas Bowels, Russell Brito, Tom Goslin, Michael Shaw, Steve Suddarth and Scott M. Tyson

We live in a time when we need to consider that many things previously thought impossible might indeed be possible, and that these changes profoundly affect what we can do technologically, and how we live as individuals in human society. Humanity is achieving at a quickening pace its deepest glimpses and understandings yet into the innermost workings of the universe, and with it the potential by which to tap into new energy sources to produce a benign, cheap and inexhaustible power production paradigm. This panel will investigate the implications of this possibility.

GETTING OFF THE PLANET

Sam Bower, Joyce Cutler-Shaw, Eric Hanson, Charles Lindsay, Jeneé Misraje, Juanita Schlaepfer and Patricia Watts

This panel features artist collaborators Charles Lindsay and Eric Hanson who have created a digital video work of a morphing proto-world titled CARBON-X for the IAIA Dome in Santa Fe; and Scott Kildall with Nathaniel Stern who are facilitating the sending of Twitter messages at the ISEA2012 Gala toward an exoplanet 20 light years away. They address the role technology based artist practitioners can play in collaborations between the fields of astrophysics and art. Moderated by the co-curators of *Getting Off the Planet,* a multi-year site residency project curated by Patricia Watts and Jenée Misraje in partnership with the Santa Fe Art Institute.

OBSERVATION AND INTERVENTIONS

Drew Browning and Annette Barbier, Kathy High, Erin Hudson, Marie-Michéle Jasmin-Bèlisle, Andrea Polli and Melissa Ramos

This selection of contemporary documentary films contrasts urban and rural experience and presents various interventions that challenge this dichotomy and offers alternative modes of living in a rapidly changing environment.

(re) Shaping and (re) Articulating Traditional Economy

P

Ron Bull

Native peoples participation in modern and post-modern practices is often viewed as outside of what is considered traditional and therefore, when choosing to participate, questions around authenticity rise. But many of the Kai Tahu people of Southern New Zealand would argue against this. Generations of whanau (family) have participated in traditional practices of food gathering, particularly with the Titi (muttonbird) harvest. Elements of this have evolved. These have been managed through the adoption and adaptation of new technologies by the whanau involved in the practice. Underpinning all this are core concepts that inform practice: concepts centered around identity politics. While the 'what' and the 'how' of practice may change, the basic concepts remain stable. Practices such as altered political economies, alternative transactional economies, and electronic art; all play their part in how the Kai Tahu people define themselves as traditional, at the same time being active agents for change.

NAVAJO CODE TALKERS & TECHNOLOGY

Andrés Burbano and Bill Toledo

The Latin American Forum at ISES2012 is proud to host Bill Toledo, Navajo Code Talker. The history of Native American Code Talkers remains as one of the most complex and intriguing interactions between indigenous communities and the geopolitical challenges that characterized the XX century. This conversation with Bill Toledo is not only an opportunity to engage with his personal history and the context of his work as a code talker, but is also an opportunity to explore topics related to the nature of language, code and computation. This presentation highlights the renovation of the discourse about Latin American understanding with the richness of the Native American Cultures.

HEY HUMAN! WHAT SHOULD WE DO NOW?

Andres Burbano, Nina Czegledy, Ricardo Dal Farra, Ramón Guardans and Roger Malina

How do you think we, the electronic artists, could and/or should contribute to the health of our environment? Do you have ideas and projects to propose? Do you have a working model that could be replicated? Each panelist is expected to contribute to the reflection, debate and

promotion of projects and actions regarding our environment and our responsibility as human beings in trying to heal the deep wounds we can see all around us.

FROM MECHANICAL TURK TO LOCAL COMMUNITIES: HOW A SHIFT IN ECONOMIES TRANSFORMED THE ALTERNATIVE OLYMPIC GAMES

Xtine Burroughs

In 2008 I crowd sourced an Olympics-style competition among members of the Amazon.com Mechanical Turk virtual workforce, the Mechanical Olympics. At an ISEA round table discussion in Belfast in 2009 I met a curator from Cornerhouse who took an interest in the project. Subsequently, it was recreated in Manchester, UK for the Abandon Normal Devices festival in 2010. A discussion of the project returns to ISEA in regards to the ways in which it changed during its transformation from one economic infrastructure, Mturk.com, to another, the Legacy Trust UK, UK National Lottery/Big Lottery Fund.

THE PLACE OF DIFFERENCE IN THE DIGITAL HUMANITIES

Micha Cardenas

An example of an approach to scholarship that centers embodied community based practices, Local Autonomy Networks, or Autonets, seeks to develop networks of communication to prevent violence against queer and trans people, women and people of color. These networks will include mesh networked wearable electronics, low-fi alternative mechanisms and face to face agreements between people, inspired by community based, prison abolitionist responses to violence. As part of Autonets, I have facilitated three collective design workshops. These workshops build on *particle group*'s Science of the Oppressed, Gloria Anzaldúa's conciencia de la mestiza, Michel Foucault's subjugated knowledge and Lisa Duggan's Femme Science.

POST-DYSTOPIA: LANGUAGE, SOUND AND MACHINES

Luz Maria Sanchez Cardona

Post-dystopia: Language, sound and machines is a larger research/creative project that I have been developing after my study of Samuel Beckett's work in electronic media; my interests in contemporary-news-organizations as data-build-structures that do the inventory of our time; language in four of its forms: as communication tool, as data [spoken and/or written data], as pure sound, and as a social construction; and my interest on what I call the collapse of the Mexican Nation/State and the arise of [i]legitimized violence: the domestication of violence and how media is crucial in legitimizing both.

GENERATING MOBILITY AND POWER THROUGH ART

Justin Carter

This paper explores ideas of mobility and power using the case study Pedalpower for Bybrua, commissioned for Stavanger 2008 Capital of Culture. Three pedal powered generators were made available to the community of Pedersgata. During daylight hours these devices were located in a number of public sites and situations, at night the stored energy was released as part of a pedestrian lighting system installed beneath the city road bridge Bybrua. This paper will focus on the only mobile generator, Bridgit, so called for its capacity to offer transit from one side of the bridge to the other.

UNFOLDING AND UNWINDING, A PERSPECTIVE ON GENERATIVE NARRATIVE

Miguel Carvalhais

Interaction with aesthetic artifacts produced by computational systems depends on processes of simulation that complement and expand

human sensorial modalities but that are fundamentally intellectual processes. Therefore, anticipation, the validation of simulations and the violation of expectations, may play a significant role in the creation of narratives or of narrative-like experiences by humans. This paper proposes an approach to how the creation of narrative can be understood in the context of performance or interactive generative systems, in an attempt to study the perspective variable, originally proposed by Espen Aarseth in his study of ergodic texts.

STORIES OF WOOD, TREES, PEOPLE & DNA ALONG A JALAN JATI

Shannon Lee Castleman

Shannon Lee Castleman will discuss her role in the Migrant Ecologies Project, an interdisciplinary collaboration about the memories of wood, trees and people. The project, as initially conceptualized and lead by Lucy Davis, combines artistic, scientific, ecological and public educational objectives that can be negotiated through this singular research project. Jalan Jati (or Teak Road) traces the historic, material and poetic journeys of a teak bed, found in a Singapore, back to the location in Southeast Asia where the original trees may have grown. Jalan Jati brings together cross-cultural natural histories, micro and macro arboreal influences as well as DNA timber tracking technology.

JUNKSPACE

Lynn Cazabon and Neal McDonald

Junkspace is a time and location sensitive video installation and corresponding iOS App that highlights two forms of waste. Earth-bound (electronic waste) are the remnants of the many devices that fill our lives, transformed from objects of desire to trash through a self-perpetuating cycle of obsolescence. Celestial (orbital debris) consists of the millions of pieces of junk currently circling the earth, left behind by decades of satellite and space missions.

X)TREES

Agnes Chavez and Alessandro Saccoia

(x)trees is a socially interactive virtual forest generated from search words found in tweets and text messages. It is collaborative experiment in data visualization, video mapping and participatory art. Artist Agnes Chavez collaborates with programmers to create algorithmic drawings generated from data and projected in real time onto buildings or walls, exploring our connections to technology and nature. For ISEA2012, Chavez has collaborated with creative coder Alessandro Saccoia to create an immersive environment with multi-layered elements such as interactive branches, leaves, flowers and sounds collected from nature.

WAI: UNDERSTANDING MAORI AND NAVAJO UNDERSTANDING WATER

Ian Clothier

Humanity and Earth are at an important juncture: the intersection of past unsustainable approaches to environment and the potential for a sustainable future. An important factor in these issues is listening to the voice of indigenous people on the subject of environment. It is quite clear that the West will not by its own means resolve climate change issues. Dr Te Huirangi Waikerepuru, a highly respected Māori Kaumatua (elder) from Aotearoa New Zealand will lead a session based around indigenous concepts of Wai – water or flow. This is central to the 516Arts installation.

LATIN AMERICA AND CYBERNETICS

Eduardo Bayro Corochano, Andrés Burbano, Pablo Colapinto, Eden Medina and Susana Quintanilla

In different countries in Latin America there can be identified important contributions to the history of cybernetics, but there are no clear intellectual efforts to explore if those contributions have been interconnected. Speakers include Eden Medina (Indiana University Bloomington) on applied cybernetics in Chile in the 1970s, Susana Quintanilla (Departamento de Investigaciones Educativas del CINVESTAV)

on her research on the Mexican scientist Arturo Rosenblueth, Eduardo Bayro Corrochano (CINVESTAV Guadalajara) on his current advanced research on cybernetics and robotics, and Pablo Colapinto (UC Santa Barbara) on his research about the first Art and Cybernetics exhibition in Argentina in the 1970s. Sponsored by Doctorado en Diseño y Creación and Universidad de Caldas.

THE CENTER FOR ART AND EXHIBIT DESIGN ELECTRONICS (CAEED) MICROCONTROLLER AND SENSOR WORKSHOP

Stanley Cohen

The Center for Art and Exhibit Design Electronics (CAEED) was created to support people who are using or considering the use of electronics in exhibits and art-installations. This workshop will provide a hands-on look at fundamentals for manipulating and using electronic sensors with microcontrollers typically used for exhibits and art installations. Participants will work with an Arduino microcontroller and a remote sensor "shield" for building projects. Each participant will take home the microcontroller and electronics sensor board. Strategies to make a re-usable and scalable program will be explored. We will consider both electronics and programming techniques.

CAN THE ARTS HELP SAVE THE WORLD? ARTISTS AND THE ENVIRONMENT

Ricardo Dal Farra

The electronic arts could become a powerful tool of awareness and transformation in times of ecological threats. Can the electronic arts help to save the world? As an outcome of the BALANCE-UNBALANCE conferences a large project involving artists with the Red Cross/Red Crescent Climate Centre humanitarian organization is being developed. The conferences brought together artists, scientists, economists, philosophers, politicians, sociologists, engineers, managers and policy experts with the intent of engendering consciousness and creating lasting intellectual working partnerships in solving our global environmental crisis. Using art as a catalyst, these two conferences explored intersections between nature, art, science, technology and society. Do you want to know more or eventually join us? The project will be introduced during this presentation, when full information will be available and our next steps will be presented.

OPEN LABORATORIES, LABORATORIOS ABIERTOS

Ricardo Dal Farra, Leslie Garcia, Felipe Cesar Londoño and Gabriel Zea

Representatives from open labs in Latin American countries share their experiences and teach workshops, Representatives from open labs in Latin American countries share their experiences and teach workshops, including: "Open Solar Circuits" taught by Leslie Garcia from Tijuana, Mexico, and "TAG" taught by Gabriel Zea from Bogotá, Colombia, a workshop about tagging objects in public spaces. There will be other contributions to the panel by Felipe Cesar Londoño from Universidad de Caldas in Colombia and Ricardo Dal Farra from Universidad de Tres de Febrero in Argentina.

A SHORT AND SUPERFLUOUS GUIDE TO YOUR NEW NEW MEDIA ART

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Ed Dambik

A Short and Superfluous Guide to Your New New Media Art Programmer/Technologist discusses observations, misunderstandings, pitfalls, the occasional blank stare and successes experienced by a programmer/technologist who went from working as a control system programmer in high energy physics at Fermilab to assisting and collaborating with artists with technology as part of the Advanced Visualization Lab at Indiana University.

URSONATE PROJECT

Jane daPain, Kristin Loree and Jack Ox

This performance of Ursonate by Dada/Intermedia artist Kurt Schwitters (1887-1948) merges two distinct approaches. Kristen Loree gives

a tour de force performance of the complete text, set against a backdrop of 1260 projections by Jack Ox. The digital syllables derived from Ox's visualization move simultaneously with the sound. Her original 800 sq.' painting is a metaphorical mapping from Schwitters' original composition and performance. The performance includes information on mapping techniques, visual sources and readings from Kurt Schwitters's son's (Ernst) letters to Ox. Introduced in this performance is the VJDJ artist, Jane daPain, creating electronically collaged views of the performers and an improvised cadenza with Loree.

TOOLS FOR COLLABORATIVE RESEARCH IN COMPLEX ECOSYSTEMS

Jaromil Dennisorio, Dr. Angelika Hilbeck, Aviva Rahmani, Juanita Schlaepfer and Eugenio Tisselli

New media is a way to connect diverse communities seeking solutions to the global collapse we are experiencing. The unsustainability of our current environmental, economic, social and cultural practices reveals the extent to which our siloed approaches have failed. Each affected ecosystem represents an entangled web in which many different types of knowledge have a specific role to play. We will address the need to create bridges for the different communities directly affected by the emergence of new problems but lacking a productive communication interface. We will present novel design methodologies for participatory, problem oriented research projects, and ways in which digital communication technologies can articulate and modify dialogues.

SCALE – TIME – COMPLEXITY: ENGAGING, ENTANGLING, AND COMMUNICATING ECOLOGY

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Andrew Denton, Nigel Jamieson and Stephen Reay

This project proposes a forum for discussion that questions how we engage with our ecology. The panel will be framed within an acknowledgment of scale, time, and complexity as an entry point into a conversation about our local ecology and the universe beyond. The panelists' aim to initiate a dialogue by situating the discussion around their own art and design research practices. These practices have emerged from local investigations into ecological issues that evolved into two overlapping research clusters, art and ecology, and design and innovation for sustainability, at AUT University, in Auckland New Zealand. In our first collaborative project we explore how we might connect with and communicate 'ecology', in methods and practice that recognizes and embraces scale, time and complexity as a tactic into the subject, rather than as a barrier to engagement and the development of potential solutions.

INDEXICAL PLEASURE: ANOTHER HISTORY OF COLOR

Joelle Dietrick

This paper focuses on the importance of using color to manufacture consumer desire and political ideology. Tracing color history from Cold War Berlin to contemporary color forecasts, the paper pays particular attention to recent trends in color use, where extremely specific colors can be indexed, collected and referenced in a streamlined approach that is more flexible and sustainable.

SEFT-1

Andrés Padilla Domene and Ivan Puig

SEFT is a project working on the interface between art, technology and society in Mexico and in the Americas in general. This "Manned Railway Exploration Probe" is a vehicle equipped with a Hi-Rail system, a metal wheel mechanism that enables it to move on rails. Mexico's trains once formed a network of connections between big cities and tiny pueblos throughout the country. This exploratory probe travels abandoned railways using photography, video, audio and text to record contemporary people, landscape and infrastructure in largely remote areas of the country, creating a futuristic exploration of Mexico's past. For ISEA2012, the SEFT-1 makes a historic journey from the U.S./Mexico border to Albuquerque. The journey of the SEFT-1 to El Paso pre-conference activities is sponsored by The Stanlee and Gerald Rubin Center for the Visual Arts, UTEP.

REENGINEERING SENSORY: BIOEMOTIONAL STATES IN OUROBORIC PERCEPTION

Diana Domingues

In the exhibition, two large screens presented impressive body rituals and the data visualization landscapes. The workshops demonstrated the importance for artists and scientists of engaging the processes and methods for creating common viable systems from which artists as well as scientists can benefit and express machines capacity for processing data and human cognitive capacities for dealing with logic and hermeneutic dialogues. The results confirm the possibilities for human/ machines sharing introspections and poetry and reveling complex behaviors and human identities taking the remote history of the rituals, which are present in the gestures of our daily acts.

MUSIC FOR FLESH II

Marco DonnaRumma

Music for Flesh II (MFII) is an interactive music performance for enhanced body. By enabling a computer to sense and interact with the sound of human muscle tissues, the work approaches the biological body as a means for computational artistry. Muscle contractions and blood flow produce low frequency sound waves. Two microphone sensors capture the visceral sounds produced by my body, and send it to a computer. This develops an understanding of my kinetic behaviour by listening to the friction of my flesh. The sound of my carnal tissues is then algorithmically processed by the machine and played back through loudspeakers. The neural and biological signals that drive the performer's actions become analogous expressive matter, for they emerge as a tangible haunting soundscape. The ISEA2012 performance of MFII is supported by an Alt-w award from New Media Scotland.

DMT

Marco DonnaRumma, Christos Michalakos and Atau Tanaka

DMT is DonnaRumma, Michalakos, and Tanaka, a trio of visceral electronic musicians that interface corporeal gesture and physical gesture with pulsing electronic noise. Based in Edinburgh and London, Marco, Christos, and Atau are 3 soloists coming together to form a trio that is greater than the sum of its parts. Marco DonnaRumma plays the Xth Sense biosphysical muscle contraction sensor system to sonify the performer's body. Atau Tanaka runs granular synthesis algorithms on the iPhone, with one in each hand. Drummer Christos Michalakos creates feedback looks to electronics from his drums. Together they create a wall of sound that is live technological thrill.

MULTISPECIES AND URBAN SPACES: AR AND PLACE-BASED LEARNING

Meredith Drum, Rachel Stevens and Phoenix Toews

Multispecies and Urban Spaces is a series of interactive walking tours made possible by an augmented reality (AR) browser for iPhone/iPad developed by Phoenix Toews. The works (in progress) make visible social, political and ecological histories of multispecies relations in urban spaces. Presenters will explain the tours, and then discuss researching local spaces and hidden histories, and developing technical, aesthetic and conceptual possibilities for an AR, GPS enabled platform, including ways of structuring an active, meaningful experience for the user. In groups, participants will storyboard / design one section of an AR tour regarding human / animal entanglements around Albuquerque.

VALLEY OF THE SUNFLOWERS

Greg Esser

This public art project in Phoenix is a model STEAM (Science, Technology, Engineering, Art, Math) education project that brings together beautification of vacant urban land in downtown Phoenix with an educational project engaging Phoenix Bioscience High School students who are growing a two-acre field of sunflowers to harvest to produce biofuel for a hybrid biofuel/solar vehicle they are designing. This presentation is sponsored by Arizona State University Art Museum.

EXTINCTION

Greg Esser, Gordon Knox, Matthew Moore and Clare Patey

Artists Clare Patey (London) and Matt Moore (Phoenix) along with ASU Art Museum Director Gordon Knox discuss a new collaborative exhibition and initiative that explores fundamental changes occurring during our lifetimes and potential means of dealing with such changes culturally. Patey and Moore's collaboration includes an exhibition, Rare Earth, at the ASU Art Museum, an event, Feast on the Street, that brings people together around a half-mile long dining table in downtown Phoenix and a symposium that brings diverse perspectives, including scientific and artistic, to bear on fundamental questions and issues of permanent change that occurs as a natural part of evolution. ASU Art Museum's Knox moderates the discussion within the context of the evolving role of the museum in society from archive to agent of social change.

MAKING SENSE OF DATA

Robert Ferry, Julie Freeman, Scott Hessels, Geo Homsy, Elizabeth Monoian and Vicki Sowry

The panel presents an inside-view of pioneering contemporary public art projects from Australia, England, Hong Kong, the United Arab Emirates and the USA that transform our understanding of our lived environments through evocative and sensate uses of data. The focus on sensation is an intentional and explicit strategy used by the panellists to break data out of the confines of the screen and into our grounded, embodied environments. The projects presented also reveal how cogently the creative arts are contributing to global conversations about climate change and sustainability.

CONSTRUCTIVE INTERFERENCE

David Fodel and Paco Proano

Constructive Interference is a hybrid artwork that questions the boundaries between installation and performance, instrument and environment, system and situation. Artists David Fodel and Paco Proano use the notion of constructive interference, a concept rooted in wave dynamics, as a metaphor for the process of collaboration itself, and as a way of exposing individual and collective modes of experience and perception. The artwork tracks the movement of multiple gallery visitors, translating those actions into audible and visible feedback. The sounds and the images react to one other, and to the audience, who collectively create the ongoing experience.

AGITATING ALGAE: PHYSICAL COMPUTING AND BIOLUMINESCENT DISPLAYS

Tyler Fox

This workshop will introduce participants to bioluminescent dinoflagellates—marine dwelling, single-celled algae that emit light upon physical agitation. Using Arduino and simple physical computing arrangements, we will explore various ways to connect the inorganic with the organic, in our case using digital micro-controllers, motors, and bioluminescent algae. Additionally, participants will learn about bioluminescent dinoflagellates in nature, how to grow them at home, and will be offered their own packet of bioluminescent algae to take home. This workshop will be informal and casual, focusing on creativity and exploration rather than on developing engineering know-how.

TECHNOTOPIA: THE COLONIZATION OF THE BODY AS THE ULTIMATE FRONTIER

Coco Fusco, Miguel Gandert, Vicki Gaubeca, Manuel Montoya and Adriana Ramirez de Arellano

Under the sign of "The Body as a Colonized Space," Coco Fusco (Performance Artist and Professor, Parsons New School of Design), Miguel Gandert (Professor, Director of the UNM Interdisciplinary Film & Digital Media Program), Vicki Gaubeca (Director, ACLU Regional Center for Border Rights), Manuel Montoya (Professor, Global Structures, UNM Anderson School of Management) and Adriana Ramírez de Arellano (Professor, UNM Anthropology Department, Women Studies and IFDM Programs) join minds, lenses and methodologies to de-construct, denounce and reclaim the use of technologies to problematize the Southwestern border of the United States, not merely as an epistemic or

aesthetic site, but in its incarnation as a no-man's land where late capitalism and empire merge, unleashing a techno-liberal assault upon the surplus of discardable bodies. Sponsored in part by the UNM Interdisciplinary Film & Digital Media Program.

GAMBIARRA AND THE PROTOTYPING PERSPECTIVE

Gabriel Menotti Gonring

This essay compares two states of technical objects: the prototype and the gambiarra. While the first is a well-known concept, whose meaning and applications are fairly clear, the second is very particular to the Brazilian context, but could be reasonably associated with practices such as bricollage and making do. I'd argue that these conditions constitute opposite epistemological and historical perspectives over technological development. This hypothesis draws heavily from the ideas of Walter Benjamin, Gilbert Simondon, Vilém Flusser and Jacques Derrida.

We depart from the idea that the prototype is an in-between, insufficient object, critical of its own function. However, its critically is always directed towards the closure of the technical entity and the ensuing stabilization of the system. In that sense, it reinforces the positivistic agenda of technological development.

We propose to look for a counterpoint of the prototype in the Brazilian gambiarra. Gambiarra is an improvised amendment to a dysfunctional artefact, normally by the means of its combination with another object. Just like prototypes are created based on expectations and the projection of integrity, gambiarras are born from deception and failure. To recover function, the superficial individuality of the artefact must be sacrificed. Simultaneously, another object reveals potentials that were not expected. Their combination results in a technical ensemble whose individuation is performed by the user. Hence, if the prototype narrows the technical object down into concreteness, the gambiarra abstracts it further, at the same time revealing potentials and limitations of its discrete parts.

RADIO CHIGÜIRO WORKSHOP: PUBLIC BROADCAST

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Esteban Garcia-Bravo

Radio Chigüiro was a social platform for the distribution of Lafayette, Indiana's "glocal" culture. It operated as a community radio, exploring youth practices associated with parties, live music shows, and free radio workshops by using a web site as a medium for contact, production and participation. Using basic computers, participants will learn to produce their own radio programs. The objective of the workshop is to instruct in easy and free resources for audio recording, editing and broadcasting.

THE TRASH PROJECT

Andrew Garrison

Sometimes inspiration can be found in unexpected places. Choreographer Allison Orr finds beauty and grace in garbage trucks, and in the men and women who pick up our trash. Filmmaker Andrew Garrison follows Orr as she joins city sanitation workers on their daily routs to listen, learn and untimely to convene them to collaborate in a unique dance performance. Hard working, often carrying a second job, their lives are already full with work, family and dreams of their own. But some step forward, and after months of rehearsal, two dozen trash collectors and their trucks perform an extraordinary spectacle. On an abandoned airport runway in Austin, Texas, thousands of people show up to see how a garbage truck can "dance."

AROS (AUGMENTED REALITY FOR OPEN SPACE)

Nettrice Gaskins and Laurie Marion

Augmented Reality in Open Spaces (AROS) explores culture and creative technologies in the open spaces of Albuquerque by working with local youth to create a mural that links to content on the web via Argon, an Augmented Reality browser developed at Georgia Tech. Participants use Culturally Situated Design Tools (CSDTs) developed at RPI to learn standards-based math and computing as they simulate designs that are combined to produce an outdoor mural. The experience of interacting with the mural through touchscreen, camera-enabled mobile devices blends virtual and physical spaces and results in a greater appreciation for STEM learning, culture and art.

„ZONE"

Alexander Glandien

The installation „ZONE" focuses on the process of demarcation, on the definition of ban zones and on the exclusion linked with it. Starting point of this kinetic installation is an ordinary, adaptable street-barrier. This barrier was modificated and automated, so that it can constantly change expansion, position and the required space. The installation cuts and crosses the exhibition space at the same time. This installation creates some kind of prohibited area by their movement and thereby it makes strategies and forms of exclusion visible.

INSTANT MESSAGES

Idris Goodwin and Tricklock Performance Laboratory

Hip Hop playwright, poet, essayist and performer Idris Goodwin is engaging Albuquerque teens in National Hispanic Cultural Center's Voces program and Tricklock Company's Manoa Project to create Instant Messages, a performance piece developed from evocative, inspiring and humorous conversations found on Twitter and social networking sites. He theatrically transforms and performs some of these "digital dialogues" together with student participants and members of Tricklock Company.

LANGUAGE AND MAGIC: AN ARCHAEOLOGICAL APPROACH TO TANIA CANDIANI'S WORK

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Rodrigo Guzman and Mariana Perez Bobadilla

Although misconstrued and permanently opposed to scientific means, magic operates inherently in the technological. Tania Candiani's Organum is an artwork that aims to propitiate this magical experience within an artistic enunciation; at the same time, it fosters a discussion on the sonorous dimension of language. Organum shifts between systems and forms of experience; being an artifact that resembles a musical organ, it offers language as mechanic sound and thus creates a magical experience to speech. It also participates to a broader, historical relationship with musical organs as discursive objects, revealing symbolic relations between today and previous forms of understanding technology.

ANIMAL ESTATES

Fritz Haeg

Fritz Haeg's work has included edible gardens, public dances, educational environments, animal architecture, domestic gatherings, urban parades, temporary encampments, documentary videos, publications, exhibitions, websites and occasionally buildings for people. For the *Wildlife: Trans-Species Habitats* theme, he speaks on his Animal Estates project, a housing initiative for native animals in cities around the world which debuted at the 2008 Whitney Biennial.

TECHNO-INTUITION

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Yolande Harris

Techno-Intuition embraces the combined roles of mental, physical and technological processes in building relationships to one's environment through sound. Such relationships are often profoundly bound up with technology, raising questions as to how instruments enable as well as inhibit certain forms of knowledge. In response, Techno-Intuition recognizes parallels between technological methods of making the inaudible audible and more esoteric techniques for revealing aspects of the unconscious through listening. Using examples from practitioners, including the author, who actively research the area between technology, intuition and the sonic environment, Techno-Intuition explores a sustainable and sensitive approach to instrument development and artistic production.

WHAT WE LEARNED: THE CHANGING LANDSCAPE OF CURATORIAL PRACTICES

Irene Hofmann, Nancy Marie Mithlo, Dannys Montes de Oca Moreda

As the role of the artist in society changes in response to global trends, communications and markets, how has the curatorial process altered? Have biennials, premised on the mobility of people, goods and ideas as an inherent good, served their purpose? Panelists take on the culture industry, audiences and the market in a discussion of the problematics of contemporary curation. Excessive demands of the global marketplace and nostalgic ideas of "art for the people" test both artist and audience. "What We Learned" charts how these tensions emerge and what critical players are doing in response.

SOLARCIRCUS

Tiffany Holmes

SolarCircus (2009-2012) is an interdisciplinary platform for eco-dialogue about the future of renewable energy. At ISEA2012, SolarCircus will take the form of a fun, two-hour, hands-on workshop. The workshop facilitator, Tiffany Holmes, will introduce participants to the mysteries and potentials of solar power in the first 15 minutes. All participants build a solar toy from a kit and then "hack" it to create a one-of-a-kind kinetic sculpture. In the last fifteen minutes, the class will assemble the sculptures outdoors as a sun-powered street intervention.

ADVENTURES IN ILLEGAL ART

Mark Hosler

"Adventures In Illegal Art" is a 90-minute storytelling and film presentation by Mark Hosler, founding member of Negativland, with Q and A to follow. No lawyers were harmed in the making of this event. Pranks, media hoaxes, media literacy, the art of audio and visual collage, creative activism in a media saturated multi-national world, file sharing, intellectual property issues, evolving notions of art and ownership and law in a digital age, artistic and funny critiques of mass media and culture, so-called "culture jamming" (a term coined by Negativland way back in 1984).... even if you've never heard of Negativland, if you are interested in any of these issues you're sure to find this funny and thought provoking presentation worth your time and attention.

ECONOTOPIAS: IMAGINING POSSIBLE FUTURES THROUGH THE CREATIVE ECONOMY

Ted Howard, Jaromil and Caroline Woolard

The "creative economy" is an evolving concept, capturing the effects of intellectual capital as it interfaces with the arts, culture, business and technology. The speakers on this featured panel explore the topic through diverse perspectives. OurGoods.org co-founder Caroline Woolard talks about the problems and possibilities of non-monetary exchange while Denis Roio, a.k.a. Jaromil, a software developer, artist and activist illustrates the technical and political aspects connected to Bitcoin, an experimental digital currency that uses peer-to-peer technology to bypass central authority. Ted Howard, listed as one of "25 visionaries who are changing your world" in the Utne Reader, will discuss his role in the Evergreen Cooperatives of Cleveland, Ohio, an innovative model of community wealth building and sustainability.

WATER-TESTING, PURIFICATION AND CREATING ART WORKSHOP/SPECIAL ACTIVITY

Marybeth Howe

With our purified water, we will tend to the plants at our site and talk about a variety of ways to save on the water we use for gardening. We will then explore the use of water in art, through two projects based on water. In the first project, we will draw pictures with water on paper, and then make the images visible by adding ink to the water. In the second project, we will mix water with sand to make molds that depict machinery or technology. In this interplay between art, nature and machine, we will use a natural element (sand) to illustrate technology.

THE NEW AMERICAN PASTORAL

Colin Ives

This presentation is about a pedagogical experiment involving students in the digital arts, landscape architecture and architecture and the conclusion they reached in response to the country's "largest green development" The South Waterfront in Portland Oregon. In the Fall of 2009 a Intel sponsored studio called The Machine in the Garden: Rethinking Urban Gardens in the 21st Century was taught by Tad Hirsch, Liska Chan, and Colin Ives, at the University of Oregon. The course took Marx's text as a "playbook" but in this case not gleaning signs of the pastoral in literature but rather using creative practice to examine the current movement of "green" urbanism. This speculative studio concluded that "green" was synonymous with Marx's pastoral — that in its' clear simple nomenclature conceals the unresolved tensions and conflicts that, like the pastoral, it harbors.

CORPUS ELECTRIC COLLECTIVE: THE MAKING OF A RESPONSIVE TECHNOLOGY FASHION PERFORMANCE

Megan Jacobs, Miriam Langer and Nina Silvferburg

Join a discussion with members from the Corpus Electric Collective (CEC) as they discuss the creation of reactive garments for an interactive fashion performance. The CEC—comprised of New Mexico Highlands Media Arts faculty and students, members of the fashion team: Taos Runway Vigilantes, and high school students from the Taos and Las Vegas STEMarts workshops—will discuss the process of creating technologically infused garments that change colors and respond to sound and light.

SQUARE KILOMETRE ARRAY – LOOKING FOR GOD: ART IN THE AGE OF BIG DATA

Nigel Jamieson

The SKA-LFG project is a live, real-time 3D graphical response to real-time observations from deep space combining very long baseline interferometry (VLBI), a high resolution form of radio astronomy, with high speed computer networks, real-time processing of VLBI data, interactive 3D graphics software and virtual reality presentation systems. SKA-LFG combines science, technology, new media and metaphysics within a time based art form linking three distinct perceptions of time; cosmic, computational, and human perceptual time. Through this joining of aesthetics, contemporary astronomy, and theories of human perception and cognition, SKA-LFG explores narratives of the sublime through computational simulation, dramaturgical narrative forms, interactive digital media, and virtual reality systems.

THE NATURAL HISTORY OF MEDIA

Douglas Kahn

The media arts situate themselves in part in relation to historical media theory in which the earth has been written out. This talk will introduce ways in which the earth has been in and out of circuit with telecommunications systems since the nineteenth century and other broad features of a natural history of media.

TWEETS IN SPACE

Scott Kildall and Nathaniel Stern

During a live, interactive performance at the ISEA2012 Gala, artists Scott Kildall and Nathaniel Stern will send Twitter messages from participants worldwide towards an exoplanet 20 light years away that can support extraterrestrial life. By engaging millions of voices in the Twitterverse and dispatching them into the larger universe, *Tweets in Space* activates a potent discussion about communication and life that traverses beyond our understanding.

INVESTMENT WITHOUT TERM: A RADICAL ECONOMY FOR DAILY PRACTICE

Kei Kreutler

With the widespread employment of algorithmic trading in the stock market, the acceleration of economic time and its disassociation from "lived" time proves a necessary site for discourse. The model of an investment that does not entail an expected return – reliant on investment's etymological context as the "act of putting on" and "surrounding" – allows one inhabitation or presence without the calculation of discrete time. I situate this critique within Jacques Derrida's Given Time and Alain Badiou's politics of "subtraction," suggesting new media art (re)opens the field of desire to think and practice such investment without term: a conceptualization of an economy of time apart from the time and speed of the economic.

ARTISTS' AUTONOMOUS TRANSPORT INFRASTRUCTORS

Rob La Frenais (speaking on behalf of HeHe –Helen Evans and Heiko Hansen), Andrés Padilla Domene, Ivan Puig and Nicola Triscott

This panel, inspired by the autonomous train projects such as Los Ferronautas (the Railnauts) (Mexico) and HeHe (France) seeks to examine the way in which artists might take on 'big' infrastructures such as personal transportation. The Railnauts question the ideology of progress, instead exploring the two poles of the social experience of technology – utility and disuse. Their 'SEFT1' rail module is currently exploring abandoned railway tracks in Mexico and Ecuador and is heading for ISEA. HeHe's mischievous public art interventions include their ongoing 'Train Project', criticizing the car as the only option for autonomous transport and proposing personal rail travel as a temporary, imaginary prototype, building individual rail vehicles for different cities around the world, including Istanbul, San Jose, NY, Paris and most recently Manchester. The panel also investigates the dream of alternative air transport (airships) as a slower, more sustainable method of transport breaking the deadlock of incessant air travel.

UNIVERSITY TECHNOLOGY DURING A BUDGET CRISIS

Moderator: J. Neil Lawley; Panelists: Dr. Linda Antas and Aaron Stutterheim

Today's tough economic times are adversely affecting funding in higher education. Especially hard hit are traditionally underfunded fields where costly technologies are used. In this panel, three educators with backgrounds in music, art, architecture, and engineering discuss ways forward under these circumstances. The common tools for the panelists are: using cheap and repurposed materials; using freeware; do it yourself books and websites; and collaborative cross-disciplinary research. The panel explores how to cultivate the correct mindset for this "doing more, spending less" approach, creating with these tools, the educational philosophy behind their use, and embracing financial challenges as a spur to creative problem-solving.

INNOVATION AND IP: GETTING WHAT YOU WANT OUT OF YOUR SPARK

Jennifer Leary

Tinkering around with materials can lead to unintended consequences. Sometimes, the result is worth pursuing commercially. This workshop explores the pathways that novel inventions can take as they meander (or explode!) out into the wider world. We will look at cases of products developed from academic or artistic research. Bring your stories of your brushes with the commercial world, and we'll collectively consider platforms such as Kickstarter, blogs, Etsy, and more. We will also get into the basics of patenting and trademarking, and debate the value of intellectual property protection.

ORNAMENTAL CACTUS DESIGN

Soyo Lee

Ornamental Cactus Design is a hands-on workshop for learning simple cactus grafting techniques. We will create our own plant sculpture to take home. Cactus grafting, or cutting and pasting two different species of cacti is a common way to propagate the plant. This method is also used for making Moon Cactus - ornamental mini plants you can easily find in garden stores and flower markets. They are mass-produced, short lived, and are designed to look like flowers. We will discuss the history, ethics and aesthetics of this design to come up with our unique versions of it.

THE VIRALNET.NET VIRTUAL FORUM ON RADICAL COSMOLOGIES

Tom Leeser and Lea Rekow; Participants: Matt Coolidge, Director, Center for Land Use Interpretation; Dan Goods, Visual Strategist, JPL; Tom Jennings, Artist and Faculty, Center for Integrated Media, CalArts; Charles Lindsey, Artist in Residence

Viralnet.net explores the cultural, educational and creative possibilities of what a Radical Cosmology could look like. Visitors to the resource room at the Albuquerque Museum will be able to explore the site's artist projects, essays and interviews. Radical Cosmologies: Conversations on Culture, Technology and Research Tom Leeser and Lea Rekow will conduct a dialogue with leading artists and visual strategists, exploring the question What is a Radical Cosmology and what does it look like? The participants are part of the Viralnet.net Radical Cosmologies project: http://viralnet.net/radicalcosmologies/description.html. Their research and creative practices pursue cultural critiques of geography, astronomy, mapping, neuroscience and the possibility of life beyond our universe.

SYNAPTIC SCENARIOS FOR ECOLOGICAL ENVIRONMENTS

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Ellen K. Levy, Angelika Hilbeck, Alison Hawthorne Deming, Patricia Olynyk, Nicole Ottiger and Jill Scott

This panel is about how artists and scientists can collaborate with cognitive scientists to address environmental issues. Through these collaborations new metaphors and analogies about sensory perception might arise to cause a more pro-active discourse with the public about environmental problems. Creative Economies: "Econotopias," explicitly addresses the need for more sustainable social practices, but can new technologies and scientific methods actually help to verify embodied ecological experience or promote "citizen science"? Digital media might be a viable tool to act as a catalyst for debate and encourage us to deal with how we might think about ecological novel problems, rather than what to think about them. The raising of our bodily awareness and perception may also affect our levels of attention and force us to reconsider our denial of the sustainability problems at hand. By explicitly exploring the relationship between cognitive psychology and environmental science we claim that public engagement actually requires controversy and an opening up of scientific debates past the consensus view as well as the mainstream media view. However, this level of engagement also requires that we gain a more fundamental understanding of our bodily-sense of place within the ecological environment and its complex systems.

SWITCHBOARD: THE ORDINARY (R)EVOLUTIONARY NEEDS OF THE PEOPLE

Sarah Lewison

In the mid-sixties, an experimental student program at San Francisco State College put community organizing and everyday life at the center of education. Students worked in city neighborhoods, learning about economic and social forces affecting others, and developing creative actions. Money was effectively diverted from the college/state to sites off campus. The program's students saw themselves as part of a revolutionary process. Poised at the historical transition between industrial and biopolitical production, and between hippie culture and the contractions of the 70s, this little known program offers speculative lessons about corporeality and affect to education in a digital age.

ANT FARM MEDIA VAN V.08 [TIME CAPSULE] 1970- 2008

Chip Lord

Chip Lord's talk presents several recent projects and includes a historical introduction to the radical art and architecture group Ant Farm, 1968 – 1978. In 1970 Ant Farm travelled cross country in a "Media Van" shooting video and networking with other artists. *Ant Farm Media Van v.08 [Time Capsule]*, an interactive sculpture made in 2008, invites users to leave a "donation" to a digital Time Capsule, but also functions as a small video theater showing works made in 1970. This on-going project migrates across time and space and intersects with new ubiquitous

technologies. Lord is an American digital media artist currently teaching at UC Santa Cruz. He is best known for his part in the Ant Farm Collective and the creation of Cadillac Ranch. Lord's work intersects with a number of themes significant to *Machine Wilderness* including transportation, media and communication and land art. Sponsored by ASU Art Museum and the Desert Initiative.

INFO/ECO

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Richard Lowenberg

Info/Eco is an essay attempting to provoke consideration of the new 'information economy' within an integrated, whole-systems understanding of 'ecological economics' and the resulting opportunities for creative development of a 'cultural ecology.

OPEN BROAD BAND

Richard Lowenberg

The U.S. is falling ever further behind other nations with regard to broadband development and its related social, environmental, educational and economic opportunities. The opportunity is at hand for communities, institutions and business partners to take shared responsibility for fulfilling the promise of becoming content-rich, economically vital, quality-of-life enhancing, broadband-based 'information societies'. This workshop will highlight open broadband initiatives in New Mexico, and will involve the audience in a general discussion of open networking.

SARC ROUNDTABLE

Richard Lowenberg and Jack Ox

Fundamental to SARC is the precept that science-art collaborations should be of mutual benefit to the furtherance of both the arts and the sciences, and to their positive implications for society. SARC is initiating a pilot series of professional artists' collaborations with Los Alamos and Sandia National Laboratories research teams. Santa Fe Institute (SFI) has invited the artists and Lab collaborators for working group presentations, discussions and interactions with SFI scientists. Santa Fe Complex, the Bradbury Museum and other partners are providing public presentation and discussion opportunities. SARC has been initiated in partnership with 516 ARTS for ISEA2012, and is currently funded in part by Los Alamos National Labs/New Mexico Consortium, and Sandia National Laboratories/Lockheed Martin. SARC is co-directed by Jack Ox and Richard Lowenberg. (Albuquerque, Santa Fe, Los Almaos).

ACTIVATE!

Colleen Maclyn and John Sharp

Come learn how to make games with Activate! In this workshop, you'll learn the secrets of how game designers make games, from prototype to playtest. We'll take you through the steps from a "physical prototype" to a fully-playable digital game, starting you on the path to becoming a game designer. We'll use Game Salad, a free game making tool to introduce game programming concepts.

GAMBIOLOGIA PROJECT

Lucas Mafra and Fred Paulino

Gambiocycle is a Mobile Broadcast unit. It is a tricycle containing electronic gear for interactive video projection and digital graffiti in public space. The vehicle is inspired by anonymous ambulant salesmen who ride on wheels through Brazilian cities, mostly selling products or doing political advertisement. *Gambiocycle* subverts this logic by gathering elements of performance, happening, electronic art, graffiti and "gambiarra" (makeshift, kludge): what it advertises is only a new era of straight democratic dialogue between people who participate in the interventions and their cities.

GAMES FOR LIBERATION: STRATEGIES FOR EDUCATION TOWARD CRITICAL CONSCIOUSNESS THROUGH PLAY

Cayden Mak

Games for learning are often oriented towards normative school curricula and do not engage players beyond simple reward systems, but there are other ways to think about play that are deeper, more robust, and more meaningful. As potential sites for critically-minded, open-ended play, alternate reality games float in discursive space between game and not-game, creating environments for meaningful play that transcend current frameworks of education through games and create the potential for truly liberating play. This paper lays the foundation for the praxis of games for liberation, building from contemporary research and theory from fields in both games and education.

KEYNOTE: BIG DATA, NEW SENSES AND THE AVATAR AS OTHER IN COSMOLOGY

Roger Malina

Astronomy is in a period of epistemological and ontological crisis. We now think that most of the universe is "dark', dark matter and dark energy, and emits no light of any kind. I want to discuss the history of astronomy as a science and its symbiotic relationship with technology. Many aspects of the universe cannot be known about until the right technology is invented; as pointed out by many scholars we augment, extend and develop new senses. And many concepts necessary to understand cosmology are untranslateable to our own languages that are derived from our sensory experience that has no history with such phenomena. An epistemological revolution is under way with the arrival with the era of "big data' with the exponential growth of available data. This terrain has been rich for art-science collaborations and a number of astronomers have collaborated with artists. I will review the major tendencies. I will address how some of the approaches of translations studies may be helpful in understanding the nature of these collaborations. If we are badly designed to understand the universe, as a species we have developed ever more sophisticated 'avatars, our scientific instruments, with whom we work to overcome the deficiencies of our own cognitive systems. As an astrophysicist and an art-science researcher I will bring to bear my own professional background in cosmology to unpack some of the underlying issues.

1 BEAT PROJECT

Chris Marianetti

Symphony 505 creates an orchestra of automobiles and re-visions their mechanic motion as dance. Working with a group of people within the lowrider community that have built and customized their cars, their lowriders will be further transformed, in their familiar landscape, into both musical instrument and dancer. Using wireless audio technology and suped-up sound systems, a conductor (or audience) will be able to "play" the cars as the drivers perform a series of movements and gestural sequences. Embedded within the architecture of Albuquerque, the vehicles' ability to respond to and dominate their environment is the catalyst for this moving symphony.

MYTH AND INFRASTRUCTURE

Miwa Matreyek

Myth and Infrastructure is a multi-media, live performance using projected animation. As Matreyek walks behind the screen, her shadow becomes an integral part of the fantastical world she has created. She traverses oceanscapes and cityscapes as she conjures magical scenes with light and shadow.

ALT.ECONOMY? QUESTIONING NEW MODELS OF CULTURAL PRODUCTION

Amanda McDonald-Crowley, Stephanie Pereira and Christina Worsing

As the economy forces us to continue searching deeper into our pockets, more sustainable systems of exchange and cultural production are being created, shifting public consciousness on how we think about money, labor and community. From crowdsourcing models of

microfinance and productions based on collective pooling of ideas and resources to swap shop styled innovations on more traditional models of barter, exchange and cultural production are being re-evaluated on a global scale. What new paradigms are emerging and how they can be evaluated will be highlighted in this roundtable session of rapid fire presentations by artists, designers and cultural producers, followed by an open discussion with both presenters and audience.

THE MATTER OF TECHNOLOGY

Moderator: Anita McKeown; Panel: Ruth Catlow, Claire Cote and Tara Baoth Mooney

With the onset of cloud computing and the increasing ubiquity of our technology we are increasingly consuming electricity and natural resources, with the relationship between our gigabytes of storage and our carbon footprints easily overlooked. Is the cloud the green alternative or a dark storm brewing? With avatars in Second Life generating a carbon footprint up to three times that of an individual in the developing world then perhaps it's time to take a closer look at The Matter of Technology. The panel convenes artists, technologists and activists to present their practices and consider our complex relationship with technology.

TEXAS BORDER

Joana Moll and Heliodoro Santos

The Texas Border is an audiovisual installation in which the recorded broadcasts of surveillance cameras placed along the US Mexican border in Texas are shown. In a private Internet platform, 25 surveillance cameras are opened to anyone willing to control Mexican individuals attempting to enter the US in an illegal way and report those actions through the website. The installation also includes sixty four videos, part of the Internet platform archive, that show failed incursions into the US territory as a direct consequence of those reports carried out by anonymous users.

ON THE BRIDGE BETWEEN BOLIVIA AND COMPUTERS

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Lucia Grossberger Morales

IAuthor was released to create interactive textbooks, but it has great potential for art books. I will discuss the media and interactive features on the iBook that enhance an artist's ability to tell their story, for example: video; music; voice-over; interactive Keynote presentations, which can have hot spots that link to other slides and individual objects that can move; links to sections of the book, or to web page and the ability to zoom into an image, The iBook can be a compelling, inexpensive format to present artists' work and catalogs.

R.I.P.: A CASE STUDY IN FACILITATING MULTI-DISCIPLINARY COLLABORATION AND EXCHANGE IN CONTEXT OF CREATIVE PRACTICE

Katharine Moriwaki

This paper explores the themes of recycling pervasive media, intervening in planned obsolescence, and practicing technological sustainability (R.I.P.) in the context of an event held by the same name during the summer of 2011 at the Banff Center of the Arts. R.I.P., the workshop, was an event organized by Katherine Moriwaki, Jonah Brucker-Cohen and Susan Kennard which brought together a multi-disciplinary group of artists, thinkers, and municipal workers to focus on reclaiming "good garbage" from waste facilities and integrating it into new public installations in urban space.

VOICE TRACK

David Moss

Participants discuss and experience ideas of technology and non-technology; voice and objects; black boxes and out-of-the-boxes. David

Moss, considered one of the most innovative singers and performers in contemporary music, says, "Consider this: a spoon is technology; your vocal chords are technology; a song is technology…technology is transfer of power." Presented by The Outpost Performance Space.

EVERY ONE OF US IS A BEAUTIFUL AND UNIQUE TECHNOLOGY

Dienke Nauta

Nauta discusses her workshop Territories! Interactive Installations in the Wild, in which students at Taos Academy use a variety of materials to translate personal stories into outdoor installations that responds to wind, water and sunlight.

PORTABLES DEVICES

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Ignacio Nieto

Portables is a curatorial project which arises as an emergency to make visible the artistic practices that involve appropriation, reuse and development of tools and techniques emerged from the information technology and communication as well as to generate collective experiences between artists, researchers and the community at large. People can then exchange opinions to determine relationships and distinctions between devices generated by this industry and currently developed by artists and researchers. The workshop will consist of portable devices even curatorial presentation of an exhibition held at the National Museum of Fine Arts in Chile and a cognitive mapping session.

ECO-ART + THE EVOLVING LANDSCAPE OF SOCIAL AND SITUATED PRACTICES

Moderated by Patricia Olynyk; Panelists: Sam Bower, Eve Laramee, Saul Ostrow and Linda Weintraub

During the second half of the 20th century, a growing number of artists produced work with an ecological dimension, including such luminaries as: Hans Haacke, The Harrisons, and Mierle Laderman-Ukeles to name a few. This panel will focus on the complex triad of eco-art, situated practices - those modes of engagement that are ordered by the conceptual and physical contingencies that arise from the specific conditions of their site of production, display or distribution, and social practices – varied forms of community engagement, participatory intervention and project-based public work that embrace democratic processes and inspire progressive social, cultural, and environmental change.

DESERT INITIATIVE EXPLORATION VEHICLE

Miguel Palma

In collaboration with engineers, robotics experts, geographers, car enthusiasts, military historians and others, Portuguese artist Miguel Palma has converted a former military vehicle into a remote exploration vehicle that explores desert surroundings during the day and returns to urban areas to project the desert imagery on buildings at night. Sponsored by ASU Art Museum and the Desert Initiative.

CURRENTS @ ISEA2012

Curated by Parallel Studios

For ISEA2012, Currents 2012 is represented with a looped single channel screening. Curated by Parallel Studios, Currents: Santa Fe International Media Festival explores the role of technology and the diverse applications of new media in the arts. This year's festival showcases single channel video, video and sound installation, interactive new media, animation, computer modulated sculpture, multimedia performance, experimental and interactive documentary video, Digital Dome projection, art gaming and art web.

4HANDS IPHONE

Adam Parkinson and Atau Tanaka

Adam & Atau exploit a commonly available consumer electronics device, the Apple iPhone, as an expressive, gestural musical instrument. A live duo, gestural music performance, running Pure Data on iPhones, transforming this object of music consumption into an expressive visceral musical instrument that captures performer gesture. One device in each hand, in 4 hands duo, a chamber music for live sampling, time stretching, and granular synthesis. With sensors, signal processing, synthesis and sound output embodied on one device, it is a self contained digital musical instrument for the performance of post-laptop music.

THE FREE STORE PROJECT

Kim Paton

The Free Store Project explores the viability of creating sustainable long-term food redistribution networks. Moving well beyond traditional models of corporate responsibility and charitable 'gift giving'. The Free Store project investigates how 'unlikely' relationships between the commercial and creative/social sector can produce projects that create sustained and productive innovation that benefits all parties. The Free Store workshop for ISEA 2012 will reflect on the New Zealand Free Store projects, throwing some radical economics into the mix the workshop will investigate grass roots ways communities can address the growing disparity between the commercial imperatives that drive food waste and the dilemma of food security.

WORLDS IMAGINING ECOLOGIES

Mike Phillips, Jill Scott, Chris Speed and Paul Thomas

The panel describes a range of transdisciplinary strategies and projects for the visualisation and sonification of complex ecologies through a variety of forms (such as mobile apps, FullDome environments or urban screens) to manifest information harvested from the environment - from bodies in landscapes to the body as landscape.

IN THE BEGINNING OR…: THE COSMIC STORIES WE TELL AND THEIR IMPLICATIONS

Sheila Pinkel

What are the stories we tell today about the origin(s) and structure(s) of the cosmos? Is there a connection between cosmological models and the socio-political landscape in which they emerge and continue to be told? Do these stories affect our relationship to this planet and one another and if so, how? Must we be locked into a system of a singular master narrative in describing the cosmos, or can we imagine the possibility of the coexistence of narratives that are seemingly incongruous but allow us to embrace the complexity of information available?

ACCELERATING NETWORKS, BROKEN NETWORKS

Rick Prelinger

Rick Prelinger, keynote speaker for the *Power: Gridlocked t*heme, is an archivist, writer, filmmaker and outsider librarian. He speaks about our dependency on the networks that connect us. He says "The networks offering power, water, mobility, commodities and communication have turned into a drunken spiderweb full of broken connections. All of us depend on networks that are growing unreliable. Identifying the utopian kernel that once resonated in our minds as these networks accelerated, is a starting place for examining nodes in emergent networks and our connectivity."

PAID USERSHIP

Renee Ridgeway

Remuneration for labour or user-generated content on the web is based on gifteconomies, debt economies and mostly, attention economics (visibility). In attempting to understand the link between new forms of virtual labour and virtual money, might we need to look at them not only from actions of 'visibility' but from the perspective of obligation, debt and remuneration? If we remit our rights of privacy and right to remuneration, how can we create other systems of negotiation and payment? Will we all need to survive off of our freemium activities in order to generate more content to contribute to the critical mass?

LOW LIVES

Jorge Rojas

Low Lives networked performance festival founding director, Jorge Rojas will give a talk about streaming performance art and his experiences creating an international online festival. Jorge studied Art at the University of Utah and at Bellas Artes in San Miguel de Allende, Mexico. A multidisciplinary artist, curator, and art educator, Rojas uses both traditional and new media, as well as performative elements to investigate communication systems and the effect of technology on artistic production, social structures and communities. His work and curatorial projects have been exhibited in galleries and museums worldwide. He was born in Morelos, Mexico. www.lowlives.net

LOW LIVES SCREENING

Jorge Rojas

This looped program during the ISEA2012 Latin American Forum features a selection of videos from the Low Lives networked performance series, curated by Jorge Rojas, Founding Director of Low Lives. The program includes performance videos from over 30 international artists as they were streamed live. The themes they address are widely varied, but they all explore aspects of human and social makeup, and our relationship with technology. Artists include Annie Abrahams, Lukas Avendaño, Tzitzi Barrantes, Profesor Bazuco, Black & Jones, The Emerge Collective, Tutu-Marambá, Kristin Lucas, Marisol Salanova, Rosa Sanchez & Alain Baumann, Second Front, and Martin Zet among others. www.lowlives.net

DE ONDAS Y ABEJAS

Silvia Ruzanka

Augmented reality is a way of both altering the visible and revealing the invisible. It offers new opportunities for artistic exploration through virtual interventions in real space. Media artist Silvia Ruzanka presents recent work that investigates the relationship between machine/technology and nature through the lens of augmented reality. Using technologies including cellphones, telegraphs, and tiny stereoscopic projections, these projects explore invisible phenomena ranging from Spiritualism to bee colony collapse disorder.

PRESERVING INDIGENOUS CULTURAL DIVERSITY IN THE GLOBAL DIGITAL AGE

Arturo Sandoval and Marta Weber

Although distinct phenomena, technology in the digital age and globalization have advanced in tandem, bringing benefits to many population sectors at the expense of others. Chief among the losers in this scenario are indigenous cultural communities whose lives are not organized around the information age, and in some cases may not have fully entered or embraced the industrial age. Other communities are 'up to date' but have lost or are threatened with loss of their unique heritage or identity as forces of technology and globalization overwhelm them. This panel will examine the issues and discuss the remedies.

SONIC FABRIC. THE UNIVERSE IS MADE OF SOUND

Alyce Santoro

Using high-tech, hand-held recording devices, students from Amy Biehl High School take sonic samples from their environment, and analyze and manipulate them to create intricate collages of sound. Teacher Alyce Santoro is an interdisciplinary artist and inventor of Sonic Fabric, a textile woven from 50% polyester thread and 50% audiocassette tape recorded with intricate collages of sound. The students' sound projects are featured during Intel Education Day, along with a talk and demo by Santoro. Produced in partnership with OFFCenter Community Arts Project.

YOU ARE. I AM. EVERYONE IS: THE AUTHORLESS AS PRODUCER

Moderator: Paul Lloyd Sargent; Panelists: Rene Abythe, Jon Cates and Marco Deseriis

This panel posits that tactics utilized by the hacker network(s) often identified as Anonymous are a response to the terrifying, creative and destructive processes of modernization. We will discuss Anonymous' history of exploiting the idealized "democratizing" technologies of social networking sites, as well as their GIF, image-macro, and Internet-prank-art, especially in light of recent spillover IRL within the Occupy movement, as a practice of revolutionary cultural production.

FINANCIAL CLIMATES ARCHIPELAGO

William Sedig

Songdo, South Korea is a brand new city, a sudden city, conceived and constructed in the last fifteen years to serve as a hub for global business travellers, seeking to emerge as a significant financial power in Northeast Asia. Because the idealized, designed location of the Songdo International Business District dictated impossible proximity to the already dense Incheon suburbs, the city is built entirely on land reclaimed from the Yellow Sea. This project investigates the potential for radical social agendas within the bounds of the political and corporate cooperation responsible for this enormous infrastructure.

PROJECT ANALEMMA

Colby Sempek

Why does the universe behave like it does? Is it acting out its own drama regardless of the audience? Or does the mere presence of an audience forcibly choreograph the show in front of them in dynamic ways? Project Analemma has sent its crew to the furthest reaches of space to answer these questions, and they have come back with surprising answers. Join project director, Dr. Patrick Alexandre, and the crew members, Alan Rosseter (physicist) and Ryan (photographer), to hear them discuss their latest mission, showcase unprecedented photographs, and explore the exciting implications that could change the nature of reality.

Smithson's Spirals, Pataphysics, and Syzygy

P

Edward Shanken

Robert Smithson read about various scientific topics and applied this knowledge to his work, but he was fundamentally anti-institutional, and was as skeptical of science and industry as he was of environmentalism and the art world. His artworks and writings are brilliantly insightful, formally resolved, and logical as well as infuriatingly opaque, unresolved, and incoherent. He died at the age of thirty-five, leaving us to wonder how his work might have matured, and what clues his subsequent production might have offered to understanding his *oeuvre*.

P

TUNING IN AND SPACING OUT: THE ART AND SCIENCE OF THE PRESENTNESS OF SOUND

Edward Shanken

Our talk addresses artistic and scientific research on phenomena that lie outside direct human experience. Sound is invaluable for understanding these spaces, for experiencing a form of "presentness" - a heightened state of awareness - in them. Tuning in and spacing out to the presentness of sound becomes a method for creating an expanded, systemic consciousness. This is key to cultivating sustainable attitudes toward the environment and to developing interdisciplinary solutions to global ecological problems.

ALTERNATIVE ART ECONOMIES: ECONOMICS IN THE 4TH DIMENSION

Erin Marie Sickler

In mathematics, the Klein bottle is a non-orientable manifold that lives in four dimensions, a continuous surface of which neither inside nor outside can be consistently defined. Economics in the 4th Dimension uses the Klein bottle as metaphor for describing the internal and external transformations necessary to move towards a different set of economic relationships. The workshop will include an interactive exercise related to terms of the Solidarity Economy alongside an activity on Threeing, a model developed by pioneering video artist and cybernetic theorist Paul Ryan to assist artists and others in understanding group dynamics and building sustainable collectives.

EXPLORING THE UNIVERSE THROUGH INTERACTIVE ART

Scott Snibbe

Scott Snibbe will present selections from twenty years of interactive art, music, exhibits and entertainment. He will show many examples of interactive art that mine themes from science and cinema to produce unabashedly entertaining and poetic re-interpretations of our universe, including recent work creating the first app album with Björk: Biophilia; and interactive exhibits created for James Cameron's movie Avatar. He will discuss the educational and societal benefits of interactivity; and the joys, challenges and research involved in the creation and distribution of interactive art as an artist/entrepreneur. Scott Snibbe is a media artist, filmmaker, and researcher in interactivity. Whether on mobile devices or in large public spaces, his interactive art spurs people to participate socially, emotionally, and physically. His artwork is in the permanent collections of the Whitney Museum of American Art and The Museum of Modern Art; and has been shown in several hundred solo and group exhibitions worldwide, including a solo retrospective at the Institute of Contemporary Arts in London. His large-scale interactive projects have been incorporated into concert tours, Olympics, science museums, airports and other major public spaces and events.

TAXI TAKES ON THE WORLD PART I

Vandana Sood-Giddings

This workshop will feature a presentation of "The Taxi Takes on the World" followed by a hands-on workshop of citizen journalism. The participants will be divided into groups of journalists and shooters. These groups will be expected to hit the streets of Albuquerque together to film their conversations with a driver inside taxis. This footage will be screened at the second session on September 24th. The second workshop will also provide training for another group of participants to pair up for training to shoot. All of the footage collected during and after these workshops will be used in the global online project.

TAXI TAKES ON THE WORLD PART 2

Vandana Sood-Giddings

This is a continuation from the workshop on Friday, September 21. The footage from part 1 will be screened during this second session. This workshop will also provide training for another group of participants to pair up for training to shoot. All of the footage collected during and after these workshops will be used in the global online project.

RESEARCH GIZMOLOGY WORKSHOP: JR. HIGH AND HIGH SCHOOL KIDS MAKING KINETIC SCULPTURES

Steve Storz

Artist Steve Storz will speak and show images about the kinetic sculpture workshop he gave at Taos Academy with kids who built machines conjured from their imaginations. Using low voltage electronics and light duty power tools kids made: a robot with lighted top hat and rotating claw hand, a surplus Los Alamos Labs test device with electronic flowers growing out of it, a Paranormal Activity Imager, an Energy Portal with hand carved wooden gears and a Political Ping Pong sculpture using air to push a 'president' between rivaling parties and lots more. The sculptures are marvelous examples of the synergy that comes from combining STEM plus Art concepts.

MEMORY IS NO OBJECT: PHOTOGRAPHY AS PERFORMANCE OF LANDSCAPE

Daniel Tankersley

The performance of photography is not limited to the creation of artifacts for future reference. It also functions as an instantaneous reality check or proofing of the body relating to an image or landscape. For many visitors to areas designated as wilderness or art contexts, imaging is the prime experiential action, not simply documentation of some other experience. While thousands of photographs of a specific site like El Capitan or the Mona Lisa are readily available online, we are still compelled to make our own. With digital technology, it is increasingly common for an individual to make hundreds of photographs in a single day. The making of digital photographs is now essential to a personal sense of reality and experience; the act of photographing carries cultural significance in excess of any images produced in the process.

THE TECHNOLOGY DESIGN EDUCATION STUDIO AS A NEW MODEL FOR INTERDISCIPLINARY LEARNING

Anne Taylor

Building on an acclaimed International design education program, Taylor will present interdisciplinary thinking and the use of a technology design studio p/k-12+ that unlocks the grid of teacher/textbook centered learning, giving power to students. The presentation will address "Technical Studios as Art, unlocking the traditional "power grid" in education which is stifling our teachers and students. This presentation offers an antidote to present day educational delivery systems from which many young students are dropping out. Developmental rights of students drive the design of learning environments that actually teach based on ecosophy and research that underpins future education.

SAUTI YA WAKULIMA: USING MOBILE PHONES TO STRENGTHEN THE SOCIAL CONTEXT OF RURAL AGRICULTURE IN TANZANIA

P

Eugenio Tisseli

I will describe the e-agriculture project *Sauti ya wakulima*, "The voice of the farmers" in Swahili. The latest scientific findings acknowledge that in order to find a sustainable way of producing food in the future, it will be necessary to understand agriculture as a complex system which, besides economic and ecological factors, also includes the social context of rural farming communities. *Sauti ya wakulima* adopts this vision by establishing an open and participative research process, in which a group of farmers living near Bagamoyo, Tanzania, uses smartphones and a web platform to document their environment, and create thus a collaborative knowledge base.

The Paradox of Evolution : Yes, I am an Obsolete Human Being

P

Paz Tornero

Technoscience is increasingly present in our daily lives, establishing new social rules and patterns of communication and interaction in a physical space which implements electronic devices and telematic systems in its design. In the race for scientific progress, the goal is making man a God, like Nietzsche's Superman, without determining how the new human morphology will be fitted. This paradigm is treated by

artists who warn of the possible fate of humanity while the technoscientific, as if he/she was Prometheus, dares to defy the laws of nature. Art exposes the actual course of science. Some artists complain that the false promises of scientific discourse, which is dominated by male vision, fails to be aware of the impossibility that technology is going to improve the moral dimension of human being. Some artists say the science sermon does not deal with humanity and the building of our future is merely phallocentric; an excessive anthropocentric vision.

RESEARCH 360: INTERACTION AND VIRTUAL REALITY ENVIRONMENT, ANALYSIS OF INTERACTION MODELS AND FUNCTIONAL PROTOTYPING METHODOLOGY

P

Mario Valencia

The research explores how the use of technology platforms enables the ownership and development of fields of interaction and interface design, the development of different virtual reality environments was planned, so it allowed a glimpse of how the analysis for formal and digital structure today is not only happening by the ratio of feedback, but by the interface, gesture and control supported in virtual media spaces. Research 360 poses the evolution into a new type of environments of synesthetic character. To examine these hypotheses in the research there were a series of prototypes that corroborate and rethink some of the ideas these parameters were developed under functional prototyping methodology which is described briefly at the end of the document.

IONIC SATELLITE FOUNTAIN

Bruno Vianna

Ionic Satellite Fountain is a artwork that establishes a sensorial and spectral connection to the satellites passing over the installation site. The liquid jets created by nozzles are made of salt water, a very conductive medium. The flow of these jets is controlled by a computer that predicts the passes of satellites, positioning them with the best direction and angle for reception. The jets are connected to a radio so visitors can hear signals emitted from the satellites, with the streams serving as antennas.

NODES OR TENTICALS - RE-ENVISIONING SUBURBAN DEVELOPMENT

Ruth Wallen

Cascading Memorials, http://www.ruthwallen.net/cascade.html, offers a public space to mourn the devastatingly rapid changes to terrestrial environments due to the combined effects of climate change and urbanization. Memorials to specific sites are designed to capture the viewer's attention, ignite curiosity, and provide questions for reflection. The work provides a vitally important public space to grieve the immensity of our losses. Having opened our hearts, this grief can inform the values by which we design technologies and build socio-political institutions that insure sustainable futures where all species may flourish.

BRAIN SIGHT WORKSHOP

Ken Wesson

Dr. Ken Wesson, S.T.R.E.A.M. educational consultant and neuroscientist, offers educators the understanding and the tools needed to move beyond STEM, toward a creative, integrated and interdisciplinary learning model. He states "In the 'S.T.R.E.A.M.' model for student learning, Science, Technology, Thematic instruction, Reading/Language Arts, Engineering, Art and Mathematics converge, to teach to the broader context of human knowledge."

GILA 2.0 DEFENDING THE WOLF

Marina Zurkow

Gila 2.0 visual signage is displayed at the Gila Wilderness trailheads or roadside, and in other graphical formats. The focus of the signage is the reintroduced Mexican Wolf, centrally positioned in the nature/culture debate that arises when interests (non-human as well as human) intersect. Seen either as the endangered poster child for native wilderness or as a competing predator, the Mexican Wolf coexists with landowners, livestock, game hunters, pets and eco-tourists. The signage leverages native "prehistoric" Mimbres/Mogollon designs – the animistic and geometric pottery that has become a graphic signature for the Southwest – and uses tracking data gathered from the radio-collared wolves, in order to visualize the complex set of relationships that comprise a contemporary ecosystem. (Silver City).

D. Bryon Darby, *Seventy Flights in Ninety Minutes, Phoenix, Arizona*

SEFT-1
by Ivan Puig & Andrés Padilla Domene

ARTIST TALKS

INSPIRATION AND INFLUENCE: LEARNING FROM AN ON-LINE PEER-JURIED DESIGN COMPETITION

Peter Anders

Between August 2011 and January 2012 Dow Solar conducted an international student design competition over the Internet. The competition was held entirely on-line through web sites created by the contestants and the competition's site: www.designtozero.com. In contrast to conventional competitions, contestants selected winners via a unique peer-review process involving three on-line elections. The ballots for the process were designed to encourage thoughtful evaluation of the projects, which was then relayed to the designers themselves. Contestants had opportunities to advise and learn from each other throughout the competition process.

LAND ETHICS AND AESTHETICS

Anthony Anella

Today more than ever before, there is a need to rediscover a more graceful way of interacting with the earth. Beauty, for me, is distinguished by this grace. It begins with a certain humility and a respectful attention to Nature, and ends with a sense of the infinite wonder of it all. I am interested in promoting a sense of beauty based on this wonder. This talk will explore the power of art to change how humans perceive their ethical relationship with Nature by focusing on several recent projects designed to inspire taking better care of our planet.

IMPROVISING CONSCIOUSNESS

Josephine Anstey

"Improvising Consciousness" is a lecture and presentation by Jennifer Årnstay, Professor of Material and Analogical Eco-Cognition. Visiting from an unspecified time and place, or, Aerea, Professor Årnstay explores the history of human and animal consciousness, introducing diverse and radical theories of mind through the ages. Elegantly consolidating the past, present and future of humanity, "Improvising Consciousness" provides unparalleled insight to our current Aearea and to those of future generations, who will very likely have radically different minds than our own…

DISORIENTALISM COLLABORATION - THE FOOD GROUP'S: MAIDEN VOYAGE

Shiloh Ashley

Disorientalism, a collaboration between Asian American artists, Katherine Behar and Marianne M. Kim, will give a presentation on their latest project, Maiden Voyage. Inspired by the Land O'Lakes Indian Maiden and the Shadow Wolves, a special, all-Native, border control unit of the U.S. Department of Homeland Security, this project explores issues of privacy, disclosure, surveillance, social class, and mobility through online and offline methods of tracking. Maiden Voyage is part of Disorientalism's series, "The Food Groups," which investigates race and labor in American mass food production and promotion.

THE ECOLOGY OF PERCEPTION

Marten Berkman

A variation on "remote sensing," which is the acquisition of quantitative data from remote locations, Remote Sensibility is the acquisition and interpretation of qualitative "information" about the arctic and subarctic where I live.

THE ECOLOGY OF PERCEPTION: REMOTE SENSIBILITY

Marten Berkman

Using primarily digital image devices and computing mediums, my work explores blurring the boundaries between contemporary urban industrial humans and the remote lands of which we are a part. Digital photo and video collage, web transfer of visual data, stereoscopic video installation become the palette that reflects many layers of relationship, contradiction and meaning.

INTERACTION IN HYBRID SPACES

Peter Beyls

True human-machine interaction implies machines to be endowed with expertise to foster self-motivation within the process of interaction itself; objectives are developed from scratch while interacting partners exercise unpredictable mutual influence. Rewarding human-machine interaction is imagined to be proportional to the appreciation of the recognition of relationships between human behaviour (e.g. spontaneous body language) and its impact on emerging behaviour in an otherwise self-organising micro-universe. Hybrid spaces may exist of biological and synthetic components interfaced in intimate interaction. We offer evidence that methods of machine learning and artificial evolution may contribute to the creation of highly complex audio-visual interactive systems. Such systems are experimental and speculative; they show that qualitative aesthetic experiences may emerge from unreliable degrees of understanding between cause and effect.

TWITTERSCAPES - PURSUING ART IN DATA

Caroline Blaker

Artist .carolinecblaker. maintains portfolios in both visual arts and web development. As both a painter and a coder, Blaker created DataScapes, (http://twitterscap.es) a generator that turns Twitter data into images, and keeps track of date and time, users, and tweets included in each image. Blaker's talk will reveal the process she followed to create DataScapes and will offer a tour of these unique images, as both fine art and recapitulations of Twitter's ongoing data set. Blaker will also discuss her experience marketing these images as fine art.

MAKING SPACE: OBJECTS OF INTERDEPENDENCE

Mark/Micheal Borowski

Through the reconstruction of familiar, domestic objects, Michael Borowski creates situationist devices combining function and fantasy. The proposed uses of these objects transform personal and private actions into communal activities. His recent work has explored the physical and psychological geography of "home" and the effects of increasing migration and mobility. Borowski's portable devices provide some of the physical comforts of home and offer space to interact with others in a public setting, encouraging participants to share intimate, domestic rituals with strangers.

HACKING THE SCHOOL YARD: SCRAPYARD CHALLENGE JUNIOR MAKER KITS

Johan Brucker-Cohen

The Scrapyard Challenge Junior Maker Kits (SCJMK) was developed from the Scrapyard Challenge workshops which are intensive workshops developed by Jonah Brucker-Cohen and Katherine Moriwaki where participants build simple electronic projects out of found, discarded, or "junk" materials. SCJMK was developed together with our team at Parsons and presents an informal learning experience for youth that utilizes the integration of art, design, and technology to deliver STEM concepts. We introduce a custom input board to facilitate the workshop and the learning experience introduces basic principles of electricity and systems thinking using hands-on activities that encourage personal creativity.

DESERT SONGS

Brit Bunkley

I will discuss the intersection of digital and actual sculpture, animation and video through examples of my art practice. This practice includes creating virtual proposals and computer aided construction of large scale outdoor sculptures, small interior sculptures, installations, as well as the creation of "impossible" moving and still images and architecture designed using computer 3D modelling, video editing and image editing programs. The content of the art work often focuses on an oblique sense of paranoid apocalyptic fear tempered with a sense of whimsy and irony.

BROWSER POEMS

Xtine Burrough

Browser Poems is an online exhibit created for TERMINAL in which classic works of American poetry or fiction were interpreted as visual experiences crafted for the web browser. This presentation will feature On The Web, a translation of Kerouac's On The Road that investigates whether modern life and web surfing are reflected in the original road-trip manuscript. In many cases, the work still speaks to hitchhikers on the open road, and to wanderers of the information superhighway. Her talk will focus on the process and challenges faced while creating this work.

MAPPING MEANING

Krista Caballero

Mapping Meaning is an ongoing project bringing together artists, scientists and scholars to engage topics of the environment through interdisciplinary exchange. Inspired by a photograph from 1918 depicting an all-female survey crew, the second conference brought together 17 women and took place this summer. This session will utilize Mapping Meaning as a case study and in particular look at the theme of this year's conference, "ecotone." Defined as a transitional zone between two communities, ecotone speaks to ecologies in tension. This will be used as a metaphor for considering transitions currently taking place with regard to ecology, technology and culture.

FEMALE KOSMOS: AN ARCHIVE OF NATURAL ELEMENTS

Silvana Carotenuto

"Female Kosmos: Planetary Writing"by Silvana CarotenutoThe planet is in the species of alterity, belonging to another system; and yet, we inhabit it, on loan.(G.C. Spivak)The talk is interested in contemporary female writing devoted to nature, specifically reading the artistic-ecological sensibility of women when confronted with the cosmos. It sets its political agenda within the theoretical framework offered by some critical 'intuitions' of the planet (Spivak, Clement, Shiva), and then it reads the poetic evocations of natural elements (earth, water, fire and air) in the writing (a 'enlarged' - oral, prosodic, plastic, radical - concept of writing) of Hélène Cixous, Rony Horn, Jamaica Kincaid and Helen Oyeyemi. The intervention will provide examples from narrative, photography and visual installations.

JUNKSPACE

Lynn Cazabon

For this presentation, we will discuss our project Junkspace, which will be on display in the ISEA Main Exhibition at 516Arts in Albuquerque. Junkspace is a time and location sensitive video installation and corresponding iOS App that superimposes two forms of waste, one earth-bound (electronic waste) and the other celestial (orbital debris), and three different forms of space: outer space, physical space and virtual space. Using NORAD orbital debris tracking data and the exhibition venue's location, the movement of e-waste on screen aligns with the orbital path of actual pieces of debris in orbit relative to the viewer's location.

CHANCE + PARTICIPATION = MAGIC

Joanna Cheung

Chance events lead to visceral pleasure, if the context, in which the event is constructed, is designed to surprise and transcend. There are two types of chance events: natural and planned. My work explores, is the development of planned chances. I want to intentionally create work that produces and defines unintentional effects. The conception of my work, often, comes about spontaneously, fueled by various sources of research and random, recreational reading (literally and metaphorically) into theory, science, art, design, and my daily life. Magic is latent it is exposed through chance and participation.

AUDIOVISUAL PERFORMANCE

Sean Clute

Sean Clute is an inventor of video, sound and performance. He has presented work internationally in suspended pods, geodesic domes and cacophonic sonic environments. By developing custom software and hardware, Clute experiments with technologies and methodologies to construct audiovisual instruments, sensor-based interfaces and computer generative processes. In this talk, Clute will focus on recent works such as Mythos, in which he captures the sprit of an ancient culture within a contemporary context. Innovations in new media enable the fusion of past and present, while moving image and sound create a new form of storytelling.

ACTIONSTATION2.5-THE DESERT

Grisha Coleman

A fusion of art installation, choreographed multi-media performance, and public engagement constructed for both live performance and participation - echo::system is a project that looks to mediate a connection between art and science. Each 'actionstation' creates a speculativefiction, a space to promote aesthetic and physical reflection on how and where we live. The project is a response to our current global environmentalcrisis caused by contemporary humans' inability to reflect on our own impact to the natural world. Lead by artist Grisha Coleman with a collaborative team of ethnographers, performers, designers and technologists - the goal is to examine intersections of art, environmental sciences and technology; information and place; performance and public engagement through the practical realization of the work.

THE AGREEMENT

Laura Curry

Walking enables me to investigate people's relationship with place and how that links to an interior landscape of memory and association.

BRIAN DAVIS: I DON'T CARE ABOUT THE AVANT GARDE, I ONLY CARE ABOUT YOU

Brian Davis

Brian Davis' work has included chairs that move, outdoor dance floors, and reactive video installations. In I don't care about the avant garde, I only care about you Davis talks about repurposing off-the-shelf technology and bridging gulfs between individuals. Davis teaches sculpture and new media at The George Washington University and the University of Mary Washington in the Washington, D.C. area.

MAPPING THE SOLAR: AUGMENTED BIKE RIDE AS PERFORMATIVE INTERVENTION

Joseph DeLappe

The Union of Concerned Scientists estimates that a hundred mile square solar farm in the American Southwest would be "more than enough to meet the country's entire energy demand." The author will describe a proposed performance to use an augmented bicycle to map a 400-mile perimeter of an imagined solar farm to re-purpose Federal lands that include the Nevada Test Site, "Area 51", Yucca Mountain and Nellis Air Force Base. The performance will utilize mixed reality, GPS technology and live streaming video for real-time documentation while also literally drawing, using a custom made armature holding surveyor' chalk to literally trace a 400-mile circle around the geographic area in question.

FACING EXPERIENCE: A PAINTER'S BRUSH IN CYBER-SURREALISM

Margaret Dolinsky

My art draws upon the subconscious taking the form of personal moments that reflect emotions examining our understanding and measuring the trusting of our cognitive space. It portrays whimsical faces and characters from multiple perspectives representing intimate moments of self-reflection and confrontation that occur daily with others and our selves. It all begins with sketches and paintings that are transformed into animation for 3D VR, kinect interactivity, opera performances and sculpture events. The visitor is situated as an active character in the world and must adapt to the language of the environment in order to progress through the lively drama.

FERAL CITY: AR AND SIGNIFICANT OTHERNESS

Meredith Drum

Feral City is a mobile media augmented reality walking tour, which invites participants to explore a constellation of situated events mixing the physical and the virtual. Narratives of city ecology emerge regarding human interchange with urban animals – coyotes, rats, pigeons, raccoons, foxes, beavers. The tour includes sound narratives, sound landscapes, virtual graphics, and virtual 3D interactive sculptures, a number of which are large, semi-transparent spaces that the participant can enter and investigate. The piece employs Palimpsest, a unique augmented reality browser for mobile devices developed by Phoenix Toews. The Feral City team is Meredith Drum, Rachel Stevens and Phoenix Toews.

ARCHITECTURAL ORGAN I / SKIN

Xárene Eskandar

Architectural Organ I / Skin is part of my ongoing body of work which are explorations into the relationship between architecture and the body. Architectural Organs are not techno-prostheses, but a vision for the architectural capacity of our body. The first piece in the series is presented as a combination of an operatic performance, an interactive cinema, and a responsive environment allowing audiences and visitors to unfold the fantastical narratives.

FORM OF RESIDENCE

Yun-Yi Fan

Form of Resonance is a series of biometric artworks developed by Yuan-Yi Fan since 2009, it explores different methodologies to manufacture the common knowdege of pulse diagnosis. The idea of pulse, as a tangible but subjective metric of blood circulation, has existed around two thousand years and people have tried to understand the pulse in terms of flow, wave, and eventually resonance of the cardiovascular system.

CREATIVE RISK TAKING: PUBLIC ART AND ECOLOGICAL DESIGN

Beth Ferguson

Design innovation, social entrepreneurship, and art activist movements are gaining momentum, spurred by our current economic and climate crises. This talk will explore the intersection between everyday objects, place making, and technology. Participants will learn about inspiring case studies that use creative risk-taking and systems-thinking methods applied to socially and ecologically minded projects with the potential for positive social change. Beth Ferguson is an ecological designer, public artist and founding director of Sol Design Lab based in San Francisco. Thousands of participants have interacted with Ferguson's iconic SolarPump Charging Stations made from 1950's gas pumps, bus stop LED light installations, solar payphones and public furniture made from up-cycled materials.

THE CINEMATOGRAPHERS EYE, THE ACADEMICS MIND, AND THE ARTISTS INTUITION

Terry Flaxton

As a professional Cinematographer, I've looked at the world through the frame, sometimes spending 24 hours on set, searching out the meaning of the dark surround and its luminous content. As an artist, I've discovered that the idea of a frame must include intuitive-boundlessness to transcend its limitations; as an academic I've found that boundlessness must be limited through critical reflection, to bring back news from the 'frontier' for you, my colleagues. In this talk about my research work, with examples of high-resolution imaging and its apparatus, I shall discuss the opposing and complimentary pressures arising from 'Practice as Research'.

DONKEY WALKING: INTERSPECIES COLLABORATION & THE RE-WILDING OF GRADUATE SCHOOL

Chris Galanis

My work explores the relationship between embodied sensual knowledge and the internalized narratives we project onto the environment through human culture. For my thesis exhibition I am developing a week-long installation in which I will cohabitate in the University Art-Department courtyard with a donkey. In an attempt to facilitate an unmediated audience experience of "nature," I'll lead regularly scheduled walks around the campus with the donkey, as well as invite the public to eat, sleep, and spend time in the courtyard with us. The project encompasses not only my love of donkeys, but also frustration with artistic attempts to "represent" nature.

MAGNITUDES

Jordan Geiger

Magnitudes change in the space and technological development of very large organizations (VLOs). VLOs are a phenomenon of our day, as the built environments of work, public assembly, agriculture, incarceration, trade, travel, education, even death join global financial and communications networks. The planning and infrastructure for these demand logistics, capital and an order of population magnitude that all must accommodate volatile shifts with spatial and computational stability. Adaptability is at the crux of dealing with diverse users or publics and unprecedented technical, cultural, social and ecological challenges; and it is where control can give way to engagement and participation.

A MOMENT IN WIREFRAME

Robbert de Goede

Robbert de Goede has been an interior architect for 12 years and thanks to the economic crisis started a career as an artist three years ago. 'I have always been inspired by minimalist art and through the use of CAD-software as my daily tool I found a language bearing my own signature'. He manages this by creating powerful real life spaces using the most basic form of computer rendering: wireframe. His work is about the line between computer modeling and manual construction, where the sterile concept turns into touchable reality. As screen resolutions can not keep up with his work, the works themselves look like low-resolution constructions.

SITE UNSEEN: THE EVERYDAY AND EMF

Lyn Goeringer

Beyond the threshold of our mundane senses, electromagnetic wave fields(EMF) are a component of our daily life. An increasingly omnipresent phenomenon, ambient EMF has the capacity to recharge batteries, power LEDs and fluorescent bulbs in areas where the signals ae quire strong. In this presentation, Goeringer will discuss her ongoing work sonifying electromagnetic wave fields, and discuss the potentiality of EMF as a hidden component in the places we inhabit for power and creative endeavors.

LIVE INTERACTIVE CINEMA PERFORMANCE & COMPOSITION

Jefferson Goolsby

Northwest artist group DataIRJ (data-urge) will present previous and current projects while discussing live cinema, remote collaboration, aesthetic data, and near real-time moments. For eight years DataIRJ has produced solo and collaborative live cinema and installation works for national and international audiences. DataIRJ are Ian Coronado, Reza Safavi, and Jefferson Goolsby.

DREAM MACHINES: AUTOMATING PSYCHEDELIA

Hilary Harp

This paper presents sculptures in my series, SETI situating them in the tradition of psychedelic and synesthetic art, particularly experiments with automated psychedelia such as the work of Brion Gysin and Thomas Wilfred. SETI are mechatronic sculptures which create continuously changing abstract video displays. In each machine, a moving camera scans an abstract fabric and glitter space-scape. The overlay of multiple translucent and transparent moving layers creates a glimmering and undulating mirage. The camera's signal is transmitted to a projector or monitor, much as satellite images allow the real-time transmission of live events.

FABRICATION:MODULAR FOOD/WATER SURVIVAL

Catherine Harris

This interdisciplinary conversation with artist/designer Catherine Page Harris will alter the lecture format. We will engage a 20-minute, hands-on, learning process by building together. The artist's work will be available for viewing through a rolling screen presentation. Issues such as material sourcing, collaboration, and fabrication techniques will be articulated by doing. Small-scale mockups will be created and may be taken home.

THE PATHETIC LANDSCAPE

Matthew Hawthorn

Matt Hawthorn is a performance artist exploring the relationship between the performing body and the landscape through live and electronic mediations. This approach considers the mediated landscape as a deconstructed narrative of traces connecting people, events and violences. More recently this has taken the form of a video collection entitled The Pathetic Landscape comprised of a series of encounters between the artist's pathetic body and a global network of contested landscapes.

TREES, BOIDS, NOISE

Paul Hertz

This talk presents three generative systems for making visual art. One is based on random, regular patterns known as "blue noise," one builds tree structures that are "pruned" to create layered geometric compositions, and another tracks flocks of "boids" governed by steering behaviors. All three operate as interactive animations which can generate high-resolution still images, animations and installations. The generative systems are based on open source Java and Processing libraries, including one created by the artist, available at http://paulhertz.net/ignocodelib/.

ECO-VISUALIZATION: USING ART AND TECHNOLOGY TO PROMOTE ENVIRONMENTAL STEWARDSHIP

Tiffany Holmes

In her artist's lecture, Holmes debates the potential of technology to promote positive environmental stewardship and showcases a range of work from this expanding field of creative production.

ECO-LOCATIVE

Meridith Hoy

In current artistic interventions deploying locative technologies, there are now two distinct domains of practice—one that engages the "digital tame" of social media, online consumer culture and other post-Situationist urban interventions, and another, which critically interrogates the "wild" by considering ecological and environmental conditions in the "natural" world, which are approached less often than urban activities by pervasive digital art. This panel will account for what we are calling the "Eco-Locative"—a strain of art practice that uses digital and locative technology to mediate on our understanding of the natural, nature, and wilderness.

SOCIAL STRUCTURE [CONSTRUCTION NO. 1]

Nick Hwang

Social Structure [Construction no. 1] addresses concepts of resonance, feedback, deconstruction, and inundation in the contexts of sound, music, audience interaction, and social media. The installation is a collection of position-aware resonant acrylic cubes with tactile transducers. With the use of computer vision and projection, audience/ participant interactions with the cubes control the responding audio and video. A resonator-laden platform, on which the structures are built, will continuously feedback all aural material, causing the entire structure system to shake and buckle on its own resonance.

THE ART WITH CONVERSATION

Paul Jacobs

People have been speaking to machines for hundreds of years, knowing quite well that the machine could never hear them. Emotional moments find us begging cars to start or swearing at elitist cell phones for preferring temporary death to the dishonor of a 3rd party charger. We speak, thus we imagine something listening, understanding, and perhaps - responding. In this talk, I'll discuss the convergence of technology just now enabling man-machine conversation, my explorations in verbally interactive art, using speech recognition as a tool for artistic expression, and how the natural human desire to anthropomorphize can help.

DOUBLE VISION INTERMEDIA PERFORMANCE

P

Pauline Jennings

DOUBLE VISION is an intermedia company that creates experimental performances for dance, music, video and installation. The group's work explores methods of combining ideas, art forms, materials, and spaces. In this talk, Co-Directors Sean Clute and Pauline Jennings, will illustrate the complexities of interdisciplinary collaboration. In particular, they will discuss their work "Evolutionary Patterns and the Lonely Owl". This series featured large-scale, interactive performances exploring simultaneity, chaos, and rule-based audience interaction. Components from this series can be applied to a multitude of artistic processes and physical spaces.

DATABASE CINEMA AND EXPERIMENTAL NARRATIVE

Jeanne Jo

This talk focuses on different conceptual cinematic investigations that create experimental forms of narrative. One such project is a large-scale database of narrative film sequences. The film sequences, or micro-narratives, are modular and exist within a recombinant system with multiple permutations. The work is non-linear and randomness operates to generate a number of pathways or different audience experiences. In the work, different aspects of emergent and generative narrative are explored as well as issues of representation–specifically the performance of femininity and the trope of the heroic.

OF WATER AND THE RIVER MEDITATIONS ON THE RIO GRANDE

Cutler-Shaw Joyce

This two-year project and its exhibition was made in collaboration with the NMSU Department of Engineering. This project was a process of discovery into the complex history and current significance of the Rio Grande and its territory. Water is a primary issue in New Mexico, as it is worldwide. The Rio Grande river water is essential to the survival of a large part of the state and the region. It is conceived as an introductory visual essay through drawings, writings, artists books and digital imagery. The river and its region encapsulate the ecological challenges of our time. Water is life.

NULL POINT

Haein Kang

'Null Point', an architectural scale installation, is connected with scores of thousands of springs. With the connection, it forms large walls like a net-shape. And these walls form a maze by taking open and closed wall. When participants enter the exhibition hall, they pass through this maze. The walls that are connected with springs are blocked spatially, but lie open visually. And the walls are not fixed firmly. The maze is kind of floating. It reacts, moves according to the motion of participants. These movements result from connecting relationships, and the motility of spring adds tension.

WILDLIFE: NEAR AND FAR

Peggy Keilman

This floated maze is a psychological description of a life in the mega city Seoul. It is empty, lost but has to be continued.

MOORI

Haeyoung Kim

Moori is an interactive audience-participatory multi-media performance system. By innovations in network-based personal mobile devices,

users collaboratively generate stories, animation, and sound. The dialogue between the performer and audience members results in a dramatic narrative and a real-time audio-visual composition. Moori allows audience members to take part actively in narrative-building, which brings visuals and sound in a performance. Users tell stories in response to guided questions by the performer by interacting with multiple modes of messaging on mobile phones and portable smart devices. As audience members input data through their personal device, the user data is processed to generate audio and graphics while creating a larger narrative. This collaboration creates dialog between the performer and audience members and suggests new possibilities that can exist through the combination of algorithmic animation, audio and language.

TELE-ROBOTIC ART USING SOCIAL & URBAN MEDIA LANDSCAPE

Hyun Ju Kim

This talk introduces tele-robotic art works utilizing both social media (SNS) space and the urban media landscape. TeleSECT and TweetBot V1.0 are artist's main works to be discussed in the presentation as the key example. TeleSECT is a telematic robot agent visualizing inter-activity between cities and people based on the traffic of Twitter messaging activities, the activities of social media related to the city. TweetBot V1.0 is also a tele-robotic work but more focusing on the personal emotion in the social media-scape. The artist will discuss the aesthetic value of telepresent robotic art works and the potentials of social media (SNS) for artistic purpose.

PATTERNS OF NATURE: THE SPIRAL IN INTERCONNECTEDNESS

Claudia Kleefeld

This discovery will enhance our own lives with a deeper sense of place and wonderment. So enjoy the "lure of the local" as Lucy Lippard wrote about our own close environments.

Grant Bot

Scott Kildall

TIME AXIS

Miu Ling Lam

What is time? Defining time in a non-controversial manner has eluded most people. The interactive installation Time Axis evokes the consciousness of the concept of time through an unfamiliar experience – taking self-portraits and watching them vanish on paper instantaneously. Photography is a process of capturing an instance of dynamic events as a permanent visual at that moment: turning fleeting matters to permanent. Still images are time-invariant, whilst still images that fade away are time-variant: turning permanent matters to evanescent. More interestingly, the evanescence of the event captured by the image is different from that of the ephemeral image itself. The installation combines the use of thermochromic paint and thermal printers to create the effect of fading image on paper. The portrait of the participant will be captured by a camera, and printed on two types of thermal paper: one is regular receipt paper and the other is custom thermochromic paper. Images created on the thermochromic paper will disappear after a few seconds of being printed out. The mechanical noise generated by the printers is manipulated by a digital resonator and sent through the headphones to be listened by the participants to intensify their experience.

COMPUTATIONAL SUBLIME

Shawn Lawson

What happens when artists use computers to quantify the infinity? We will explore the sublime in a few computational artworks that evoke

both pleasure and fear. Where, on one hand, we aesthetically comprehend the process and results; but, on the other, we are overcome by the sheer magnitude of data and cosmic time scales needed to completely compute the simple algorithms.

NOBODY WILL HURT YOU

Terri Lindbloom

In 2006 I was invited to do a site specific piece consisting of three rubber mats with water jet cut text stating: NOBODY WILL HURT YOU, NOBODY WILL SAVE YOU AND NOBODY for the Yard at Casa Lin during Art Basel Miami. The Yard at Casa Lin is an alternative outdoor exhibition space created by Lin Lougheed located within a small ungentrified neighborhood in the Wynwood District of Miami.

CONSTRUCTING "FILM OF SOUND"

Will Luers

"Film of Sound" is a video installation (and live performance) in which the screen is placed at the center or "sweet spot" of an acoustic space. Rather than acting as a window onto another 3D world, the screen becomes a semiotic surface for the 3D audio space; a skin of image and text on the body of sound. A collaboration between Roger Dean (sound), Will Luers (video) and Hazel Smith (text) the video surface hints at a narrative trajectory — a sleeping man, an evening in a hotel room, a journey across vast and challenging spaces – but the work remains open, as image follows the patterns and textures of sound rather than a pre-scripted narrative. In this talk, Will Luers will present the 10-minute video and discuss the indeterminate and remix processes involved in the collaboration and, in particular, the challenges of imaging sound.

MALLART SOLAIRE

Ana MacArthur

Taking observations from specific sites and their biological landscape can be used for insights and inspiration for energy generation possibilities. The project focuses on generating energy from the sun, with critical aesthetic and conceptual objectives being decentralized energy production, incorporation of early effective New Mexico solar design components, and geographical information. The interest explores specific biological organisms that utilize the sun with particularly unique methods, and selecting from them particular traits that give intuitive technological design insights to energy generating methods. The lecture will put this current preoccupation in context of earlier work that contributed an influence to this direction.

BONE MACHINE: BODIES AND TECH

Ana MacArthur

PRIMATE CINEMA

Rachel Mayeri

Primate Cinema, by Rachel Mayeri, is a series video experiments on the subject of the primate order. Primate Cinema: Apes as Family is a two channel video installation: an original drama made expressly for a chimpanzee audience on the one side, and documentation of an actual chimpanzee audience at the Edinburgh Zoo, on the other. Chimps respond to the drama individually - some touch the screen, others ignore it, and some just sit and watch. The two channels create a prism for humans to learn about their primate cousins, who are, like us, fascinated by cinema.

BABYLONIA, 2012

Victoria/Vicky Moulder

A variety of augmented-reality games (ARGs) have been designed over the last decade. Often it is the case that these games have two main components - the technology and the story-narrative - that when combined create a rich playing experience. In this presentation, Vicki Moulder will discuss her ISEA proposal and most recent production with Radix Theatre called Babylonia. Babylonia used ARG technology to engage people in the co-creation of story-narrative. Moulder is a researcher at SIAT, SFU, the primary focus of her work explores creative collaborations at the intersection of technology and cultural production.

BEESPACE: AUDIO OBSERVATION

Jan Mun

BeeSpace : Audio Observation explores the bee's natural system in an artificially built environment to consider the threat of modern living practices to both bees and humans. Creating a perspective shift by building new spaces and gaps and to call attention to our social landscape, generating critical sites and developing voices. Viewers are invited to reconsider the gaps from previous interpretations of established systems and consider the new gaps that are in the process of developing.

ALBEDO PROSPECT

Ed Osborn

Albedo Prospect is a set of media works that explore the polar imaginary using video, still images, audio, sculptural elements and text. The project is based in part on the 1931 airship flight to the high Arctic from which the writer Arthur Koestler filed wireless reports. The piece re-imagines Koestler's reports and updates them with a contemporary perspective and an acute awareness of how personal, journalistic, and scientific narratives function to shape our knowledge and readings of polar geographies.

TRANSMODAL JOURNEYS: DIGITAL ADVENTURES IN THE PHYSICAL WORLD

Frederick Ostrenko

Frederick Ostrenko is a new media artist and educator within Louisiana State University's AVATAR initiative. He will present on his interactive environments that focus on revealing hidden networks between people by creating structures for expression and discovery. His installations use brainwaves, text messages, live video processing, and electric shock as interfaces for people to explore their identity and connect with other participants. Frederick will also talk about a recent work, which is inspired by a hero's journey towards transcendence, and how such a narrative relates to a participant's experience within a digitally augmented environment.

OPENLAB: ART + ASTROPHYSICS

Jennifer Parker

"Down to earth: Art, Astronomy and Physics" Highlighting new works created by artists and scientists from the OpenLab at the University of California Santa Cruz.

MYTHS OF CREATION AND DESTRUCTION

Ellen Pearlman

Atoms are never still. They move and dance in levels of electrons shells negotiated by subatomic particles. Native American Kachina dancers move too, talking to unseen deities negotiated by spirit. I proposed a visual, motion and auditory performance installation on Myths of

Creation and Destruction working with students and faculty at the IAIA Institute, as well as scientists to make a piece premiered at IAIA's Digital Dome with images output on the EMMU-Ruidoso Gateway System of Video Teleconferencing. Also discussed will be more recent developments using the Kinect, the Emotive Cap, NeuroSky, Makerbot and others.

"IN THE BEGINNING" OR… : THE COSMIC STORIES WE TELL AND THEIR IMPLICATIONS

Sheila Pinkel

What are the stories we tell today about the origin(s) and structure(s) of the cosmos? Is there a connection between cosmological stories and the socio-political landscape in which they emerge and continue to be told? Do these stories affect our relationship to this planet and one another and if so, how? Is it possible for seemingly incompatible narratives to productively co-exist suggesting a way to embrace complexity?

OBJECT PERMANENCE: USING GRAPHICS AND ROBOTICS TO EXPLORE VISUAL COGNITION

Marco Pinter

Object permanence and persistence have been explored philosophically by the likes of Plato, Locke and Leibniz; and psychologically by Piaget and others. The way in which we perceive the existence of objects over time is fundamental to how we experience the world and our place in it. Robotically-controlled sculptural works will be presented which exploit this phenomenon. The pieces employ on-screen "virtual" objects that appear to manifest in the real world, exhibiting behavior in and impacting physical space. This work will be discussed, as well as future directions to explore this space.

"OBJET PETIT A" SERIES

Anat Pollack

This work explores the allure of the unattainable. Generic television commercials set up unresolvable tensions between erotic desire and the banal. This series is meant to distill the desires being represented in advertising by co-opting co-opted imagery of the sublime. The images are meant to evoke a sense of hope even while the vaguely sinister is revealed as the excavatinggaze pieces together the commercialized foundation of the dream. Layering results in the denotative erasure of the advertised. Traces remain and it is that stubborn refusal to disappear that infuses this series with poetic melancholy as well as political critique.

LOCAL TIME

Julian Priest

Local Time is a 2011 artwork that created a temporary timezone at the Dowse Museum in Wellington, New Zealand. In our day to day existence we structure our lives around time. In Local Time a fluctuating time signal was generated from a network of wireless sensors around the museum grounds and displayed on a giant digital display on the outside of the building. The piece is used as a starting point for a discussion of how time is co-ordinated and operationalised in society and how it relates to environmental processes.

STOP MOTION ANIMATION IN SINGAPORE

Eileen Reynolds

Eileen Reynolds is one of the pioneers who helped develop and design the School of Art Design and Media at Nanyang Technological University in Singapore. As an expat living in Southeast Asia for the last 7 years, her stop motion video projects infuse subtle critiques about living in a culture apart from ones own and reflect on the rapid modernization of Singapore. A few pieces inspired by this rapid transformation will be shared: "Hungama,The Lap Top Project", a collaborative project made by Bangladeshi Migrant Workers in Singapore and "Big Bio", an

experimental stop motion animation which toys with science fiction, biology, and reproductive technologies. Having recently relocated to the United States, Eileen is now faculty in the experimental animation area at CalArts.

SECRET GARDEN

Martin Rieser

Secret Garden is an attempt to recreate a contemporary version of the Eden myth in the midst of an urban environment. The structure of Secret Garden will be loosely modeled on the ten paths of the Sephirot in the Jewish telling of the story, which is itself also a symbol of the Tree of Life and the oldest extant version. The Eden scenes will grow around a user in 360 degree 3D panoramas tied to the GPS nodes selected and will be triggered by location automatically.

THE TREE ALONE

Dawn Roe

This talk will focus on my 3-channel video installation and photographic series, The Tree Alone. The project takes its title from a line within Virginia Woolf's novel The Waves. She writes, "The tree alone resisted our eternal flux, for I changed and changed." The manipulation of imagery within this series attempts to visually manifest the conflicting durations between nature and self. Taken as a whole, the work emphasizes the necessary duration of present experience by asking the viewer to repeatedly consider their perceptive response to familiar, visual phenomena.

THE SECRET NIGHTLIFE OF SOLAR CELLS

Annina Rust and Amy Alexander

Do solar cells have a nightlife? According to Amy Alexander and Annina Rüst, solar cells aren't just for making green energy anymore. Discotrope is an audiovisual performance that resembles a cinematic nightclub light show. At the heart of the show is the Discotrope, a solar-powered disco ball that reflects videos in a kaleidoscopic, rotating projection that encompasses the entire area, turning it into both giant movie and dance party. Discotrope's projected visuals depict the curious history of how dancers have been represented in cinema - and how they represent themselves - from Thomas Edison to YouTube. You might be surprised... More info: http://discotrope.org.

INVENTED LANDSCAPES

Sara Schnadt

Performance and installation artist Sara Schnadt talks about three recent projects that are concerned with technology innovation, landscape and our perception of space. One is an absurd performance about our efforts to quantify the universe. The second creates a collision of ordinary and virtual space using everyday materials. The third traces her travel history within a constructed collective landscape. Much of Schnadt's work involves representations or data that translate large quantities of socially resonant information into poetic forms, including data visualization. Schnadt often performs within accompanying sculptural environments, attempting to articulate the personal within virtual and technological innovation.

THE ARK

Dennis Summers

The Ark consists of a decaying wooden ship roughly 40 feet long. Inside, there are 100 small digital screens. Each displays a still image of a local endangered plant or animal. To depict the extent of earth?s ecological problems, the species range from the photogenic jaguar to the homely moss beetle. A motion sensor located at the entrance is tripped by a person?s entry, each entry will switch off a different screen to symbolize the extinction of that species and the ecological destruction wrought by human progress. The destruction continues until all screens are off; until all species are extinct.

NATIONAL PARKING

Daniel Tankersley

National Parking is an ongoing series of digital paintings, photographs, videogames, and other media. It explores connections between the institutions of art gallery and national park. As destinations, both offer transcendent experience in a public setting and derive authority or importance from notions of beauty. The work's representations of landscape simultaneously celebrate and question the idealization of nature in art. Nature is presented as a construction, a product of human perception and action. National parks, iconic of the natural beauty of America, are shown to require a great deal of maintenance and infrastructure toward their production of particular experiences of nature. Likewise, the gallery space, often valued for an apparent absence of contextual noise, is implicated as a mediated environment with specific rules governing the experiential possibilities within its walls.

AN AUTOMATIC EVOLUTIONARY ART

Tatsuo Unemi

This talk introduces the authors latest work of automatic evolutionary art that produces an infinite series of abstract animations and synchronized sound effects in real-time on site. The machine generates and selects short pieces by means of a genetic algorithm utilizing statistic aesthetic measures for fitness evaluation. The project includes fully automatic daily production that is exhibited on the internet by innovative Web technologies. The author is also engaged everyday. This talk will give a subject for discussion about the possible creativity by machines and relation between humans and the complex wild artifacts out of our control.

SENSORIUM

Claudia X. Valdes

New directions in my creative practice focus on production within the genre of Visual Music paralleled with investigation into the neuroscience of audio-visual perception and multisensory integration. This talk will cover 1) psychological and neuroscientific studies on the interaction of the senses, 2) some effects of visual and musical stimuli on brain state, and 3) my own artistic experiments with attendant AV modalities.

MOVING LOGIC: CHOREOGRAPHING THOUGHT IN A WORLD OF PHYSICAL COMPUTING

Nina Waisman

Nina Waisman's works highlight the roles that gesture, rhythm and mirroring play in forming our thoughts - scientists call such "physical thinking" the pre-conscious scaffolding for human logic. How might our new tech-inflected gestures, then, be shaping our relationships with bodies and systems we connect to when we move with technology? During her residency at Albuquerque Academy, Waisman will make an interactive sound installation in collaboration with 6th-12th grade students. Waisman exhibits nationally and internationally: venues include the House of World Cultures, Berlin; the California Biennial at OCMA; the Museum of Image and Sound, São Paulo, Brazil; and the San Diego Museum of Art.

PUBLIC ART OBJECT AS A VEHICLE FOR COMMUNICATION

John Taylor Wallace

It is the responsibility of those aware individuals in society who recognize malfeasances in the world around them to act with the intention of improvement. Public art is the venue to juxtapose individuals from every avenue of life in a cross pollination of words and ideas. The viewing of a sculpture can create a momentary opening in the viewer's perception of place and time. In this opening held conventions may be questioned and alternate layers of dialogue may be injected. Stubborn complacency may be jogged into cognizance. At each layer of communication, an increasingly focused spectrum of understanding is reinforced. Knowledge is shared. Conversation and collaboration are the foundation for change.

FROM LIFE TO AFTERLIFE CINEMA

Timothy Weaver

This artist's talk will explore emergent forms of biological narrativity in relation to threads between the subdomains of new media and the evolving/cumulative data streams of bio- and ecoinformatics. Weaver will present his creative investigations into new media-based processes for the re-animation of the digital residues of lost lifeforms (including ancient DNA & protein sequences) and sonic, visual and data sampling from extinct habitats & endangered environments. Presented works will follow the emergence of life and afterlife interactive cinema as sensorial access to complex biological, ecological and biogeographic interactions across a spectrum of scales from the phylogenomic to the biospheric.

IMMEMORIAL-REW

Pascale Weber

Immemorial deals with the functioning dynamics of our memory and its anticipatory prolongation through our imagination and the network of meaning that these functions continuously weave. Owing to the technical process of spatialization and sound trajectories and the four-sided presentation of the images, the version "Rew"projects the viewer into the heart of an environment, which is divided into 26 ambiances based on poignant experiences, in order awaken long-term memory. The discovery of our earliest emotions, our frustrations and our desire is treated as evidence through audio-video case-studies; reconstituting them like a nature study: analyzed, identified, and quantified...

FOREVER NOW

Willoh S. Weiland

In the footsteps of Voyager, a group of Australian artists and curators will present and discuss curatorial strategies for the creation of a new digital 'golden record' to be launched as part of ISEA2013. The work examines the question of who has the right to represent Earth and the elitism of curatorial processes versus the democratisation of digital space. Willoh S.Weiland is the Artistic Director of artist led cross-artform company Aphids, Jeff Kahn is a curator and the Co-Director of Performance Space, Brian Ritchie is a musician and the curator of the MONAFOMA Festival, Thea Baumann is media artists, producer and director of Metaverse Makeovers.

HEAR ALL ABOUT IT: PUBLICATION OF FIRST ECO ART TEXTBOOK

Linda Weintraub

TO LIFE! Eco Art in Pursuit of a Sustainable Planet, the first international survey of twentieth and twenty-first-century eco artists, has just been published by the University of California Press. The text's ' A to Z' panorama of artistic responses to environmental concerns beings with Ant Farm's anti-consumer antics in the 1970s and culminates with Marina Zurkow's 2007 animation that anticipates the havoc of global warming. The author will explain how the book can serve students of art, design, environmental studies, and interdisciplinary studies integrate environmental awareness and activism into their professional and personal lives.

BLENDING PARTICIPATORY CULTURE AND URBAN ECOLOGY: EXPERIMENTS IN COLLABORATIVE IMAGING FOR URBAN FOREST MONITORING

Ruth West

In urban settings trees are often perceived at the edge of our awareness. As cities world-wide engage in large-scale tree planting initiatives to address a broad range of environmental issues, they are engaging in what is essentially a massive ecological and social experiment. State of the art imaging technologies -- air-borne, space-borne, and field-based imaging and inventory mechanisms -- fail to provide key information on urban tree ecology that is crucial to informing management, policy, and supporting citizen initiatives for the planting and stewardship of

emerging urban forests. Mobile participatory/social media as a medium offers novel collaborative imaging approaches with the potential for public engagement at the intersection of cultural vibrancy, stewardship, sustainability, community participation and science. Smartphones hold the potential to enhance real-world experiences with geo-spatial networks of abstract data. We are designing and prototyping mobile-based tools to capture bio-imaging data about the health status of urban trees. The development process blends the arts, participatory culture, science and sustainability.

SOUNDWALKS AND URBAN SOUND ECOLOGY

Andrea Williams

Andrea Williams is a sound artist who enjoys using site-specific elements and perceptual cues to reveal the unseen connections between people and their environment. Her compositions, soundwalks, installations, and videos have been exhibited and performed most recently at the Whitney Museum, Eyebeam Art + Technology Center, Yerba Buena Gardens Festival, Children's Creativity Museum, Fountain Miami Art Fair, and the Mamori sound artist residency in the Amazon rainforest. Andrea is the Co-Director for the sound art non-profit, 23five and a co-founder of the New York Society for Acoustic Ecology. Andrea will be presenting improvisational techniques for the creation of soundwalks and art interventions. www.listeninglistening.com.

FORECASTING DESIGN: ARCHITECTURE DEFINED BY ENTROPIC PROCESSES

Jared Winchester

Jared Winchester and Cory Greenfield will present recent work from their collaborative design studio, Entropic Industries, including their proposal for the Albuquerque Public Art Design Competition. The studio seeks new ways of conceiving architecture so that the forces of time and nature are not an antithesis to its inhabitation, but a catalytic ingredient. Each project, in different ways, accepts the inevitability of a changing environment and forecasts ways in which the building or infrastructure can not only persevere, but be transformed through these dynamic and unpredictable states. The designs emerge as a result of serendipitous relationships staged between built form and a set of geographic variables—the initiation of a process, not the execution of a fixed result.

CLIMATE CONTROL: WEATHER DAMAGE MODIFICATION PROGRAM

Bart Woodstrup

Global climate change and its effect on the environment is a concern that affects humanity's collective cultural conscious. Understanding and developing a relationship to this problem is key to uncovering solutions and inspiring change. To the extent that new technology holds the answers to these problems, artists are poised to explore these technologies to discover and critique remedies. New Media, after all, relies on the energy infrastructure that powers it, and is therefore obligated to it. These issues challenge and inform my work - a work to decipher environmental data, to question the uses of new technologies, and to inspire the use of alternative, green energy sources.

TRUTH OR CONSEQUENCES/A GLOBAL WARMING INTERACTIVE GAME

Nina Yankowitz

Global warming and other environmental concerns present some of the most challenging dilemmas that we face today. In a performance-based action, during the ISEA2012 conference in Albuquerque next September, we propose presenting some of these concerns in a new way. People will be asked to download a free QR code scanner to their smart phones. One or more performers will circulate, wearing custom designed interactive garments with printed images culled from various landscapes indigenous to regions in New Mexico. The Interactive QR codes will be embedded into landscape images of rocks, grasses, water, earth, trees, wetlands, etc. Seven to ten different codes will be available for participant scanning.Upon scanning any of the QR codes, a series of multiple-choice questions pertaining to an environmental dilemma will appear on the player's phone screens. Each code (landscape object) will represent a different series of questions. The participant will be able to select an answer from the menu of three possible choices by tapping the touch screen. A panel of invited experts, creative thinkers, and environmental activists will compile the questions. At the end of the ISEA conference, we hope to have the community "tally" of answers to the posed dilemmas texted to all participants so that they can see how their answers corresponded to the other participants.

PART HUMAN, PART ANIMAL, PART MACHINE

Doo-Sung Yoo

Doo-Sung Yoo's Organ-machine Hybrids project series have reused and transformed discarded animal organs within artworks since 2007. Disembodied animal organs were combined with electronic devices to become the conceptual artificial hybrids as part human, part animal, and part machine, which illustrate metaphors for the human body's ongoing tendencies and attempts to physically and biologically transform itself through technological augmentation. For the artist talk, Yoo will introduce the project concepts and the processes and talk about his artistic purview of the ongoing scientific issues associated with the human-animal hybrid and human-machine hybrid.

FROM NET ART TO MOBILE ART

Jody Zellen

This talk will be about transformations from the creation of net art to mobile apps. I will present my interactive installations, net art and mobile apps and talk about the relationship between them. The projects I will discuss include The Unemployed, Spine Sonnet, 4 Square, Without A Trace, and Urban Rhythms. for more information visit www.jodyzellen.com/apps.

MOBILE PANOPTICAM

Sarah Zimmer

Our purpose is to shape a select environment with active experience – inserting unexpected sensory stimuli. Technology not only facilitates this practice, it provides a base for aesthetic and theoretic representations. Digital video, audio, along with mobile computing and interactive programming allow our work to shape the public realm of everyday experience. Our interest in psychogeography and how technology affects the perception of place guides our creative vision. Technology can reform our perception of place, or at least temporarily punctuate it. We will discuss one of our current projects, Panopticam, to illustrate this relationship.

ISEA2012 – OVER 100 COLLABORATION PARTNERS

LEAD PARTNERS (ALBUQUERQUE):

516 ARTS
The University of New Mexico
The Albuquerque Museum of Art & History

ALBUQUERQUE:

5G Gallery & Factory on 5th Art Space
ABQ Sprout
Albuquerque Academy
Albuquerque Convention & Visitors Bureau
Albuquerque Mini Maker Faire
Albuquerque Public Schools
AMP Concerts
Anderson-Abruzzo Albuquerque International Balloon Museum
Basement Films
The Box Performance Space
City of Albuquerque Cultural Services Department
City of Albuquerque Open Space
City of Albuquerque Public Art Program
Creative Albuquerque
Downtown Action Team
Downtown Arts & Culture District
Down Low Car Club
¡Explora!
Friends of the Orphan Signs
The Guild Cinema
¡Globalquerque!
Harwood Art Center/Escuela del Sol Montessori
Indian Pueblo Cultural Center
Instituto Cervantes
Intel Corporation
KiMo Theatre & Art Gallery
KNME-TV
KUNM Radio 89.9 FM
Richard Levy Gallery
Local Poets Guild
National Hispanic Cultural Center
New Mexico Museum of Natural History & Science
New Mexico Wilderness Alliance
OASIS
OFFCenter Community Arts Project
Outpost Performance Space
Sandia National Laboratories
SCA Contemporary Art
School Zone Institute
Small Engine Gallery
Tamarind Institute
TEDx ABQ
Tricklock Company
University of New Mexico Art Museum
Warehouse 508
Wells Park Neighborhood Association
Working Classroom

SANTA FE:

Axle Contemporary
Center for Contemporary Arts (CCA)
Institute of American Indian Arts
Marion Center for Photography
at Santa Fe University of Art and Design
Museum of Contemporary Native Arts
Parallel Studios / Currents:
International New Media Festival
Radius Books
Santa Fe Art Institute
Santa Fe Institute
Santa Fe University of Art & Design
SITE Santa Fe
Zane Bennett Contemporary Art

TAOS:

Amigos Bravos
Earthship Biotecture
JandreauArt
The Harwood Museum of Art
KTAOS Solar Center
Larry Bell, Inc.
LEAP & NeoRio 2012
PLAND
Stables Gallery/Taos Center for the Arts (TCA) & SEED
SMU-IN-TAOS
Spitfire Forge
Sube, Inc.
Taos AV/UnitedSpace
Taos Center for the Arts (TCA)
Taos Tourism Department
The Tales of Thatcher Gray
Touchstone Inn
Town of Taos
Two Graces Plaza Gallery
Touchstone Foundation and Touchstone Inn
UNM Taos Branch
Wilder Nightingale Fine Art
Wise Fool New Mexico

REGIONAL:

ASU Art Museum / Desert Initiative, Tempe, AZ
Bradbury Science Museum, Los Alamos, NM
Gila River Festival, Silver City, NM
THE LAND/an art site, Mountainair, NM
Los Alamos National Labs
Los Alamos Public Library
New Mexico Centennial Celebration, statewide
New Mexico Highlands University, Las Vegas, NM
The Next Big Idea, Los Alamos, NM
New Mexico State University, Las Cruces, NM
Scientists/Artists Research Collaborations (SARC)
Stanlee & Gerald Rubin Center for the Visual Arts
at The University of Texas at El Paso
Western New Mexico University, Silver City, NM

NATIONAL/INTERNATIONAL:

Eco-Sapiens, New Zealand
Earthbound Moon
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516 ARTS

ISEA2012 IS ORGANIZED AND PRODUCED BY 516 ARTS, An independent, nonprofit community organization, in partnership with The University of New Mexico and The Albuquerque Museum of Art & History. The mission of 516 ARTS is to forge connections between art and audiences, and our vision is to be an active partner in developing the cultural landscape of Albuquerque and New Mexico. Our values are inquiry, diversity, collaboration and accessibility. 516 ARTS offers programs that inspire curiosity, dialogue, risk-taking and creative experimentation, showcasing a mix of established, emerging, local, national and international artists from a variety of cultural backgrounds.

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