machinations

KINETIC SCULPTURE IN THE AGE OF OPEN-SOURCE

Participating Artists:

Daniel Jay Bertner, Jeremy Boyle, Stephen Cartwright, Paul Catanese, Paul Granjon, Theo Jansen, Joseph Morris, Anat Pollack, Chris Reilly, Randy Sarafan Pencil Studios (Sabrina Raaf and Travis Saul)

The Second Renaissance:

DIY, MAKERS, ART AND THE SECOND AGE OF PROTO-INDUSTRIALISM

PATRICK LICHTY

"Every work of art is the child of its time; each period produces an art of its own..." – Wassily Kandinsky

As a New Media practitioner, one might be surprised that I invoke Kandinsky in light of an essay addressing topics in kinetic sculpture. I admit to truncating the quote's ending, "which cannot be repeated," in part because I disagree. Culture does revisit themes throughout history. Do-It-Yourself (DIY) and kinetic sculpture are no exception. Kandinsky's quote is a prescient one, as the art of our time, and artisanship associated with it are the present zeitgeist. This is reflected as the First World is entering what Jeremy Rifkin in The Economist terms in his article, The Third Industrial Revolution . posits that manufacture is moving into the hands of the consumers through the use of affordable tools like DIY machine tools and 3D printers. Furthermore, the Open Source (that is, free to everyone) movement has created an entire DIY subculture.

Websites such as makezine.com, evilmadscientist.com, adafruit.com, and others showcasing "hobbyist" and independent production ethics typify the DIY movement, which are then promulgated through other web-based communications, magazines, and festivals called "Makerfaires." In many ways, this is a familiar milieu, as it is reminiscent of the beginning of the Personal Computer revolution, thus my dissension with Kandinsky. Tropes do repeat themselves. In the 1980s there were huge computer fairs while magazines like Byte and Popular Electronics urged enthusiasts to explore the wonders of their time. Is today so different?

The echoes of the industrious artisan-inventor reverberate as other great eras of invention flow through contemporary society. For example, current Steampunk culture glorifies the Victorian era, another great age of invention. It comes as no surprise to me then that today's tinkerers, building amazing (and sometimes preposterous) contraptions, should embrace the age of Jules Verne.

There have been bursts of invention and hobbyism in society, but how does this relate to the practice of art, criticism, and cultural production? The milieu of 2012 represents an environment where the artist can be solely in charge of their own project because of the emergence of affordable "pocket factories," or the ability to easily crowdsource/outsource/offshore means of production. This is markedly different from the time of the birth of technological art on the late 1960s when teams of engineers and corporate support were needed to achieve events like Experiments in Art and Technology's 9 Evenings . Furthermore artists like Lillian Schwartz or Ken Knowlton's computer-based artwork developed around creative centers like Bell Labs. Today, the intersection of artistic practice and creative technology has migrated squarely into the hands of practitioners possessing ingenuity and modest resources. In Chicago, there is an upsurge of rapid prototyping/3D-printing being explored by New Media artists Mike Moceri, Tom Burtonwood, and myself. The equipment used in the creation of DIY printing of objects is built by the users, and is often an assemblage of off-the-shelf components. In this vein, Chicago artist Taylor Hokanson is pioneering craft through the fashioning of ones own tools and plan sharing. He has been developing an Open Source DIY Computer Numerical Control, or "CNC" machine in which "makers" can construct their own robotic table that can guide a cutting tool to fabricate shapes created on the computer. One can design a relief sculpture on the computer, then see it realized in various materials that same afternoon.

The increased ability to create and produce digitally has led artists to engineer and fabricate their own work. Sabrina Raaf and her subsequent collaborations with Travis Saul reflect an aesthetic of the neo-industrial. Grower , a robot designed by Raaf, seems to reflect this new era of invention. It draws lines on a nearby wall with a green Sharpie pen in response to the room's carbon dioxide levels. The device has the feel of contemporary robotics with the functionality of high technology, but the professional finish of a gallery artwork. The fact that the green lines create a field of grass-like pattern while the world wonders if grass is going to survive in the next hundred years due to waning carbon dioxide levels is ironic considering the very technology that created the robot itself. Possible reads on the cultural significance of the age of fabrication are many. For example, there are articles like the aforementioned one in The Economist, but there are also odd similarities to other periods in time as well as new proclamations by revolutionaries. While the new age of "making" feels like a scaled down redux of the industrial revolution, other aspects of this age are also evident. The elements of DIY, home fabrication, etc. have similarities to the era of the Renaissance artisan where artists have specific areas of expertise, whether in weaving, 3D printing, robotics, and so on. The emergence of so-called "hackerspaces," or organizations created for the group sharing of knowledge and skills feels akin to the old European guild structure of craftspersons and journeymen; however, in the Maker era, these lines seem to be blurred or juxtaposed which is a major point of difference. What is relevant is a sub-cultural proto-industrialization that is merging with a host of other practices, like art as public practice/ Relationalism, and the Open Source/FLOSS movement . The proto-industrial of the Renaissance led to the Industrial Age, where the current milieu is one that is sub-cultural and dependent on the global superstructure of just-in-time manufacturers and suppliers like Grainger, McMaster Carr, and any number of online distributors. So, imagine a time where we have the equivalent of Postmodern Gepettos in huts, making their projects with tools they built along with their guild, but sourced by evilmadscientist.com or alibaba.com.

The movement towards the DIY is also reflected in progressive and radical ideologies. Another emergence of this guild/communal subculture creativity is seen in the writings of the techno-anarchist group, The Invisible Committee. In their manifesto, The Coming Insurrection , they describe a post nation-state world in which proto-industrial commune-enclaves cooperate in a network that share skills and members in the pursuit of the common good. Their statement assumes the overthrow of the state and reclamation of social space by these post-apocalyptic communities, however, what actually seems to be happening among artist-inventors is different. Emerging is the creation of a network of free spaces, hackerspaces, and online experimentalist/ Open Source communities that support the free and open sharing of skills, materials, and computer code. In many ways, the vision of The Invisible Collective does not seem far-fetched except in details like the overthrow of the State and the simple fact that access to technology relies on an infrastructure that is supplied by the current military industrial government superstructure.

The new social structures are creating new ways of creating, and this includes art. We are networked, supplied, freely sharing, hanging out at hackerspaces, and going to "Makerfaires." The artist/artisan-citizen-inventor is a peculiar mix of Postmodern and ancient genres that reflect a radical paradigm shift in our conception of the making of art and what an artist can be. The fact that shows like Machinations at Columbia College Chicago incorporate practices of the artisan-maker as artist, and not just equating the two, provides a critical insight into the state of cultural production in the second decade of the Third Millennium. It appears that as a result of this shift, we have a generation of new DaVincis tinkering away in their shops, making new tools and processes that are influencing the cultural production of their age. We are witnessing the emergence of the practitioners of the Second Renaissance.

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[1] Rifkin, Jeremy. The Third Industrial Revolution, The Economist. 2012, Web. http://www.economist.com/node/21553017

[2] Steampunk is a fantasy genre that romanticizes an alternative future where steam and arcane powers became the prominent sources of energy rather than electric and petrochemicals. An example of this literature would

be Gibson and Sterling's The Difference Engine.
[3]Kluver, Billy and Robert Rauschenberg, Nine Evenings, 1965 Langlois Foundation archive, Web. http://www.fondation-langlois.org/html/e/page.php?NumPage=294
[4]Raaf, Sabrina, Grower, 2004, robotic installation. http://raaf.org/Electronic_Works/Grower/Grower_frames.html
[5]Examples of books/projects that are relevant to these subjects are:
(Public Practice) Thompson, Nato, ed. Living as Form, 2012, MIT Press, Cambridge, MA
(Relationalism) Bourriaud, Nicholas. Relational Aesthetics. 1998. Les Presse Du Reel, Paris.
(Open Source/FLOSS) http://www.flossproject.org/ 2012, example project website
[6]The reference to Gepetto stems from Disney's Pinocchio, in which the movie depicts the marionette maker Gepetto in a small workshop in the forest making his creations. The invocation of Gepetto ifers the maker that creates a work that is imbued with a life of its own.
[7]The Invisible Committee, The Coming Insurrection, 2009, Semiotext(e)/MIT Press, Cambridge, MA

Curator's Statement

Machinations: Kinetic Sculpture in the Age of Open-source is a glimpse into the ever-expanding spectrum of contemporary new media artists. The exhibit features works by a cast of tinkerers, hackers and inventors utilizing and re-contextualizing technologies to create works of art that are seemingly alive. From the simulated ecosystems of Anat Pollack to the self-playing musical instruments of Jeremy Boyle and the ever-watching eye of Daniel Jay Bertner's *Gestural Interactive Automaton*, this collection of works is an investigation into a community of experimentalists who share and create with a DIY spirit.

As educators and active participants of the open source community, the artists of *Machinations* share their discoveries through online forums, workshops, customizable software and reproducible designs. Randy Sarafan's *Simple Bots*, roving kinetic sculptures, can be constructed via instructions posted online and Dutch artist Theo Jansen offers miniature assembly kits resembling his monumental, anthropomorphic wind walking *Strandbeests*; Pencil Studios, the collaborative efforts of Chicago new media artists Sabrina Raaf and Travis Saul, provide a new solution to water harvesting with *(n)-Fold*, a sculptural, utilitarian travel system designed for nomads.

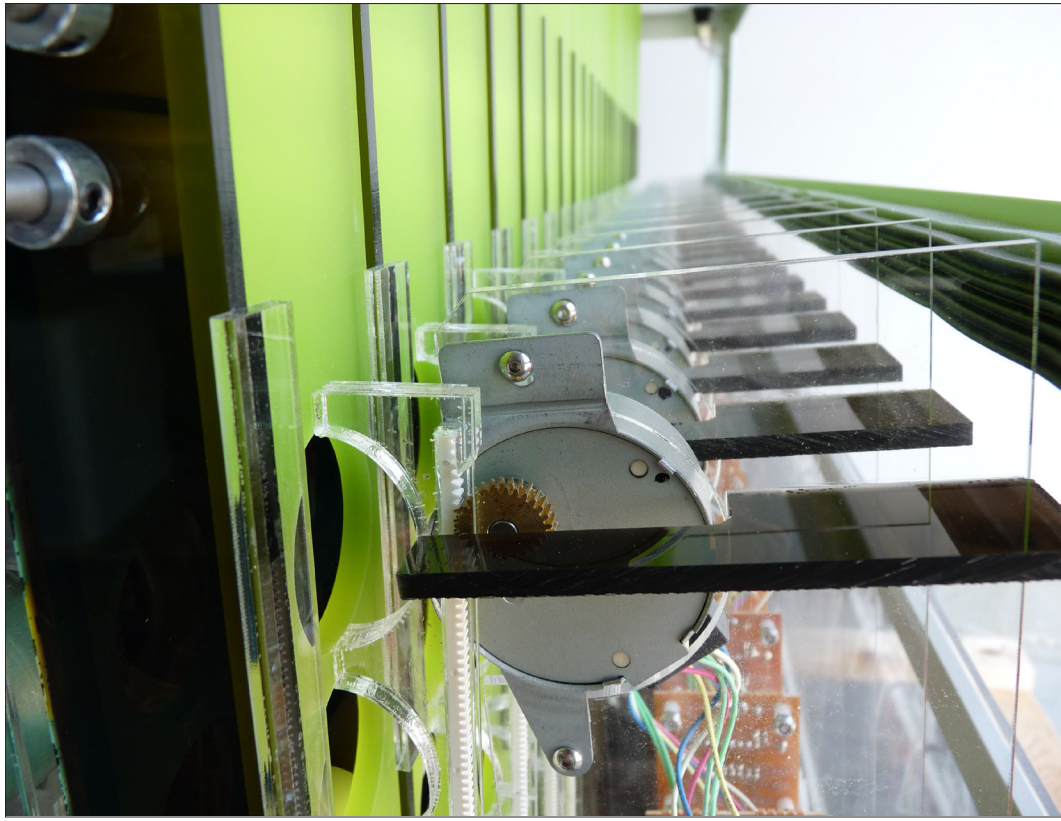
In the vein of the DIY and Free Software movements, *Machinations* elucidates the magic behind the machine, bringing into focus new media practices and technologies. Essentially two exhibitions merged into one space, there exists a formal presentation of artist works along side the Research Lab, a educational resource area where viewers can peruse artworks, instructional videos and publications submitted in response to a nationally posted call for works.

A myriad of artists need to be credited for the advancement of technologies that achieve increasingly complex results by way of less complicated and less expensive means. Artists have always played a role in society that calls us to look at the same problem from a new perspective. Through tinkering, hacking and inventing, the artists of *Machinations* change our perception of what is possible and readily achievable by using technology as an extension of the human hand.

Mark Porter

Stephen Cartwright

Champaign, Illinois



Deviation, 2012
Acrylic, aluminum, Arduino microprocessors, mixed media

In 1999 Stephen Cartwright began his Latitude and Longitude Recording Project, records of his exact latitude, longitude and elevation for every hour of every day. Since the inception of the project, he has completed several bicycle journeys totaling over 20,000 miles through North America, Europe and Asia. He compiles the collected data from both his epic journeys and from everyday life and uploads it into his sculptures, which commonly serve as animated graphs or kinetic diaries.

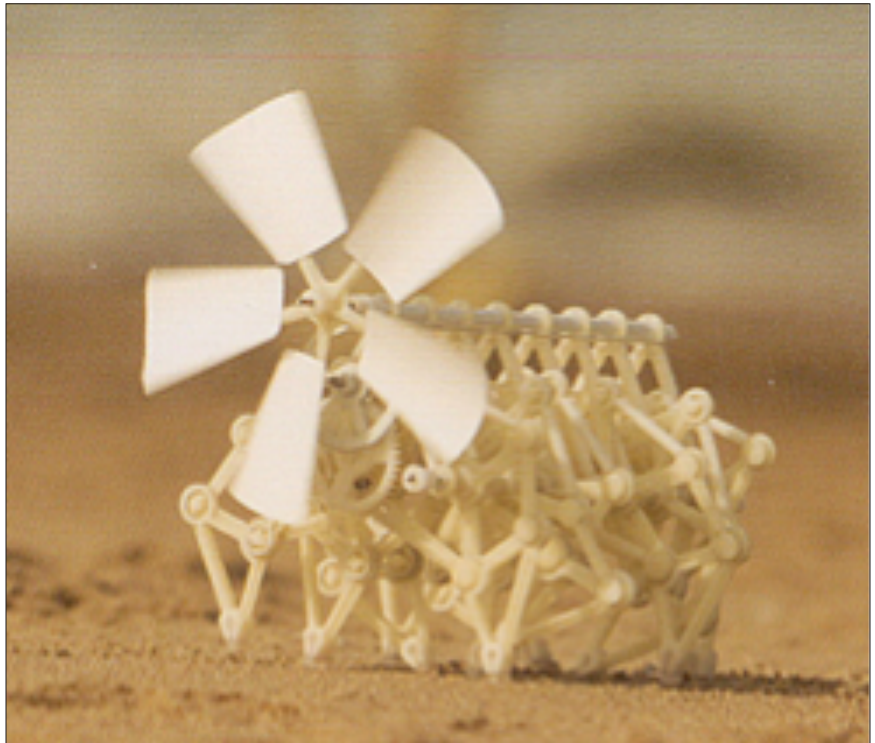
Cartwright states, "I create objects from my exploration; they are abstractions, tangencies or stills culled from the original data and attempt to gain some distance and perspective to view my transit through life from a removed position. My work explores the divergence of natural and man-made laws and systems, and perception versus fact."

Theo Jansen

Netherlands

Animaris Ordis Parvus, 2010
Assembly kit made of plastic, first made available August 2010
modeled after Animaris Rigide Properans

Theo Jansen creates what he terms “new forms of life” – kinetic works of art created with simple materials such as plastic tubing, wood and bottles. His works possess an animalistic presence which evolve to become independent of their creator. In 1990 he began to produce a series of works titled *Strandbeests*, which were designed to walk along the beach near his studio in the Netherlands. *The Parvus* series was created with the intention to make small, kinetic and interactive works of art available to the public at affordable prices. Jansen states, “The idea behind the small versions is that people have a close 3D view and they touch my work,” which is essentially impossible with the large-scale *Strandbeests*.



Jeremy Boyle

New York, New York

Self Playing Guitar, 2012
Midi-controlled pneumatic guitar

Jeremy Boyle is currently the resident artist of Carnegie Mellon University’s Community Robotics, Education and Technology Empowerment (CREATE) Lab where he created the Children’s Innovation Project. In this program, kindergarteners are taught how to work with basic technology. By looking at his exhibition record, it is evident that Boyle has been “living” the CREATE Lab mission for years – “using technology to benefit communities.” He has reached out to audiences as a hybrid sculptor/ engineer and as a musician through his role as guitar player for the experimental rock band Joan of Arc.

Self Playing Guitar is the latest in a series of works in which Boyle’s accomplishments as a sculptor and musician collide. He describes the inspiration for the series: “I had severely injured my left ring finger and was committed to a performance date – guitar was my primary instrument and I realized I was not going to be able to play in time. I decided to build the first automated guitar to serve as a stand in for me. The project has grown from there and now the instruments exist, performing in the context of an art gallery installation and sometimes in the context of a stage performance.”

JOSEPH MORRIS

Chicago, Illinois

A Breath of Wind, 2012
Flexinol, acrylic, plastic

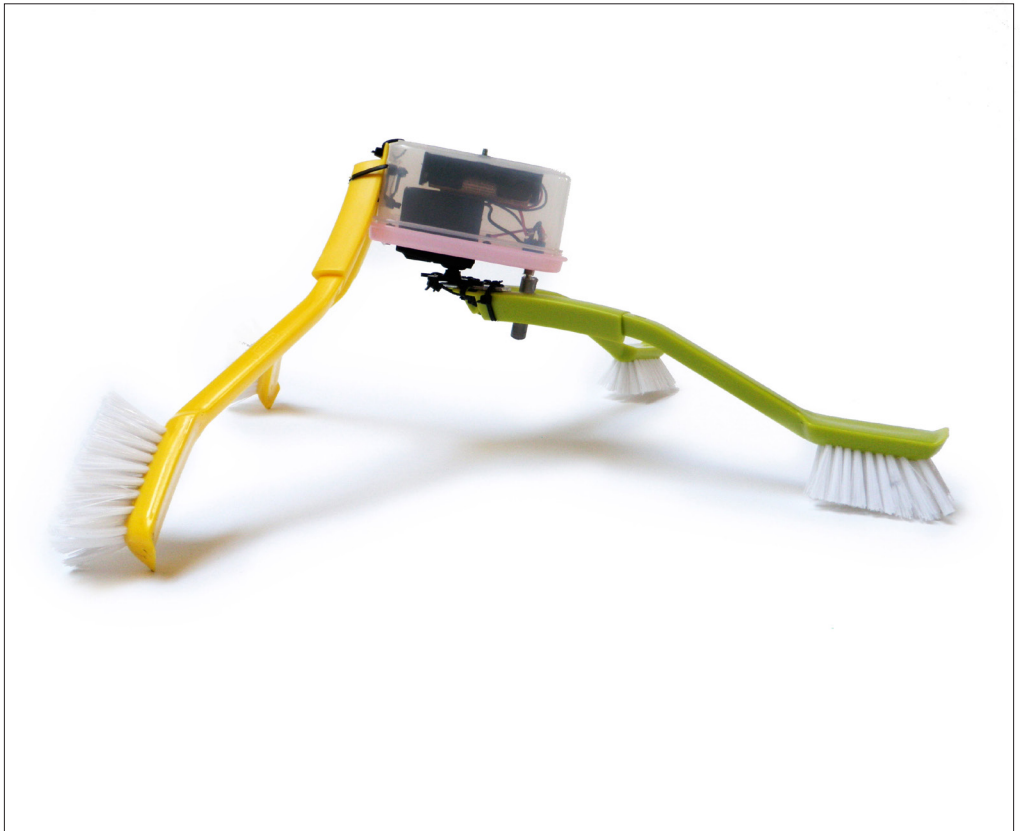
Joseph Morris creates kinetic sculptures that are constructed of discarded gears, rods, pulleys and motors, while emphasizing mechanical elements that are normally concealed. Joseph states, “At the heart of the work resides ambiguity between the metaphor and its material, at once a gesture and the machine.” Inspired by a multitude of projects he and his father “tinkered” with throughout his childhood, his works are graceful and determined.

Randy Sarafan

San Francisco, California

Simplebot, 2012
Tooth brushes, electric motors, custom electronics

Randy Sarafan is a visual artist, author, fellow with Free Art and Technology (F.A.T.) Lab, co-founder of San Francisco Media Lab, Technology Editor for Instructables.com and self-proclaimed “Interstellar wrecking ball of immeasurable destruction.” He is the creator of innumerable DIY projects, all incorporating basic technologies and a sense of humor that can be easily reconstructed via detailed instructions posted online and in his recent book *62 Projects to Make with a Dead Computer*. As Technology Editor at Instructables.com, Sarafan’s role manages a vast community of experimenters who share fascinating DIY projects. He offers design advice to members of the community and shares the workings of his own projects, including *Simple Bots*, everyday objects made intelligent.



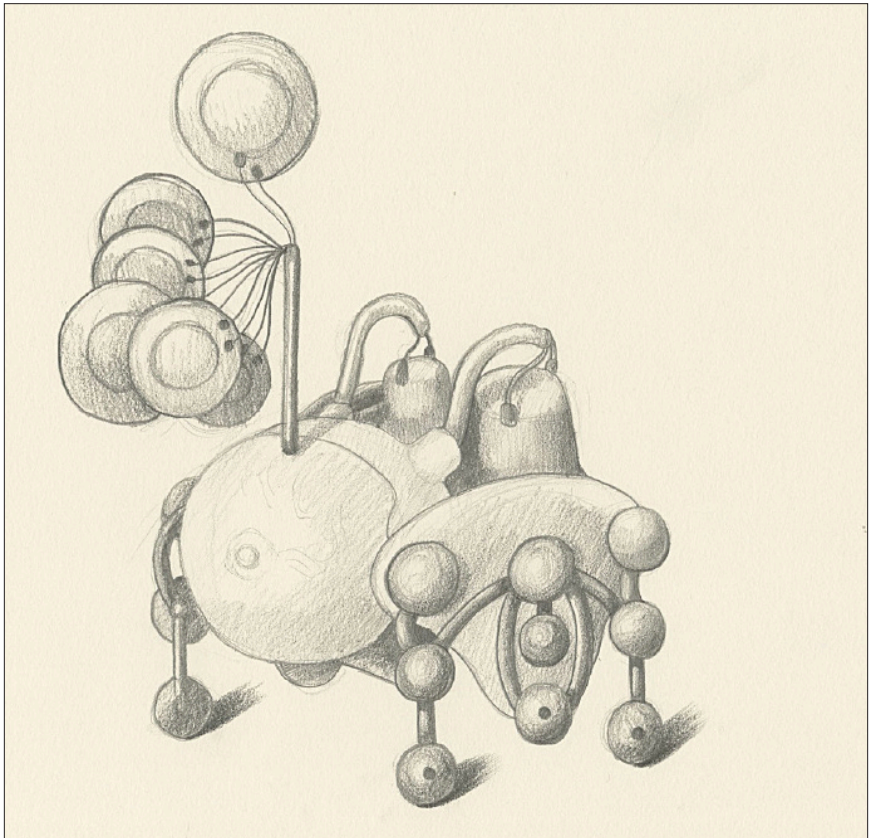
anat pollack

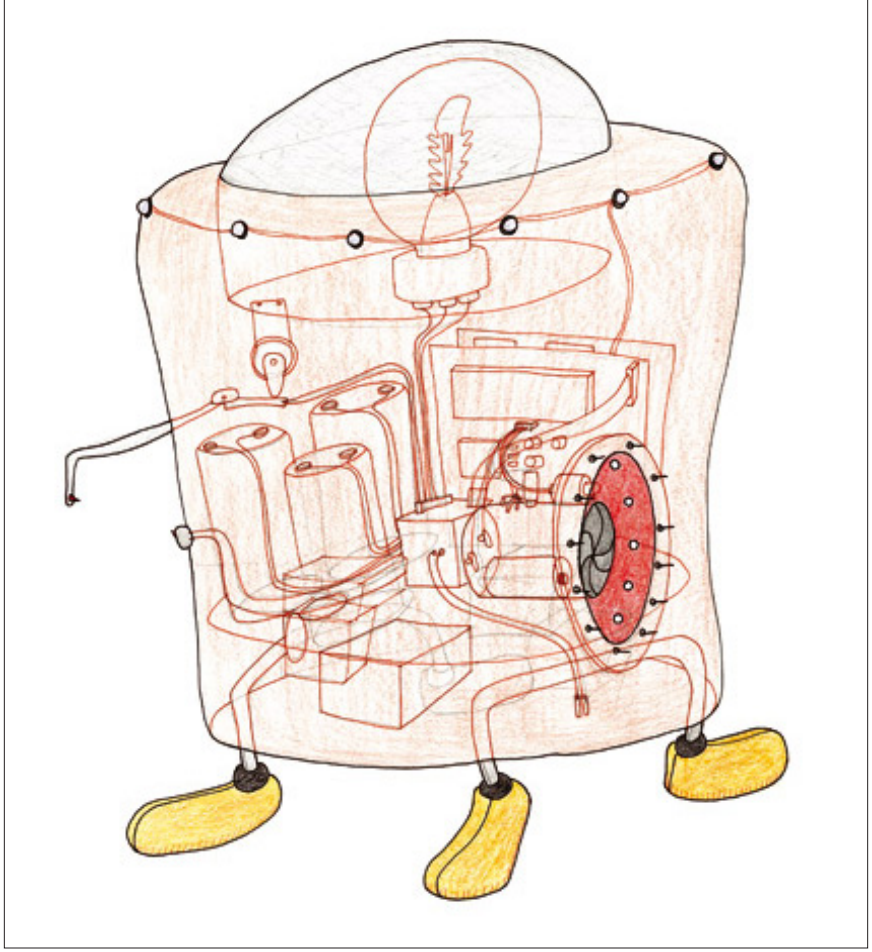
Tampa, Florida

Sketch for Quantum Populi,
Crus Sextus (Six Legged Beast), 2012
Graphite drawing

Anat Pollack, Professor of Art at the University of South Florida, combines old technologies with new technologies to create interactive installations that engage memory and nostalgia with the present. Her work often focuses on the difference between the way humans and machines process information. Pollack states, “My work exploits the abilities of computer algorithms to deconstruct and reconstruct sensory data extracted from the audience, forming new relationships between familiar images and sounds. At first, the data derives from audience interaction with the space. Over time, this information becomes disjointed as it is processed: it breaks apart, repeating fracturing and reverberating in unpredictable ways.”

Quantum Populi is a social experiment with unforeseen results. Pollack created intelligent, simply-constructed robots by hacking into battery powered toys and altering them so that they sense and react to their environment. The congregation of these automated creatures, resembles a biologically diverse ecosystem.





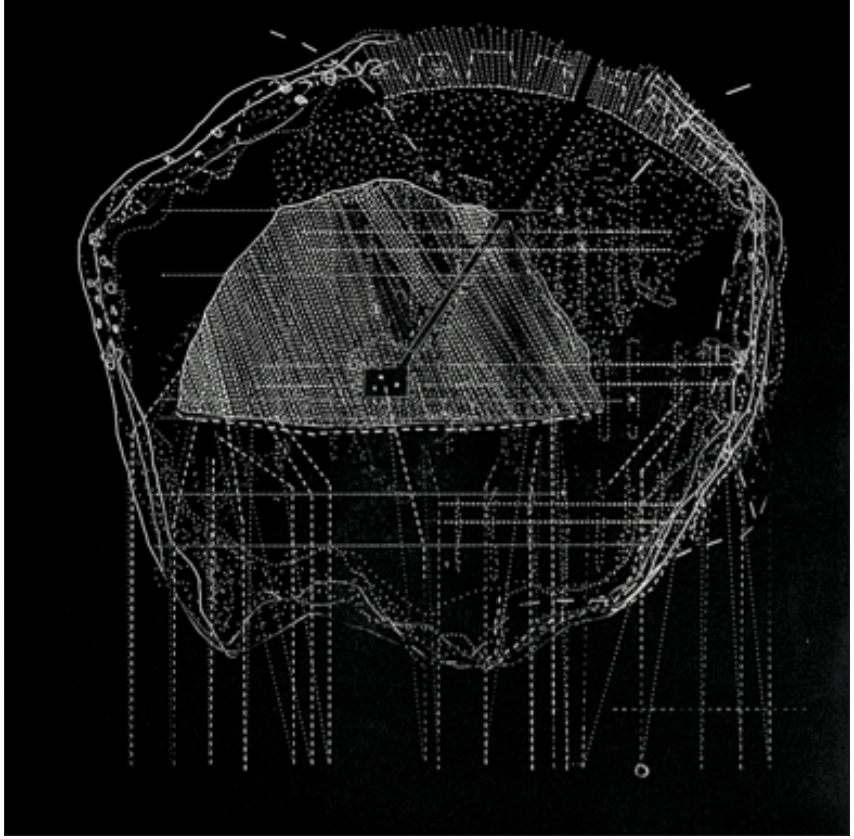
paul granjon

United Kingdom

Sexed Robot process sketches

Electronic artist Paul Granjon is the founder of Z Productions and a faculty member of the Cardiff School of Art and Design. For decades Granjon has created performative, kinetic artworks, which he states as being focused on “the co-evolution of humans and machines”. Additionally, he presents performances and workshops which feature humorous and complex works constructed of low-tech materials.

In 2005, he represented Wales at the Venice Biennale with a commissioned piece titled *Sexed Robots*, a pair of autonomous robots on wheeled platforms fitted with genital organs, one male and one female. Each of the sexed robots navigates independently until it enters an “in heat” mode, which directs the robots to search each other out and attempt to mate.



Pencil Studios
(Sabrina Raaf and Travis Saul)
Chicago, Illinois

(n)-Fold, 2010-present
FDA compliant, food-grade polyethylene (LDPE) sheeting, dew condensing film, aluminum, solar paneling and PVC foam insulation

(n)-Fold, a collaborative effort of Pencil Studios, is a flat-foldable, sculptural utilitarian travel system. It is the solution that Chicago artists Sabrina Raaf and Travis Saul suggest for the lack of water harvesting options available to nomadic individuals. The idea stems from Raaf's research on river morphology conducted during her 2009 appointment as the first artist-in-residence at Gibotech Scandinavia A/S in Denmark. Raaf unveiled this research in *Meandering River*.

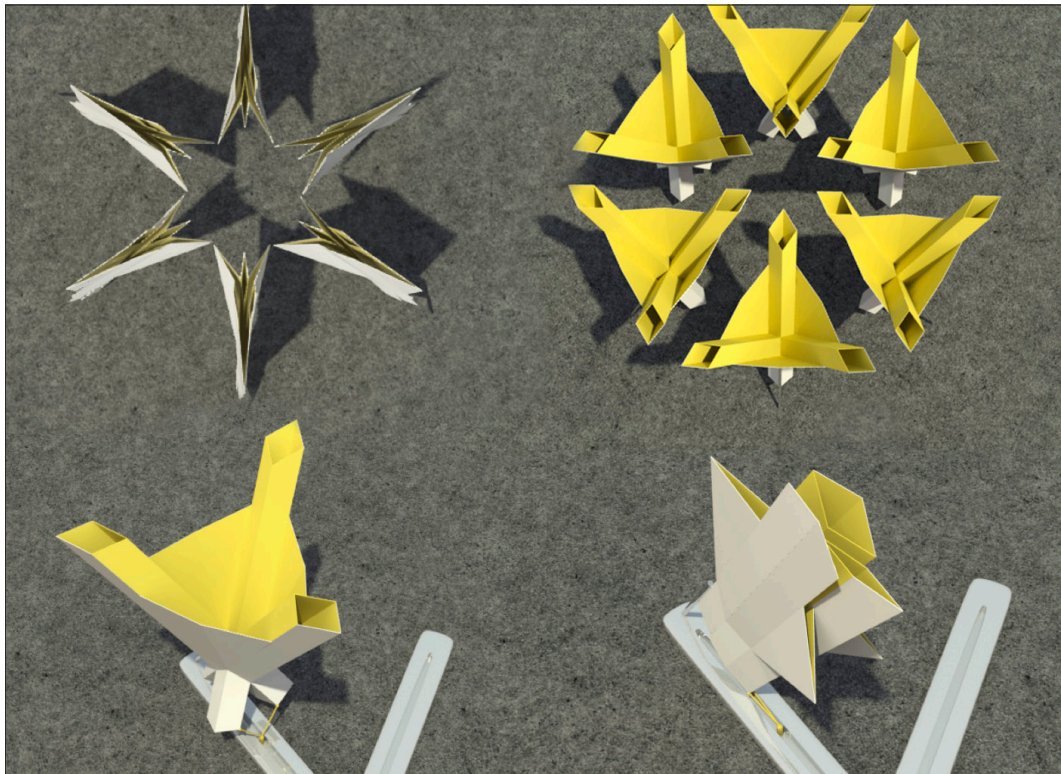
The pairing of Raaf with artist, designer and programmer, Travis Saul to form Pencil Studios is natural. Raaf works in experimental sculptural media to create responsive environments and kinetic sculptures. Her works often involve robotic or automated processes, which mimic natural attributes. Much like Raaf, Saul uses techniques typically utilized by new media artists to create sculptural works.

Paul Catanese
Chicago, Illinois

Celestial Workshops 003, 2007
Digital relief print

Celestial Workshops 004 and *Celestial Workshops 003* are part of an open-series of digital relief prints that appear to be both macroscopic and microscopic. The works by hybrid media artist Paul Catanese are in fact imaginary constellations, which he describes as being an "expanding series of images that describe imaginary constellations initially inspired by translucent objects suspended in the fluid within my eyes. These diaphanous objects appear to me as playing the role of ones personal, ephemeral constellations forced upon the sky."

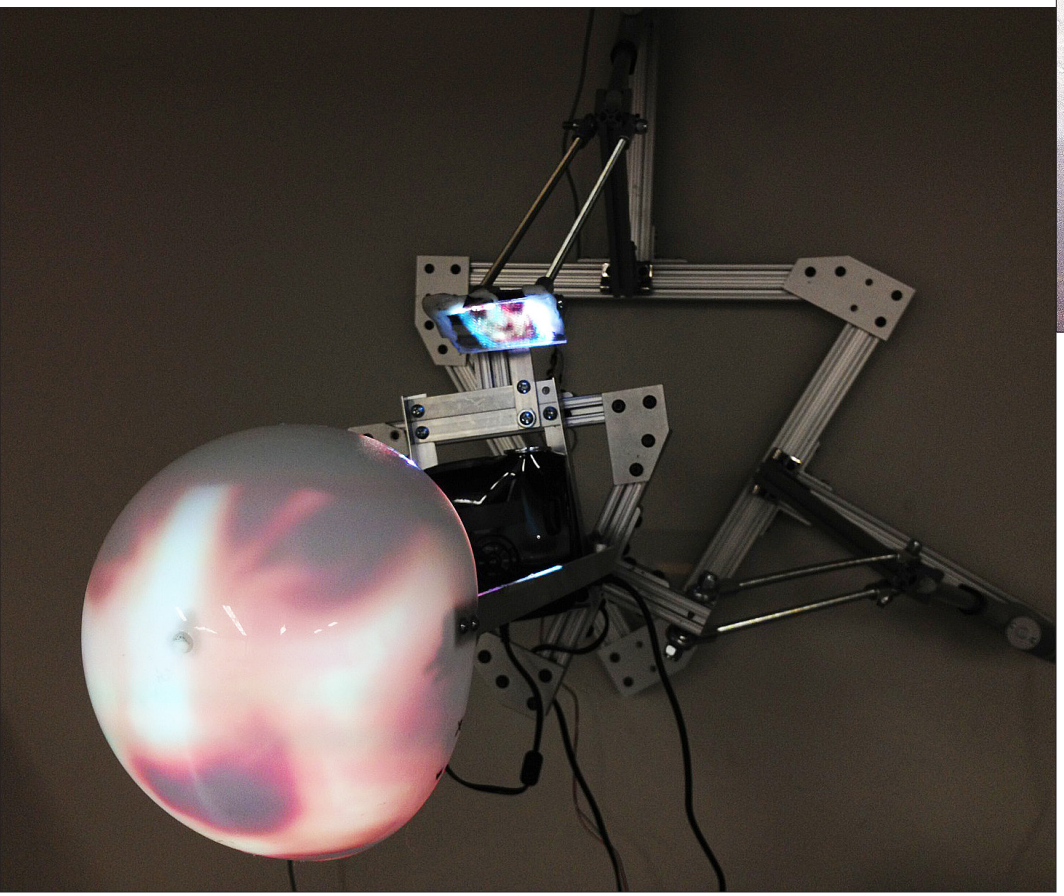
Both works were created during the artist's residency at the Prairie Center of the Arts, in Peoria, Illinois, during which he employed techniques commonly used amongst new media sculptors to create two-dimensional works. The Digital Relief Process is the result of combined experimentations in traditional printmaking techniques, industrial machine control and custom drawing software.



Daniel Jay Bertner

Chicago, Illinois

G.I.A. (Gestural Interactive Automaton), 2012
Aluminum, custom electronics



G.I.A., a recent creation by Chicago based robotic artist, Daniel J. Bertner, just wants to make friends. As Bertner describes it, *G.I.A.* is a robotic life form that "strives to emulate and socially engage its viewers in hopes to become understood and accepted." This complex robot is constantly analyzing its environment via open source software in the hopes of finding someone to have a relationship with. In this case, the ideal bond formed between human and machine is an emotionally based one. Further describing the work, Bertner states, "I am interested in the relational bridge we create between man and machine, physically and emotionally. *G.I.A.* is a study in our interactions with A.I. (Artificial Intelligence) in correlation to robotics."

Chris Reilly

Los Angeles, California

Zen Lunar Blood Sugar Meter, 2012
Electronics, software, granulated sugar

Los Angeles based artist, hacker and teacher, Chris Reilly creates artwork that has been described as an exploration of telepresence, mediated relationships, physical subjectivity and community building. Additionally, he works in kinetic sculpture, augmented reality, robots, and open-source hardware/software projects. Reilly's ability to work with a wide range of processes has led him along a non-linear path that includes the invention of the *DIYLILCNC*, a CNC milling machine he designed along with artist Taylor Hokanson that can be easily reproduced at a low cost. *Zen Lunar Blood Sugar Meter*, serves as Reilly's version of an intelligent, robotic drawing machine. Designed to freely rove about a designated space, the *Zen Lunar Blood Sugar Meter* dumps small amounts of granulated sugar at irregular intervals as it drives about on tiny rubber wheels. The sugar deposits form circular patterns similar to the mysterious crop circle formations, once thought to have been created by UFOs.

The Research Lab

The Research Lab is intended to be a source of information relating to new media artists, DIY'ers, hackers and electronics experimentalists. It is in no way an attempt to cover the vast spectrum of processes and resources available. The artworks on display were submitted in response to a nationally advertised call for works. We are proud to have the opportunity to display works by the following artists:

Arthur Ganson, Joseph Kramer, Steven Laurie, Conor Peterson, Ryan Rasmussen, Elizabeth Rossiter and Tim O'Keefe

acknowledgements from the curator

This exhibition could not exist without the effort and stunning talent of all participating artists, Patrick Lichty and Paul Catanese for their support and inspiration, and Neysa Page-Lieberman for her encouragement and guidance. I would additionally like to thank Chelsea Goodwin Cossu for her support and the multitude of meetings spent discussing new media artists and the potential for this exhibition. A great deal of credit is also due to the following Columbia College Chicago departments, individuals and organizations- Interactive Arts and Media, Art +Design, Interdisciplinary Arts, Student Communications, Phillip Nadasdy, Taylor Hokanson, Instructables.com, Arduino, Camille Morgan and Erik Lundquist.

In conjunction with *Machinations* artist/inventor Taylor Hokanson conducted three hands-on DIYLILCNC machine building workshops. We would like to thank Taylor for his fantastic contributions to the exhibition and his brilliant direction of the completely open-source invention, the DIYLILCNC, a 3 axis cnc mill which can be built from scratch for under $600. For more information, please visit: diylilcnc.org

DEPS Mission Statement

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DEPS incorporates the College's curriculum by partnering with academic departments and centers, the city community and professionals in all fields, merging formal pedagogy with each student's individual learning path. In our commitment to produce the most innovative, distinguished and accessible programs, DEPS addresses contemporary issues concerning the diversity of thought, values and culture.

machinations

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September 6 - November 3, 2012

glass curtain gallery

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