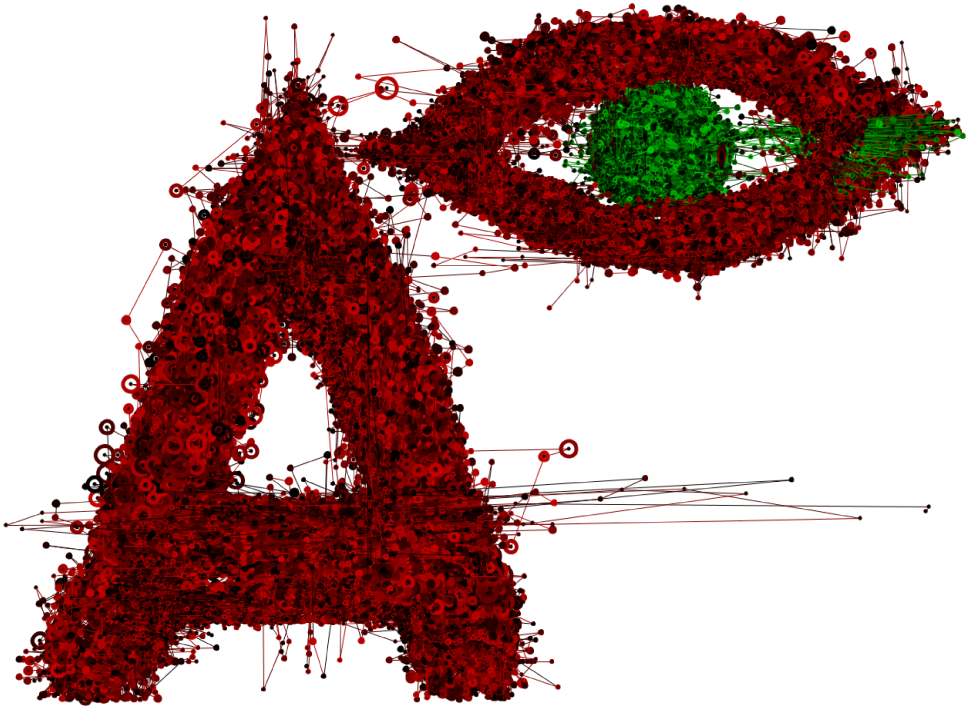

A-EYE

An exhibition of art and nature-inspired computation

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Catalogue for A-EYE: An exhibition of art and nature-inspired computation
ISBN: 978-1-908187-41-3

2014

Designed by: Mohammad Majid al-Rifaie

INTRODUCTION

In the last few decades, nature and bio-inspired digital art has been attracting many researchers with background in arts and sciences.

This exhibition is the first of its kind at the AISB convention and it incorporates various approaches for generating artworks using swarm intelligence, evolutionary algorithms, artificial neural networks, multi-agent systems, artificial life and any other algorithm or method that derives from the natural world.

The submissions of the contributing artists were evaluated by at least two members of the Programme Committee and they belong to one of more of the following A-EYE related categories:

---Nature inspired art: creating drawings, paintings, images, animations, music, sculptures ...
---Information visualization: linking art, nature, and science
---Visualising the invisible: visual presentation of scientific concepts and data
---Robotic-based evolutionary art
---Artificial intelligence or generative techniques for computer art

This art exhibition is organised as part of AISB-50, a convention commemorating both 50 years since the founding of the society for the study of Artificial Intelligence and the Simulation of Behaviour (the AISB) and sixty years since the death of Alan Turing, founding father of both Computer Science and Artificial Intelligence. AISB-50 will be held at Goldsmiths, University of London, UK from the 1st to the 4th April 2014.

Curated by:

Mohammad	Majid al-Rifaie
Tim	Blackwell
& Chiara	Puntil (assistant curator)

Programme Committee:

--- Peter Bentley (University College London, UK)
--- Paul Brown (University of Sussex, UK)
--- Harold Cohen (University of California San Diego, USA)
--- Simon Colton (Goldsmiths, University of London, UK)
--- Alan Dorin (Monash University, Australia)
--- Rui Filipe Antunes (Goldsmiths, University of London, UK)
--- Mohammad Ali Javaheri Javid (Goldsmiths, University of London, UK)
--- Janis Jefferies (Goldsmiths, University of London, UK)
--- Anna Jordanous (King's College London, UK)
--- William Latham (Goldsmiths, University of London, UK)
--- Frederic Fol Leymarie (Goldsmiths, University of London, UK)
--- Penousal Machado (University of Coimbra, Portugal)
--- Jon McCormack (Monash University, Australia)
--- Frieder Nake (University of Bremen, Germany)
--- Jane Prophet (Goldsmiths, University of London, UK)
--- Rob Saunders (University of Sydney, Australia)
--- Patrick Tresset (Goldsmiths, University of London, UK)
--- Anna Ursyn (University of Northern Colorado, USA)

Special thanks to the members of the Programme Committee for their invaluable input in evaluating the large number of submissions.

We would like to extend our thanks to our artists/scientists, AISB-50's local Organising Committee, sponsors and all those who helped us in organising this event.

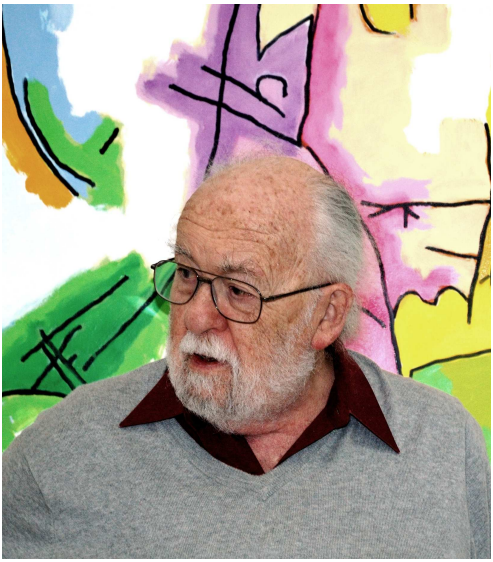
CONTRIBUTING ARTISTS

Angelo Airò Farulla
Rui Filipe Antunes, Frederic Fol Leymarie and William Latham
Alexander Berman and Filip Strebeyko
William Bondin
Anabela Costa
Francesco De Comité
Gabriele Dini and David Hedberg
Ernest Edmonds
Leonidas Gkelos
Sally Grizzell Larson
Moshik Hayman
Desmond Paul Henry
Ryo Ikeshiro
Vicky Isley and Paul Smith
Raven Kwok and Zhipeng Wang
Andy Lomas
Garrett Lynch
Asmaa Majid Al-Rifaie
Dave Murray-Rust and Rocio von Jungefeld
Blerim Mustafa, Jonathan Shimony and Georgi Stojanov
Mari Ohno
Chiara Passa
Alex Peckham
Ivan Petkov
Marie Polakova and Jonathan Cremieux
Serena Porrati
Justin Tyler Tate
Patrick Tresset
Anna Ursyn

invited artist:

Harold Cohen

Harold Cohen had a major reputation as a painter in the 'sixties, representing the UK in the Venice Biennale, documenta and other international spaces. In 1968 he went to California on a one-year visiting professorship at UC San Diego, became involved in computing, and stayed on to build a second reputation as a pioneer in the application of computing in the arts. His celebrated AARON program was begun in 1972 while he was a Visiting Scholar at Stanford University's AI Lab, and together they have exhibited at the Tate, the Brooklyn Museum, the San Francisco Museum, the LA County Museum, documenta 6, the Tsukuba World Fair and too many others major spaces to list here. The fuller story is available on haroldcohen.com, along with a selection of Cohen's work and most of his papers.



Another Spring (for R.C.)

Oil over pigment ink on canvas, 84 by 144 inches

2011

haroldcohen.com

Imago Fermenti

Imago Fermenti is a piece of music about *abiogenesis* that takes a look to common aspects of chemical and harmonic aggregations: compounds and chords are both structures defined in their own functions through reciprocal relations.

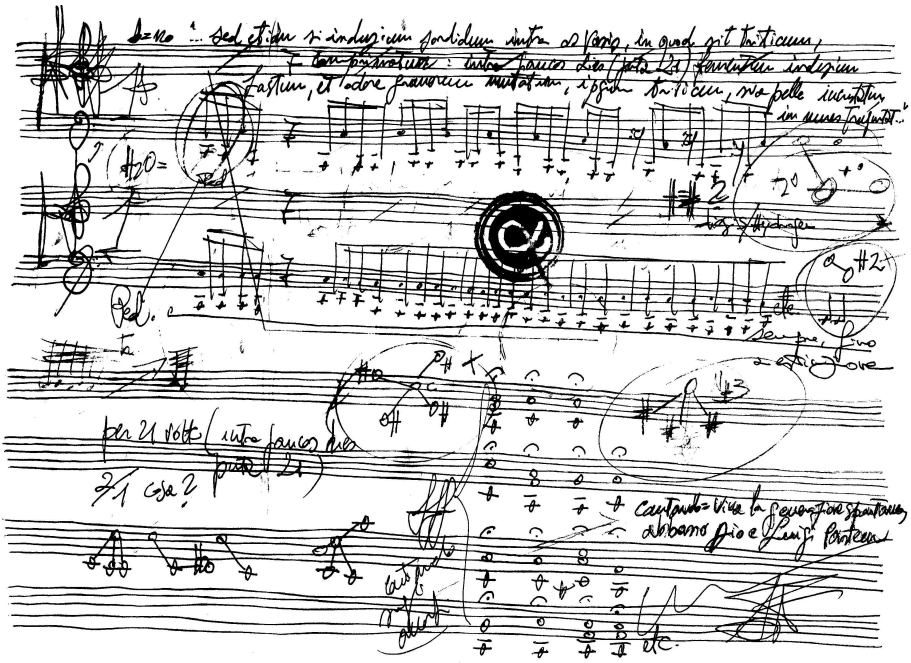
The piece, that takes its name from a XVII Century J. B. van Helmont's book, translates data from Miller-Urey experiment of 1953 into a musical score. In the famous experiment, the two scientists reached to create organic compounds (as amino acids) from inorganic ones (as CH_4, NH_3, H_2O and H_2), recreating the early Earth conditions.

I work around the atomic number of elements involved in the experiment. E.g., the atomic number of Hydrogen is One, that corresponds to the first note of the reference scale in equal temperament, C major. Then H = C and so on: the atomic number of O is Eight and so O will be the octave of H (and it will play an higher C); C is Six and it will be the sixth of H, the A; N is Seven and it will be the B.

Established criteria to individuate notes, the four inorganic substances, written as chords or as simply melodic cellules, were circulated in the staves, from one piano to another, passing through aggregations and disaggregation, reaching new successive *synthesis*, toward the final result where, in an invention around the same notes, I translate the formulas of the organic compounds in many chords enchanted in a conclusive *cadenza*.

So, this is my version of the *primordial soup*.

Angelo Airò Farulla



meditation around spontaneous generation
for two pianos

Sound-work on video file

December 2013

http://www.epimeteide.org/imagofermenti.htm

Where is Lourenço Marques?

This is an ethnographic artwork taking expression in a virtual world animated with humanoid characters. It is a representation the city of Lourenço Marques, in Mozambique, during the historical period of Portuguese domination.
The elaboration of the project started from a process of interviews with a community who left the city during the period next to the independence, in 1975, and now lives in Portugal. Their accounts and shared material form a memorabilia, from which an artistic and subjective reconstruction of the city was built in a 3D virtual environment.

A community of humanoid avatars roam autonomously the city and interact with each other as well as with the human audience. These avatars are the agent storytellers When the user selects (points or clicks on) any one of these avatars, it interrupts its current activity and approaches the camera. Then, animated and gesticulating as if it was speaking, such an agent streams an audio testimony of one of the oral accounts recorded during the interview process. Thus, this population of avatars assists in the task of bringing the experiences of the respondents. Each of the individuals in this population is the bearer of an excerpt from an interview, functioning as the carrier and mediator of real-life human stories. The audience is thus implicitly invited to seek-out these story-tellers, 'chasing' virtual characters through the city, in order to listen to their stories.

The behavioral model of AI animating these characters is called a Computational Ecosystem. These are multi-agent systems where individuals emulate simplified life forms, with reproduction and death, and are organized in a hierarchy as they trade units of 'energy' trying to survive and perpetuate their genetic heritage.

Rui Filipe Antunes
Frederic Fol Leymarie
and William Latham

Interactive software

Lisbon, London, 2009-2012

http://www.lourencomarques.net
http://www.youtube.com/watch?v=Tp8lvdNWucw

Torrential Forms

BitTorrent is a popular technology for sharing files on the Internet. The technology is characterized by decentralization, non-linearity and fragmentation. It is used both illegally to distribute copyrighted films and music, but also by companies such as Facebook and Twitter for efficient data replication.

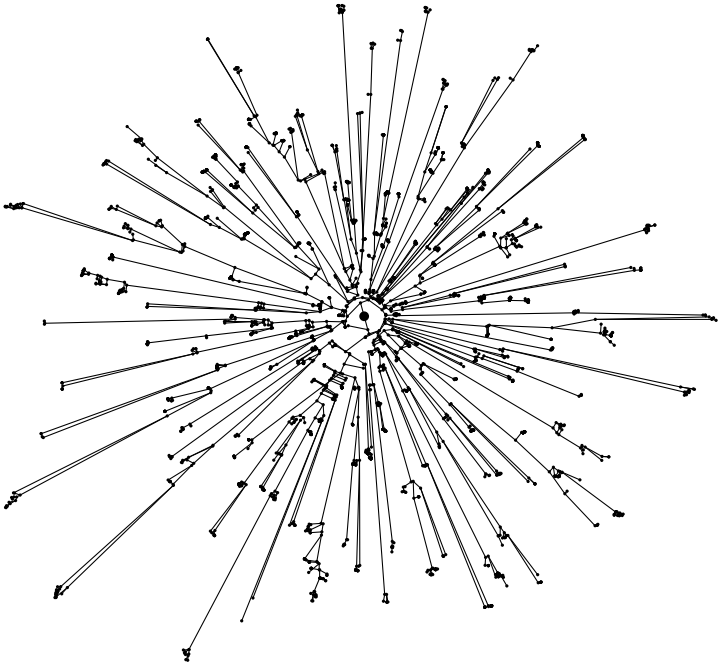
What is less known is that the BitTorrent algorithm gives rise to emergent patterns in its traffic. Torrential Forms is an attempt to artistically visualize structures that form spontaneously when people share digital files. These patterns turn out to bear resemblances with natural structures such as snowflakes, nervous systems and trees.

The artwork consists of a series of graphs, each one depicting a monitored and analyzed BitTorrent replication. In essence, graphs are "ancestry trees" where a central "grandparent" node represents the completed download, and each peripheral "grandchild" node represents the introduction of a new, isolated piece of content. Each other node represents a merge of two or more "ancestry lines".

How can a file-sharing protocol give rise to such a broad range of unintended and elaborate structures?Most likely, the flora of patterns reflects emergent properties of the BitTorrent algorithm. While the rules of the algorithm are fairly simple, various factors contribute to the individual ancestry patterns, such as network congestion, the amount of file-sharers and their geographical distribution, as well as algorithmic randomness.

Torrential Forms are artistic visualizations suggesting that knowingly or not, BitTorrent and the Internet have nature-inspired designs, giving rise to lifelike patterns.

Alexander Berman
and Filip Strebeyko



Screenprints, video, 3'49''

2013

http://torrentialforms.net/

Mobile Reconfigurable Polyhedra

MORPHs, short for Mobile Reconfigurable Polyhedra, are motive architectural structures which can crawl and self-assemble in order to encourage social interaction through play. These playful robotic creatures encourage the public to choreograph them into dance routines, assemble them into complex sculptural geometries or else play music at them, which they will play back over time. Groups of people can interact at any one time and eventually develop a dialogue amongst participants, through the use of contemporary digital technology.

This speculative architectural project is inspired by the slime mould Physarum polycephalum, an organism which performs its cognitive processes within its environment through the use of localised feedback mechanisms. Analogously to slime mould, MORPHs deposit digital data into their environment in order to off load their computational processes such as path finding and spatial memory.

Credit:
Ruairi Glynn, Ollie Palmer, Sam McElhinney, Paul Harkin, The Bartlett School of Architecture UCL, Malta Arts Scholarships

William Bondin

Architecture, robotics

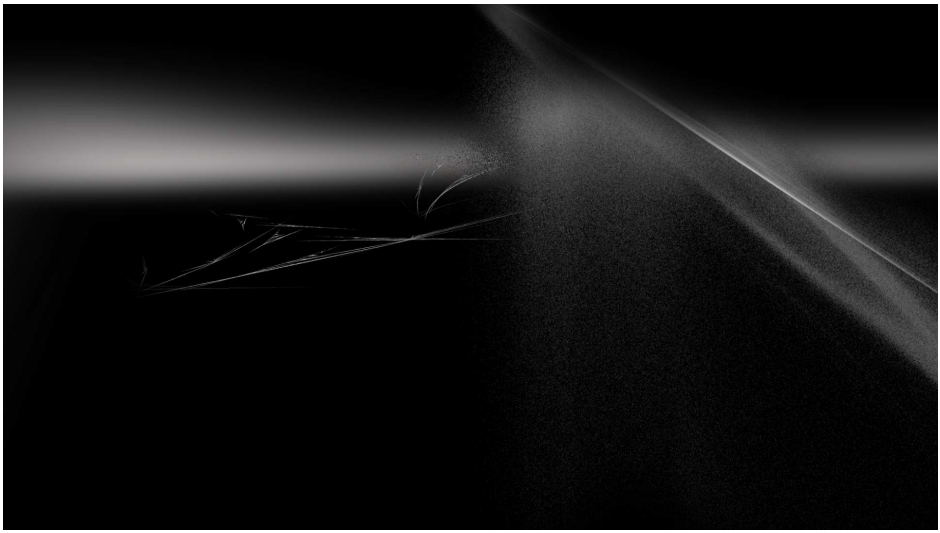
2012 - 2013

http://www.youtube.com/watch?v=COOskycZioM

Landscape

Landscape, is what can be seen, and not in physical terms but as an outward expression of human perception: "a landscape is a cultural image, a pictorial way of representing, structuring or symbolising surroundings", so it will always be a personal take over an area of land, of human elements buildings or structures with a cultural and aesthetic dimension.

Anabela Costa



Video, HD stereo 16:9 black and white, 10'40"

2012

Website: http://wwwanabelacostacom.blogspot.fr/p/landscape-2012.html

Cardioidal Variations

Sometimes, natural objects or artworks are aesthetically appealing because one has the strong feeling that the generation of this objects obeys to simple rules and procedures (think of panther spots, seashell cellular automaton-like patterns...). One can try to discover those rules and to find a way to reproduce those objects. From a computer scientist's point of view, discovering those rules and procedures, and then producing those objects can be a programming challenge.

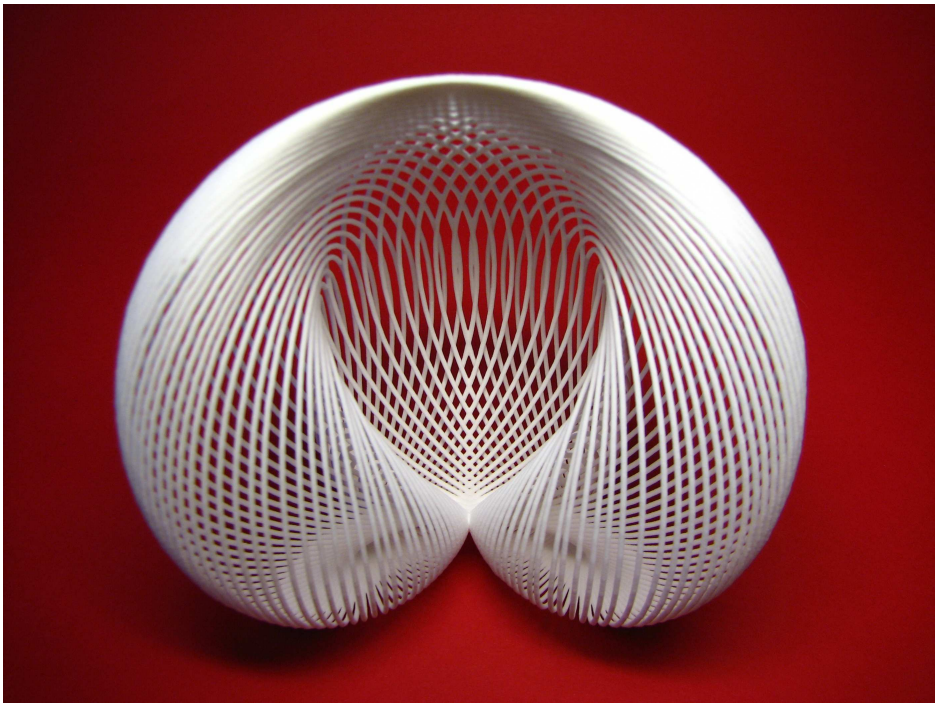
Also attractive is the feeling that a family of objects, though quite different from each other, share some similarities. Here is another challenging task for a programmer: being able to find the good set of parameters to describe simply an infinite set of forms.

Cardioid is a old and known curve, which can be defined in several ways. Pedoe described a method for constructing a cardioid as the envelop of a set of circles. Beginnning with this construction, we can alter the disposition of the circles, adding a third dimension to the construction. This simple procedure generates an infinity of unexpected shapes, from seashell-like structures to amish hats, whales...

Those designs are quite easy to describe in a way suitable for 3D printers. Flat renders are already attractive, but 3D cardioidal objects are fascinating: moving them into your hands let you have different visions of them in a glance (not to speak about their shadows...)

This work was partially funded by ANR and FEDER

Francesco De Comité



3D printed sculpture: Plastic.
Image: Digital print on cardboard.

2010-2012

www.lifl.fr\~decomite

Colony

Just about everything we do, such as our browsing habits, conversations, places we visit, and our predicted intents is increasingly being analysed and monetized somewhere - generating value to someone based on our every day lives. These are invisible transactions to most of us, done on 'free to use' platforms and applications adding to an exponentially growing stack of 'big data', often proclaimed as "the new oil".

We constantly emit information in an uncontrolled fashion just by going about our lives. Similarly to bees whom generate honey in excess, we both have 'beekeepers' around us with the know-how to extract value from this unforeseen product. It is unlikely that bees are aware that they are part of a business model when they go about their daily routines. We think that people are aware but find it hard to relate to what exactly generates value when the data is intangible. This made us interested in making the data visible through the use of sculpture and metaphor.

We created this artificial honey comb that turns data-sets into honey as a physical representation of this situation and time where the honey comb is the city, the bees are the citizens and the honey is the information, ready to go on the shelf in real time.

Gabriele Dini
and David Hedberg

Installation and video, 2'0''

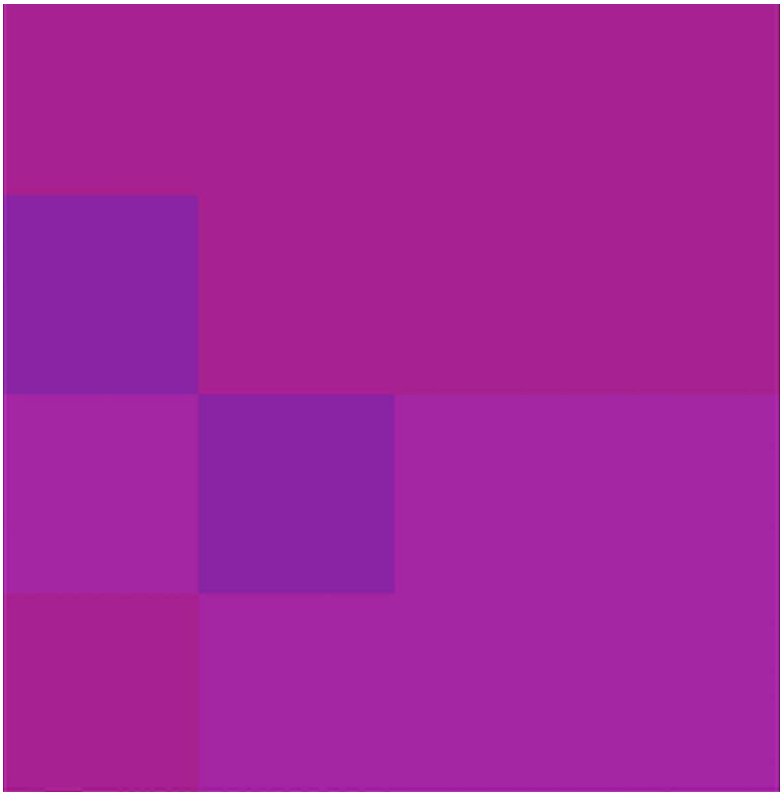
2013

www.gabrieledini.com
www.davidhedberg.info

Shaping Form 20.10.2013

Each Shaping Form time-based work consists of unique abstract interactive artwork that generates colours and forms in time from a set of unique rules: rules that are rather like their DNA. They also take data from a camera and continuously calculate the amount of activity seen in front of the work. The computer software then steadily modifies the rules depending on that activity. The artwork and its development over time is, then, influenced by the people who look at it. The audience help to shape the work. Shaping Form is a representation of computed life, moving and changing of its own accord but maturing and developing as a result of the movement of audiences. The screen shows a living matrix of colours that sometimes change very slowly and at other times burst into life, depending on the movement of people in the space. The colours use a small, but changing, pallet of hues at any one time but the saturation and brightness levels can vary considerable. The rules determine the colours, the patterns and the timing. People can readily detect the immediate responses of the work to movement but the changes over time are only apparent when there is more prolonged, although not necessarily continuous, contact with it. This is because changes to the rules often only influence future behaviours. A systems, rather than an action-response, model of interaction is used. A first viewing followed by one days, or months, later reveals noticeable developments in the colours and patterns.

Ernest Edmonds



Software, lcd screen, computer, camera

2013

www.ernestedmonds.com

Populus gaze

With nature and technology working synergistically, the "Populus[1] gaze" project is a site specific artwork in front of an old quarry in the area of Loutrohorion, in Northern Greece's prefecture of Pella. The design of artwork has stemmed from the ideogram created upon my gazing at one of my photos of nothing more than Poplar leaves. An S2 mirametrix Eye tracker has been used for this project in the premises of the Mindsearch Company in Athens. The Purpose was to witness the non-material substance of my gazing path upon a field created by Nature itself, as portrayed on the leaves of this particular picture.

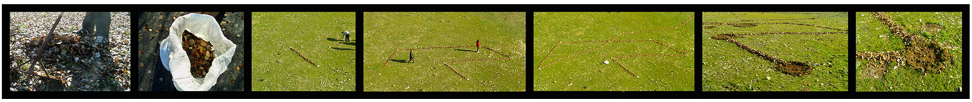
Dug into the ground, the circles depicted in the site specific work denote the alterations on the gaze focus. The middle lines have also claimed their place to denote the Saccadic[2] movements of my eyes and were constructed by Poplar leaves which were collected on the spot, in an area exceeding 200 square meters.

This particular site specific work now resembles a poetic topographic spot. The invisible and non-material range of gazing is thus made visible so that the project viewer will be able to actually walk on the gazing path.

[1] The word Populus is derived from the Latin name of the Poplar tree, which means people, due to the fact that the whispering of such Poplar leaves resembles the noise of the crowd)

[2] Derived from the Latin word saccus (ie: sack-bag). Saccadic called the involuntary, sudden jerky movement of the eyes when changing fixation point-focus on them.

Leonidas Gkelos



3 color instant prints, 1 document and a frame with poplar leaves from the site specific work.

08/01/2014

www.leonidasgkelos.com

No. 6 from Thread and Carbon

Modern life is cluttered with merchants of desire brokering replications of the natural world to a highly receptive public. And no wonder—the natural world is irresistibly incandescent with lively narratives, colorful creatures, and rich allusions that conspire to delight the senses and provoke the imagination. For most of us it is a state of mind that draws its currency from the appropriation of its best and most enduring quality: it is real.

But faced as it is with our monumental greed, and armed with little more than an obstinate disposition, the orderly and elegant beauty of this world is slipping into verifiable decline; to the extent, I would argue, that nature has inevitably become for us a choice between true authenticity (burdensomely high maintenance) and the convenience of well-crafted artifice—an economic and ethical one that wouldn't exist were the original not so often sacrificed, sleight of hand by unscrupulous merchants of desire or otherwise, to manufacture the imitation.

The imaginary landscapes in this ongoing series are meant to highlight this modern dilemma and the ongoing dance of attrition where nature is co-opted by its own fabricated image, or, where the snake as jewelry, becomes the prey of the bird as silhouette.

Sally Grizzell Larson

Chromogenic print on Plexiglas, 55 by 89 cm. (21 1/2 by 35 inches.)

2006-14 (The series is ongoing.)

http://sallygrizzelllarson.com

space groups

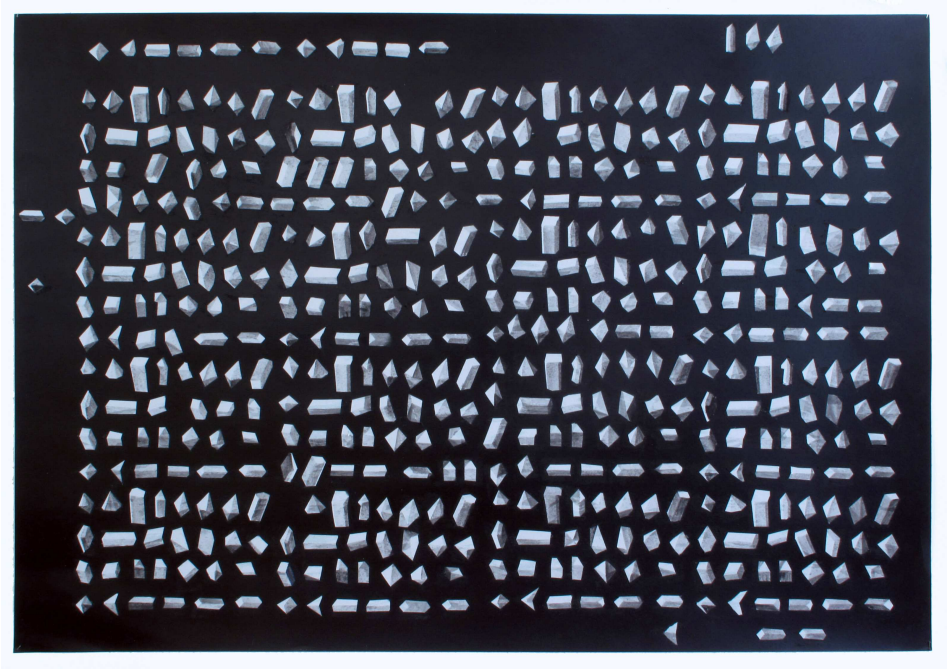
The work "space groups" present a grid like constellation of crystal formations that fills the picture plane.
I was originally drawn to those crystal shapes after reading about an early hypothesis in the field of Abiogenesis (the natural process by which life arose from non-living matter)
One theory that visually interested me was the clay theory. It perceived the self-replication of clay crystals as an intermediate step between biologically inert matter and organic life, and considered crystals to be a primitive forms of genes abled to store and transfer information.

This also led me to think about the line between material and data. As philosopher Manuel de Landa pointed out, in order to emphasis the materialistic nature of language, the fact that the earliest form of writings was in the form of hieroglyphs pressed on clay tablets.

The pattern in 'space groups' was made using six basic Chrystal formations, unique, in my eye, in that their outward appearance is identical to their molecular structure. I constructed the image trough this limited number of possible marks, each mark treated separately, first stenciled and spray-painted, then its shade brush-painted gray.

In this work I wanted to use those basic formations as a base for a possible code and through that to contemplate technologies of communication and information and the always shifting relations between natural phenomena and code, between material and data, and in the ties that bind information and meaning.

Moshik Hayman



Painting, acrylic on cardboard 70 by100 cm

2013

moshikhayman.com

Untitled, (1964)

Untitled was created *fifty* years ago by Computer Art Pioneer, Desmond Paul Henry (1921-2004) using a semi-automated drawing machine of his own invention, the second in a series of three, of which only a few remnants are preserved.
Untitled represents the permanent performative trace of a drawing machine Henry skilfully constructed by converting an analogue Bombsight Computer originally employed in WW2 bombers to calculate the accurate release of bombs onto their targets. Henry, both artist and philosopher, was so enthralled by the motions of the inner workings of these computers that he decided to capture their internal "**mechanical dance**" (Henry) on paper.

To create *Untitled*, features of the analogue computer influenced two servo-motors, one powering a mobile drawing arm holding pen(s), and another, a mobile drawing table. This produced varying ellipses which were traced by technical tube pens containing Indian inks. In response to their suggestive features, Henry subtly hand-embellished the machine's mark-making, often struck by their uncanny resemblance to 'weird' organic forms.

Untitled is an unrepeatable, unique image since the machine which created it was not a programmable digital computer with information storage capabilities. Henry was free to directly interact with the machine to influence the actual image-making process whenever he chose. Henry only had overall control of his machines; they relied on a 'mechanics of chance', which made their graphic results surprising and unpredictable.

Untitled is testimony to Henry's close collaboration with an idiosyncratic drawing machine, thereby combining both artistic intuition and technical ingenuity of the utmost originality.

Desmond Paul Henry

Untitled, (1964) was executed by Desmond Paul Henry using Drawing Machine Two, which he constructed from a wartime bombsight computer. He employed indian inks in 'Rotring' Technical Tube pens on 'Fabtex' paper. Henry has used indian ink to make subtle hand-embellishments which highlight selected areas of the machine's mark-making work.

22 1/4 by 26 inches (fully framed)

1964

www.desmondhenry.com

Construction in Zhuangzi

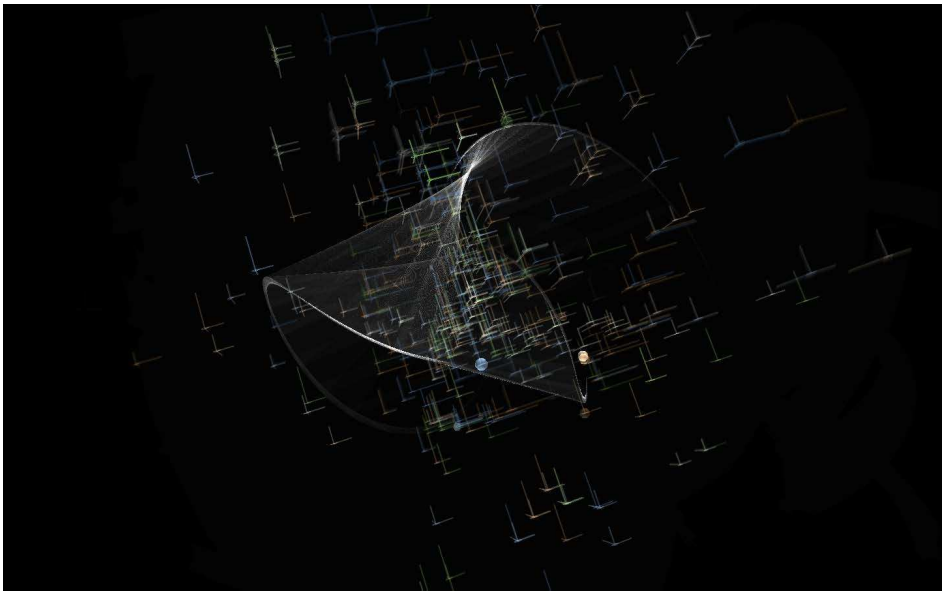
Construction in Zhuangzi is a live "audiovisualisation": the simultaneous sonification and visualisation of the same process and data in real-time. It is based on a modified Lorenz dynamical system, a three-dimensional model of convection that is non-linear, chaotic and has sensitive dependence on initial conditions or the "butterfly effect". It is featured in the *Electronic Music* volume of the Cambridge Introductions to Music series.

A performance consists of an attempt at understanding and controlling the mechanisms of the near-autonomous generative system through an improvisation involving the modifications of the parameters of the Lorenz. Such moments of human intervention are indicated by a colour inversion and an audio click. The exhibited work contains excerpts from a live performance.

As audio, it is used at both signal rate in non-standard synthesis and control rate for rhythm, pitch and panning; no pre-recorded samples or conventional oscillators are used apart from sine waves. Visually, it is used to generate and control an OpenGL 3D environment.

Lorenz stated that the equations do not produce realistic representations at large values of the parameters of the equations. In the work, such parameters are taken to beyond their original real-world limits, allowing the work to explore a hypothetical extended world. An appropriately machinic or post-human sensibility is evoked through a digital noise/glitch presentation of emergent phenomena.

Ryo Ikeshiro



digital movie (1280 x 720 resolution, quadraphonic audio)

2011-12

http://www.ryoikeshiro.com

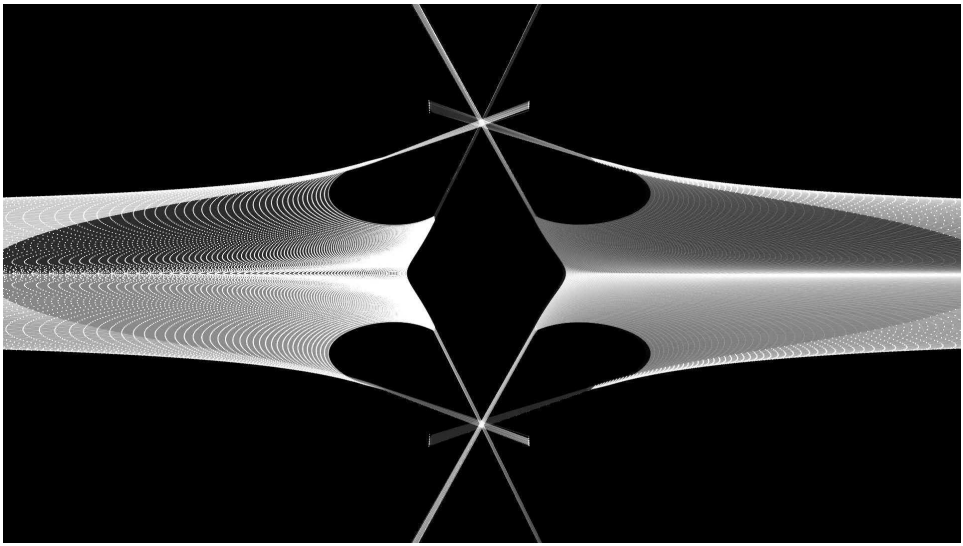
Composition:
White Square, White Circle

Composition: White Square, White Circle is available as a limited edition digital format from Sedition, cloud-based digital art platform.

It is an "audiovisualisation": the simultaneous sonification and visualisation of the same process and data. It depicts the effects of ray marching a series of two-dimensional slices to determine the boundaries of the Mandelbox using distance estimation. The recursion formula upon which the Mandelbox is based is similar to the well-known baker's map involving the process of flattening a square into a rectangle, then folding in half to form a square. Movements and patterns that are seen can also be heard and vice versa, with visual shape, screen location and speed corresponding to audio timbre, panning and pitch.

The title is a homage to the Russian Suprematist artist Kazimir Malevich whose works include *Black Square* (1915), *Black Circle* (1915), *Suprematist Composition* (1916) and *White on White* (1918).

Ryo Ikeshiro



Digital movie (1920 x 1080 resolution, stereo audio)

2013

https://www.seditionart.com/ryo_ikeshiro/composition_white_square_white_circle

Lost Calls of Cloud Mountain Whirligigs

Lost Calls of Cloud Mountain Whirligigs is a virtual world running in real-time, combining boredomresearch's playful use of computer modelling and poetic rendering to create an imagined world of intrigue and beauty. At the peaks of a craggy mountain live a population of artificial flying life forms called Whirligigs. These alluring beings, inspired by birds of paradise, flower petals and flying machines, spend their days above the mountain swishing their ornate tails. Coming to rest on wires which span the view, they sing melancholic songs before curling their tails and preparing for sleep.

The Whirligigs have a lifespan of a few days and as old Whirligigs are lost new ones are born. Each new Whirligig is unique with its own song and markings, often brightly coloured and with a flamboyant tail. The virtual world shifts slowly through different pseudo astrological cycles, subtly effecting the quality of light. When darkness comes they use their tails to give electrified displays, glowing and pulsating.

Building on boredomresearch's former explorations, incorporating computational techniques to explore viewer experience over extended time frames. The artwork combines concepts of pattern generation, informed by mechanisms in natural systems, with bespoke compositing software; creating an almost infinite variation of colour and pattern by dynamically reconfiguring texture and lighting maps.

boredomresearch:
Vicky Isley
and Paul Smith

Custom software & frame, computer & TFT screen

2010

www.boredomresearch.net

Fragments of Lost Flight

In *Fragments of Lost Flight*, scaled wings are generated by computational mechanisms, inspired by Alan Turing's descriptions of a virtual machine now known as a Turing Machine. Over time a narrow facet of diversity is explored as the 'machine' is fed random programs. Each wing fragment generated by the 'machine' exists only for the time it is on screen and is unlikely ever to be recreated. The mechanisms of pattern formation explored in this generative artwork reveals the diverse beauty of turbulent living organisms as they change over extended time frames. The work has a visual quality evocative of botanical illustrations, combining the act of simulation with representation.

In *Fragments of Lost Flight* free moving agents deposit and respond to daubs of colour, similar to ants pheromone trails, determining the colour of each individual scale as they grow from a seed location at the base of the image. A population of these agents act on each wing form with their interactions giving rise to a wide variation of pattern. Particles travelling from this seed location stimulate scale growth. After a few minutes, identical particles are released, reversing the growth process and causing the wing form to eroded from its base in preparation for the next unique form.

Lost Flight Plume
#A83CBE42 & #B8B1B884

The *Lost Flight Plume* prints employ the same agent based mechanics used in boredomresearch's generative system Fragments of Lost Flight (2012) but rendered at a much higher resolution than is allowed on screen. boredomresearch developed the Fragments software to create large curled plume shaped structures. In these c-type prints a myriad of individual scales combine to form an image redolent of preserved specimens captured from mysterious unknown organisms. The prints allow the generative images to be appreciated differently to those formed on screen, giving preference to the interaction between individual pattern elements and their emergent form. In these works the artist have captured specific forms they find particularly rewarding. Each image presents a vibrant, intricately scaled surface with an overall appearance reminiscent of plumes from an alluring life form.

boredomresearch:
Vicky Isley
and Paul Smith

Fragments of Lost Flight

custom software
& frame, computer & LED screen

2012

www.boredomresearch.net

Lost Flight Plume #A83CBE42 & #B8B1B884

c-type print on aluminium

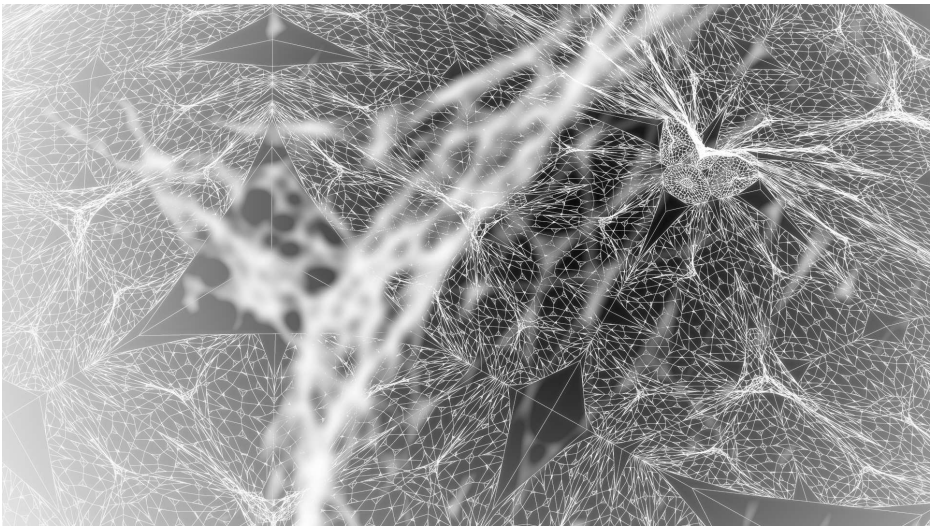
2013

18F44

18F44 is one of my "Algorithmic Creatures", a series of organically morphing cellular structures based on various customized finite subdivision rules. Its structure was originally a further study based on its ancestor - Creature EDF0 (vimeo.com/43752422). The recursive cellular formalism was extended to the third dimension, protruding from a group of six intersecting planes to provide more complexity. The video shows one life cycle of the creature, including four stages - "Proliferation", "Mutation", "Protrusion" and "Disintegration".

The creature was programmed using Processing and the graphics was generated in real-time. My collaborator Zhipeng Wang composed the soundtrack for 18F44.

Raven Kwok
& Zhipeng Wang



Digital Video (Computer-based generative work)

Apr. 8th, 2013

http://ravenkwok.com
http://wackwang.com/

Cellular Forms:
An artistic exploration of morphogenesis

Cellular Forms uses a simplified biological model of morphogenesis, with three-dimensional structures generated out of interconnected particles to represent cells. The aim is to create forms emergently: exploring generic similarities between many different shapes in nature rather than emulating any particular organism, revealing universal archetypal forms that can come from growth-like processes rather than top-down externally engineered design.

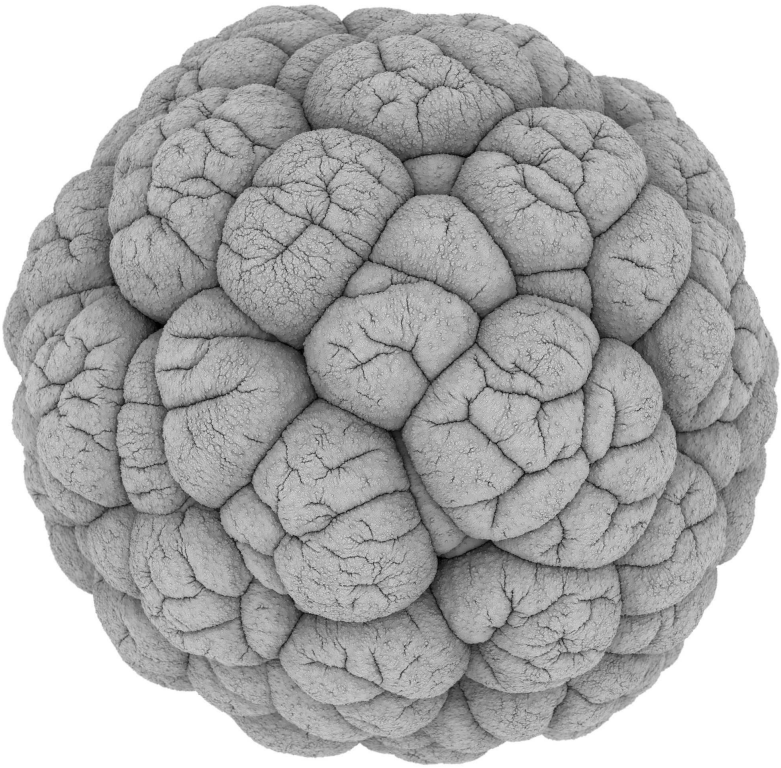
Cell division is controlled by accumulated nutrient levels. When the level in a cell exceeds a given threshold the cell divides, and various parameters control how both the parent and daughter cells re-connect to their immediate neighbours. Rules can also be adjusted for how nutrient is created, such as by being randomly uniformly created by each cell, or by incident light rays creating nutrient in cells hit by photons. Nutrient can also be allowed to flow to adjacent cells. The simulation process is repeated over thousands of iterations and millions of particles, with typical final structures having over fifty million cells.

A number of internal forces affect the structures, including linear and torsion spring forces between connected cells. Additional forces repel cells that are in close proximity but are not directly connected.

Many different complex organic structures are seen to arise from subtle variations to the rules governing the systems, with selection of forms based on aesthetic considerations rather than optimising a conventional fitness function.

All the software used to run the simulations and render the resulting images was written and designed by the artist, and implemented using C++ and CUDA.

Andy Lomas



High definition video, K3 prints on archival paper

December 2013

www.andylomas.com

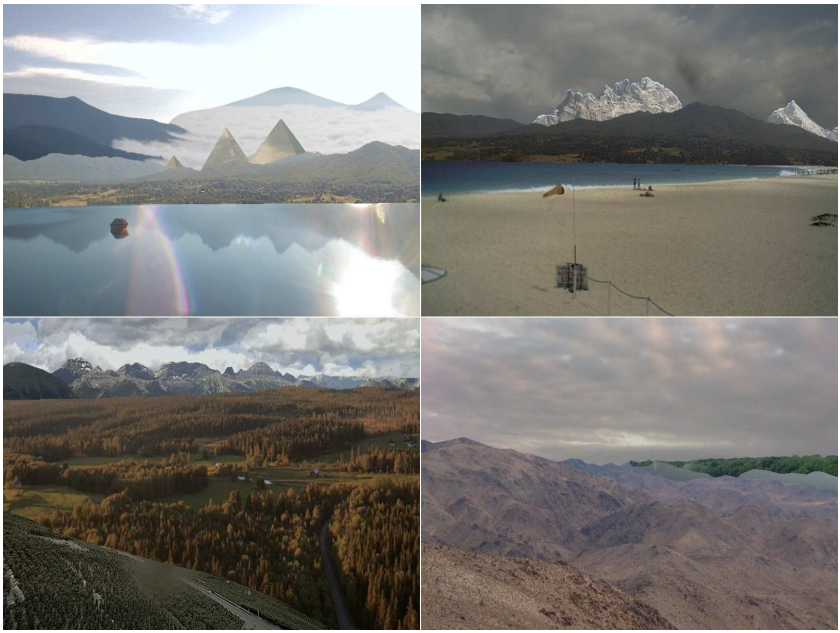
Netscapes

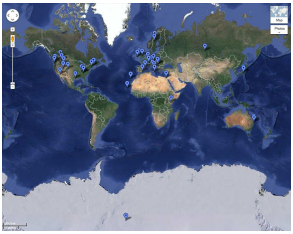
Netscapes is an automated generative networked application custom designed by the artist Garrett Lynch. The application uses live feeds from networked webcams to create combined and imagined landscape compositions; networked landscapes or Netscapes. It employs a technique called web scraping where data is retrieved from websites and presented elsewhere. Netscapes retrieves imagery and considers the network as an augmented lens, an extension of our vision as a means to see distant places. The computer screen is a window, a vista, on a landscape that is simultaneously real and yet impossible.

We see Netscapes where lakes reflect mountains that are not there, pyramids cast no shadow in full daylight and a rain filled sky does not allow its rain to touch the desert it drifts over. Netscapes merges multiple time zones, we can observe dawn, midday, dusk and night all at once, creating a virtualised place that exists both in and outside of multiple times and spaces.

Netscapes is a landscape work in the tradition of classical western landscape art. It is intended to evoke the experience of viewing a traditional landscape painting in a gallery environment. Similarly it depicts landscapes that are idealised, identifying and rendering the most aesthetically pleasing combination of elements originating from different vistas in throughout the world. The edit, composition and display of these elements however is live, the elements used are animated and so the resulting composed Netscape is in constant motion.

Garrett Lynch





Generative networked software.

2011

Practice: http://www.asquare.org/
Research: http://www.asquare.org/networkresearch/

As Seen by Birds,
a Poet's Tomb

The work proposes the use of a swarm intelligence algorithm as a filter to 'interpret' the digital 2D representation of the tomb of the poet Hafez, one of the Iranian's most famous and respected poets of all times who lived in the 14th century. Hafez, throughout his life, emphasized on reading the nature; many of his most well-known pieces are on birds and their implication on his life. As such, the input image used is the poet's final rest place, his tomb, which this time is being 'interpreted' by a flock of birds.

The algorithm used is Particle Swarm Optimization (PSO) which is an evolutionary computation technique developed in 1995, and it's inspired by social behavior of bird flocking. In particle swarms, members of the swarm neither have knowledge about the global behavior of the swarm nor global information about the environment, the local interactions of the swarms result in complex collective behavior, such as flocking, herding, schooling, exploration and foraging.

In the presented work particles are made to follow a hypothetical point (focal point, f_p) moving horizontally (i.e. scanning each row, with a constrained random vertical offset); once f_p reaches the end of a line, it goes to the next row; this process is repeated until the entire input image is scanned. As particles trace the f_p , the average color of the pixel, where each particle 'flies over', is taken and the color is reflected on the output image.

Note: The Mausoleum was designed by a French archaeologist and architect, André Godard, in the late 1930s and the original image is taken by Ondřej Žváček – The tomb of Hafez in Shiraz (Fars, Iran), 2011 – and is used under Creative Commons Attribution-ShareAlike 3.0 Unported (CC BY-SA 3.0).

Asmaa Majid al-Rifaie

3 prints

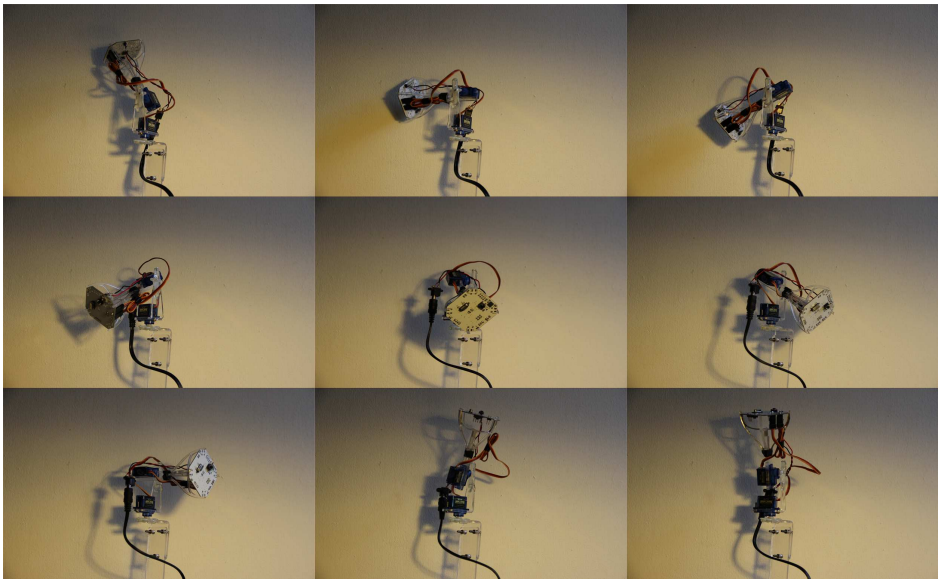
Janurary, 2014

Lichtsuchende
Cybernetic sunflowers with Maslovian

The Lichtsuchende are small static robotic creatures, forming an interactive digital photo-kinetic sculpture. Their movement is modelled after sunflowers turning to face then sun, in their constant search for effulgent nourishment. As well as consuming light, they can produce light, giving possibilities of exchange and communication, and an ascension up Maslow's hierarchy of needs. They are presented in the form of an interactive installation – a group of around 25 Lichtsuchende are placed in an otherwise dark room; participants enter with torches and engage with the robots, setting up cascades of movement and light, and exchanging photonic information with the cyber-society.

Thanks to Edinburgh University Innovation Initiative, New Media Scotland and Alt-W for support.

Dave Murray-Rust
& Rocio von Jungefeld



Phototropic robots, lasercut acrylic

2014

http://www.mo-seph.com/projects/lichtsuchende
www.mo-seph.com
http://www.rociojungenfeld.eu/

Still-A-Life: Nature Morte

This work plays with the audience's expectations in this particular context of an exhibition organized around a scientific conference. The assumption is that people will be expecting to see some rather high-tech objects that are interactive (touch, motion, etc). To counter that, the work looks like a classical looking still-life (*nature morte, vanitas*) oil painting like.

This image, is shown on a thin LCD monitor, covered with a non-reflecting film (with uneven texture to appear like color brush traces). To stress the tableau-like quality the monitor is placed in a massive wooden frame.

The surprise comes from the hidden camera in the wooden frame which films whatever is in front of the "painting" and shows the video flux on the reflective surfaces of the painted objects (clepsydra and glass vases). The shown reflection is deformed according to the 3D shape of the painted objects and, as everything happens in real time, the illusion of one's own reflection in the "3D" glass objects is enhanced. This gives rise to a strange feeling that the painted objects become "alive" and act like real ones. As spectators become aware of their own reflections moving in the painting, they start to engage in subtle interactions while commenting on their experience.

Blerim Mustafa
Jonathan Shimony
& Georgi Stojanov

LCD monitor, wooden frame, web camera, computer

January, 2014

http://mblerim.net84.net/cap/still.php

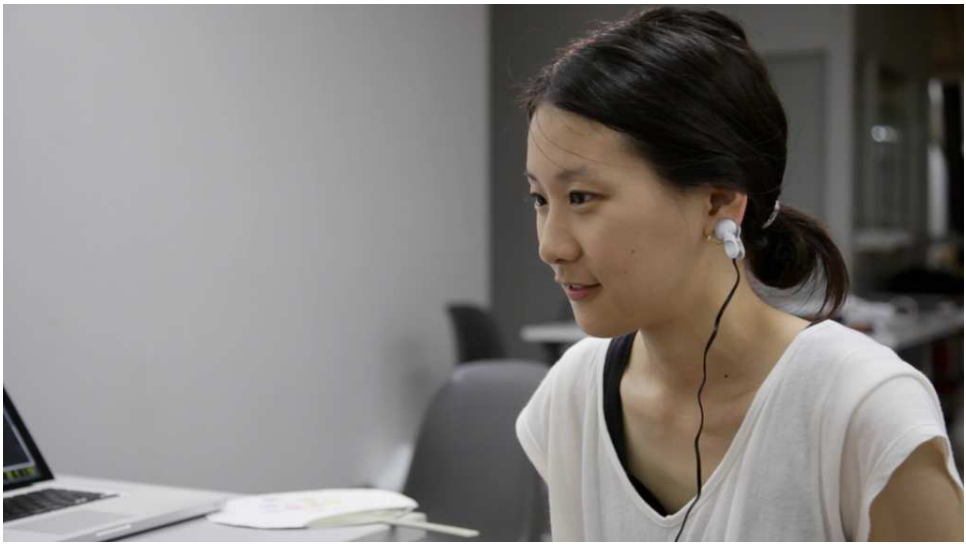
floating sound

We release extremely subtle sounds from inside our bodies which are hard to perceive. Although the sound is made by the body, it cannot be heard because of the limited audible range that a human being can hear.

This work is a composition using the sound of the composer's bloodstream as a sound source. All the sounds were created from the sounds of the bloodstream recorded mainly in an anechoic chamber.

The purpose of this work is to deconstruct and reconstruct the components of personal biological information via computing. These sounds were composed to express another reality beyond the boundary of the animate / inanimate.

Mari Ohno



Electroacoustic Composition, 9' 5''

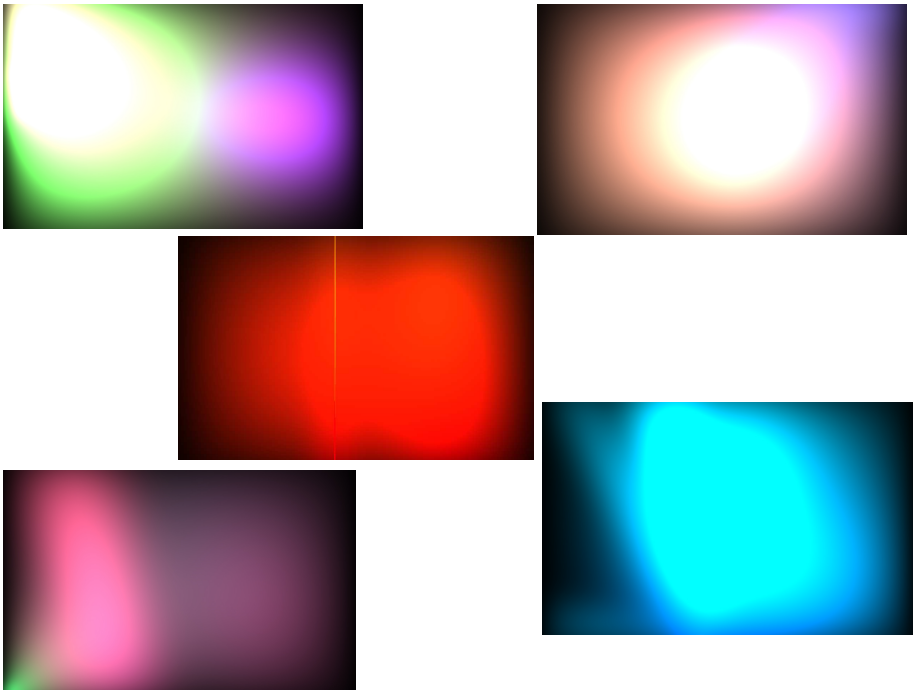
2011

http://www.mariohno.com

Tales from Space

"Tales from Space" is a generative video installation (and also an interactive live-set, multi screen performance) that develops in a hollow space or under a dome. The viewer is surrounded by the projections and listens to short sentences about the concept of super-space. The words, generating a barrage of random points, black holes, micro-flash-dimensions and macro forms of light that intersect each other; envelope themselves, doubleback, widen and shrink, depending on the spectrum modulation of the sound narrative that is based on the concept of quantum mechanics.

Chiara Passa



Generative audio-video installation based on the concept of quantum mechanics

2011

http://www.chiarapassa.it/videoenglish.html

The Naïf garden

"The Naïf garden" is an interactive video projection created especially for gardens and forests. I built the enchanted garden basing myself on video-mapping technique, using Quartz Composer programming language, as well as, After Effects and MadMapper software.

Since an art festival takes place mainly in the dark, I thought about turning a part of the garden in a sort of virtual and interactive nocturne happening as a 'Live Painting', where the viewer is totally protagonist and associated with the creative process of the artwork itself, that is in constant transformation. In fact, through the audience's voices it is possible redesign a new atmosphere, that comes alive through various digital patterns based on the "particle system" swarming in the real garden, they show cells, viruses, multi-cellular organisms, and various molecular forms.

In the "Naïf Garden", the interactivity carries the people through an emotional and learning journey where their subjectivity is put in question by the choices they constantly make throughout the artwork's layers.

The "Naïf Garden" is part of the project "Live Architecture", a series of site-specific interactive video installations and video mapping projects, I thought them up and created them in order to reshape architecture in public places, as well as interior environments and natural landscapes into something vibrant and lively. A dynamic place is always displayed within the multimedia installations - that's why I called it "Live" – since it moves independently, beyond its functionality.

Chiara Passa

Interactive video mapping and AR project

2013

http://www.chiarapassa.it/thegardennaifZooArt.html

Interstice

Interstice is a subtly interactive installation that combines spatialised sound, light and traditional sculptural techniques to produce an immersive experience which sonifies the human genome. Each genetic base is considered to represent a single note, thus the entire sequence becomes one long score. The data is read in real time, producing a spatialised melody in the gallery space that would take centuries to play it its entirety.

Interstice is also a sculptural work, a four foot long water clear resin cast of an inverted boat made entirely by hand. Illuminated from within, each time a note plays the light inside her grows and then fades, plunging participants momentarily into darkness.

The boat at the center of *Interstice* is a copy of the smaller boat seen in the artist's earlier work *Mother*. This sculptural element took around three hundred hours to produce, with much of this time devoted to the creation of a plaster positive of the piece. Over two hundred plaster tiles were individually cast to provide the surface relief – the positive is itself an artefact of replication and the finished work is a replica of the positive.

As in nature, the repeated replication that characterises the process inevitably introduces small imperfections, mutations and differences between the two objects that extend beyond mere scale; thus the central sculptural element of the work is more a descendent or child of the earlier work than a verbatim copy.

Alex Peckham

Installation – water clear resin, sound, light

July 2013

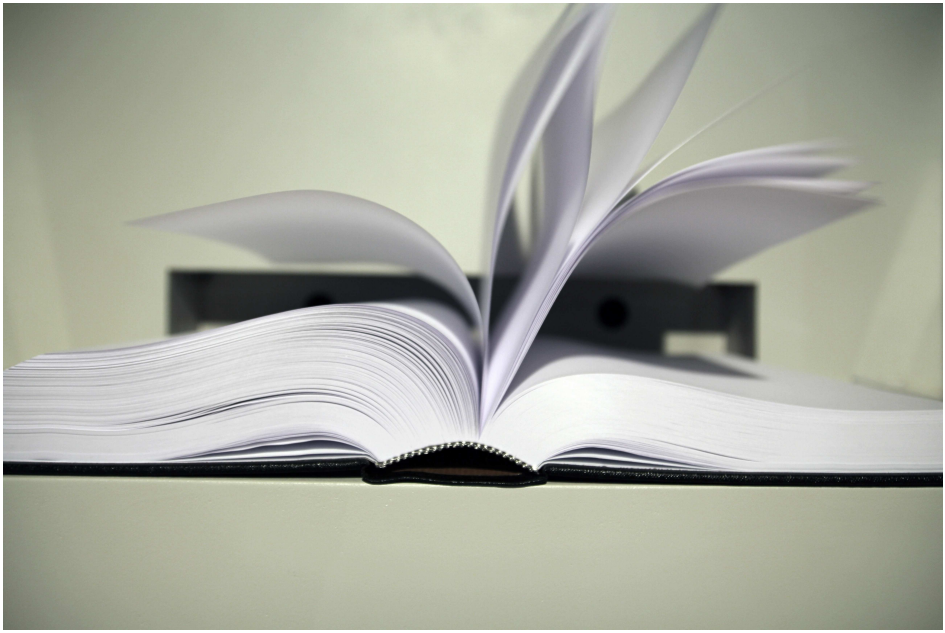
http://synthetic.me.uk/

Video documentation:
http://vimeo.com/86254138

A Day In A Life

Starting at sunrise, the pages of an empty book are turned by airflow. At midday, the amount of the pages that have been turned roughly equals the ones that are still left. At sunset, the end of the book is reached. An unexpected usage of a book takes place in this installation. It is blank, but can still be read. In an intuitive way, without the torturous precision of the signs and by the invisible power of the wind. It reveals the time passed since the morning and the time left till dusk. It is reminiscent of a bygone era in which people lived actively in the daytime hours and spent the night sleeping. It invites to a reflection on weather this ancient way of life wouldn't be reasonable in our time again, taking into account energy- health- and other contemporary crises.

Ivan Petkov



Autonomous kinetic object

2013

https://vimeo.com/76288420

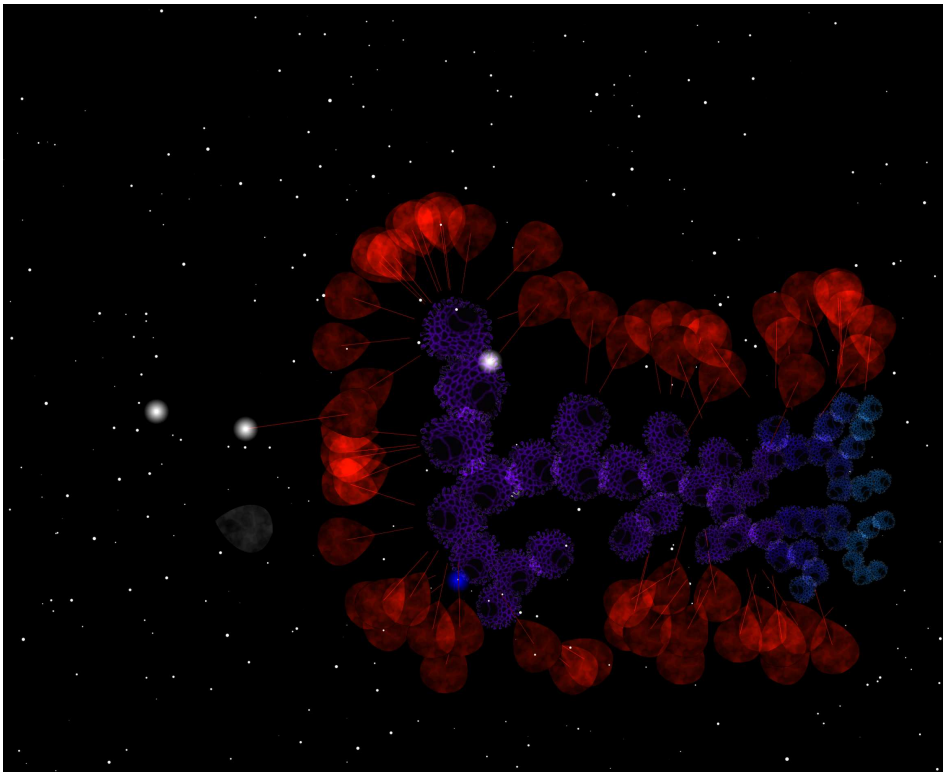
MIMODEK

Mimodek is a dynamic and interactive installation, based on on the the principles of the living world.

As all living systems in nature, MIMODEK reflects its own environment. It is site specific, formed by unique, location-related data sources, and by behaviour of the visitors. Every installation evolves into a unique virtual "ecosystem" reflecting its location.

MIMODEK highlights the delicate relation between human beings and their environment, and their connection to other living beings with whom they share this environment.

Marie Polakova
& Jonathan Cremieux



Interactive installation

2010

http://marura.wordpress.com/mimodek-2/

Before the Final Blast

The sculpture Before the Final Blast is about steel.

Steel is one of the most common manmade material in the world, with more than 1.3 billion tons produced annually. It is a major component in buildings, infrastructure, tools, ships, automobiles, machines, appliances, and weapons.

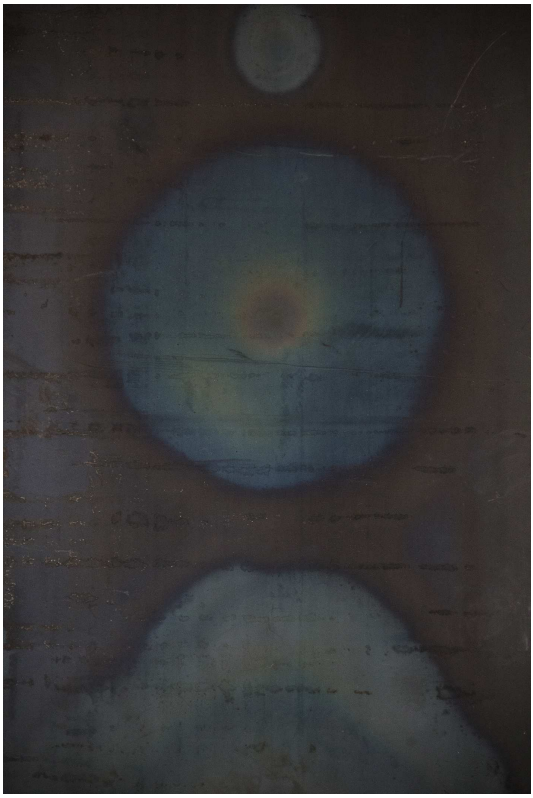
Steel is so widely used that its production and employs are barometers for the world economy.
I have become interested to know the story of steel, to discover its origin -from the biological and geological level of the iron and carbon formation in the Earth's crust- up to the human's mining and industrial treatments.

One element that was linking the cosmological to the geological to the industrial state was thermodynamic. The heat.

I therefore collected all the data as a chart. This same chart is represented on the steel surface translated into circular forms obtained by heating the surface with a gas flame _as steel has the property to change color when heated at high temperatures.

The work displays a series of out of sight information and engages the viewer into a journey through time and space. The natural and the artificial are here merged into one discursive piece that talks about a primordial connection between humans, the build environment, the Earth and the origin of the matter. When humans use heat to melt rocks they are, on a micro scale, reproducing what started 4,5 billion years ago at the origin of our planet. Humans are an active part of the biological and geological flux of the matter. Until the final blast will melt everything once and for all.

Serena Porrati



Steel sculpture, 220x100x2,5cm

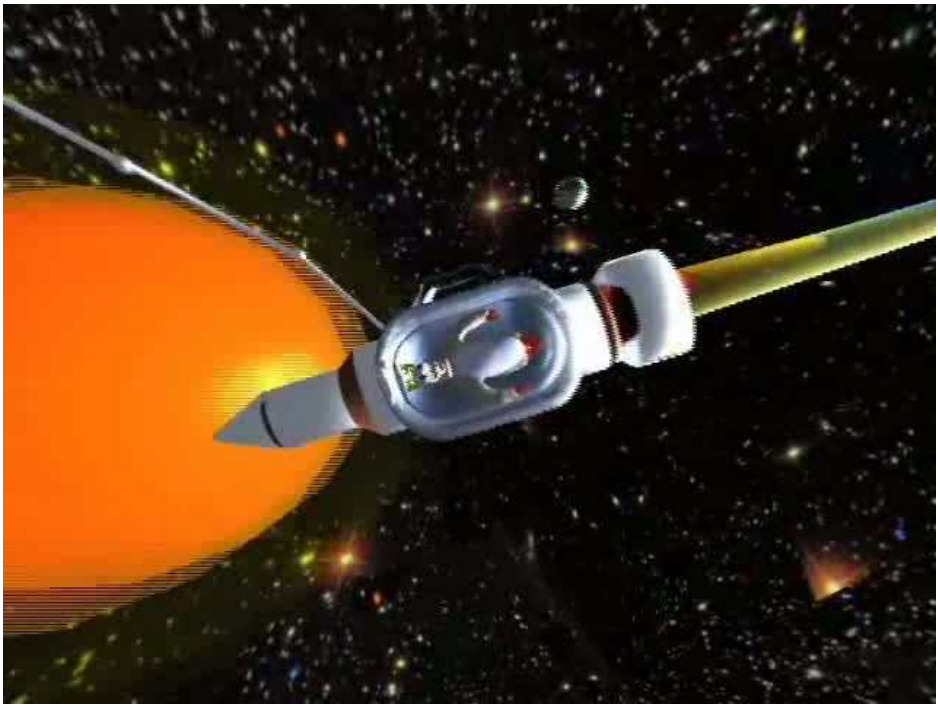
2013

www.serenaporrati.com

Artificial Intelligent Soft Sculpture

The *A.I.S.S.* (*Artificial Intelligent Soft Sculpture*) is not just interactive but also introspective; reacting to the surroundings it is able to learn from what external stimuli may be encountered. While the mind of the *Artificially Intelligent Soft Sculpture* is advanced, it's body- a deer's body, is in shambles. Cut off at the waist and elbows it remains relatively unanimated except for the blinking of its doe eyes. Contained within this soft exterior is the ultimate combination of advanced robotic technology: a network of sensors, motors, feedback devices, and real foam stuffing. These sculp-tronic features allow the *Artificially Intelligent Soft Sculpture* to realize the entire gamut of sculptural capabilities. Finally a sculpture is able to experience how it feels to be a sculpture and what it means to be looked at as an object. As the A.I.S.S. is off traveling to distant cultures the work may be exhibited to the public via PowerPoint presentations, video installations, exhibition of the prototype(s), or a combination of options.

Justin Tyler Tate



Video, 8' 3''

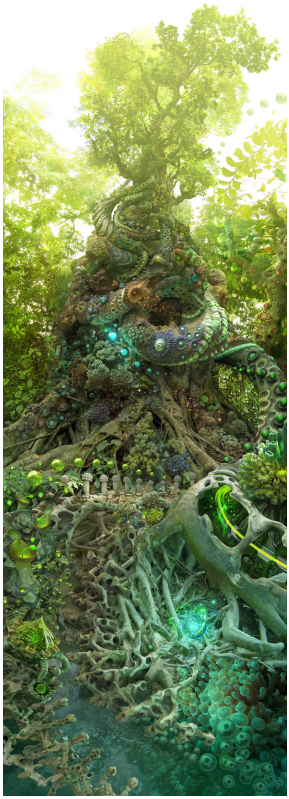
2009

Artist: http://justintylertate.weebly.com
Artwork: http://cargocollective.com/AISS

Echoes

The digital trees by Andy Thomas are a visual description of symbiosis and fractal theory in nature. Fractals exhibit self-similarity, meaning their inner structure has the same pattern as their outer structure - like a pine cone or a fern tree. A tree looks similar to a head of Broccoli. The more you zoom in or out the same patterns emerge over and over again. Andy Thomas mixes together moss and trees, insects and animals, coral and ferns, landscapes large and small, real and computer generated, to form an over all picture that expresses in fine detail the concept of worlds within worlds. Each section of the picture is an alien world that is strangely familiar, co-existing with seamless integration with its neighbours. The idea in nature that each life form depends on one another for survival. The power of symbiosis. And at the top of this tree of life is mankind, the strangest creature of all, we have somehow transcended this direct relationship with nature with the use of technology to calve out our own future. To mould the environment into a shape that suits our needs. By using computers to recreate natural images Andy celebrates these themes in his work to produce intricate and fascinating works.

Andy Thomas



2 prints, 70 by 25 cm

2012

www.andythomas.com.au

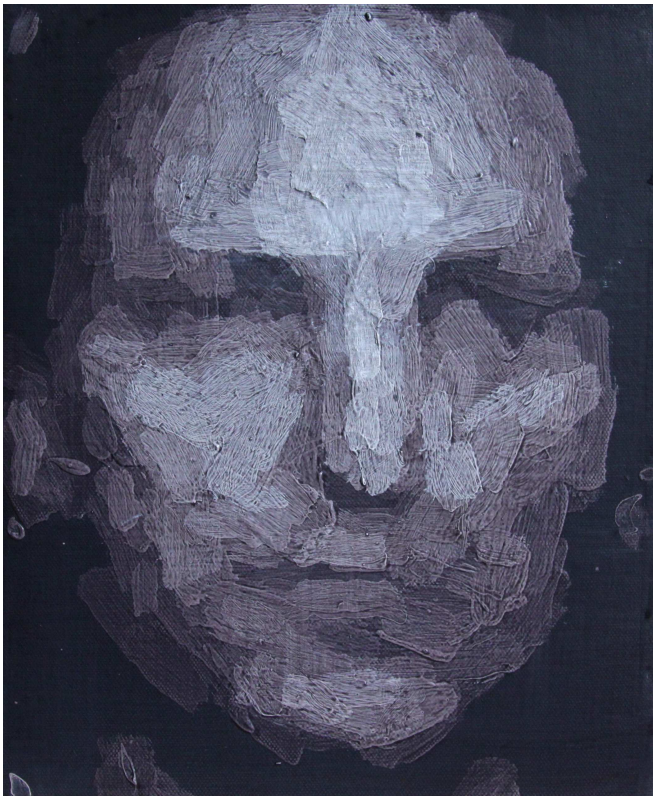
Paul's Memories

These paintings were produced using the e-David robot, developed at the University of Konstanz (Germany) by Prof. Oliver Deussen and Thomas Lindemeier. e-David was controlled by a system developed by Tresset during a 9 months residency in Konstanz.
The technique inspiring the system' was developed by Patrick Tresset when he was a painter trying to find a way to represent human beings. Tresset was originally influenced by painters such as Rembrandt, Francisco Goya and also by twentieth century painters such as Leon Kossof, Howard Hodgkin and Yan Pei-Ming and Gerhard Richter. The subjects of the paintings were chosen from Paul's the drawing robot's memories.

Detailed information can be found in the paper: P. Tresset and O. Deussen, Artistically Skilled Embodied Agents, that will be presented at the Computational Creativity Symposium, AISB50.

Patrick Tresset's nine month residency in the informatik department of the University of Konstanz was financed through a senior fellowship at the University's Zukunftskolleg.

Patrick Tresset



Acrylic on Canvas
Paintings #4 #2 #1, Paul's Memories Series #2

2013

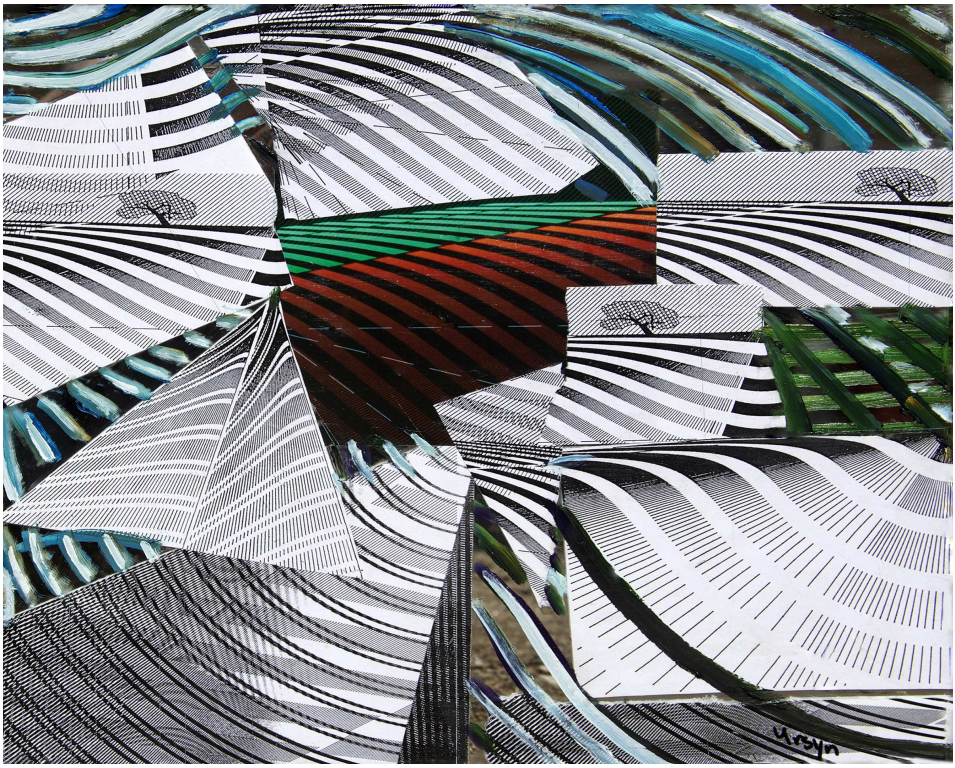
http://www.patricktresset.com

Folds and Faults

In a landscape, we can find patterns, textures, repetitions, fractal geometries, and balanced structures that are typical of the principles of art making. In the spirit of the A-EYE2014 theme, "Exhibition of art and nature inspired computation," I included programmed elements into my artwork, and then added painterly details to unite computed art with the mainstream art traditions. This work tells about the impact of geological forces on the appearance of a present landscape, and its visual qualities seen in terms of art, computing, and geology.

Our planet is populated by many kinds of living objects that change under different conditions, circumstances, and events. On a flat area, we can feel a presence of rocks, mountains, and big masses that long ago made the hills. After millions of years no more hills can be seen, and the land surface meets the sky along a horizontal line. However, our mind makes a reconstruction of past forces that caused movement of the terrain under our feet. We may be aware of fundamental forces acting deep under the Earth's surface, eg. gravity, electromagnetism, or even nuclear forces. We may imagine how temperature and pressure inside the Earth caused the actions of forces expressed as friction or tension, which resulted in translocation of big masses of minerals and rocks, their folds and faults of various kinds. Many times the presence of what we think existed in our neighborhood million years ago shows geological forces; we may label them as informative parts of geological landscape.

Anna Ursyn



Archival print after computer code, 8 by 10 inches.

2013

Ursyn.com

Info about the the cover design:

The cover of the catalogue is designed by visualising the behaviour of agents aiming to trace the logo of A-EYE art exhibition. The agents are powered by two nature inspired swarm intelligence algorithms and a biological mechanism.

One of the swarm intelligence algorithms simulates the behaviour of birds flocking, and the other one mimics the recruitment behaviour of one species of ants, *Leptothorax acervorum*.

The biological mechanism is inspired by the behaviour of blood flow and cells in blood vessels. This particular design deployed the concept in Outward Eutrophic Remodelling, where the concept of high and low blood pressure and its impact on the vessel calibre is utilised. The details of the hybridisation can be found in the following book chapter:

Mohammad Majid al-Rifaie, Ahmed Aber and Mark Bishop, (2012), Cooperation of Nature and Physiologically Inspired Mechanism in Visualisation, Book Chapter, *Biologically-Inspired Computing for the Arts*: Scientific Data through Graphics, DOI: 10.4018/978-1-46660-942-6, ISBN13: 9781466609426, IGI Global, USA.

Swarmic Art by: © al-Rifaie, Swarms & Blood Vessels

A-EYE:
An exhibition of art and nature-inspired computation

The exhibition is organised as part of AISB-50 Convention at Goldsmiths, University of London, UK.

Curated by:

Mohammad	Majid al-Rifaie
Tim	Blackwell
& Chiara	Puntil (assistant curator)

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