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# VISAP'15, the IEEE VIS Arts Program

Exhibition Catalog: Installations, Demonstrations, and Performances

Leroy Neiman Center, School of the Art Institute of Chicago October 19-30

Chicago, Illinois



9 **Spiral 5 PTL**, A Study of 4D Julia Sets, and **Particle Dreams** in Spherical Harmonics 12 Lagoglyph and Lagoogleglyph 14 **Aerial Bold** 15 **Endless Current** 

16 We Become the City 17 **Bad Data** 18 **Inner Space** Artifacts 19 **MEMORY-**SCAPES 21 Seeing **Temporal Data** 22 Agitato 23 Visual Gibberings

**Demonstrations** 

25 **Climate Prisms:** The Arctic 25 20/X26 **Sorting Out** Cities 28 A Stranger to Words 28 **Deep in** Poetry 30 **FreeHands:** A Journey along Sketching in Virtual Space

30 Natural Rejection 31 MarshVis 32 We Need Us

> 35 Credits

The IEEE VIS 2015 Arts Program, or VISAP'15, showcases innovative artwork and research that explores the exciting and increasingly prominent intersections between art and visualization. Through a dedicated papers track and an exhibition that run concurrently with the IEEE 2015 VIS conference, the Arts Program aims to foster new thinking, discussion, and collaboration between artists, designers, technologists, visualization scientists, and others working at the intersection of these fields.

The theme for VISAP'15 is *Data Improvisations*. Artists and visualization researchers share common goals: to make visible what is normally difficult for us to see, and to facilitate grappling with concepts that we might otherwise remain ignorant of. Media artists create opportunities for reflecting on cultural issues, but also highlight how we absorb technology and explore how the exposure to tremendous amounts of data affects our daily lives; visualization researchers raise new questions by pushing the boundaries of what we can perceive when introducing new interactions with and representations of complex data.

Does artistic exploration offer insight into thinking about effective representation in visualization research contexts? Complementarily, do the advances in visualization research present new opportunities for artists to think about the creative coupling of data to meaning? Could scientific and arts research improvise new spaces of interaction and analysis? The installations, performances, and demonstrations featured in the VISAP'15 exhibition explore these relationships between visualization research and artistic practice. We are particularly pleased to showcase projects from three pioneers of media arts and visualization. Donna Cox. Dan Sandin. and Eduardo Kac. The nine other featured installations include work by both established and emerging media artists from around the world, including Kevin Badni, Benedikt Groß, Haru Ji, Scott Kildall, Joey Lee, Ben Ridgway, Charlie Roberts, Emilio Vavarella, Graham Wakefield, Jo Wood, Rebecca Ruige Xu, and Sean Hongsheng Zhai. Additionally, a wide range of creative visualization projects will be demonstrated during the opening night of the exhibition.

The artists and collaborative teams participating in the VISAP'15 Exhibition present work that is not only

aesthetically compelling, but that also wrestles with complex questions about the use and misuse of data, using their art as an opportunity to present new forms of meaning-making. We invite you to join with the VISAP'15 artists in thinking about the many intersections between art and research.

We would like to acknowledge all those who made this year's Arts Program possible, including everyone on the IEEE VIS Organizing Committee, and especially Maxine Brown, Michael Papka, and Gautam Chaudhary. A number of people provided extensive support over the course of the Summer, including Laura Wolf, Jack Henrie Fisher, Jennifer Keefe, Loretta Auvil, Meghan Haley, and many others too numerous to list here. This exhibition would not have been possible without the enthusiasm and expertise of Douglas Pancoast and Jaclyn Jacunski of the SAIC Shapiro Center and Ross Staton Jordan and Sadie Woods of the Leroy Neiman Center at SAIC. Finally, we also thank the large pool of expert reviewers who graciously volunteered to serve on the VISAP'15 Program Committee.

Angus Forbes, Fanny Chevalier, and Daria Tsoupikova Co-Chairs, VISAP'15



## Solar Superstorms

Donna J. Cox, MFA, PhD, Director, Advanced Scientific Visualization Laboratory at the University of Illinois at Urbana-Champaign (UIUC); Director, Visualization and Experimental Technologies at National Center for Supercomputing Applications (NCSA); and Director, eDream (Illinois Emerging Digital Research and Education in Arts Media Institute) http://www.ncsa.illinois.edu/People/cox/



Double coronal mass ejection. Simuation by Yuhong Fan, High Altitude Observatory, National Center for Atmospheric Research

> Solar Superstorms is a high-resolution science visualization describing the dynamics of the Sun: high-velocity jets, a fiery tsunami wave that reaches 100,000 kilometers high, rising loops of electrified gas. What drives these strange phenomena? How do they affect planet Earth? This work explores the answers by venturing into the seething interior of our star. The ultra-high resolution *Solar Superstorms* provides an experience that takes viewers into the tangle of magnetic fields and superhot plasma as the sun vents its rage in dramatic flares, depicting violent solar tornadoes and coronal mass ejections, the largest eruptions in the solar system.



Solar plasma interacting with Earth's magnetic field. Homa Karimabadi, Associate Research Scientist, UCD. Mahidhar Tatineni, User Support Group Lead, San Diego Supercomputer Center. Vadim Roytershteyn, Space Science Institute. Hoanh X. Vu, Associate Research Scientist, Electrical and Computer Engineering, UCSD. Amit Majumdar, Director, Data Enabled Scientific Computing, San Diego Supercomputer Center

> Solar Superstorms is the culmination of one of the most intensive efforts ever made to visualize the inner workings of the sun. It includes a series of groundbreaking scientific visualizations computed on the giant new supercomputing initiative, Blue Waters, based at the National Center for Supercomputing Applications, University of Illinois.

#### Credits

Solar Superstorms was first developed as a full-dome production by NCSA, University of Illinois, Thomas Lucas Productions, and Spitz Creative Media, and funded in part by National Science Foundation Award #ACI-1445176 and The Centrality of Advance Digitally Enabled Science: CADENS Visualization Advanced Visualization Lab, National Center for Supercomputing Applications at the University of Illinois at Urbana-Champaign: Donna Cox, Kalina Borkiewicz, Jeff Carpenter, AJ Christensen, Stuart Levy, Robert Patterson, and Matt Turk. Narration: Benedict Cumberbatch, London, UK

# Spiral 5 PTL,

## A Study of 4D Julia Sets, and Particle Dreams in Spherical

![](_page_9_Picture_2.jpeg)

Frames from the live video computer performance *Spiral 5 PTL (Perhaps The Last)*, 1979. Dan Sandin, Tom DeFanti, and Mimi Shevitz

### **Harmonics**

Dan Sandin, Electronic Visualization Laboratory (EVL), University of Illinois at Chicago and California Institute For Telecommunications And Information Technology (CalIT2), University of California, San Diego https://www.evl.uic.edu/dan

10

Installations

![](_page_10_Picture_1.jpeg)

11

A Study of 4D Julia Sets: Iterations of Z = Z2 + K in the Quaternions, 2005 by Dan Sandin. Animation: Dan Sandin. Algorithms: John Hart, Yumei Dang. Programming: Dan Sandin, Shalini Venkataraman. Visionary Leadership: Tom DeFanti. Mathematical leadership: Louis Kauffman. Music Composition and Performance: Stephan Vankov. (Produced at the Flectronic Visualization Laboratory, UIC, and Calit2, UCSD)

> Spiral 5 PTL, 4D Julia Sets, and Particle Dreams provide a retrospective of work by Dan Sandin, a pioneer of electronic art and visualization. The projects explore mathematical themes and consist of performances, animations, and interactive installations created in collaboration with Tom DeFanti, Louis Kauffman, and others. Spiral was created with the Sandin Image Processor, a highly-programmable analog computer for processing video images in real time, invented by Dan Sandin in the early 1970s. 4D Julia Sets was one of the first high-resolution animations to explore the fractal geometry. Particle Dreams is an ongoing virtual reality project that presents an interactive, immersive physical simulation of over one million particles with momentum and elastic reflection in an environment with gravity.

![](_page_11_Picture_1.jpeg)

Particle Dreams in Spherical Harmonics, Virtual-Reality installation, photo by John Hanacek. Particle Dreams in Spherical Harmonics. Content and application programming: Dan Sandin. Content and systems programming: Robert Kooima. Aditional systems programing by Andrew Prudhomme. Music and sound effects: Laurie Spiegel. Driver: Tom DeFanti

### Lagoglyph and Lagoogleglyph

Eduardo Kac, Art and Technology, School of the Art Institute of Chicago http://www.ekac.org

Lagoglyph Animation is a real-time computer animation of lagoglyphs, i.e., pictograms that evoke rabbits. Lagoglyphs are a series of works that create a visual language and a form of writing that refers to the artist's project GFP Bunny (2000)—also known as Alba, the green bunny—a genetically modified rabbit that glows fluorescent green under blue light. The lagoglyphs are visual symbols composed of two units (one green, one black), each evoking Alba through infinite variations.

#### Installations

![](_page_12_Picture_1.jpeg)

![](_page_12_Picture_2.jpeg)

In this video, the pictograms continuously flow and reconfigure themselves in new streams, placing emphasis on the generative mutability of writing.

Lagoogleglyph is a distributed, global artwork that inscribed a Lagoglyph (i.e. a bunny pictogram) into the environment and made it visible across the planet to anyone via Google's geographic search engine. The Lagoogleglyph video shows a zoom, created online within Google Earth itself, that progressively approaches the Lagoglyph installed on the roof of the Oi Futuro Cultural Center in Rio de Janeiro. The animation takes us from outer space into the eye of the bunny and back again. The Lagoglyph (referencing a rabbit head) was made for and photographed by WorldView2, a satellite employed by Google.

## **Aerial Bold**

Benedikt Groß, Studio Benedikt Groß Joey Lee, University of British Columbia https://vimeo.com/108969735

Contrary to popular belief, much of the world has not been mapped. While satellites orbit around the earth taking hundreds of images each day, there is limited knowledge on what unique features have been captured on those images and even less awareness about the ways in which those features can be found and classified. To raise awareness about some of the modern and increasingly prevalent tools and processes surrounding contemporary geographic discovery and mapping the authors created Aerial Bold, the first map and typeface of the earth.

Composed of letterforms, or alphabet shaped features "written" into the topology of buildings, roads, rivers, trees, lakes and a combination of the above, *Aerial Bold* is both a global database of human crowd- and algorithmicallysourced letterforms and an OpenType format vector font family. The database of letterforms not only includes the letterform classification (e.g. "A", "B", "C", etc), but also other metadata including the features' location (e.g. city, country) and type (e.g. road, building, park, etc.) as described in the Open Street Map database. The font, which is a translation of the major letterform archetypes, summarizes the

![](_page_14_Picture_1.jpeg)

letterform database, transforming the data from aerial imagery into a tangible product, and showcases one of the many different ways in which satellite imagery can be used in the pursuit of art, design, and science. *Aerial Bold* is a process based work that seeks to

engage a larger community of people — artists, designers, scientists, researchers, and lay audiences — to look deeper into satellite and aerial imagery and to discover it as rich, geographic data and as a material for creating art and understanding space.

# Endless Current

Haru Ji, Sogang University Graham Wakefield, York University http://artificialnature.mat.ucsb.edu/endless\_current.html

Endless Current is an artwork and a visualization of a complex biologically-inspired system. Through immersive display it presents an infinitely explorable world sustaining

![](_page_14_Picture_7.jpeg)

a virtual ecosystem of multiple species. These artificial life forms subsist within a simulated 3D fluid environment that is constrained by an amorphous landscape reminiscent of underwater or microscopic spaces. Immersed participants view

virtual doubles of their hands and arms within this world, with which they can intuitively havigate the space and discover interactions with the simulated life.

We believe that nature is improvisation as a complex adaptive system. As an artificial nature, *Endless Current* visualizes and sonifies not the specific appearance but its underlying mechanisms, allowing an open-ended space of nature-as-it-could-be and new sensorial interactions or discoveries of agency by its immersants.

![](_page_15_Picture_3.jpeg)

### We Become the City

Jo Wood, City University London http://gicentre.org/wbtc

*We Become the City* is a collection of data improvisations that explore how people, machines, time and place become the city they share. What does it mean to improvise with data? In a context of interactive visualization for the masses, who does the

improvisation— the "producer" or "consumer"? Does improvised data generation, visualization, assembly and consumption affect the objective authority claimed by computing technologies and the use of big data? This work explores these questions by considering interpretations of improvisation in the context of data on movements of people and bicycles in the city of Chicago.

Data were mapped from the Chicago 'Divvy' public bicycle hire scheme for all journeys made in 2014. Over the year 2,454,634 journeys between 300 docking stations were made on a total of 2,968 bicycles. New mappings of these data are explored in this exhibit through temporal

#### Installations

![](_page_16_Picture_1.jpeg)

![](_page_16_Picture_2.jpeg)

and spatial juxtaposition and superposition prompting us to question who shapes the cities we live in, how we shape them and how we build our shared identities though movement and place. By viewing our movement not from the perspective of the individual, but from the viewpoint of the bicycle, we see the imprints we leave on our cities.

We make journeys with a purpose but the shared vehicles on which those journeys are made have none. As we move a bicycle from one station to the next, a larger, unplanned composition is created, sequencing a set of discrete yet connected movements

to create an urban choreography. There is diurnal and seasonal rhythm to the composition, embellished with the illusory randomness of thousands of small stories.

## Bad Data

#### Scott Kildall http://kildall.com

Bad Data is a series of twelve data-visualizations etched onto aluminum honeycomb panels using a high-pressure water-jet machine. They take the form of static objects, which collapse time into a single viewable space, emphasizing the ruptured surface of the material itself. The data is "bad" in the shallow sense of the word, depicting datasets that evoke a sense of moral ambiguity, political polarization, or social corruption, such as the locations and size of every prison in the United States, mass shootings in the United States, and every marijuana dispensary in Colorado. Bad Data also investigates scientifically questionable datasets, such as worldwide UFO sightings and haunted locations across the globe,

#### 17

![](_page_17_Picture_1.jpeg)

![](_page_17_Picture_2.jpeg)

![](_page_17_Picture_3.jpeg)

and recent ruptures in our cultural fabric, such as meth labs in Albuquerque and evictions in San Francisco.

Bad Data offers an alternative form of data-representation through contemporary forms of digital fabrication. The effect of the waterjet machine is unpredictable. The top layer of the honeycomb gets pierced with the etching, while the bottom

layer remains intact, creating gaps and fissures in the honeycomb material. The selected data mirrors the material itself with uneven patterns and uncertain outcomes.

# Inner Space Artifacts

Ben Ridgway, San Francisco State University https://vimeo.com/benridgway

Inner Space Artifacts is part of a series of recent abstract animations that investigate the metaphysical features of reality. The animations are designed to stimulate archetypal associations and invite the viewer to make personal connections to the visual and auditory experience, without any reliance on narrative or spoken language. The driving vision behind the work is fueled initially by drawings made using traditional media. These drawings are created spontaneously using a vocabulary of structural forms that

#### Installations

![](_page_18_Picture_1.jpeg)

was developed over time, and that can be arranged and interchanged in a multitude of different ways. These drawings are mostly abstract, but they sometimes cross over into figurative designs fused with abstract forms. The musical compositions are also inspired by the use of both analogue and digital sources. Sound is used to create an auditory parallel to the visual experience; both music and motion play equal

roles in the filmmaking process.

The work is abstract by nature and uses non-narrative film making techniques. The undercurrents of the work point to themes centered on time, cycles, the concept of infinity, and the similarities between artificial and natural systems. In a world where technology and artificial systems are becoming more prevalent. *Inner Space Artifacts* is a reminder that they are both a product of nature.

Emilio Vavarella http://emiliovavarella.com

MEMORY-SCAPES

**MEMORYSCAPES** investigates how memory and reality affect one another through notions of architecture and related mental images. Through interviews with Italians

19

![](_page_19_Picture_1.jpeg)

![](_page_19_Picture_2.jpeg)

City, an objective 3D model of Venice is altered and "glitched" by the collective memories of its former residents. Architectonical data (structures, distances, descriptions, dimensions, details) and recorded stories are used to generate a "memory archive" in which personal memories of the city are merged with tridimensional satellite data, creating a holographic and fragmented "audio-cartography" of Venice. New phantasmagoric and paradoxical structures emerge from this unforeseen combination of technical and mnemonic errors. The accompanying sound installation is based on the most poetic memories in the archive. It was designed utilizing transducers instead of normal speakers, creating a slightly distorted metallic

living in New York

sound that vibrates throughout the space.

#### Installations

# <mark>See</mark>ing Temporal Data

Keyin S. Badni, American University of Sharjah https://www2.aus.edu/facultybios/profile. php?faculty=kbadni

![](_page_20_Picture_3.jpeg)

© 2015 Kevin Badni

Since the introduction of the camera lucida and the camera obscura. artists have been using technology to help them analyze what they see. The use of these technologies helped them to study the scene being viewed, bringing new insights and knowledge into how we see. A modern method to assist in analyzing data collected from eyetracking experiments highlights important features within a viewing. The analysis of this data is usually output in statistical

form, or as **2D** graphic overlays placed on top of flat images. Seeing Temporal Data uses a new methodology developed to convert quantitative eye tracking data captured during a cognitive experiment into unique **3D** sculptural forms. The transformation of the captured data not only contributes to the continuing process of adding knowledge and insights in to how we see, but also literally makes what we see visible.

Research has shown that when observing a face the observer can prioritize their gaze towards "diagnostic"

21

features resulting in a gaze strategy that retrieves as much information as possible. The main goal of the research was to see how it was possible to translate the transitory visual dialogue created by observing a model into a tangible three-dimensional form.

# Agitato

Rebecca Ruige Xu, Syracuse University Sean Hongsheng Zhai, Red Dot Blue Square http://rebeccaxu.com/agitato/

*Agitato* represents evolving musical information within a single image frame, in an attempt to capture the subjective and perceptual qualities of time that are expressed in music. Each image in this series is generated based on a

![](_page_21_Picture_5.jpeg)

![](_page_21_Picture_6.jpeg)

![](_page_21_Picture_7.jpeg)

musical passage from Nicolas Scherzinger's *inter-sax-tive*. For a given moment in time, a spectrum of frequencies from this composition is analyzed and used as the input to construct visual elements. As the music progress, the visual elements accumulate and are composed into a single image that reflects the musical material within a defined duration of time, allowing viewers to perceive a musical passage from a single viewpoint, rather than as a linear experience of time.

The title of the project, named from the Italian musical term "agitato," depicts the restless agitated style of the music. By sampling music at uneven intervals, the effect of a time warp is created within a single image; some moments are compressed,

while others are stretched. The observation of time becomes more subjective, arguably more accurately reflecting the

human experience of musical and visual arts in general. Through the intertwining of the musical with the visual, *Agitato* produces a visual aesthetic experience that alludes to sounds and emotions via a unity of sensation.

# Visual Gibberings

Charles Roberts, Rochester Institute of Technology http://www.charlie-roberts.com/gibber Visual Gibberings is a live coding performance where

![](_page_22_Picture_4.jpeg)

dynamic aspects of system state and scheduling are visualized for audience members. Visualizing temporal processes can be difficult, particularly with multidimensional datasets that often defy representation. In a live coding performance, dozens of visual and musical properties are being manipulated over time. *Visual Gibberings* embellishes the source code as it is being written in order to best represent the state and structure of the improvised algorithmic composition.

![](_page_23_Picture_1.jpeg)

## Climate Prisms: The Arctic

Francesca Samsel, The University of Texas at Austin Linda Deck, Bradbury Science Museum Bruce Campbell, Rhode Island School of Design https://datascience.lanl.gov/samsel.html

Climate science is **conveyed** via visualization of a climate model— an abstraction that removes the science from the research field activity that forms the basis for

![](_page_24_Picture_4.jpeg)

constructing the model. *Climate Prisms* bridges the distance between the physical world and scientific visualization through multiple modalities: visual art, literature, scientific text, information graphics, and field imagery, among others. By allowing participants to view science

through different lenses, each person plots their own path, moving through the content at the pace and level that best enables them to engage with the material. Embedded assessment will log basic demographics and each individual foray through the content. These assessments will be analyzed to explore trends of use and drive further content development.

# **20/X**

Shannon McMullen, Purdue University Fabian Winkler, Purdue University http://www.gardensandmachines.com/

![](_page_25_Picture_1.jpeg)

![](_page_25_Picture_2.jpeg)

![](_page_25_Picture_3.jpeg)

![](_page_25_Picture_4.jpeg)

![](_page_25_Picture_5.jpeg)

Experimental geographer and artist **Trevor Paglen recently made the insightful** observation that computer vision images are largely created "by-machines-for-machines," great numbers of which are never seen by humans. But, in order to understand, critique and shape the impact of machines seeing with abilities beyond human vision capabilities, humans will need to learn to see like machines, to understand their abstractions and their categorizations of things in the wo<mark>rld. Computers</mark> that look at the world are not passive observers of reality. but increasingly become active shapers of the reality we experience. Synthetic vision merits attention by artists/humanists as both a technological and cultural invention, particularly as a way to promote interdisciplinary knowledge that can create a space for public engagement. 20/X is an art and science project based on unseen images created by a state-of-the art synthetic vision system. The title of the work refers to the measurement of perfect human vision (20/20), which is contrasted with a yet unquantifiable measure of seeing (specifically in a cultural context) for a synthetic vision system represented by the variable "X."

### Sorting Out Cities

Dietmar Offenhuber, Northeastern University Roland Haring, Peter Holzkorn, Andreas Jalsovec, Michael Mayr, Nicolas Naveau, Emiko Ogawa, Ars Electronica Futurelab http://offenhuber.net/upcoming-sorting-out-cities/

Although cities cover only a small fraction of the earth,

#### Demonstrations

![](_page_26_Picture_1.jpeg)

![](_page_26_Picture_2.jpeg)

![](_page_26_Picture_3.jpeg)

they have a tremendous impact on the world. *Sorting Out Cities*, a visualization designed for the GeoCosmos display at the National Museum of Emerging Science and Innovation in Tokyo, Japan, explores how cities relate to the rest of the world in terms of the space they occupy, the people they shelter, the resources they use, and the global movements they facilitate and are subjected to. The work uses a unique approach to visualize topics such as land-use and urban extent, rural and urban population, water availability and consumption, global accessibility and migration. By literally

"sorting out" the complex spatial relationships between cities and the world, global connections, trends, and inequalities become directly observable.

# A Stranger to Words

Meng Chih Chiang, Hi-ReS! http://astrangertowords.com/

A Stranger to Words is an interactive network graph that visualizes the artist's personal learning experience. Based on a daily reading report, the personal database of 23,358 words was created originally to express how the artist understood words. The complicated graph evolves

![](_page_27_Picture_4.jpeg)

through a great diversity of transformations, creating a mesmerizing interactive visual experience in which the language and the lines of connection work in unison. The goal of *A Stranger to Words* is to reveal a system of underlying text algorithm in a novel and insightful way, and to unfold the personal sentiments of a dyslexic through the capabilities of data visualization.

# **Deep in Poetry**

Julie Lein, Nina McCurdy, and Katharine Coles, University of Utah Amanda Hurtado, University of Washington-Bothell http://www.sci.utah.edu/~nmccurdy/Poemage/

#### Demonstrations

![](_page_28_Figure_1.jpeg)

29

Poetry might seem twodimensional: composed of language, often in lines, it appears on printed pages or digital screens to be read in familiar left to right, top-down order. Many poets, though, challenge these assumptions through material means, using such tools as needle and thread, Lego bricks, QR codes and webcams, even a benign, resilient bacterium, to write poems whose multidimensionality is

![](_page_28_Figure_4.jpeg)

immediately perceived. Yet, poems encountered through more traditional means— the scripted pages of a book, the sound of human speech— also are far from flat. Poetry relies

on complex temporal dynamics for aesthetic structure(s) and paths toward meaning making. The powerful, pleasurable expansion of linear time (accomplished in part through its sonic relationships) helps distinguish poetry from less resonant and ambiguous language. In this project, poet-scholars and computer scientists improvised interactive, experimental spaces utilizing 3D visualization of poems to explore what (and how) "sonic depth" might mean in analyzing and writing poetry. Our proposed installation displays ways we used and adapted the poetry visualization tool *Poemage* to: 1) reveal 3D sonic-temporal contours of existing poems; 2) interactively aid the iterative interpretation and creation of new poems; and 3) showcase new poems developed through that interaction.

## FreeHands: A Journey along Sketching in Virtual Space

Pauline de Chalendar, Le Fresnoy, Studio National des Arts Contemporains, France Samuel Degrande and Laurent Grisoni, University Lille, INRIA/CNRS

![](_page_29_Picture_3.jpeg)

*FreeHands* is an artwork that addresses the practice and dynamic of modern sketching. This installation involves several types of lines, including some that have been drawn on a paper roll during a

lonesome walk in mountains over the course several days. Here, drawing becomes almost an act of resistance against time that seems to always run faster and faster. Other lines are virtual, and defined to exist only in a 3D world. Hung at the end of the long unrolled paper sheet, two virtual reality headsets allow the viewer to explore an immersive sketching session. The sketching session is recreated using data about the gestures of the artists, previously captured during the original creation process.

# Natural Rejection

#### Demonstrations

![](_page_30_Picture_1.jpeg)

Kurt Kaminski, University of California, Santa Barbara http://vislab.mat.ucsb. edu/2015/kaminski/ p4/index.html

*Natural Rejection* visualizes extinct species from the Tree Of Life Web Project's phylogenetic database. Of the database's 94,300 nodes, 2467 were identified as extinct according to the entries' metadata. Simple rules determine the

angle and position by which a node is placed, giving rise to a gnarled branching form that reflects the structure and content of the database. Users may explore extinct species spatially by hovering or clicking on tips of the tree, revealing the species name and its taxonomic lineage as well as highlighting its path to the root of life on Earth. *Natural Rejection* is a dialogue between these references, the emotional tension underpinning permanent species loss, and the self-preservation reflex evoked by this information.

# Ma<mark>rsh</mark>Vis

QianSheng Li, Shanghai Institute of Technology Gershon Dublon, Brian Mayton, Joseph A. Paradiso, Massachusetts Institute of Technology https://vimeo.com/132137535

*MarshVis* visualizes data from a dense sensor network, highlighting spatiotemporal and inter-sensor relationships while also exposing the system operation. The sensor network documents ecological processes resulting from

31

These interactive visualizatio

![](_page_31_Figure_1.jpeg)

wetland restoration taking place at Tidmarsh Farms, a decommissioned 577-acre cranberry farm in southern Massachusetts. Every 30 seconds, thousands of data points are streamed to a server, capturing a rich picture of the environment in flux as the restoration proceeds. MarshVis represents this information graphically for a variety of users and audiences, ranging

a large- scale

from research collaborators studying wetland ecosystems to the visiting public. Our work is motivated by the need for interactive graphical tools that shed light on the delicate, interdependent ecological processes that make a natural environment sustainable.

# We Need Us

zing Ecology

Julie Freeman, Queen Mary University of London Hannah Redler, Open Data Institute http://weneedus.org

![](_page_31_Picture_6.jpeg)

We Need Us is a real-time, on-line, animated artwork powered by citizen scientists. It explores both "life data" and the life of data, and treats metadata data about data—as

![](_page_32_Picture_1.jpeg)

a raw material: a substance to be manipulated. The work uses open metadata from user science project, *Zooniverse2*, to create an animated sound composition. It explores how the properties of the data as a whole can be experienced, asking: if the data had lives of their own, how would they be revealed?

We Need Us considers the humanity in the network. Properties of data undoubtedly affect the process, output, and intention of an artwork. Real-time data from a biological source can provide a sense of "real-life" within the work, leading us to wonder what it means if the work suddenly stops. Fabricated and misrepresented data can guide us into false truths. Our own data reflected back at us creates an intimacy that prods at our ego, and perhaps engages us in the work longer than a disconnected data source might. In other words, the *context* of data is as much a part of its personality as its content.

![](_page_33_Picture_0.jpeg)

![](_page_33_Picture_1.jpeg)

Credits

VISAP'15 Chairs Angus Forbes, University of Illinois at Chicago http://evl.uic.edu/creativecoding Fanny Chevalier, INRIA http://fannychevalier.net Daria Tsoupikova, University of Illinois at Chicago

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#### 36

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#### Design note

Data may be the new oil. Perhaps it's also a new kind of blood — something which can get spilled in real space. The blood on these pages is generated by the text itself, as it enters the algorithms of Indesign's underline styles. This blood is displaced from its text — its body — by the images which it must flow around. A call and response is thereby executed, partially and uncontrollably disentangled across pages. VISAP'15 is partially supported by the Electronic Visualization Lab and the School of Design at University of Illinois at Chicago, Keysight Technologies, Inc., and the Shapiro Center for Research and Collaboration at the School of the Art Institute of Chicago.

![](_page_36_Picture_2.jpeg)

![](_page_37_Picture_0.jpeg)