



ENCOUNTERING DATA

Artists, scientists, and scholars consider the promise and problem of Big Data

Data is one of the central problems of our era—we have more of it than we can parse, and the question then becomes how we sort, categorize, and otherwise make it legible for interpretation and analysis. Much of this data still exists only as strings of numbers read by machines and then by humans, but in recent years researchers have begun to harness the power of visualization and sonification, as well as the potential for tactile interaction. The ability to perceive data in multiple formats – image, sound, touch – adds immeasurably to the possibilities of understanding and inspecting the massive sets of data that researchers in all disciplines are constantly accumulating. Thus, addressing the problem of data demands that conversations take place across a wide range of disciplines. **ENCOUNTERING DATA** showcases recent works in computer science, art, physics, music, mathematics, and intersections thereof.

Thursday February 9 – Friday February 10, 2012
Stony Brook University

COMPLETE SCHEDULE

THURSDAY, 2/9

3:00 Lecture 1: “The Use of Data Manipulation Techniques in the Music of Iannis Xenakis”

Stefanos Thomopolous – Wang Center Lecture Hall I

4:00 Lecture 2: “Hello_World!: Global Data in the Works of Art of Failure”

Nicolas Maigret – Wang Center Lecture Hall I

5:15 Workshop Theatrical Event: “Phison 7: A Futuristic Look at Immigration Through Interactive Performance”

Jeanette Yew – Wang Center Chapel, followed by Lecture Hall I

6:30 Art Exhibition Reception – SAC Gallery

*Works by: The Art of Failure, Brooke Singer, Dan Tesene,
Joseph Esser, Moira Williams, Nicholas Maigret, Paul Prudence,
Reena Katz, Shawn Greenlee, Timothy Vallier*

FRIDAY, 2/10

4:00 Lecture 3: “Using End-User Machine Learning to Build Data-Driven Musical Instruments”

Rebecca Fiebrink – Simons Center Auditorium

5:00 Lecture 4: “Looking Around Corners: Capturing Light in Motion”

Andreas Velten – Simons Center Auditorium

6:00 Reception – Simons Center Lobby

8:00 Concert – Staller Center Recital Hall

*Performances and works by: The Art of Failure, Carr Wilkerson, Iannis Xenakis,
Jorge Herrera, Luke Dahl, Margaret Schedel, Mark Ballora, Sarah O'Halloran,
Shawn Greenlee, Stephanos Thomopoulos, Timothy Vallier*

10:00 Party – University Cafe

With Performances by Adriano Clemente and Lonely Brook

LECTURES

THURSDAY, 2/9 – CHARLES B. WANG CENTER – LECTURE HALL I

3:00 Lecture 1: The Use of Data Manipulation Techniques in the Music of Iannis Xenakis – Stefanos Thomopolous

Iannis Xenakis (d. 2001), a Greek-born composer who became a citizen of France, wrote stunningly original music. This talk discusses why and how Xenakis came to the manipulation of data methods in the very beginning of his career, and the result this had in the music, through an examination of Stochastic, Symbolic and graphic principles in his music. Two piano pieces, Herma and Evryali, will be the focus; these pieces will be featured on the Friday evening concert.

4:00 Lecture 2: Hello_World!: Global Data in the Works of Art of Failure – Nicolas Maigret

A discussion about their works using global or large scale data. They offer a concrete and sensitive representation of these codified abstractions by different transpositions of the internal disturbances or behaviors of the data. These imperfections allow us to identify a medium, as when glass becomes visible by the accumulation of dust and scratches. Within the ART OF FAILURE collective, Nicolas Maigret and Nicolas Montgermont experiment with the capacity of contemporary technologies to generate specific sound or visual languages. In their realizations, the internal characteristics of the media are revealed through their errors, dysfunctions, borderline successes or failures, which they develop into sensory and immersive audiovisual experiences.

FRIDAY, 2/10 – SIMONS CENTER FOR GEOMETRY AND PHYSICS – AUDITORIUM

4:00 Lecture 3: Using End-User Machine Learning to Build Data-Driven Musical Instruments – Rebecca Fiebrink

I study machine learning from an HCI perspective in order to build interactive machine learning systems that are more effective and efficient, and that allow human users to apply machine learning effectively to new problems. I'm especially interested in applying machine learning to real-time, interactive, and creative domains. Within music, I am interested in studying human-computer interaction in the process of both composition and live performance, and I seek to develop new compositional and performance technologies in collaboration with other composers and performers.

5:00 Lecture 4: Looking Around Corners by Capturing Light in Motion – Andreas Velten

What does the world look like at a trillion frames per second? New optics, mechanics, and algorithms allow us to capture high resolution 2D videos of repetitive events with an effective time resolution of 2 picoseconds. In these videos, light moves less than one millimeter in each frame. The motion of a light pulse and the propagation of light through a scattering medium become visible. Time of flight becomes an additional dimension of data accessible in light capture. Time of flight imaging allows us to do many fundamentally new things in computer vision. The ability to effectively analyze multibounce light transport allows imaging around a corner, capturing of material properties and the analysis of sub surface scattering. Visualizing the captured data directly gives a fascinating intuitive insight into real-time light transport. We have recently demonstrated the reconstruction of objects around a corner in a table top setup. Applications of this new ability are in disaster response, robot navigation, and medical imaging.

PERFORMANCES

THURSDAY, 2/9 – WANG CENTER CHAPEL / LECTURE HALL I

5:15 Workshop Theatrical Event: Phison 7: A Futuristic Look at Immigration Through an Interactive Event – Jeanette Yew

In the year 2400, due to over-population and scarcity of resources on Earth, we develop and move to a new planet called Phison 7. In this new colony, we in the audience (also known as Phisonian) will be given an opportunity to decide via voting who can immigrate into our planet. Our decisions are to be made based on a set of statistical and cultural information about our own colony and the home planets of the applicants and the direct personal pleading that each applicant will make in front of us. This is an interactive event.

Created by Caitlin Bartow and Jeanette Yew with THR 307+680

FRIDAY, 2/10

8:00 Concert – Staller Center Recital Hall

Rubber Petals – Timothy Vallier

Rubber Petals is a collaboration piece between composer Timothy Vallier and artist Moira Williams. Part of a larger work focusing on multiple physical objects, *Rubber Petals* focuses on the sonification/audification of one of those objects. The process of transforming physical objects into sound and subsequently into sheet music involves the use of a 3D infrared camera, in this case, the Microsoft Kinect. Using the Kinect, a 3D snapshot of the object is taken which records 10s of thousands of 3D points which comprise the object, each point carrying an X, Y, and Z location data set.

impressions | expression – Margaret Schedel and Sarah O'Halloran

impressions | expression is a collaboration between composers Margaret Schedel and Sarah O'Halloran. The piece features sonifications of data collected by psychologist Matthew Lerner of the University of Virginia on recognition of facial expressions by people with and without Autism Spectrum Disorder. The work is not meant to further understanding of the data sets, but rather to use the data as a catalyst for musical creativity.

8_SILENCES – Art of Failure

8_Silences offers a sensible representation of the Internet by broadcasting audio streams that travel and reverberate throughout the web. Initially silent, the streams progressively incorporate an infinity of transformations or “errors” that modify the sound as it circulates on the network. These alterations are comparable to a form of erosion caused by the network space – they are the key in allowing different mental representations of this digital topography. Presented as a live performance, *8_Silences* is a sound immersion in the heart of data flows.

Xenakis' *Herma* – Stéphanos Thomopoulos

Herma is the first major piano work from Iannis Xenakis, a Greek-born citizen of France, who studied and worked as an architect as a young man. Xenakis applied various mathematical and statistical processes to his music, which results in alternating clouds of sound and pointillist moments of breathtaking virtuosity. *Herma* is from the Greek work for both “stringing together,” and “foundation.”

Stephanos Thomopoulos is a pianist known for the originality of his repertoire, a choice made by a true reflection on music and art. Considering music as a territory without border, style, or history, he has performed a variety of works from composers who fascinated him since childhood such as Beethoven, Liszt, Debussy, Ravel, Rachmaninov, with recent composers such as Iannis Xenakis, Thomas Adès Philip Glass, George Koumendakis Gerard Pesson, Bruno Mantovani.

~ *Intermission* ~

Xenakis' *Evryali* – Stéphanos Thomopoulos

Evryali uses a technique, somewhat related to fractals, termed “arborescence”, in which a melodic curve generates curves from itself which in turn generates more curves, etc. The result gets so dense that the pianist must sometimes choose which notes to omit. One also notices, of course, the stunning silences, used as one of several contrasting elements. The title comes from the name of one of the Gorgon sisters: we are more familiar with Medusa.

Sounds of the Cosmos – Mark Ballora

These sonifications were created for Rhythms of the Universe, a multi-media production being created by astrophysicist George Smoot and percussionist/ethnomusicologist Mickey Hart.

Impellent – Shawn Greenlee

Using works-on-paper (drawings), the performer shifts what the cameras can see and thereby alters the sonic outcome. All changes are determined by the incoming visual/graphic data. *Impellent* uses two simultaneous camera inputs, one graphic determines sonic timbre and the other graphic determines system states and parameter control.

Tweet Dreams – Luke Dahl, Jorge Herrera, and Carr Wilkerson

Tweet Dreams is a multimedia musical performance made from live Twitter data. During a performance tweets containing specific terms are retrieved from Twitter's servers, sonified into short melodies, and displayed graphically. The piece is created by three groups of users: the audience, the performers, and the world.

10:00 Party – University Cafe

Performances by Adriano Clemente and Lonely Brook

EXHIBITION

TUESDAY, 1/24 – FRIDAY, 2/17 – SAC GALLERY

Decoct – Shawn Greenlee

In Shawn Greenlee's video installation *Decoct* a series of black and white portraits blur into and out of focus. The image data generates an enveloping soundscape, letting the viewer not only see, but also hear the images. The installation confuses the separation of the senses, with grey scale imagery generating a process of listening, in a movement towards synaesthesia.

Ephemeral Artifacts – Timothy Vallier & Moira Williams

Timothy Vallier and Moira Williams' interactive media installation *Ephemeral Artifacts* moves between object and sound—only in this work, the objects vanish from the visual landscape on the screen as soon as they are selected by the viewer. They are replaced with the sound of the objects—not the sounds they would produce, but an aural representation of the form of the original. The viewer interacts with this sound, and an accompanying set of abstract images—dots and lines and blurred shapes—with gesture, pushing forward and back, changing focus.

FFT/RMS #1-4 [Songs of Milarepa] – Paul Prudence

Paul Prudence's work moves in the opposite direction—generating image from sound, through the visualization of audio data. The *FFT/RMS [Songs of Milarepa]* series are generated using parameters derived from realtime audio analysis [frequency and volume] of Eliane Radigue's electroacoustic microtonal 'Songs of Milarepa' LP. Frequency modulates and arrays surface textures, while the volume parameters are used to construct a 3D mesh on which the textures are projected.

EEG [16/01/12, Reading] and EEG [16/01/12, Eyes Closed] – Paul Prudence

While visually similar to the *Songs of Milarepa*, this dyptich utilises realtime EEG [Electroencephalography] readings from the wireless neubotic EEG Pendant device. After Fourier Transform processing in BioExplorer [software] the data is sent to VVVV where Beta/Alpha states are visualised at textures on shapes informed by time-based averages which generate the shape [mesh].

Earth to Disk – The Art of Failure

The Art of Failure's *Earth to Disk* uses earth elevation data—the elevation information is analogically transposed to a 12-inch record. Visually, the records offer a relief of the continents but when placed on a standard turntable, the elevation becomes sonic vibration. Each rotation reveals patterns impossible to simply see.

System Introspection – Nicholas Maigret

System Introspection, by Nicholas Maigret, an artist who collaborates with Art of Failure, observes a different topology—that of the machine itself. The computer is instructed to display its data in sound and on the screen. Sectors stutter into sound, with a multi-colored visual static. The computer thus generates a concrete exploration of its internal binary codes. Intrinsic qualities emerge in this instantaneous depiction of visual and auditory flows: structure, logic, rhythm, redundancy, and compression.

It gets better, Alan – Reena Katz

Reena Katz's installation, *It gets better, Alan*, presents juxtaposed fragments. Bits of text from Dan Savage's "It Gets Better" online project appear on a computer screen, next to a typewriter with World War II Cryptanalyst and Computer Scientist Alan Turing's suicide note in italic script. Any sound triggers the living testimonies of Savage's project to change; Turing's note, indexing the insurmountable devastation he endured because of his queerness, is obdurate.

Superfund365 – Brooke Singer

Brooke Singer's *Superfund365* depicts another kind of violence that lies underneath the surface of things: the devastation wrought on the landscape by environmental contamination. The work shows 365 "Superfund" sites—areas that the government has committed to investigate and clean up toxic waste, drawing on a superfund created by the polluting companies, whose money has long since run out. The website elaborates on these sites with images and statistics, graphs and data showcasing the hazards of these sites.

Oil Fix – Brooke Singer

Included in a collection titled, *An Atlas of Radical Cartography*, Brooke Singer's *Oil Fix* is the most straightforward presentation of data in the exhibit. Perceived through an artist's eye, the large wall graphic depicts various statistics about the transportation of oil, and the living conditions of people in countries with substantial oil deposits.

Ultra Large Crude Carrier – Dan Tesene

Dan Tesene's *Ultra Large Crude Carrier* depicts another environmental hazard: oil. Specifically, the drawing depicts the oil conveyed by carrier ship around the world. The enormous drawing spirals inward, showcasing the almost unimaginable amount of oil that is transported, and required for everyday activities.

Kinesthetic 1.0 – Joseph Esser

This large format sculpture uses data gathered from the placement of visitors to the gallery to bring the sculpture to life. By relating to the observation of the other pieces in the exhibit *Kinesthetic 1.0* moves beyond the object and into the space, activating multiple senses and layers of perception.



For more information about ENCOUNTERING DATA, visit
<http://emedia.art.sunysb.edu/cdact/EncounteringData/>



ENCOUNTERING DATA is presented by the Consortium for Digital Arts, Culture, and Technology (cDACT) at Stony Brook University.