Beyond Borders

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The exhibition works and pictorials featured in this catalogue seek to address the timely theme of borders and the many ways in which they infiltrate our physical and metaphorical spaces as delineated infrastructural elements or impenetrable bounds. Borders can be artificial lines enforced by habit, convenience, force, or law. They can be physical expressions of once conceptual borders, keeping in or keeping out, protecting or preventing. In all their manifestations, borders have counterparts in our minds and our bodies, both individual and social. We tell stories with implicit borders; we speak of boundaries, tribes, parties, identities.

Many of the contributions to this year's program took maps as their basis or product -- maps that are geographically-based, part of an intermediary machine process, temporal by-products of physical or artificial processes, crowd-sourced, or procedurally generated to resemble familiar territories. Others focused on invisible boundaries or instances of transitions/translations between places or stages -- where losses and gains, and other discontinuities are the only visible traces. Some aimed specifically at contested spaces where maps and trajectories are deliberately obscured or redrawn to obfuscate ownership and alliances. In all, we can see a grappling with the utility of borders as convenient packages and the necessity to blur boundaries to get access to another kind of collective truth. It is this back and forth between overview and analysis that makes visualization such a notable asset in the search for dialogue within complexity.

This is the second year the exhibition has included Pictorials, in addition to artworks and opening night demonstrations. The Pictorials present a visual record of the process of creating visualizations and their supporting tools and techniques. The Pictorials are particularly well suited to a research creation methodology which emphasizes an iterative creative approach to enquiry. We are happy to showcase three Pictorials that will be on display during the exhibition and available on the VISAP website thereafter.

Now in its seventh year, VISAP continues to thrive as a proud associated event to IEEE VIS thanks to a large web of supporters. We are thankful for the ongoing logistical support of the IEEE VIS Conference Committee -- particularly the attentive communication of Brian Fisher, Meghan Haley, Maria Velez, Lisa Avila, Jörn Kohlhammer, and Nicole Finn; the VISAP Steering Committee and the outstanding group of expert reviewers that form the Program Committee; and the Vancouver Convention Centre for their flexibility in accommodating an art exhibition in the South Foyer. We are also grateful to our generous supporters: Hochschule Mannheim, Northeastern University College of Arts, Media and Design, and Parsons The New School for Design; as well as Emily Carr University of Art + Design for their organizational, equipment, and infrastructural support of the exhibition. Finally we gratefully acknowledge Valerie Truong who designed the visual identity and website, and Damla Çay who designed the beautiful catalogue for this year's exhibition.

Till Nagel, Yoon Chung Han, and Maria Lantin
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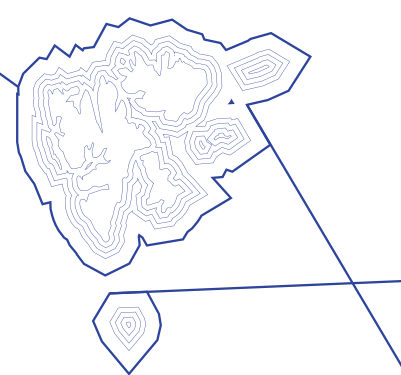
Machine Hallucination

Refik Anadol, Julia Pryde Thompson, Alex Morosov. Nick Boss,
Refik Anadol Studio, Los Angeles, California, United States

Earth is a synesthetic reality experiment that uses machine learning to deconstruct and investigate the memories of machine captured images of Earth from space. This work aims to question the aesthetic representation of our planet acknowledging and providing a visualization of the interconnectedness of its varied landscapes. Acquiring raw images from the ISS and Hubble Telescope we acknowledge the inherent cultural implications that these machines have in various global peacekeeping missions. To objectively view our planet as a holistic concept is to eliminate barriers through a transcendental lens. In order to create a new kind of borderless cartography for such a data universe, we are using a neural network trained on nearly 260,000 images of earth. As the machine generates this new understanding of our planet, it creates hallucinations of earth in 512 dimensions, exploring the ways in which we can challenge our conceptual definition of space itself. The final output for Machine Hallucination: Earth is a compelling AI data painting which provides a kinetic experience of the varied textures that are woven together to create the totality of the place we call home.
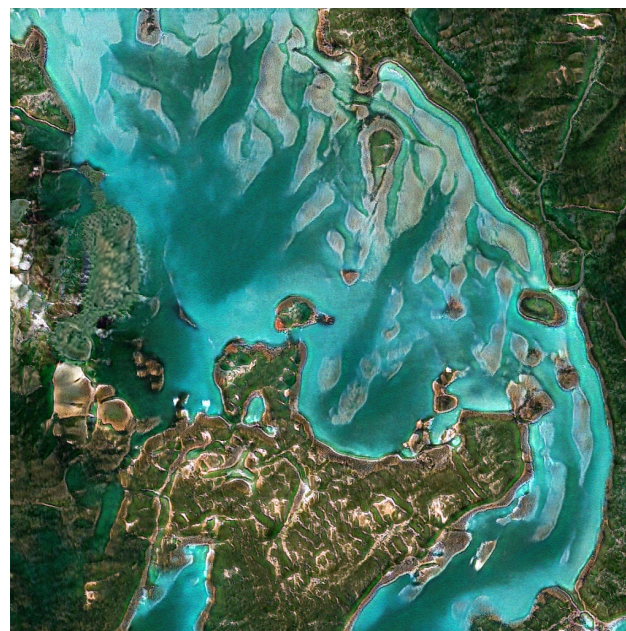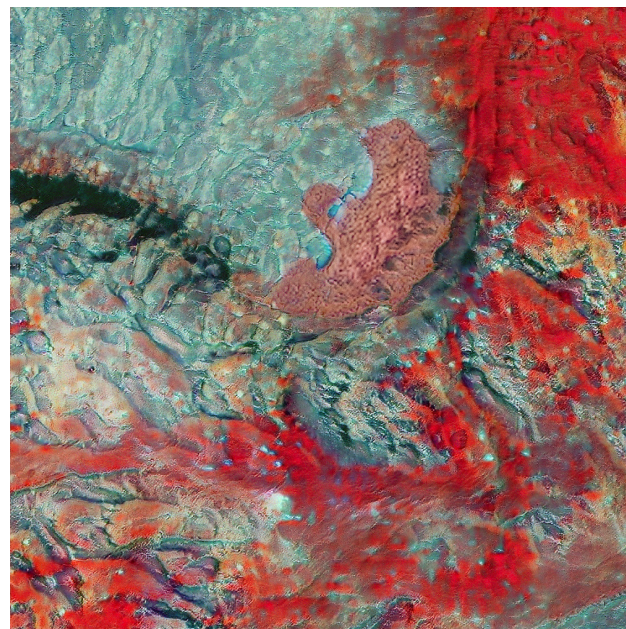
Infranet:NYC, AI/A-life data art installation. Korean Media Art Festival, Sylvia Wald & Po Kim Art Gallery, Manhattan, New York, USA. 2019-8-1 – 2019-10-15. Image by artists.

Infranet:Gwangju, AI/A-life data art installation, screen capture, 2018. Image by artists.

Infranet: Vancouver AI/A-life data art installation

Artificial Nature
Haru Ji, *OCAD University*
Graham Wakefield, *York University*

Can data form a habitat for life?

"Infranet" is a generative artwork realized through a population of artificial lifeforms with evolutionary neural networks, thriving upon open geospatial data of the infrastructure of the city as its sustenance and canvas.

In this living city, the found data grounds an unbounded, decentralized, open-ended, and unsupervised system. Non-human beings flourish in this environment by learning, discovering, communicating, self-governing, and evolving. Born curious, they form spatial networks through which associations spread in complex contagions.

The invitation is to witness, through immersive visualization and sonification of this complex adaptive system, how a new morphologic landscape may exhibit generative creativity and emergent beauty as a possible but speculative city.

The Space Between Characters:
# Trees of Translation

Ignacio Pérez-Messina, *Universidad del Desarrollo*
Ilana Levin, *Universidad Diego Portales*
Simón López Trujillo, *Universidad de Chile*

Beyond every text ever written there is a process that made it happen: a process of fracturing and ramification that paradoxically produces unification and coherence. Thanks to our modern computers, the writing is sometimes as invisible to the writer as it is to the final reader. Characters are inserted and deleted, but the page always looks as clear and clean as the final draft. This project visualizes the invisible process that takes place behind the page, where space is repeatedly created and destroyed, only to make more space for new ideas. As J.L. Borges wrote, "The concept of the definitive text corresponds only to religion or fatigue."

Poetic translation is regarded by some as the purest form of writing, as the translator's duty consists in "conveying the same with different words" and so he is free from the burden of conceiving an idea in the first place. Picking up the metaphor of the tree, selected poems of american poet Emily Dickinson and chilean contemporary poet Victoria Ramírez are translated into each other's language by different chilean translators (including Ramírez herself), and the writing of each piece visualized, exposing the nuances in each individual's translating process.
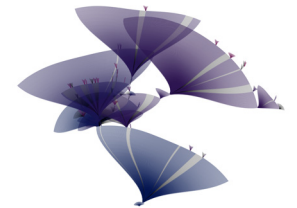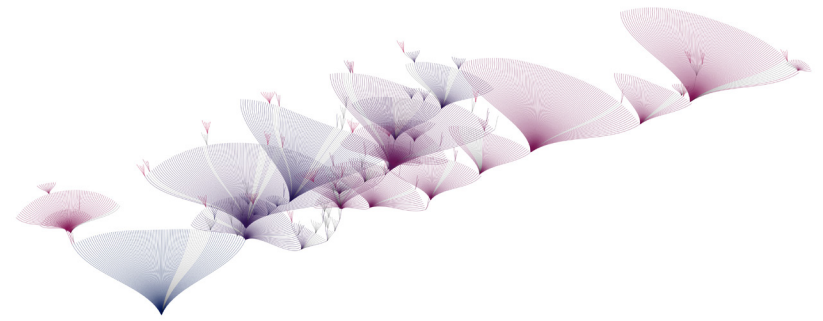
#home

Joel Ong, *York University*

#home responds to the nascent global phenomenon of dislocation, translocation and the ambiguity in the concept of home. It recognizes that home is less a bordered geographical space than a collection of ideals and memories - all of which could be shared across and beyond borders by diverse groups of people around the world.

#home was initially inspired by calvino's invisible cities, where each city described by the protagonist marco polo transits from one to the next through fluid descriptions and caricatures and provokes the question: that all of them are not but different ideas of a single place manifested through different instances of recollection.

The visitor to this installation is asked to come up with a series of key words describing his/her home. These are then used as filters through a realtime twitter feed. These ideas and metonymical utterances that appear in the twitter-verse are collected in a database, and algorithmically constructed as three dimensional forms. These are then 3d printed into small scale architectural prototypes. The cities are printed and amassed over the course of the installation, each one housed in a jar.

Arctic LiDAR

Daniele Profeta, *Syracuse University*

Arctic LiDAR is an immersive 360° Video Installation exploring the quickly expanding logistic landscape of the Arctic coast.

In this work Borders are invoked and simultaneously posed into question as devices able to position viewers within a specific context: for example, they are leveraged as starting point of a geopolitical conversation on the system of logistics, an infrastructure of commerce that pushes against established, rigid nation-state borders. Borders become experiential devices in the medium of the 360° video, when machinic and human vision are slowly contaminated, suggesting alternative territories of perception; finally, in the context of the installation, Borders between physical and digital content are problematized as a part of a stale dichotomy, providing moments of alignment as well as tension between the content displayed in the VR headset and the physical counterpart of the exhibit. Borders and their activations to engage in a conversation around the Space of Logistics.

Ultimately the installation urges the viewers to understand the architecture of logistics beyond a 'technicality', a politically neutral act of management, but rather as one that predicates itself around ideas of anticipation and prediction, acting as a transforming agent of the built environment, of territories as well as of bodies.
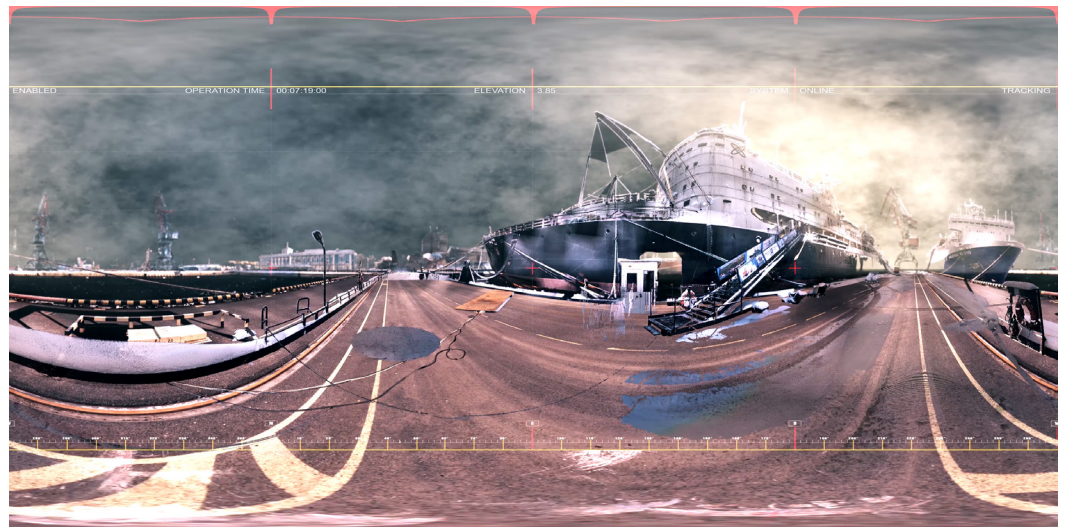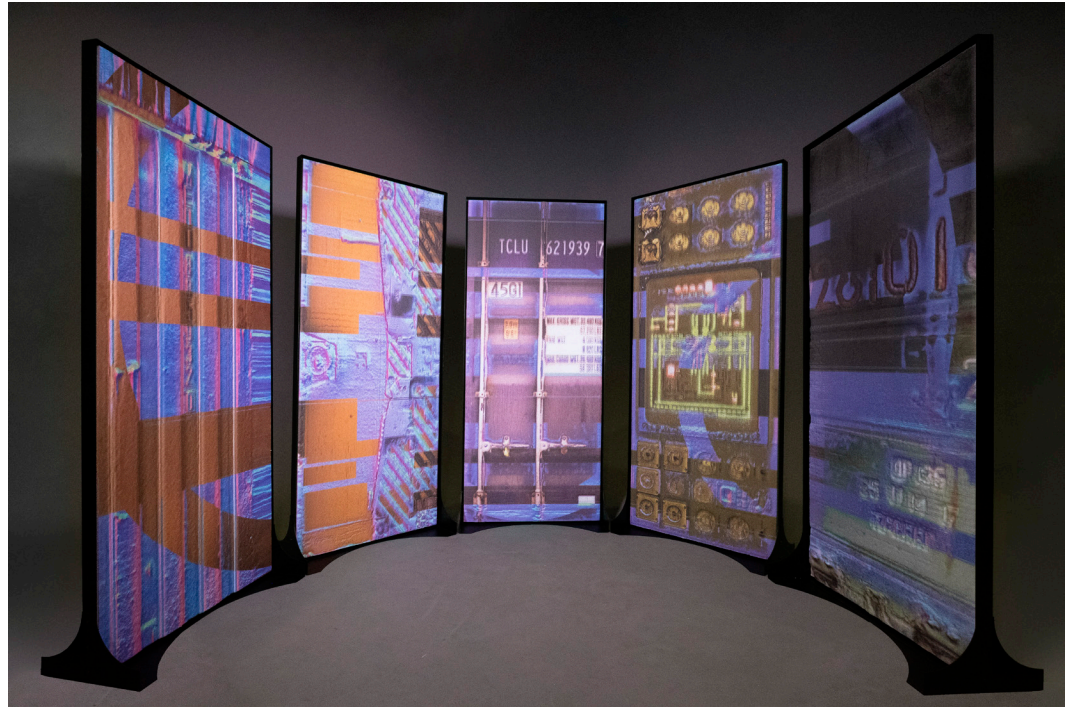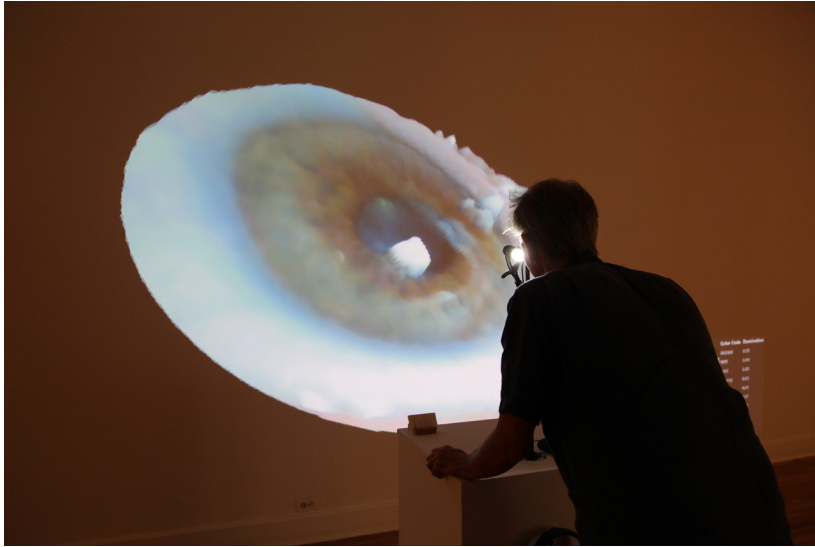
Eyes

Yoon Chung Han, *San Jose State University*
Praful Surve, *Accutive*

"Eyes" is an interactive biometric data art that transforms human's Iris data into musical sound and 3D animated image. The idea is to allow the audience to explore their own identities through unique visual and sound generated by their iris patterns based on iris recognition and image processing techniques. Selected iris images are printed in 3D sculptures, and it replays the sound generated from the iris data and projects 3D converted image images. This research-based artwork has an experimental system generating distinct sounds for each different iris data using visual features such as colors, patterns, brightness and size of the iris. It has potentials to lead the new way of interpreting complicated dataset with the audiovisual output. More importantly, aesthetically beautiful, mesmerizing and a bit uncanny valley-effected artwork can create personalized art experience and multimodal interaction. Multi-sensory interpretations of the iris data art can lead a new opportunity to reveal users' narratives and create their own "sonic signature", which will be able to trigger a new way of interaction in the fields of art and science.

Cartographers of North Korea

Wonyoung So, Fábio Duarte
Massachusetts Institute of Technology

Volunteered Geographic Information (VGI) has made possible the expansion the mapping to previously unmapped areas, thanks to technological advancements such as Web 2.0 and satellite imagery. However, more than a technical feature, VGI has brought to light the political aspects of cartography, when multiple stakeholders have access to mapping tools. This is the case of the collaborative mapping strategies used to map North Korea. OpenStreetMap (OSM) enables "armchair mappers" to map opaque territories in which local governments control citizens' access to the internet. In this project we ask the following questions: Who is mapping North Korea in OSM? Which tools and methods do contributors use to gain access to information about the country and to represent it? What are the motivations behind this mapping endeavor? We analyze technical aspects of OSM data for North Korea and structured correspondence exchanged with 889 contributors. We argue that crowdsourced efforts can make good the dearth of knowledge resulting from the physical, cultural and political barriers associated with uncharted territories and that, although the motivations for such efforts vary greatly, they all have their origin in a sense of empathy and the power technology has to penetrate geopolitical barriers.

Distribution of Contributors by # of Contribution
* Names have been anonymized for privacy
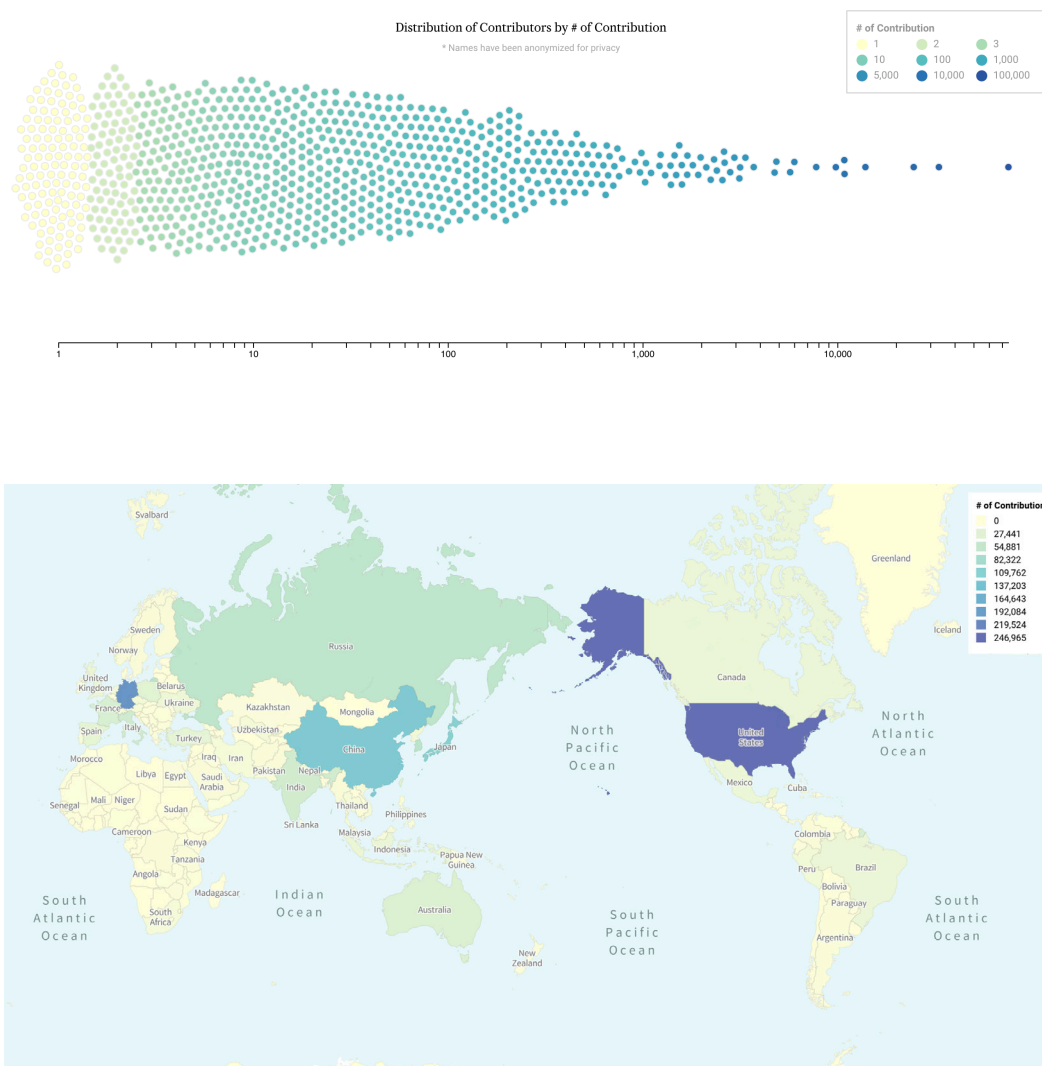
OceanForestAir

Mieka West, *University of Calgary*

What will it take for North Americans to act on climate change? OceanForestAir aims to elicit empathy for our natural surroundings and shared carbon sinks. It is a cumulative emissions physicalization made of four handmade pieces. Each piece is a year in the data: 1750, 1990, 2010 and 2030. The project uses repurposed materials and data from Environment Canada and the World Resources Institute.

The first piece, 1750, represents pre-industrial times where cumulative emissions are negligible and the earth is able to sustain these outputs. This piece shows a multitude of free flowing coloured yarn, representing the carbon sinks and their vast biodiversity. Fast forward to today, Canada's forests, have turned into carbon sources and are no longer able to offset the emissions we generate. Cumulative emissions are represented by grey yarn winding and tightening around the pieces. The intention of this project is for viewers to think of emissions from the perspective of the oceans, forests and air, and to mimic a sensation of tension and suffocation.

Distinction Machine

Kim F. Albrecht

metaLAB, Harvard, Cambridge, Europäische Medienwissenschaft and Universität Potsdam

By rendering shapes of different colors in the same location, the computer reveals its incapacity of representing ambiguity. In these experiments, a computer-mediated aesthetic of strange and intricate patterns emerges.
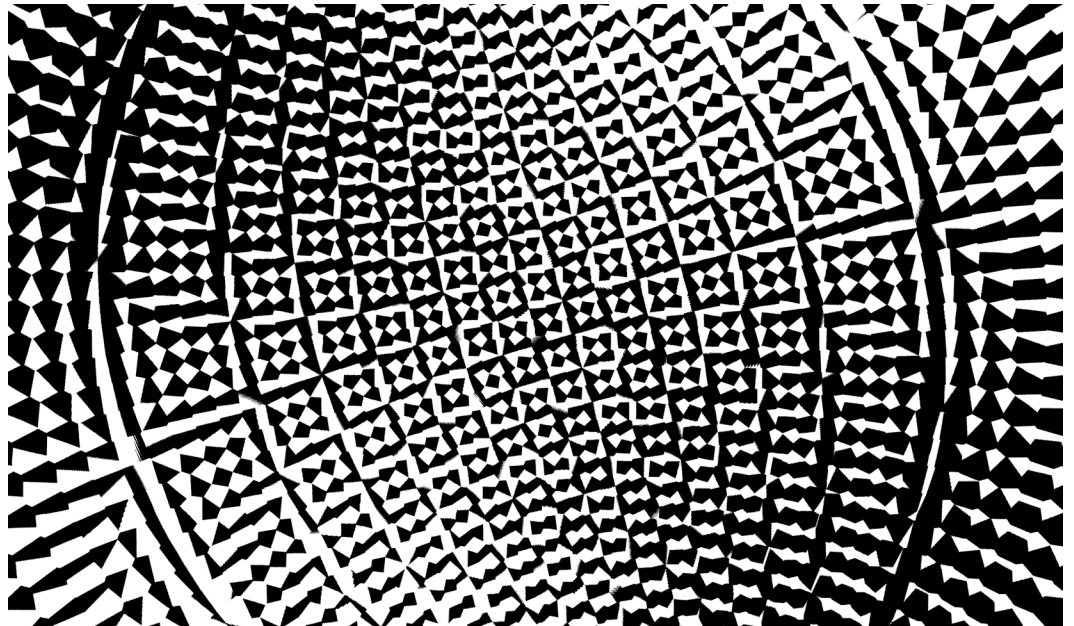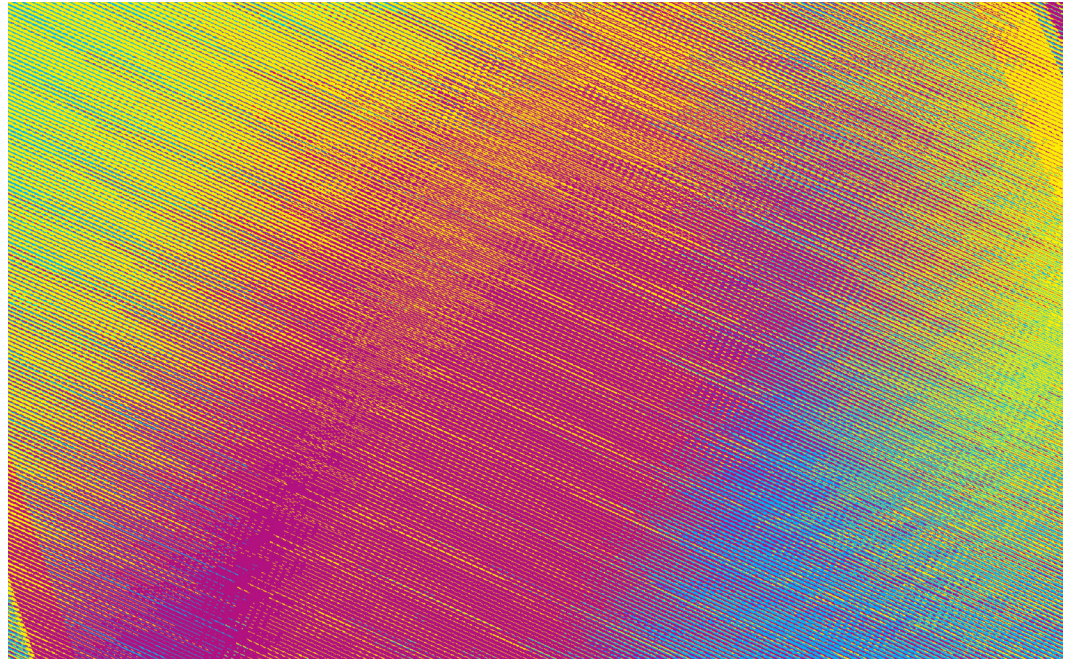
Watchers

Benjamin D. R. Bogart

Objects are constructed through their excision from context that requires the manifestation of a border that both includes and excludes. This separation allows for recognition and temporal continuity that are the basis of subjectivity where the world is experienced as a collection of objects. These objects emerge from the interaction between the subjective imagination of borders and the underlying structure of the world. Machine Subjects, such as "Watching (2001: A Space Odyssey)," manifest this subjective act in clustering algorithms that 'understand' through boundary-making. Subjective machines construct abstract 'mental' images that reflect underlying statistical properties of the world while differing from the world. The subjectivity of "Watching (2001: A Space Odyssey)" is embedded in the world portrayed in Kubrick's 1968 cinematic depiction of AI. The machine appropriates the film by breaking up each frame using mean shift segmentation (including similar pixels and excluding others), then grouping those segments (including segments of similar colour and rough shape and excluding others) into percepts. Percepts are represented by the visual mean of their constituent segments. 'Mental' images are constructed by replacing each segment with its most similar percept. These percepts also serve as the visual vocabulary for large-scale collage.

Fog of Finance Visualising Offshore and the Aesthetics of Uncertainty

Michele Mauri, *DensityDesign Lab,*
Ángeles Briones, *DensityDesign Lab*
Jonathan Gray, *King's College London*
Daniel Haberly, *University of Sussex*
Chris Anderson, *University of Leeds*
Tommaso Venturini, *Centre National de la Recherche Scientifique*
Michele Invernizzi, *DensityDesign Lab*

Foreign Direct Investment (FDI) consists of controlling investments by companies and individuals that cross international borders. FDI is often considered to be the backbone of the global economy, as it is created whenever a company makes a "bricks-and-mortar" cross-border investment in a factory or other facility, or acquires or merges with a company in another country. FDI also consists largely of "paper" shell companies used for tax avoidance and other purposes. Corporations create chains of such companies moving through "conduit" countries, often bringing money back to the origin country. There is uncertainty about the amounts of money that are transferred between coun- tries and the paths they follow. This project combines various available data sources to explore these complex chains of investments, what we know about them, and what we don't. The project uses offshore companies as a proxy to see power relationships among countries, introducing a system that unpacks the FDI money flows and its degree of uncertainty. The design of the interactive tool allows exploring FDI between selected countries, making the case for stronger disclosure rules. This is materialized encoding the uncertainty — explained through the concept of "fog"— of these obscured investments as blurred flows.
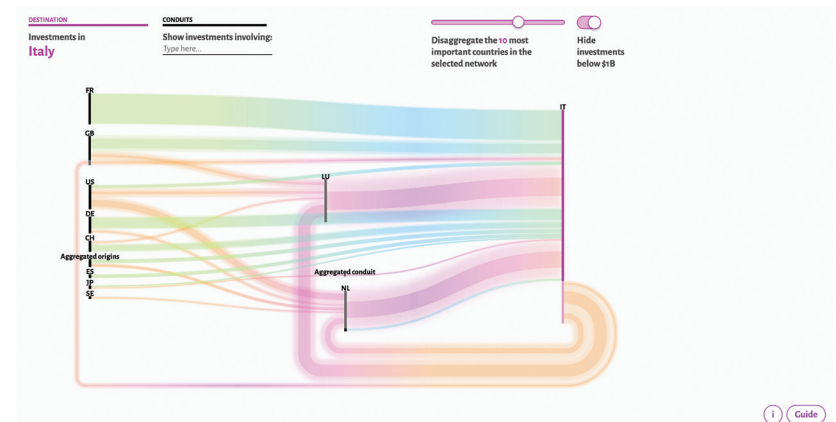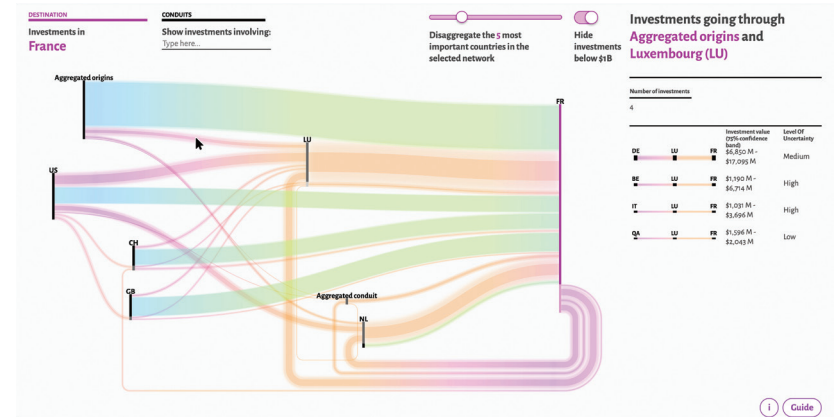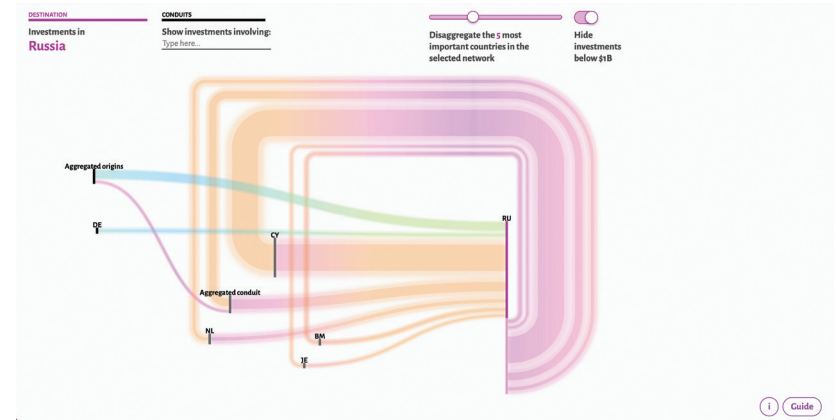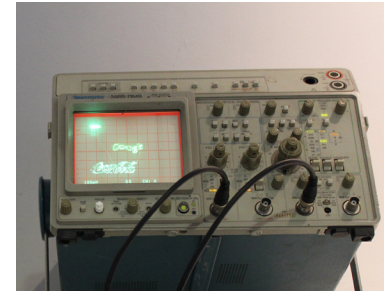
Demonstrations

Do-It-Yourself Visualization

Nil Tuzcu
Massachusetts Institute of Technology

Keywords: Tangible interaction, Augmented reality, DIY

Brand Logo Sonification

Sihwa Park
University of California

Keywords: Brand Logos; Image Processing; Vector Synthesis; Data Visualization; Data Sonification; Oscilloscope; Brand Ranking Data

Borrowed Scenery

Weidi Zhang
Experimental Visualization Lab, University of California

Keywords: Image Data Visualization, Virtual Reality, Algorithmic Art, Spatial Assemblage

Visualizing Visualizers

Doris Kosminsky,
Lucas Barcellos Oliveira,
Claudio Esperança
Federal University of Rio de Janeiro

Keywords: Networks, VIS papers, collaborations, researchers, aesthetics

Pictorials

Scientific Visualization: Enriching Vocabulary via the Human Hand

Francesca Samsel, *University of Texas at Austin*
Seth A Johnson, *University of Minnesota*
Annie Bares, *University of Texas at Austin*
Daniel F. Keefe, *University of Minnesota*

Keywords: Scientific visualization; glyphs; visual art; collaboration

As scientific data grow larger and more complex, an equally rich visual vocabulary is needed to fully articulate its insights. We present a series of images that are made possible by a recent technical development "Artifact-Based Rendering," a component of our broader effort to create a methodology for scientific visualization that draws on principles of art and design.areas of future research.

Dustmark and Ozone Tattoos: Autographic displays of air pollution

Dietmar Offenhuber, *Art + Design, Northeastern University*

Keywords: autographic visualization, traces, environmental data, public space

We present two examples of autographic visualizations - displays based on material traces rather than digital data - that aim to make environmental pollution visible and legible. Using particulate matter and ground-level ozone pollution as case studies, this pictorial illustrates the design principles of creating autographic visualizations that make phenomena reveal themselves.

Mapping The Prelude: A Visualisation of Wordsworth's Poetry

Andrew Richardson, *Northumbria University*

Keywords: Poetry, Visualisation, Text, Literature, Mapping, Walking, Geospatial, Computation

Mapping The Prelude is an investigation which explores the potential for a creative code-driven approach to re-locate Wordsworth's epic autobiographical poem, The Prelude, in the context of the wider geographic landscape which informed and inspired his work. Situated between disciplines of creative data manipulation and digital humanities, the project begins to examine novel ways to re-map the 'landscape' of a literary text in relationship with its wider geo-spatial data: exploring the border area between literary and geographic spaces and creating new encounters of each. This annotated portfolio outlines the work produced during the investigation and considers areas of future research.
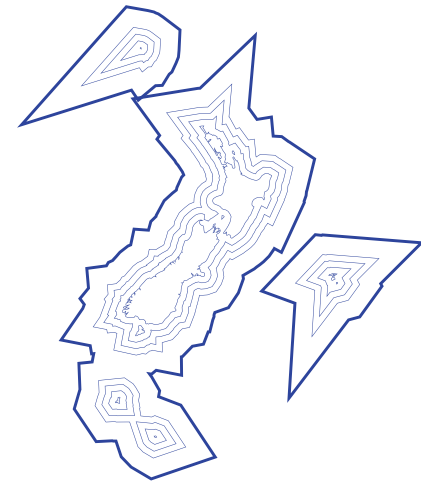
Program

Session 1: AI & Geography

Wednesday, 23 October
9:00 am - 10:30 am, Room 8+15

Chair: Yoon Chung Han

LOoW: Visualizing Art & Science collaborations (Keynote)
Ingrid Koenic, Randy Lee Cutler

Mapping The Prelude: A Visualisation of Wordsworth's Poetry (Pictorial)
Andrew Richardson

Data Brushes: Interactive Style Transfer for Data Art (Paper)
Mahika Dubey, Jasmine Tan Otto, Angus G. Forbes

Infranet: A Geospatial Data-Driven Neuro-Evolutionary Artwork (Paper)
Graham Wakefield, Haru Hyunkyung Ji

Invited artist talks

Session 2: Physical & Environmental

Thursday, 24 October
9:00 am - 10:30 am, Room 8+15

Chair: Till Nagel

Dustmark and Ozone Tattoos: Autographic displays of air pollution (Pictorial)
Dietmar Offenhuber

Data Manifestation: Merging the Human World and Global Climate Change (Paper)
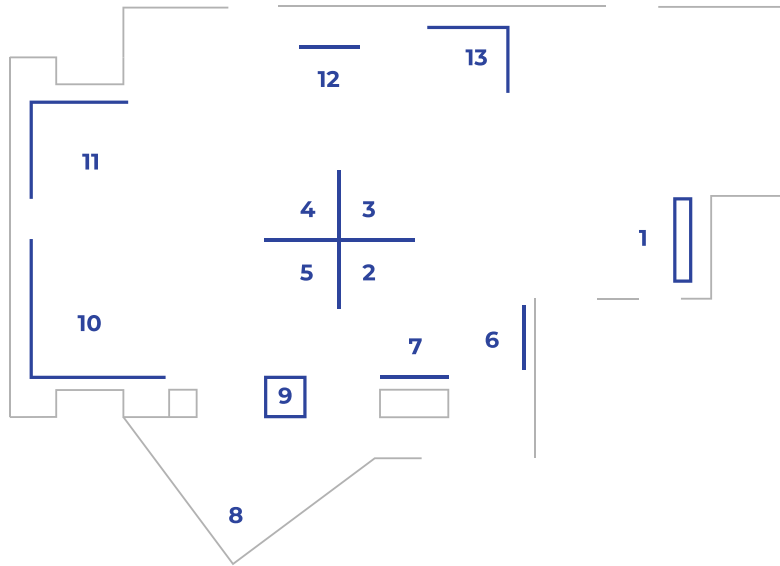*Karin von Ompteda*

Scientific Visualization: Enriching Vocabulary via the Human Hand (Pictorial)
Francesca Samsel, Seth A. Johnson, Annie Bares, Daniel F. Keefe

Embroidering Translations between Digital Art and Design for a Sustainable Environment (Paper)
Rodrigo Rosales González, Ana Carolina Robles Salvador

Invited artist talks
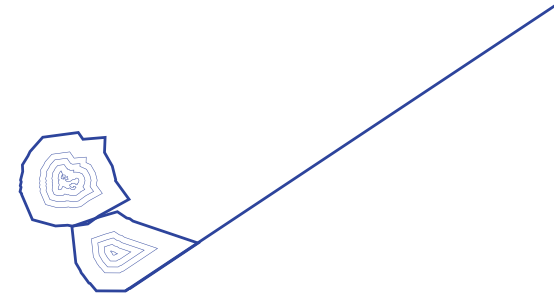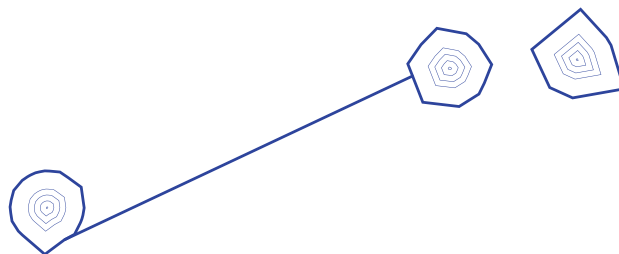
Exhibition plan

1. Pictorials

2. Demonstrations
Do-It-Yourself visualization
Borrowed Scenery
Brand Logo Sonification
Visualizing Visualizers

Installations
3. Fog of Finance: Visualising Offshore and the Aesthetics of Uncertainty
4. The Space Between Characters: Trees of Translation
5. #home
6. Distinction Machine
7. Machine Hallucination
8. Eyes
9. OceanForestAir
10. Infranet: Vancouver
11. Watchers
12. Cartographers of North Korea
13. Arctic LiDAR

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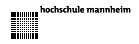https://creativecoding.soe.ucsc.edu

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