



LEONARDO ELECTRONIC ALMANAC

VOL 18 NO 3 VOLUME EDITORS LANFRANCO ACETI, JANIS JEFFERIES,

IRINI PAPADIMITRIOU / EDITORS JONATHAN MUNRO AND ÖZDEN ŞAHİN

Touch and Go is published in collaboration with Watermans and Goldsmiths College in occasion of the Watermans' International Festival of Digital Art, 2012, which coincides with the Olympics and Paralympics in London. The issue explores the impact of technology in art as well as the meaning, possibilities and issues around human interaction and engagement. *Touch and Go* investigates interactivity and participation, as well as light art and new media approaches to the public space as tools that foster engagement and shared forms of participation.



TOUCH AND GO

Copyright 2012 ISAST

Leonardo Electronic Almanac

Volume 18 Issue 3

August 2012

ISSN 1071-4391

ISBN 978-1-906897-18-5

The ISBN is provided by Goldsmiths, University of London.

LEA PUBLISHING & SUBSCRIPTION INFORMATION

Editor in Chief

Lanfranco Aceti lanfranco.aceti@leoalmanac.org

Co-Editor

Özden Şahin ozden.sahin@leoalmanac.org

Managing Editor

John Francescutti john.francescutti@leoalmanac.org

Art Director

Deniz Cem Öndüğü deniz.onduygu@leoalmanac.org

Editorial Board

Peter J. Bentley, Ezequiel Di Paolo, Ernest Edmonds, Felice Frankel, Gabriella Giannachi, Gary Hall, Craig Harris, Sibel Irzik, Marina Jirotko, Beau Lotto, Roger Malina, Terrence Masson, Jon McCormack, Mark Nash, Sally Jane Norman, Christiane Paul, Simon Penny, Jane Prophet, Jeffrey Shaw, William Uricchio

Contributing Editors

Nina Czegledy, Susan Collins, Leonardo Da Vinci, Anna Dumitriu, Vince Dziekan, Darko Fritz, Marco Gillies, Davin Heckman, Saoirse Higgins, Jeremy Hight, Denisa Kera, Frieder Nake, Vinoba Vinayagamoorthy

Cover Image

Scenocosme

Editorial Address

Leonardo Electronic Almanac

Sabancı University, Orhanlı – Tuzla, 34956

Istanbul, Turkey

Email

info@leoalmanac.org

Web

- » www.leoalmanac.org
- » www.twitter.com/LEA_twitts
- » www.flickr.com/photos/lea_gallery
- » www.facebook.com/pages/Leonardo-Electronic-Almanac/209156896252

Copyright © 2012

Leonardo, the International Society for the Arts,
Sciences and Technology

Leonardo Electronic Almanac is published by:

Leonardo/ISAST
211 Sutter Street, suite 501
San Francisco, CA 94108
USA

Leonardo Electronic Almanac (LEA) is a project of Leonardo/
The International Society for the Arts, Sciences and Technol-
ogy. For more information about Leonardo/ISAST's publica-
tions and programs, see <http://www.leonardo.info> or contact
isast@leonardo.info.

Leonardo Electronic Almanac is produced by
Passero Productions.

Posting of this journal is prohibited without permission of
Leonardo/ISAST, except for the posting of news and events
listings which have been independently received.

The individual articles included in the issue are © 2012 ISAST.

LEONARDO ELECTRONIC ALMANAC, VOLUME 18 ISSUE 3

Touch and Go

VOLUME EDITORS

LANFRANCO ACETI, JANIS JEFFERIES, IRINI PAPADIMITRIOU

EDITORS

JONATHAN MUNRO, ÖZDEN ŞAHİN

Watermans International Festival of Digital Art, 2012

Touch and Go is a title that I chose together with Irini Papadimitriou for this LEA special issue. On my part with this title I wanted to stress several aspects that characterize that branch of contemporary art in love with interaction, be it delivered by allowing the audience to touch the art object or by becoming part of a complex electronic sensory experience in which the artwork may somehow respond and touch back in return.

With the above statement, I wanted to deliberately avoid the terminology 'interactive art' in order to not fall in the trap of characterizing art that has an element of interaction as principally defined by the word interactive; as if this were the only way to describe contemporary art that elicits interactions and responses between the artist, the audience and the art objects.

I remember when I was at Central Saint Martins writing a paper on the sub-distinctions within contemporary media arts and tracing the debates that distinguished between electronic art, robotic art, new media art, digital art, computer art, computer based art, internet art, web art... At some point of that analysis and argument I realized that the common thread that characterized all of these sub-genres of aesthetic representations was the word art and it did not matter (at least not that much in my opinion) if the manifestation was material or immaterial, conceptual or physical, electronic or painterly, analogue or digital.

I increasingly felt that this rejection of the technical component would be necessary in order for the electronic-robotic-new-media-digital-computer-based-internet art object to re-gain entry within the field of fine art. Mine was a reaction to an hyper-fragmented

and indeed extensive and in-depth taxonomy that seemed to have as its main effect that of pushing these experimental and innovative art forms – through the emphasis of their technological characterization – away from the fine arts and into a ghetto of isolation and self-reference. Steve Dietz's question – *Why Have There Been No Great Net Artists?*¹ – remains unanswered, but I believe that there are changes that are happening – albeit slowly – that will see the sensorial and technical elements become important parts of the aesthetic aspects of the art object as much as the brush technique of Vincent Willem van Gogh or the sculptural fluidity of Henry Moore.

Hence the substitution in the title of this special issue of the word interactivity with the word touch, with the desire of looking at the artwork as something that can be touched in material and immaterial ways, interfered with, interacted with and 'touched and reprocessed' with the help of media tools but that can also 'touch' us back in return, both individually and collectively. I also wanted to stress the fast interrelation between the art object and the consumer in a commodified relationship that is based on immediate engagement and fast disengagement, touch and go. But a fast food approach is perhaps incorrect if we consider as part of the interactivity equation the viewers' mediated processes of consumption and memorization of both the image and the public experience.

Nevertheless, the problems and issues that interactivity and its multiple definitions and interpretations in the 20th and 21st century raise cannot be overlooked, as much as cannot be dismissed the complex set of emotive and digital interactions that can be set in motion by artworks that reach and engage large groups of people within the public space. These interactions

generate public shows in which the space of the city becomes the background to an experiential event that is characterized by impermanence and memorization. It is a process in which thousands of people engage, capture data, memorize and at times memorialize the event and re-process, mash-up, re-disseminate and re-contextualize the images within multiple media contexts.

The possibility of capturing, viewing and understanding the entire mass of data produced by these aesthetic sensory experiences becomes an impossible task due to easy access to an unprecedented amount of media and an unprecedented multiplication of data, as Lev Manovich argues.²

In *Digital Baroque: New Media Art and Cinematic Folds* Timothy Murray writes that "the retrospective nature of repetition and digital coding—how initial images, forms, and narratives are refigured through their contemplative re-citation and re-presentation—consistently inscribes the new media in the memory and memorization of its antecedents, cinema and video."³

The difference between memorization and memorialization may be one of the further aspects in which the interaction evolves – beyond the artwork but still linked to it. The memory of the event with its happening and performative elements, its traces and records both official and unofficial, the re-processing and mash-ups; all of these elements become part of and contribute to a collective narrative and pattern of engagement and interaction.

These are issues and problems that the artists and writers of this LEA special issue have analyzed from a variety of perspectives and backgrounds, offering to the reader the opportunity of a glimpse into the complexity of today's art interactions within the contemporary social and cultural media landscapes.

Touch and Go is one of those issues that are truly born from a collaborative effort and in which all editors have contributed and worked hard in order to

deliver a documentation of contemporary art research, thought and aesthetic able to stand on the international scene.

For this reason I wish to thank Prof. Janis Jefferies and Irini Papadimitriou together with Jonathan Munro and Özden Şahin for their efforts. The design is by Deniz Cem Önduygu who as LEA's Art Director continues to deliver brilliantly designed issues.

Lanfranco Aceti

Editor in Chief, *Leonardo Electronic Almanac*
Director, Kasa Gallery



1. "Nevertheless, there is this constant apparently inherent need to try and categorize and classify. In *Beyond Interface*, an exhibition I organized in 1998, I 'datamined' ten categories: net.art, storytelling, socio-cultural, biographical, tools, performance, analog-hybrid, interactive art, interfacers + artificers. David Ross, in his lecture here at the CAD-RE Laboratory for New Media, suggested 21 characteristics of net art. Stephen Wilson, a pioneering practitioner, has a virtual – albeit well-ordered – jungle of categories. Rhizome has developed a list of dozens of keyword categories for its ArtBase. Lev Manovich, in his *Computing Culture: Defining New Media Genres* symposium focused on the categories of database, interface, spatialization, and navigation. To my mind, there is no question that such categorization is useful, especially in a distributed system like the Internet. But, in truth, to paraphrase Barnett Newman, "ornithology is for the birds what categorization is for the artist." Perhaps especially at a time of rapid change and explosive growth of the underlying infrastructure and toolsets, it is critical that description follow practice and not vice versa." Steve Dietz, *Why Have There Been No Great Net Artists? Web Walker Daily* 28, April 4, 2000, <http://bit.ly/QJEWIY> (accessed July 1, 2012).
2. This link to a Google+ conversation is an example of this argument on massive data and multiple media engagements across diverse platforms: <http://bit.ly/pGgDsS> (accessed July 1, 2012).
3. Timothy Murray, *Digital Baroque: New Media Art and Cinematic Folds* (Minneapolis: University of Minnesota Press, 2008), 138.

Touch and Go: The Magic Touch Of Contemporary Art

It is with some excitement that I write this preface to Watermans International Festival of Digital Art, 2012. It has been a monumental achievement by the curator Irini Papadimitriou to pull together 6 groundbreaking installations exploring interactivity, viewer participation, collaboration and the use or importance of new and emerging technologies in Media and Digital Art.

From an initial call in December 2010 over 500 submissions arrived in our inboxes in March 2011. It was rather an overwhelming and daunting task to review, look and encounter a diverse range of submissions that were additionally asked to reflect on the London 2012 Olympic and Paralympic Games. Submissions came from all over the world, from Africa and Korea, Austria and Australia, China and the UK, Latvia and Canada and ranged from the spectacularly complicated to the imaginatively humorous. Of course each selector, me, onedotzero, London's leading digital media innovation organization, the curatorial team at Athens Video Art Festival and Irini herself, had particular favorites and attachments but the final grouping I believe does reflect a sense of the challenges and opportunities that such an open competition offers. It is though a significant move on behalf of the curator that each work is given the Watermans space for 6 weeks which enables people to take part in the cultural activities surrounding each installation, fulfilling, promoting and incorporating the Cultural Olympiad themes and values 'inspiration, participation and creativity.'

Some, like Gail Pearce's *Going with the Flow* was made because rowing at the 2012 Olympics will be held near Egham and it was an opportunity to respond and create an installation offering the public a more interactive way of rowing, while remaining on dry land, not only watching but also participating and having an effect on the images by their actions. On the other hand, Michele Barker and Anna Munster's collaborative *Hocus Pocus* will be a 3-screen interactive artwork that uses illusionistic and performative aspects of magical tricks to explore human perception, senses and movement. As they have suggested, "Magic – like interactivity – relies on shifting the perceptual relations between vision and movement, focusing and diverting attention at key moments. Participants will become aware of this relation as their perception catches up with the audiovisual illusion(s)" (artists statement, February 2011). Ugochukwu-Smooth Nzewi and Emeka Ogboh are artists who also work collaboratively and working under name of One-Room Shack. *UNITY* is built like a navigable labyrinth to reflect the idea of unity in diversity that the Games signify. In an increasingly globalized world they are interested in the ways in which the discourse of globalization opens up and closes off discursive space whereas Suguru Goto is a musician who creates real spaces that are both metaphysical and spiritual. *Cymatics* is a kinetic sculpture and sound installation. Wave patterns are created on liquid as a result of sound vibrations generated by visitors. Another sound work is Phoebe Hui's *Granular Graph*, a sound instrument about musical gesture and its notation.


Audiences are invited to become a living pendulum. The apparatus itself can create geometric images to represent harmonies and intervals in musical scales. Finally, Joseph Farbrook's *Strata-caster* explores the topography of power, prestige, and position through an art installation, which exists in the virtual world of Second Life, a place populated by over 50,000 people at any given moment.

Goldsmiths, as the leading academic partner, has been working closely with Watermans in developing a series of seminars and events to coincide with the 2012 Festival. I am the artistic director of Goldsmiths Digital Studios (GDS), which is dedicated to multi-disciplinary research and practice across arts, technologies and cultural studies. GDS engages in a number of research projects and provides its own postgraduate teaching through the PhD in Arts and Computational Technology, the MFA in Computational Studio Arts and the MA in Computational Art. Irini is also an alumni of the MFA in *Curating* (Goldsmiths, University of London) and it has been an exceptional pleasure working with her generating ideas and platforms that can form an artistic legacy long after the Games and the Festival have ended. The catalogue and detailed blogging/documentation and social networking will be one of our responsibilities but another of mine is to ensure that the next generation of practitioners test the conventions of the white cube gallery, reconsider and reevaluate artistic productions, their information structure and significance; engage in the museum sector whilst at the same time challenging the spaces for the reception of 'public' art. In addition those who wish to increase an audience's interaction and enjoyment of their work have a firm grounding in artistic practice and computing skills.

Consequently, I am particularly excited that the 2012 Festival Watermans will introduce a mentoring scheme for students interested in participatory interactive digital / new media work. The mentoring scheme involves video interviews with the 6 selected artists and their work, briefly introduced earlier in this preface, and discussions initiated by the student. As so often debated in our seminars at Goldsmiths and

elsewhere, what are the expectations of the audience, the viewer, the spectator, and the engager? How do exhibitions and festival celebrations revisit the traditional roles of performer/artist and audiences? Can they facilitate collaborative approaches to creativity? How do sound works get curated in exhibitions that include interactive objects, physical performances and screens? What are the issues around technical support? How are the ways of working online and off, including collaboration and social networking, affecting physical forms of display and publishing?

As I write this in Wollongong during the wettest New South Wales summer for 50 years, I want to end with a quote used by the Australia, Sydney based conjurers Michele Barker and Anna Munster

Illusions occur when the physical reality does not match the perception. 

The world is upside down in so many alarming ways but perhaps 2012 at Watermans will offer some momentary ideas of unity in diversity that the Games signify and *UNITY* proposes. Such anticipation and such promise!

Janis Jefferies

*Professor of Visual Arts
Goldsmiths
University of London, UK*

23rd Dec 2011, University of Wollongong, NSW, Australia

-
1. Stephen L. Malnik and Susana Martinez-Conde, *Sleights of Mind: What the Neuroscience of Magic Reveals about our Everyday Deceptions* (New York: Henry Holt and Company, 2010), 8.

Leonardo Electronic Almanac

Volume 18 Issue 3

4 **EDITORIAL** Lanfranco Aceti

6 **INTRODUCTION** Janis Jefferies

10 **SUGURU GOTO, CYMATICS, 2011 - AN ACTION SHARING PRODUCTION** Simona Lodi & Luca Barbeni
+ **SUGURU GOTO** in conversation with Paul Squires

30 **INTERACTIVITY, PLAY AND AUDIENCE ENGAGEMENT** Tine Bech

44 **UNITY: IN PURSUIT OF THE HUMANISTIC SPIRIT** One-Room Shack Collective
+ **ONE-ROOM SHACK COLLECTIVE** in conversation with Evelyn Owen

52 **HOKUSPOKUS** Michele Barker & Anna Munster

58 **AS IF BY MAGIC** Anna Gibbs

60 **BLACK BOXES AND GOD-TRICKS: AN ACCOUNT OF USING MEDICAL IMAGING SYSTEMS TO PHOTOGRAPH CONSCIOUSNESS IN THE CONTEXT OF A DIGITAL ARTS PRACTICE** Eleanor Dare

72 **CO-AUTHORED NARRATIVE EXPERIENCE: AFFECTIVE, EMBODIED INTERACTION THROUGH COMBINING THE DIACHRONIC WITH THE SYNCHRONISTIC** Carol MacGillivray & Bruno Mathez

84 **UNTITLED** Phoebe Hui
+ **PHOEBE HUI** in conversation with Jonathan Munro

98 **GOING WITH THE FLOW**
GAIL PEARCE in conversation with Jonathan Munro

102 **THE SWEET SPOT** Graeme Crowley in collaboration with The Mustard and Blood Orchestra

108 **STRATA-CASTER: AN EXPLORATION INTO THE TOPOGRAPHY OF POWER, PRESTIGE, AND POSITION** Joseph Farbrook
+ **JOSEPH FARBROOK** in conversation with Emilie Giles

114 **WHERE IS LOURENÇO MARQUES?: A MOSAIC OF VOICES IN A 3D VIRTUAL WORLD** Rui Filipe Antunes

122 **GEOMETRY**
FÉLICIE D'ESTIENNE D'ORVES in conversation with Claire Le Gouellec

130 **THE EMPOWERING POTENTIAL OF RE-STAGING** Birgitta Cappelen & Anders-Petter Andersson

140 **SCENOCOSME: BODY AND CLOUDS**
Grégory Lasserre & Anaïs met den Ancxt

154 **LIGHT, DATA, AND PUBLIC PARTICIPATION**
Dave Colangelo & Patricio Davila

164 **INCARNATED SOUND IN MUSIC FOR FLESH II: DEFINING GESTURE IN BIOLOGICALLY INFORMED MUSICAL PERFORMANCE**
Marco Donnarumma

176 **THE STORY OF PARCIVAL: DESIGNING INTERACTION FOR AN INTERDISCIPLINARY DANCE PERFORMANCE** Gesa Friederichs-Büttner & Benjamin Walther-Franks

190 **INTERACTION'S ROLE AS CATALYST OF SYNTHESIZED INTELLIGENCE IN ART** Judson Wright

200 **IN SEARCH OF A DIGITAL MASTERPIECE (OR TWO): STANZA**
Maria Chatzichristodoulou [aka Maria X]

212 **TELEMATIC TOUCH AND GO**
Ellen Pearlman, Newman Lau & Kenny Lozowski

224 **HAPTIC UNCONSCIOUS: A PREHISTORY OF AFFECTIVITY IN MOHOLY-NAGY'S PEDAGOGY AT THE NEW BAUHAUS**
Charissa N. Terranova

236 **THE GESTALT OF STREET TEAM: GUERRILLA TACTICS, GIFS, AND THE MUSEUM** Charissa N. Terranova

240 **BIOGRAPHIES**

250 **ACKNOWLEDGEMENTS**

Light, Data, and Public Participation

by

Dave Colangelo & Patricio Davila

Dave Colangelo
Ph.D. Candidate in Communication and Culture, York and Ryerson Universities
Instructor, OCAD University
dave.colangelo@gmail.com
http://www.davecolangelo.com

Patricio Davila
Ph.D. Candidate in Communication and Culture, York and Ryerson Universities
Assistant Professor, OCAD University
patricio@patriciodavila.com
http://www.patriciodavila.com

INTRODUCTION

What happens when you combine the explanatory potential of information visualization with situated and collective experiences produced by urban screens? As practices in reactive architecture and locative media converge and urban screens and projection technologies proliferate people are becoming increasingly able to interact with data in public space. This confluence presents us with modes of digitally mediated participation in urban space that highlight bodily and architectural relationships with data rich environments as well as new sets of problems and possibilities regarding aesthetics, poetics, and politics. The article will analyze works by Alfredo Jaar, Krzysztof Wodiczko, and Rafael Lozano-Hemmer, as they respectively exemplify the efficacy of the key components of public data visualization: mapping, expanded presence through architecture, and the ‘incomplete’ and participatory nature of relational aesthetics. A more recent example, the *E-TOWER* project, an interactive data visualization of Toronto’s *energy* visualized on the CN Tower for Nuit Blanche 2010, will also be examined as a form of collective participation in public data visualization. ¹ These projects provide the case studies necessary to reflect on the concept of the public, the potential of relational art strategies and the utility of play strategies for combining visualization and public space in order to enrich these spaces through the dramatization, problematization, animation, and relation of people, places, and data with from-a-distance interaction and urban screens.

ABSTRACT

As practices in reactive architecture and locative media converge and urban screens and projection technologies proliferate we are becoming increasingly able to interact with data in public space. This confluence presents us with modes of digitally mediated participation in urban space that highlight bodily and architectural relationships with data rich environments as well as new sets of problems and possibilities regarding aesthetics, poetics, and politics. The article will analyze works by Alfredo Jaar, Krzysztof Wodiczko, and Rafael Lozano-Hemmer, as they respectively exemplify the efficacy of the key components of public data visualization: mapping, expanded presence through architecture, and the ‘incompleteness’ and participatory nature of relational aesthetics. A more recent example, the E-TOWER project, an interactive data visualization project of Toronto’s energy visualized on the CN Tower for Nuit Blanche 2010, will also be examined as a form of collective participation in public data visualization. These projects provide the case studies necessary to reflect on the concept of the public, the potential of relational art strategies and the utility of play strategies for combining visualization and public space in order to enrich these spaces through the dramatization, problematization, animation, and relation of people, places, and data with from-a-distance interaction and urban screens.

NEW SPACES

With smart phones, networked screens, large digital public displays, and the many surfaces being mapped with images from powerful projectors, connections thicken between concurrent and contingent, on- and offline spaces and the traces that each device can obtain from the people and things that inhabit them. Large media facades, ² reactive and relational architecture, ³ geo-tagging, projection mapping, and networked location-aware mobile devices present us with a potentially productive confluence — a fluid, digital

layer ⁴ that permeates the city. This mix of technology and urban space creates an increasingly conflated real and virtual space — a hybrid space. ⁵

In the context of a history of lights, the city, and public space, we have seen the reinvigoration of sociality in physical space via digital layers (urban screens, reactive architecture, projection mapping, geo-tagging, and augmented reality) that blanket public and private space.

The combination of networked, fragmented publics of the Internet and the publics formed in the squares, roads, and shared physical spaces of our cities, now adorned by media facades, sensors, and mobile devices, presents us with an expanded presence for cultural engagement and self-reflection. As Scott McQuire points out:

.. *media-dense spaces, comprising a variety of platforms such as large screens, LED signage, wireless networks, and a growing range of interactive capabilities ... are the inheritors of the tradition of public space constituted by street life, city squares, cafes, and public cultural institutions. They have assumed the task of catering for those who are present at a moment when being present has assumed new dimensions.*⁶

The layers constituted by the city, data, and communications networks create a new and unique point upon which identity; knowledge, narrative and experience can be constructed.

VISUALIZING DATA IN SPACE

The digital and interactive visualization of information has added yet another layer to this hybrid space. Continued advancement in computation and the increasingly ubiquitous presence of networked data gathering and data-storing processes and devices has produced an incredible surge of information available to both specialized researchers and general consumers. Information visualization is one response to the cognitive and representational challenges related to the information excess brought about by these technical advances.

Augmenting cognition is often stated as the key purpose of information visualization.⁷ The externalizing of cognitive processes, rearrangement of visual information, and facilitation of pattern-recognition make visualization an incredibly powerful tool for both analysis and persuasion — a power that, the authors argue, is further increased when within the concept of visualization are incorporated public space, built structures and participation.

Some of the first instances of visualization are simple tools for counting or mapping things in geographic space.⁸ By representing quantities of things or events in time and space as abstract forms, visualizations allow the visual human sensory apparatus to find shapes in data and, through more elaborate cognitive processes, infer correlations. This capacity to find patterns and meaning is augmented significantly when computers are used to amass, calculate, arrange, and animate large amounts of data. These latest forms of visualization, which include animation and interaction, allow users to see change over time and explore different spatial configurations of the data.

Of particular importance is the mapping function that occurs through a visualization operation. Donna Cox suggests that visualizations are particularly powerful in how they recontextualize data.⁹ For instance, when demographic data is placed on a visual representation of the city, a *source domain* is mapped onto a *target domain*. Meaning is thus borrowed from one in order to create new meaning.

While this mapping function occurs regularly in visualizations presented on paper and screens we may also think of ways this applies to mapping *virtual* data onto other *physical* spaces. Information visualization that takes on an architectural scale often presents new data resting on a built structure where both components bring a network of meanings. In order to employ the notion of Cox's *visaphor* we need to adapt it to the way new meaning is created with physical structures. Data, according to Cox, represents the source domain and its translation into a visual model, the target domain, produces the visaphor and recontextualizes the source data. For our purposes, the visual model includes both the image (color, animation, shape) and the physical structure.

Take, for instance, Alfredo Jaar's *Lights in the City*,¹⁰ presented as part of Mois De La Photo in Montreal in 1999. In this piece, red lights were installed in the Cupola of the Marché Bonsecours, a landmark in Old Montreal. Homeless shelters located within 500 yards of the Cupola were equipped with information about the installations. In each shelter were installed electronic buttons connected wirelessly to the red lights in the Cupola. Every time a client entered one of the shelters they were asked to push a button that would engage the lights. The lights sent a sign to the city about the unacceptable condition of the homeless while respecting their privacy. At the same time, as the Cupola had suffered from several fires in the past, the red light represented a new threat to the community, that of its own inadequacy in caring for its members.

The real-time data generated by people entering shelters and its representation in the Cupola allowed the viewers to experience a marginalized and largely invisible flow of people. Jaar succeeded in collecting and displaying data about the city and mapping it onto

a powerful symbol of the city — source domain and target domain combined through light and networks of data.

There is another point to be made here about the potential of visualizing data in public space. Traditionally, visualizations have been treated as surfaces for a sole user to view. With architectural projections, these visualizations can be viewed simultaneously by a group of users. Shared experiences within large visualization environments can harness the cognitive and communicative capacity in a group of viewers.

The mapping of information onto physical contexts and the shared experience of interacting with a visualization signal a key combination of participatory and meaning-making potentials that are the focus of public data visualizations. The physical space in which the visualization is displayed as well as the opportunity for people to engage collectively can provide novel ways of experiencing space as well as opportunities of apprehending the complex data flowing between users, objects and environments.



Shared experiences within large visualization environments can harness the cognitive and communicative capacity in a group of viewers.



As a precursor to the potential of visualization in public space and on existing architecture we may turn to the works of Krzysztof Wodiczko to provide an example of how imagery and physical structure can become a powerful tool for social commentary. Wodiczko's projection works create a surrealistic collision between the image of a building or monument and the projected image. In this relationship, the built environment has figured as a central element of the final work as it brings forth its own social histories. For instance, Wodiczko's *The St. Louis Projection* in which prisoners and victims of crime share their stories, was originally intended to be projected on the face of the St. Louis Historical Old Courthouse, the site of a landmark lawsuit against slavery in 1846. Due to last-minute controversy concerning the content of the project it was moved to a nearby library building. This movement signals the potential for the social histories of buildings to be re-presented along with contemporary issues through visualizations and projections.

While Jaar's installation visually abstracts the movement of people in the city, Wodiczko's installation literally places the bodies of people onto the building. Through light, architecture, and data visualization, these works, along with the E-TOWER project discussed below, allow for the creation of stories and knowledge that are directly connected and representative of viewers located in that space.

E-TOWER

Our first attempt at combining data visualization and public space was E-TOWER.¹¹ E-TOWER was an interactive visualization installation that was presented at Scotiabank Nuit Blanche 2010, a citywide all-night contemporary art event¹² that took place on October 2, 2010 in Toronto. E-TOWER asked participants to interact with Toronto's CN Tower, the world's third

tallest free-standing structure,¹³ by texting the word *energy* along with any additional text that would be displayed on the E-TOWER Twitter feed. The color and speed of the lights on the tower varied depending on the amount of *energy* sent by participants around the city. Volunteers at five vantage points around the city handed out information cards and encouraged participation.

This project attempted to engage participants as intelligent reporters that might respond to both the visual stimulus provided by the tower and E-TOWER information cards and volunteers that informed the audience of the significance of the lights on the tower. The participants were entrusted with initiating and perpetuating the data visualization.

For every ten texts we received, the lights on the tower would advance to the next *energy phase* running through a series of increasingly energetic stages and culminating in a multi-colored animation. Additional Twitter functionality allowed for a more nuanced field of interaction where, in 140 characters or less, participants could express and share their thoughts, feelings, and ideas related to the project.

Throughout the night, individuals and groups participated by sending their *energy* to the tower, creating links across physical and virtual space, in proximity and at a distance, sutured together by the tower as a shared representational and communicative beacon. Like Jaar's *Lights in the City*, E-TOWER allowed the city to communicate to itself with itself through a visualization of data using light and architecture. By using the CN Tower as the central transfer point for the city's participation, people's actions were mapped on to a powerful civic symbol.

PARTICIPATION AND RELATING THINGS IN PUBLIC

The convergence of publicly accessible space and viewable displays affords another possibility of relating people and things in ways that are participatory as well as revelatory. The term *public*, especially in view of the installations we are discussing, requires an elaboration in order to understand part of the potential in visualizations appearing on buildings. The notion of *public* can be defined as a group of people interested in a particular problem.¹⁴ *Res publica* evokes the notion of a thing held in common. We take this aspect of *public* to be our basic concept to explain how public data visualization may function.

To *make things public*, as Bruno Latour advocates,¹⁵ is to bring together a diversity of reactants that escape representation. Latour argues for an active and creative engagement with the networks of associations not only between people but also between people and things that are often disregarded. For Latour, to make things public is to make spaces for critical reflection and engagement, which entails gathering people and things that can develop active and critical engagement.

In order to manage the added complexity of ephemeral data flows and multiple actors, a mention of how relational aesthetics has been theorized may provide a useful foundation for work in this field.¹⁶ At the heart of relational form is the idea that an installation is incomplete without participation.¹⁷ We can think of relational aesthetics, as artist Liam Gillick puts it, as we might think of a light in a fridge: it only works if someone opens it.¹⁸ Jaar's *Lights in the City* is an excellent example, as it remains inactive and imperceptible without the participation of clients from the homeless shelter pressing buttons in various shelters around the city. This on-going incompleteness encourages viewers and participants to enter into a dialogue not only with the artwork but with others 'present' in the space produced by the artist.¹⁹ Meaning is

therefore elaborated collectively and the work allows for the formation of temporary publics where the relations between humans are central to the intention of the work. Relational aesthetics is concerned with fostering inter-subjective relationships. Here, if we combine Latour's concept of the politics of things and their existence as actors in public space, along with the combination and collision of these actors (which include data, architecture, and participants) within a framework of participation and relationality, we can see how complexities, data flows, and multiple actors are combined, dramatized, and externalized.

Wodiczko's work is similar in its explicit aim to create inter-subjective relations in public space. In *The St. Louis Projection*, victims and perpetrators of crime as well as other viewers enter into a public discussion with the aim of healing. With Jaar's *Lights in the City*, we can trace relations between the homeless, shelters, and the city through the lights on the tower. Inter-subjectivity between people, things, and data is co-constituted by these various actors and networks combining in the processes of the artwork.

Works that engage a relational aesthetic seek to model a possible universe²⁰ by creating a micro-utopia,²¹ and not one where all is harmonious, but one where communication among participants is enabled and emphasized, regardless of the outcome. These works, as Bourriaud notes, bring about the conditions for social exchange and interaction with the viewer generating "processes of communication in their concrete dimensions as tools that can be used to bring together individuals and human groups."²² Rather than represent social utopias or engage in critique, relational works attempt to create tangible spaces for social experimentation in an effort to discover new assemblages and "possible relations between discreet units by building alliances between different partners."²³ Far from being a social utopia, Jaar's work sets out a so-

cial experiment, which rests upon the cooperation and consent of various participants in making a connection, through the data they create and the communicative assemblage of electronics, light, and architecture, with a public they seek recognition from.

Claire Bishop has perhaps been one of the most notable critics of relational aesthetics.²⁴ She notes that the theory, as set out by Bourriaud, lacks an agonistic element crucial to democratic process.²⁵ She has also critiqued the emancipatory and political import that is taken for granted through the assumption, via the intention of the artist, of *producing* rather than *reflecting* social conditions, and thus trumping mere optical contemplation of the work. Although Bishop's criticisms are not unfounded, and we should not jump to conclude that relational works are automatically political and democratic, it should be noted that the works we have described thus far and related to relational aesthetics can certainly be seen as both producing *and* reflecting social conditions, allowing for an oscillation between direct participation and spectatorship, and allowing for dissensus, most notably in the option to disengage the work by non-participation. Extending relational aesthetics beyond the gallery, into public space and on to architecture, and augmenting participation through data and networks and allowing these works to remain incomplete without participation better produces and reflects the relationships that constitute our contemporary experience.

Present concerns amongst the artistic community reflect the increased importance of relational aesthetics, particularly as it can be applied to public space. As Patricia Phillips writes: "A growing number of artists and agencies believe that the responsibility of public artists and agencies is not to create permanent objects for presentation in traditionally accepted public places but, instead, to assist in the construction of a public – to encourage through actions, ideas, and

interventions, a participatory audience where none seemed to exist."²⁶ Like Latour's notion of *making things public*, aspects of relational form – particularly its emphasis on the incomplete and the production of relationships through our environment including the relationship between and with non-human actors such as data and architecture – can help us think about how we might construct temporary, productive spaces that highlight associations between actors by using light, data, and the built environment.

Rafael Lozano-Hemmer is particularly adept at incorporating relationality between people, architecture, and public space. Perhaps the most well known example is *Body Movies*, which Lozano-Hemmer describes as part of a larger project on "Relational Architecture."²⁷ *Body Movies* has been installed in public squares across Europe, in Hong Kong, and in New Zealand, often projected on to significant public architecture. The work is activated by participants walking in front of powerful light sources and casting shadows on a wall, revealing projected photographic portraits otherwise obscured by the lights. Video surveillance tracking systems trigger new portraits when existing ones have been fully revealed by participants.

According to Timothy Druckrey: "Relational architecture disorganizes the master narratives of a building by adding and subtracting audio-visual elements to affect it, effect it and re-contextualize it."²⁸ In many ways, *Body Movies* achieves this by allowing people, through shadows or images, to represent themselves on an architectural scale. Druckrey goes on to note that relational architecture "is an evocation of the kind of social space in which active participation is not a by-product, but the driving force in the creation of dynamic agora."²⁹ Here, Lozano-Hemmer's work illustrates the kind of dynamic participatory space made possible by light, data traces, and architecture and the possibilities of relational aesthetics.



Play is important for inviting and sustaining participation in public space. Play helps to coordinate impersonal social relations and enables participants to enter into a contest or situation in which they share a common space and a set of rules.



PLAY

In many ways, the work of Lozano-Hemmer exemplifies the spirit of the work of the Situationist International (SI), a group whose influence has had wide ranging impacts on how we theorize and practice what it means to be public amidst shifting political, social, and technical conditions. Constant Nieuwenhuys, a Situationist whose primary concern was architecture, outlined a theory of "unitary urbanism" that involved treating the city not as a Corbusian machine for living, but as an artist's tool, creating lived artworks that are temporary, emergent, ephemeral, transitory and volatile.³⁰ The Situationists envisioned cities built with movable walls and elements of public space that could be manipulated creatively and collectively, often with a spirit that was as critical as it was playful.

Ludic elements³¹ may be beneficial to dramatizing public space and data. Play, Scott McQuire notes, "... is a key mechanism for testing and potentially reinventing social rules concerning appropriate modes of public behaviour."³² Play is important for inviting and sustaining participation in public space. Play helps to coordinate impersonal social relations and enables participants to enter into a contest or situation in which they share a common space (screen, data and public space) and a set of rules. For instance, *Tentacles*, a project produced by Michael Longford, Geoffrey Shea and Rob King, invites users to add themselves to an ecosystem projected in a public common area where they can control the movements of their avatars through their respective mobile phones.³³ As their creatures interact on the shared display, players can decide to cooperate or compete as they can either steal valuable *tenticules* and inhibit the growth of others, or share resources with one another. What results is a public field of play: a space that accommodates passion and cooperation as well as adversarial positions. More importantly, play is important for increasing the frequency of personal contact that is vital for the development of culture, a point that the

Situationists advocated.³⁴ In fact, the Situationists envisioned cities as playing fields for new, participatory games that elicited emotional experiences. "The urbanists of the twentieth century," Debord said, "will have to construct adventures."³⁵

CONCLUSION

Engaging people through light, architecture, and data, in overlapping material and immaterial spatial regimes, as the artists and theorists described above have, allows us to explore the expanded presence afforded by the current interconnected state of media, communication, and public space. This work, as Liliana Bounegru points out, can afford "opportunities for amplified consciousness of the self in relation to other beings in an intense sensorial, engaging way which goes beyond community and allows a more primary, more deep sense of human communion, a collective genesis afforded through technological mediation."³⁶ In public data visualizations, we can represent actors (human and non-human) and networks on physical structures in order to augment and extend the impact of these actors and the participatory processes between them while weaving a richer tapestry between physical and virtual spaces. ■

REFERENCES AND NOTES

1. "E-TOWER," <http://www.ewater.ca> (accessed June 18, 2011).
2. See SPOTS Installation, "HVB Immobilien AG – SPOTS," <http://www.spots-berlin.de/en/index.php> (accessed June 18, 2011).
3. See Rafael Lozano-Hemmer, "Body Movies," http://www.lozano-hemmer.com/body_movies.php (accessed June 10, 2011).
4. Struppek Mirjam, "Urban Screens – The Urbane Potential of Public Screens for Interaction," *Interactive City* 6, 2 (2006).
5. Adriana De Souza e Silva, "From Cyber to Hybrid," *Space and Culture* 9, 3 (2006): 261–278.
6. Scott McQuire, "Mobility, Cosmopolitanism and Public Space in the Media City," in *Urban Screens Reader*, ed. Scott McQuire et al. (Amsterdam: Institute of Network Cultures, 2009), 61.
7. Stuart K Card, Jock D. Mackinlay and Ben Shneiderman, *Readings in Information Visualization: Using Vision to Think* (San Francisco, CA: Morgan Kaufmann Publishers, 1999), 1.
8. For instance, see Michael Friendly and D.J. Denis, "Milestones in the history of thematic cartography, statistical graphics, and data visualization," <http://www.math.yorku.ca/SCS/Gallery/milestone/> (accessed June 29, 2011), where he notes that one of the earliest known maps is the Konya town map (c. 6200 BC) in Turkey.
9. Cox calls this *visaphor* and builds on George Lakoff and Mark Johnson's work in "Metaphors We Live By;" see Donna Cox, "Metaphoric Mappings: The Art of Visualization," in *Aesthetic Computing*, ed. Paul A. Fishwick (Cambridge, MA: MIT Press, 2006), 89–114.
10. "alfredo jaar," *Alfredo Jaar*, <http://www.alfredojaar.net/index1.html> (accessed June 7, 2011).
11. "E-TOWER," <http://www.ewater.ca> (accessed June 18, 2011).
12. "Scotiabank Nuit Blanche," Scotiabank Nuit Blanche, <http://www.scotiabanknuitblanche.ca/> (accessed June 7, 2011).
13. "CN Tower," Wikipedia, http://en.wikipedia.org/wiki/Cn_tower (accessed June 25 2011).
14. See John Dewey, *The Public and Its Problems*, (Chicago, IL: Swallow Press, 1954).
15. Bruno Latour and Peter Weibel, *Making Things Public: Atmospheres of Democracy*, (Cambridge, MA [Karlsruhe, Germany]: MIT Press ZKM/Center for Art and Media in Karlsruhe, 2005).
16. Nicolas Bourriaud, *Relational Aesthetics*, (Dijon: Les Presse Du Réel, 1998).
17. The *incomplete* is a necessary aspect of digital aesthetics, according to Sean Cubitt. See Sean Cubitt, "Precepts for Digital Artwork," in *Fluid Screens, Expanded Cinema*, eds. Janine Marchessault and Susan Lord (Toronto: University of Toronto Press, 2007), 304–319.
18. Gillick, quoted in Claire Bishop, "Antagonism and Relational Aesthetics," *October* 100 (2009): 60.
19. Bourriaud, *Relational Aesthetics*, 112.
20. *Ibid.*, 13.
21. *Ibid.*, 31.
22. *Ibid.*, 43.
23. *Ibid.*, 45.
24. Claire Bishop, "Antagonism and Relational Aesthetics," *October* 100 (2009).
25. For an exploration of agonism see Ernesto Laclau and Chantal Mouffe, *Hegemony and Socialist Strategy* (London: Verso, 1985).
26. Phillips, quoted in Steve Dietz, "Public Sphere_s," *Media Art Net*, http://www.medienkunstnetz.de/themes/public_sphere_s/public_sphere_s/ (accessed April 1, 2010).
27. See Rafael Lozano-Hemmer, "Body Movies," http://www.lozano-hemmer.com/body_movies.php (accessed June 10, 2011).
28. Druckrey, quoted in Steve Dietz, "Public Sphere_s," *Media Art Net*, http://www.medienkunstnetz.de/themes/public_sphere_s/public_sphere_s/ (accessed April 1, 2010).
29. *Ibid.*
30. Constant, "Unitary Urbanism," in *The Situationists and the City*, ed. Tom McDonough (London: Verso, 2009), 112–22.
31. Johan Huizinga argues that culture, and cultural development, bears the character of play. See Johan Huizinga, *Homo Ludens: A study of the Play Element in Culture* (Boston, MA: Beacon Press, 1950).
32. Scott McQuire, "Immaterial Architectures: Urban Space and Electric Light," *Space and Culture* 8, no. 2 (2005): 57. Michael Longford, Rob Kind, and Geoffrey Shea, "Tentacles," <http://www.tentacles.ca/> (accessed June 8, 2011).
33. Constant, "Unitary Urbanism," in *The Situationists and the City*, ed. Tom McDonough (London: Verso, 2009), 120.
34. Guy Debord, "Toward a Situationist International," in *The Situationists and the City*, ed. Tom McDonough (London: Verso, 2009), 103.
35. Liliana Bounegru, "Interactive Media Artworks for Public Space: The Potential of Art to Influence Consciousness and Behaviour in Relation to Public Spaces," in *Urban Screens Reader*, ed. Scott McQuire et al. (Amsterdam: Institute of Network Cultures, 2009), 213.

