GSD DESIGN LABS

Annual Report
2016 - 2017

CITY FORM LAB
Professor Andres Sevtsuk

COMPUTATIONAL GEOMETRY LAB
Professor Preston Scott Cohen
Professor Andrew Witt
Professor Cameron Wu

THE JUST CITY LAB
Professor Toni Griffin

MATERIALS PROCESSES AND SYSTEMS GROUP
Professor Martin Bechthold

RESPONSIVE ENVIRONMENTS AND ARTIFACTS LAB
Professor Allen Sayegh

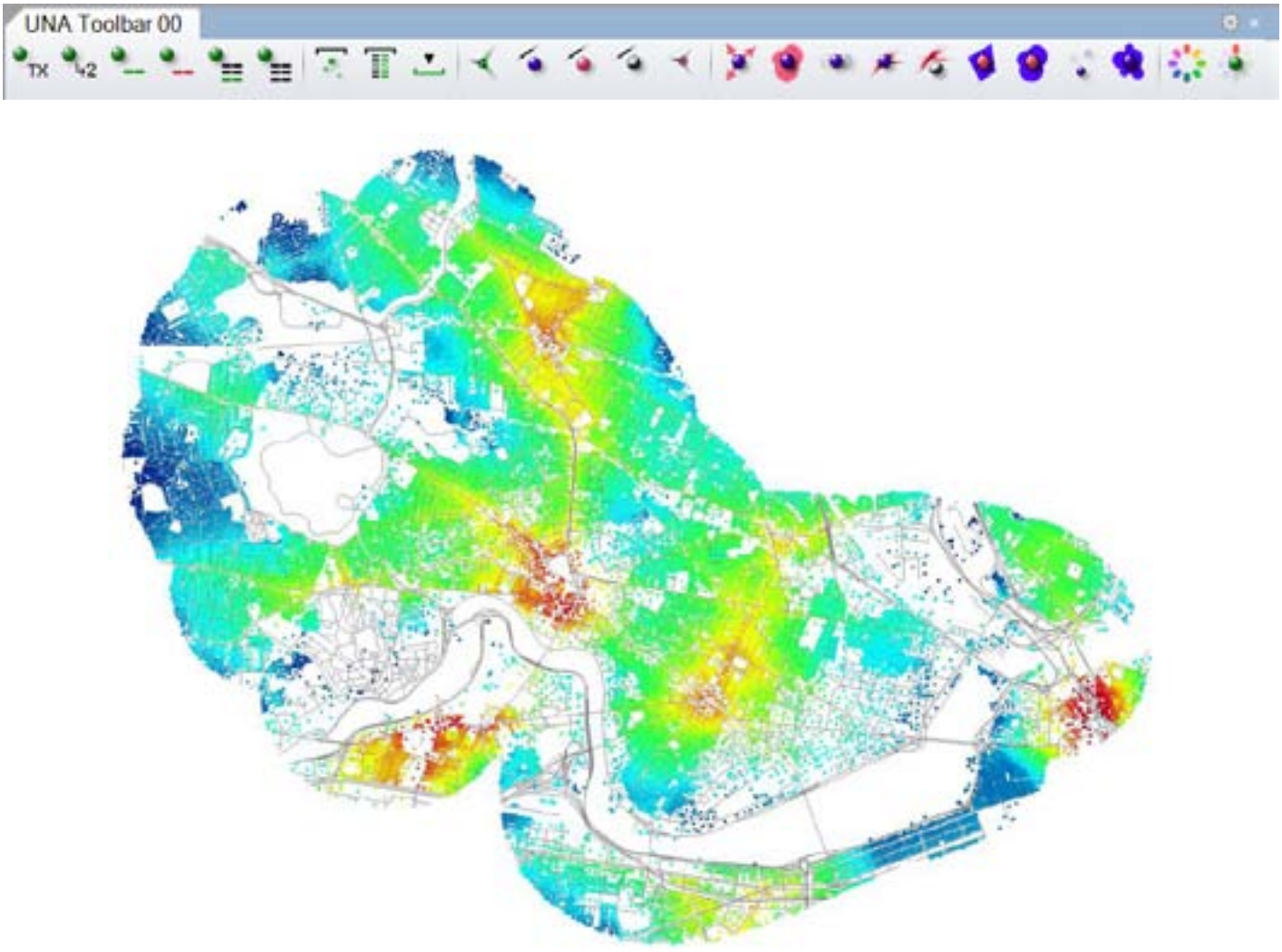
SOCIAL AGENCY LAB
Professor Michael Hooper

Research Projects

1. Completed the first full draft manuscript for the book “Street Commerce: the hidden structure of retail location patterns and vibrant public space”. Expect to submit to publishers during summer 2017. The book is a monograph, consisting of 8 chapters and 55 illustrations. It provides a comprehensive overview of issues and opportunities involved in planning and developing retail and services oriented city streets. Print publication expected in 2018.

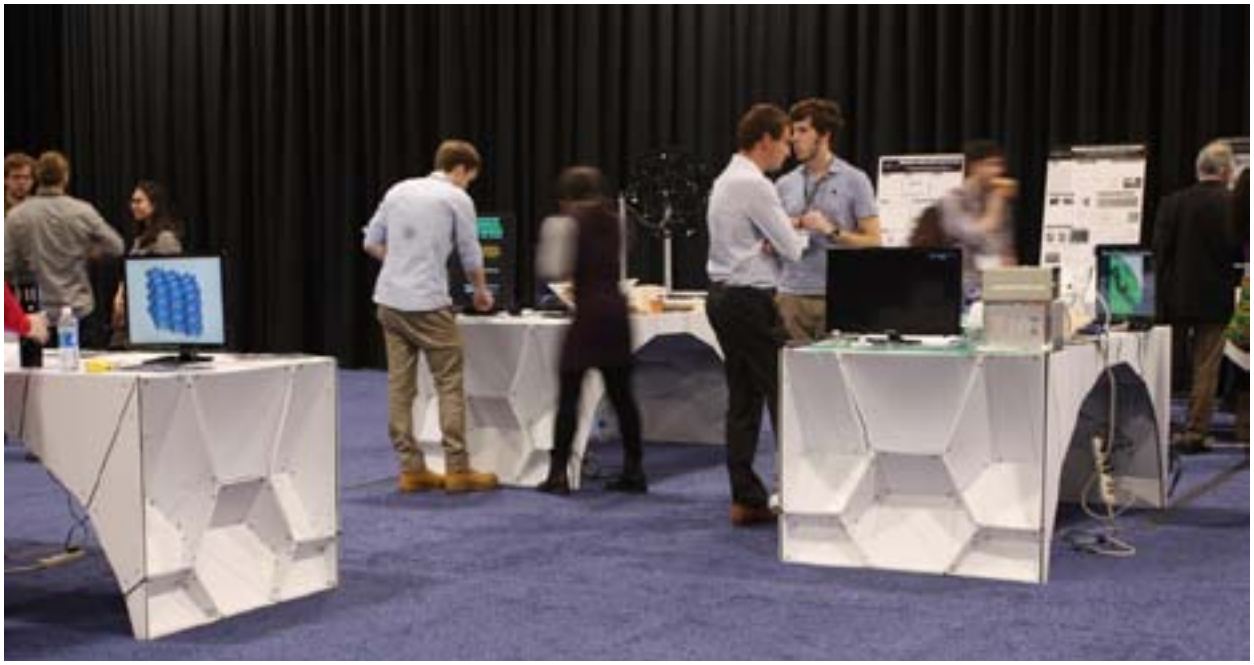
Support: GSD Deans Research Grant, $10,000.

2. The CFL released four new releases of the Urban Network Analysis Toolbox for Rhino, with functionality and GUI improvements. (versions 5.10.10.25 - 5.10.10.25 R5RS10)



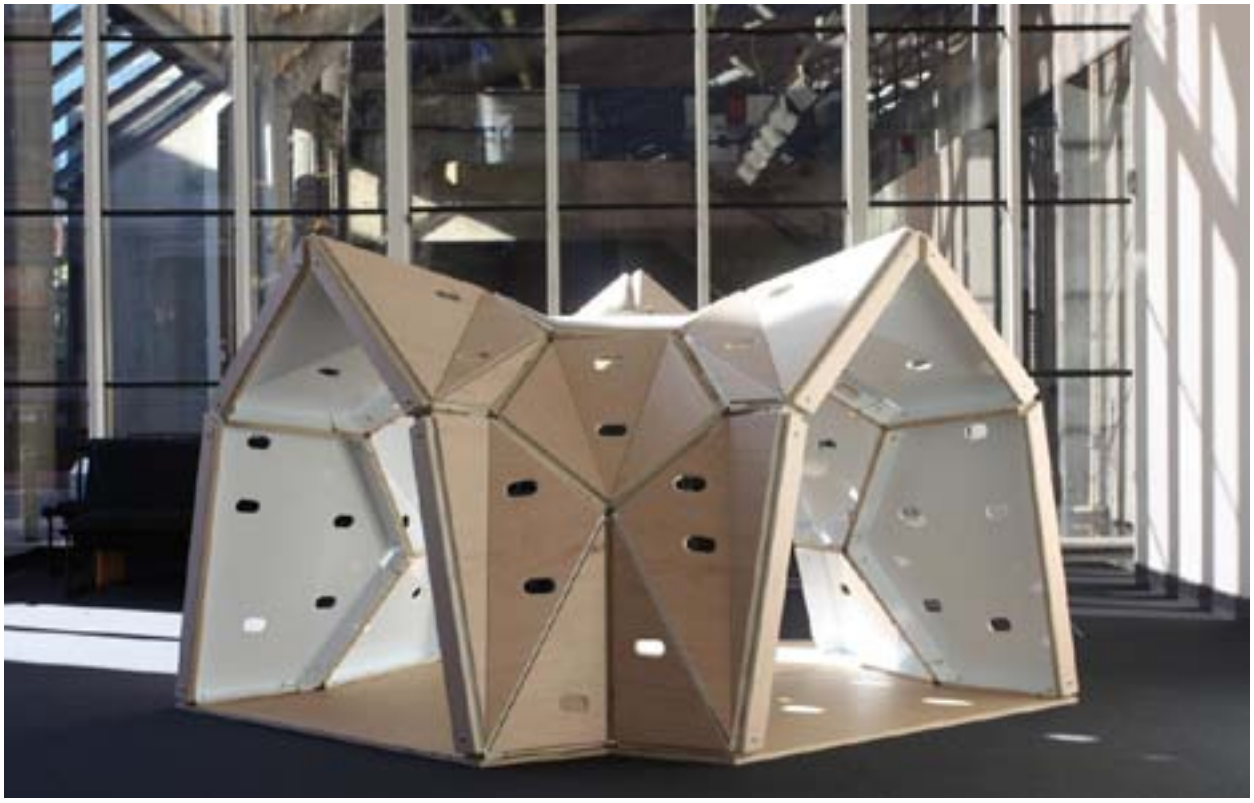
3. CFL designed and fabricated custom tables for Wyss Institute for Biologically Inspired Engineering Annual Conference in Boston.

Support: Wyss Institute of Biologically Inspired Engineering, $4,500.



4. *Grid Structures workshop* with GSD students, August 20-25, 2016. Introduced participating students to the Grid Structures technology and software library developed at the City Form Lab and built a full-scale grid-structure in the GSD yard.

5. *Toy House workshop*
Built a toy-house prototype using CFL's grid-structures technology during GSD Fall Open House. November 2016.



6. *Tartu Participatory Design Workshop*
Led a participatory urban design workshop with city government and other stakeholder participants in Tartu, focusing on re-imagining the Vabaduse Boulevard in central Tartu. May 14, 2017.

Support: City Government of Tartu, Estonia. $3,000.

7. Indonesia's Urban Story Exhibit
http://cityform.gsd.harvard.edu/projects/indonesia-s-urban-story-exhibit

Support: The World Bank. $10,000.

Jakarta, World Bank Office lobby (Indonesia Stock Exchange Building)

Harvard Science Center Plaza

Researchers 2016/17
Alexander Mercuri, Harvard GSD, MUP 2016
Matthew Schreiber, Harvard GSD, MUP 2017
Jia Gu , Harvard GSD, MArch 2019
Haibei Peng, Harvard GSD, MArch 2017
Karen Stolzenberg, Harvard GSD, MArch 2019
Raul Kalvo, Estonian Academy of Arts 2009, Architecture and City Planning

Selected Presentations
Presentation on *Applied Spatial Analysis* to the World Bank Knowledge Days. June 2017. Washington, DC.

Presentation on *Tallinn's City Center Planning* at the Tallinn Center Urban Forum. June 2017, Tallinn, Estonia.

Presentation at the Amazon Radical Urban Transport Salon. "*Connecting Smart Mobility to City Form: Rethinking the Territorial Aims of Transportation Innovation".* May 2017. Seattle, WA. (with Diane Davis).

Keynote presentation at the Estonian Economics Association Annual Conference. *"Street Commerce".* January 2017, Tallinn, Estonia.

Open Lecture (public) on *Integrating Transit and Land Use Planning for a Sustainable Urban Core in Tallinn*. December 2016, Tallinn, Estonia.

Presentation at the Workshop on Confronting Violence and Vulnerability in the Urban Century. *Urban Network Analysis.* Ford Foundation. Pittsburg, PA.

Presentation at the Inaugural Conference on Heliomorphism by the GSD Office for Urbanization. September 2016, Cambridge, MA.

Competitions
CFL participated in the International Tallinn Harbor Masterplanning Competition (together with Kees Christiaanse Architects and Planners). Result: 4th place.

Patents 2016
Grid-Structure Utility Patent

Publication number	US9458620 B2
Publication type	Grant
Application number	US 14/777,244
PCT number	PCT/SG2014/000132
Publication date	Oct 4, 2016
Filing date	Mar 17, 2014
Priority date	Mar 15, 2013
Also published as	US20160024780, WO2014142763A1
Inventors	Andres Sevtsuk, Raul Kalvo
Original Assignee	Singapore University Of Technology And Design

https://www.google.com/patents/US9458620

Papers

Sevtsuk, A., Kalvo, R. (2017). *Patronage of urban commercial clusters: a network-based extension of the Huff model for balancing location and size.* Accepted in Environment and Planning B: Urban Analytics and City Science.

Sevtsuk, A. (2017). P*ublic Space in a Polycentric Metropolis.* In Jakarta: Models of Collective Space for the Extended Metropolis. Eds.Correa, F. and Strange, C. Harvard University Graduate School of Design, 2017.

Sevtsuk, A., Kalvo, R., & Ekmekci, O. (2016). *Pedestrian accessibility in grid layouts: the role of block, plot and street dimensions.* Urban Morphology, 20(2), pp. 89-106.

Sevtsuk, A. 2017. *Commentary on Ubiquitous Mobility.* Harvard Real Estate Review. Issue nr. 6, Places and Platforms of New City. Fall 2017.

Popular Media Articles

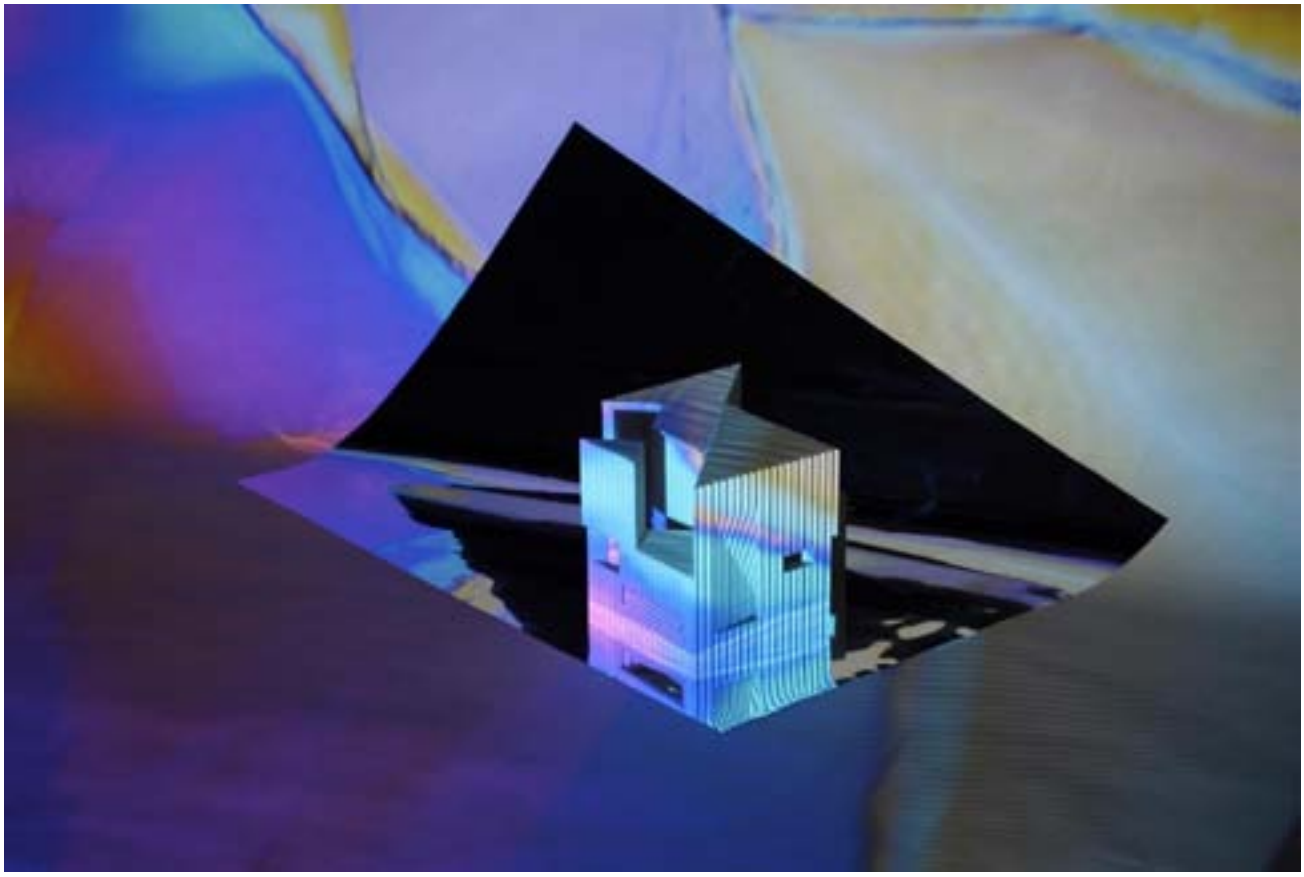
Sevtsuk,, A. 2017. *Tallinn's Old Harbor does not need a "wow-effect", but stable urban design.* Opinion piece. Eesti Ekspress, May 24, 2017. PDF

Sevtsuk, A. *"Why cars and pedestrians don't get along."* Postimees, ARTER Laupäev, 8. oktoober 2016. PDF

Sevtsuk, A. *"Concrete steps needed to bolster street commerce."* Äripäev. February 10, 2017. PDF

Why city blocks work? Harvard Gazette, interview, October 2016. PDF

Harvard faculty: current Reidi Road project would make Tallinn worse. Interview. Eesti Päevaleht, August 3, 2016. PDF

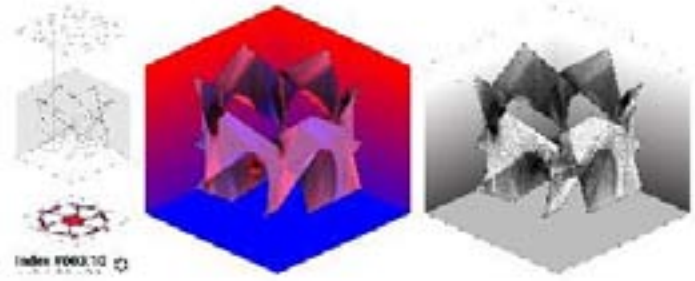


The Computational Geometry Lab researches the design and science of shape, aided by computational tools and design intuition. The Lab is unique at the School in the sense that it combines computational, formal, architectural, and historical research into a single synthetic program. This year the lab has continued to bridge the domains of design, technical and historical research. The projects pursued in the Lab, highlighted below, attest to the variety and depth of this work. In addition to active research projects, the members of the Lab pursue its research topics through seminars that use the facilities of the Lab, including Mechatronic Optics, Conic and Developable Surfaces, Structural Surfaces, and Narratives of Design Science.

With Andrew Witt's more active involvement in next year's MDE studio and his increased involvement in MDes Tech, the Geometry Lab has the opportunity to evolve into a resource for synthetic research bridging multiple programs through the school, and becoming more central to the overall strategy of design technology at the GSD. We also anticipate that its participation as one of the founding labs of the over-arching Laboratory for Design Technologies will allow it to take on more ambitious and industry-focused projects in the future.

DESIGN RESEARCH TOPICS

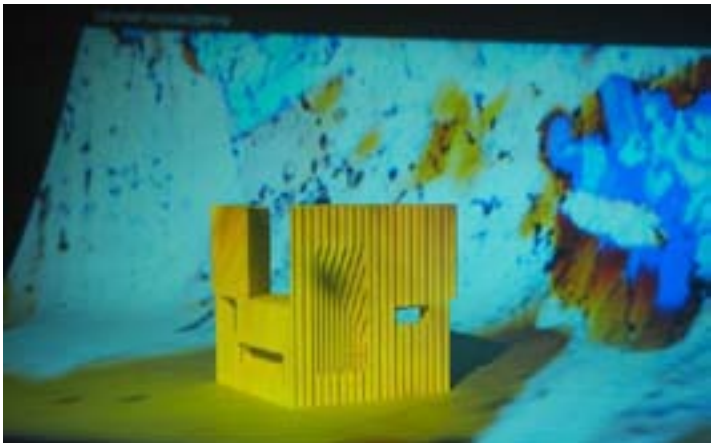
Spanning and Developable Surfaces

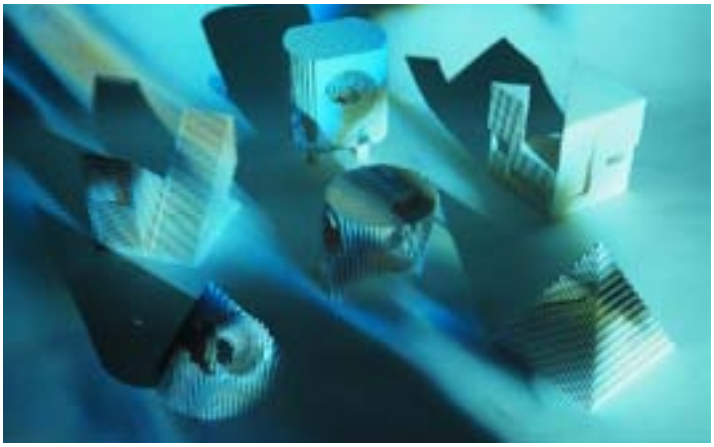


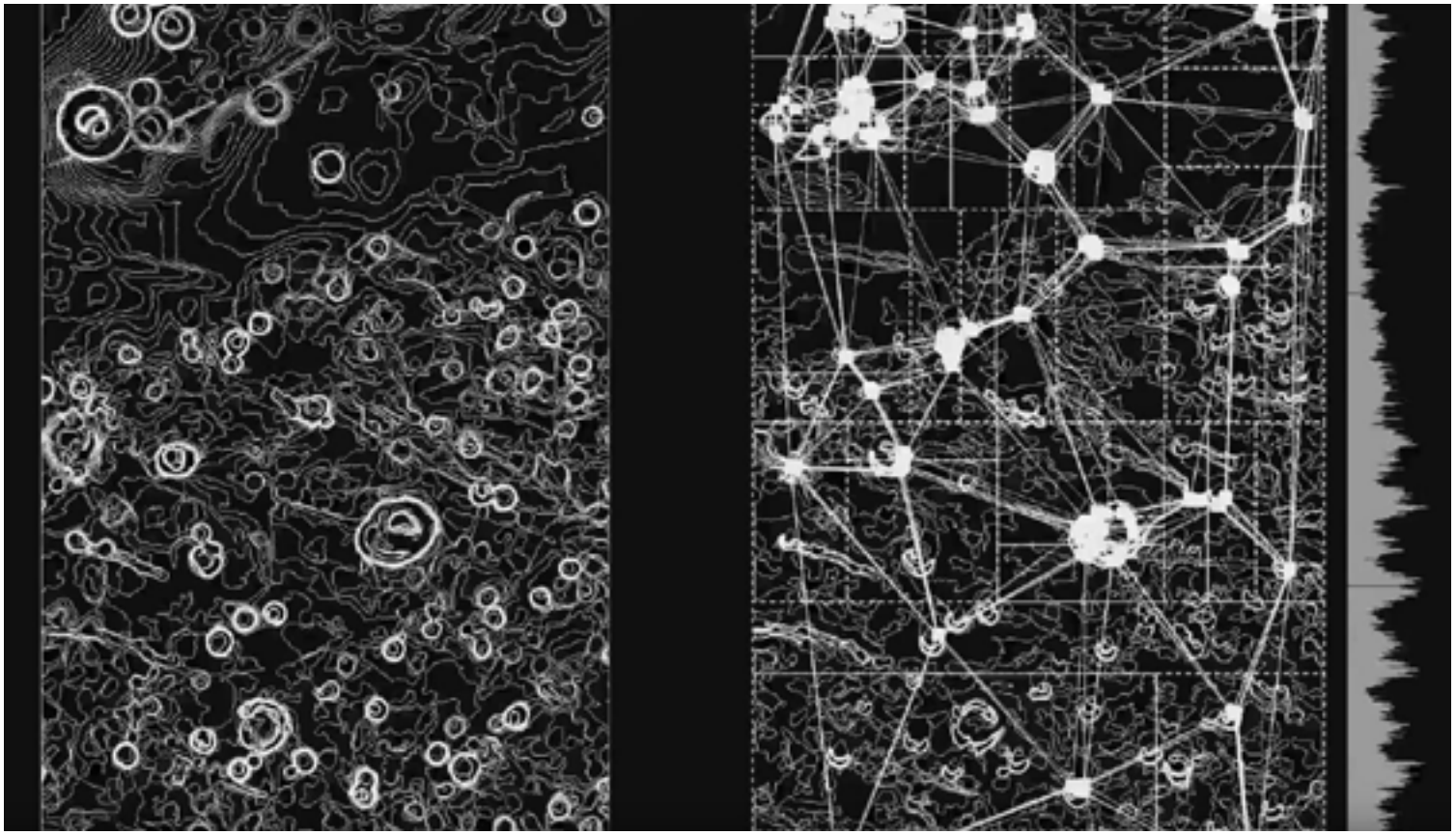
The Lab continues to investigate Knot and Spanning surfaces and also has developed a remarkably efficient method of developable discretization which allows the assembly of complex surfaces with an order of magnitude (10x-100x) reduction in the number of parts and assembly complexity for intricate structures (see image above). The technique creates a series of strips, incrementally twisted, which can be used to approximate with high precision the original surface and can be constructed from a range of materials, including plywood and plastics. This work has been developed with the Junior Faculty Research grant for research into compliant mechanisms.

Smaller scale mockups of this method are in process, and the intention is to develop a larger scale installation for the back yard of Gund Hall for spring 2017. A related set of software tools have been developed both for the formal exploration of this design space and for its assembly.

Machine Vision and Sensing







The Lab has recently been more actively considering the geometry of optics, both human- and machine-perceived. As a result, it has developed hardware and software systems that assist with both machine vision and projection mapping for augmented experiences. This is motivated by the potential of machine vision and AI techniques to change the fundamental process of design and also by an interest in creating geometrically intricate effects from simple underlying forms. One speculative project in that direction, a proposal for a Glacier Observatory, considers the remarkable geometry of acoustic and optical lenses as a point of departure for generative design constraints (above).

A suite of tools have been developed and tested for real-time sensemaking from unstructured data, will allow both more interactive and adaptive robotic assembly processes, and new methods of large-scale data mining. The lab recently purchased several high resolution and high-brightness projectors suitable for projection mapping and augmented assembly applications.

On the Bipartite Staircase

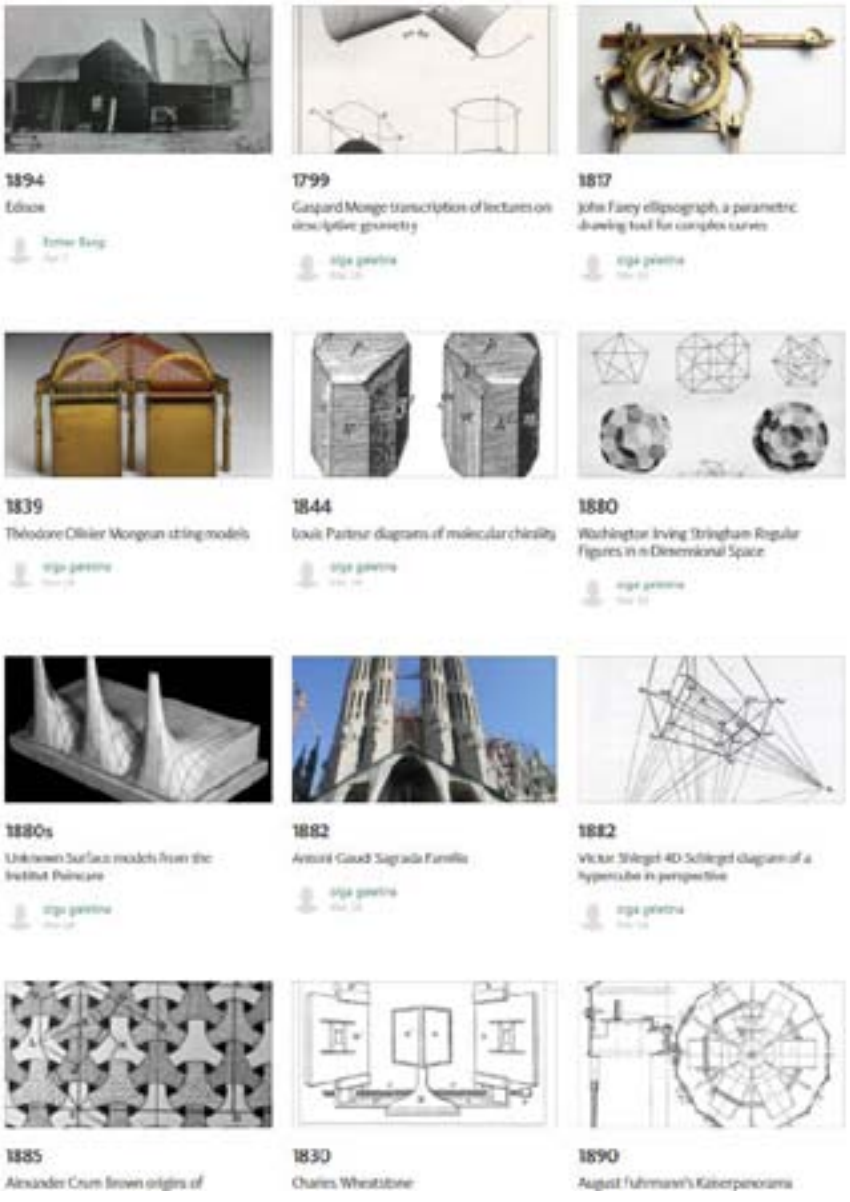


The lab has been increasingly interesting in typological issues, not only at the building scale but also at the building element scale. An effort of these investigations is to extract formally essential logics from historical types which may be creatively explored through procedural methods. Among other work, our research on Bipartite Staircases, those which have two helical, bifurcating, or otherwise interrelated paths, is being developed into a short publication. The text includes historical and geometric reflections on this specific type, as well as a short manual on the generative creation of surface types developed in the lab with specific application to the staircase. This work has also been supported by coursework such as Digital Media and the collaboration of Iman Fayyad.

HISTORICAL RESEARCH AND PUBLICATIONS

Much of the historical research of the lab has been compiled into a diverse range of publications, including web and ePub formats. Topics include the history of the relationship of geometric crystallography to design, the emergence of the quasi-professional computational designer in the 1970s, the notion of behavior in autonomic design processes, and the history of the triangulated mesh from a surveying technique to a computational one.

CCA ePubs and Chronology of Design Science



We are in the process of developing a co-publication program with the Canadian Centre for Architecture which will focus on a series of ePub profiles of design research institutes and labs in the twentieth century. These publications will feature first-hand oral histories from researchers directly involved with the work of these earlier labs.

The first three ePub will focus on the Natural Forces lab of Ralph Knowles, the geometric work of the Center for Computer Graphics at Harvard, and Kenzo Tange's Tange Laboratory at the University of Tokyo which was the center for the geometric implications of economic forces on design.

Part of this historical research has been aggregated, with the help of the Narratives of Design Science class, to a website that documents vignettes of intersection between design and science which can be accessed at:

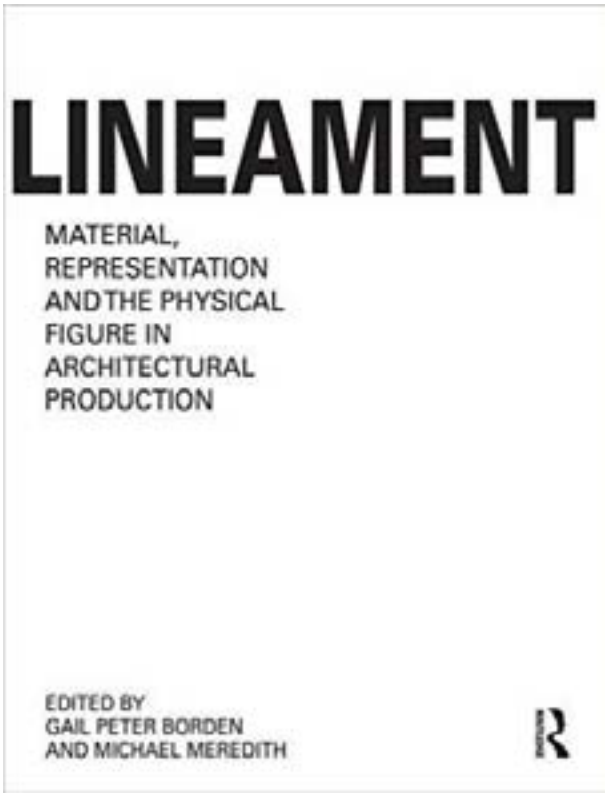
medium.com/designscience.

Andrew Witt, "The Machinic Animal: Autonomic Networks and Behavioral Computation." In *When is the Digital in Architecture?* Berlin: Hans Mueller, 2017.

This anthology extension of the CCA's Archeology of the Digital project proposes a series of origin points for what we understand as digital design, from a range of theorists including Stan Allen, Mario Carpo, Peter Galison, Mark Wigley, and Antoine Picon. Witt's essay considers how projects such as Yona Friedman's Flatwriter and the software development for the Munich Olympic Stadium drew on behavioral and communicative models to define a new discipline of computational design. It also is the first English publication to document in detail the important German 1976 show Architect and Computer: A Man Machine System, which showcased seminal work in this domain.

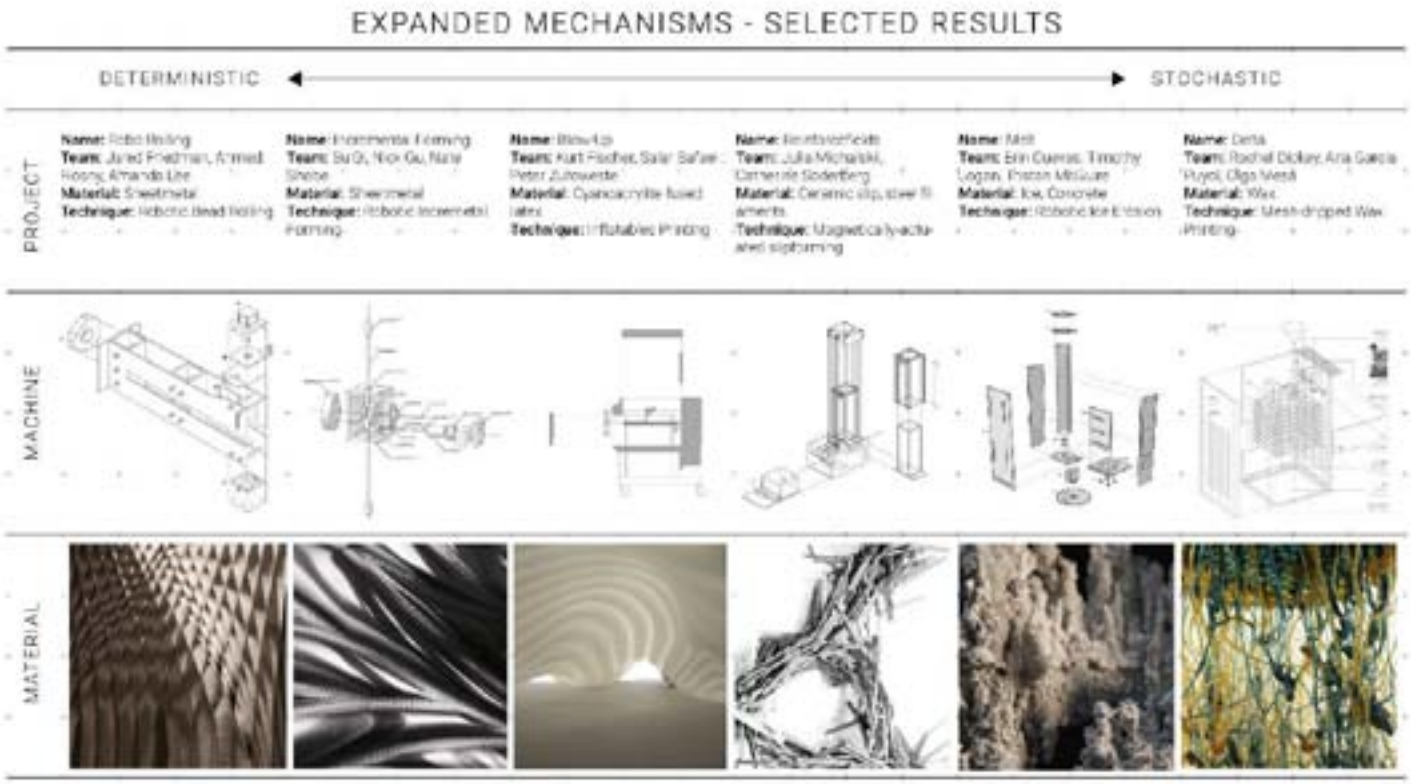
Andrew Witt, "Landscapes, Spaces, Meshes: A Cultural Narrative of Design Technics" in *Architecture is All Over,* New York: Columbia University Press, 2017.

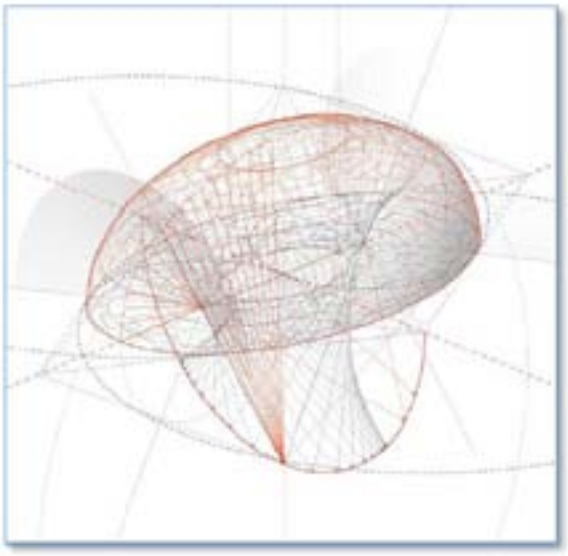
This paper considers the historical development of meshes as both tools of landscape and spatial measurement, and proposes their technical history as an alternate strain of representational development parallel to projective geometry.



Andrew Witt, "Expanded Mechanisms: The Signalization of Material," in *Lineament: Material Representation and the Physical Figure in Architectural Production,* Gail Borden and Michael Meredith, Eds. London: Routledge, 2017.

This paper documents the work and research of Expanded Mechanisms, a research seminar which used the lab's resources, including its two universal robots, in the development of bespoke and material-specific fabrication devices.





Cameron Wu, "Borromini and the Elastic Idiom" in *Finding San Carlino,* New York: Columbia University Press, 2018.

Using classification methods from analytic geometry, this paper will propose close readings of San Carlo all Quattro Fontane to differentiate between varied idioms and syntaxes employed by Borromini. The descriptions of the sectional interiors may be interpreted as incremental steps of an evolving idiomatic language for Borromini, marking the advent of a nascent architectural modernity.

The Just City Lab investigates the definition of urban justice and the just city, and examines how design and planning contribute to the conditions of justice and injustice in cities, neighborhoods and the public realm. Past projects include “Public Life and Urban Justice in NYC’s Public Plaza’s”, completed in 2015 at the City College of New York School of Architecture in partnership with Gehl Studios and Transportation Alternatives. The indicator framework tool including an elaborate menu of urban values, indicators and metrics, both spatial and social, designed to evaluate how design of the built environment contributes to health, economic, civic, cultural, aesthetic and environmental design wellbeing Also in 2015, The Just City Essays, Volume One, was published, a collection of essays from 26 prominent thinkers who define the just city in 22 different global cities. Both publications can be found at www.designforthejustcity.org.

During the 2016-17 academic year, the Lab began the development of a distinct index of urban justice values and an exploration of participatory tools for developing a just city framework at the neighborhood scale. The index of urban justice values identifies and defines 50 values that the Lab has found to be the most desired components of a healthy, vibrant and equitable community. The Lab’s researchers Caroline Lauer, MUP ‘18; Milan Outlaw, MIT, March ’17, and Meghan Venable Thomas, MPH ’18, used preference surveys collected over three years to identify and create distinct design-oriented definitions for a collection of values that seek to repair and/or strengthen conditions of inequality, disinvestment, abandonment, marginalization, and disenfranchisement. The values are organized around 12 principle values including Fairness, Acceptance, Rights, Welfare, Democracy, Resiliency, Welfare, Democracy, Aspiration, Mobility, Choice and Mobility. The Lab will publish an illustrated index of the values as a tool to help community members facilitate meaning dialogues and development of clear and measurable goals and imperatives for neighborhood improvement.

The Lab also initiated a partnership with Cambridge city councilman Nadeem Mazen, the city's first Muslim American to hold the office, in an effort to pilot the exploration of approaches for engaging community members in the development of their own just city value proposition and design prototypes that test ways to advance specific just city values. Engagement tool and design prototypes developed in the Design for the Just City seminar will be further investigated in the Lab during the 2017-18 academic year to produce a toolkit of participatory methods of engagement.

Visit our website (www.designforthejustcity.org) for updates on our work, previous publications and the Just City manifesto videos, a collection of student videos defining the Just City.

2016/17 Accomplishments Update

MaP+S employed between 3 – 5 mostly full time Research Associates, as well as DDes students and occasionally MDes students. We worked on three related areas of material systems research:

1. Architectural Ceramics

We completed a large, 3D printed ceramics installation in Valencia, Spain, collaborating with local partners for production. Our research included software and hardware development of ceramic 3D printing using the large GSD robot, design studies, FEA simulations and more. We are planning to write a paper on the work this year. Funding: ASCER Tile of Spain ($ 46 k for work at GSD), CEVISAMA (Euro 35 k for work outsourced to Spanish contractors). The same research funding also provided $ 4 k for a digital fabrication course taught by Leire Asensio Villoria. After obtaining a new round of funding we have been working on a novel ceramic lamination process (filed a Harvard Report of Invention that currently undergoes review) in preparation for an exhibition we have been invited to design for the CEVISAMA 2018 in Valencia, Spain. We are also collaborating with Sal Craig on developing thermally optimized tile morphologies that maximize heat transfer in naturally ventilated buildings.

2. Composite Materials

We completed phase 1 of the work sponsored by Taiwan-based Advanced Multitech, working on integrating fiber optics and other visual effects into composite production processes and composite components. Work included in-house prototyping and a production prototype of a novel composite stool produced as a prototype at the Sponsor's facility in Taiwan. Another project investigated novel compliant composite mechanisms whereby a simple tensile strain can result into large geometry changes in previously flat composite parts. MaP+S signed a contract for phase 2 of composites research, currently in the final phase. During this phase of the work we completed work on composite compliant systems started in phase 1. We produced multiple prototypes, computational studies and design proposals for production at the sponsor's facility. A paper on the work will be written over the summer. Phase 2 also develops a robotic process for composites forming without the use of conventional hard tooling. The work includes design studies, software and hardware development that allows us to do in-house prototyping with the small MaP+S robot located in the GSD FabLab. We are planning to write a paper on this project after its completion, and are considering filing a Harvard Report of Invention as well. The total sponsored funding for both phases was $ 174 k.

3. Adaptive Living Environments Research

This year we focused on finishing a number of projects by completing work needed to either file patents or publish science/design papers. All work is collaborative with a group of scientists from SEAS/WYSS, mostly Joanna Aizenberg's group, James Weaver and the Bertoldi Group. Funding from Wyss/AMT over $ 150 k.

- Pneumatic Privacy Control: work is almost complete on a pneumatic actuation system for a nano-scale structured silicone membrane to act as privacy and light control. The research is complete and the paper ready to send out for review.
- Infrared-reflective PDMS interlayers for ETFE envelopes: Related to the pneumatic actuation project, this ongoing project was begun in the course co-taught by M. Bechthold and J. Aizenberg. It investigates the role of metal vapor deposition on nano-treated, highly elastic silicon membranes as a way to control IR and heat gain in ETFE envelopes. Ongoing.
- Ferrofluidic mold: A process whereby a magnetic fluid can be used as a mold to produce complex perforation patterns that are near-impossible to achieve in any other way. Developed and built a numerically controlled active mold and conducted research to produce legible images with the system. Work for the paper is wrapping up. The next phase will include investigating a continuous ferro-molding process suitable to bring costs down in a production context. Prototype pieces are silicon resin, concrete, and ceramic.

- Vascular cooling systems: supported doctoral work by Jonathan Grinham that included development of a newly optimized vascular cooling system for buildings. We are currently filing a patent (review of provisional patent is complete) supported by Wyss. Collaboration with Sal Craig and Don Ingber.
- Kiriform: we invented a novel compliant mechanisms that consists of simple flat pieces which, once assembled and actuated, can form 3D shapes through buckling mechanisms. We collaborated on non-linear FEA with the Bertoldi group. Harvard OTD decided to move forward with patenting and the patent attorney is currently working on the provisional patent. Promising application domains will be medical, cameras, cell phones as well as other uses.
- Auxetic Surfaces: a project completed for the Wyss retreat in 2016, we added more work and authored a detailed academic paper for ACADIA 2017 (under review). The system uses controlled buckling of specific surface patterns to achieve desirable form and size changes without a myriad of mechanical hinges.

RESPONSIVE ENVIRONMENTS AND ARTIFACTS LAB (REAL)

Professor Allen Sayegh

The Responsive Environments and Artifacts Lab (REAL) pursues the design of digital, virtual, and physical worlds as an indivisible whole. It recognizes the all-pervasive nature of digital information and interaction in the realms of architectural, urban, and landscape design. The lab takes an interdisciplinary look at the design of the built environment from the lens of technologically augmented experiences, with a strong focus on the sustainability and longevity of technology. Putting the human being at the center and forefront, researchers at REAL examine the emerging ways in which technology fuses into the ways we live, work, and play – from the micro (bodily sensors, smart product design, augmented interfaces) to the macro (interactive buildings, information infrastructures, communication frameworks).

ON GOING RESEARCH TOPICS

Technological Longevity
Augmented Environments
Responsive Technologies and Materials
Body-centric Interaction
Adaptive Environments

RESEARCH AND TEACHING ACTIVITIES 2016-2017

Workshops on REAL Design Research Methodologies at University of Bergamo / Fall 2016
Responsive Environments course at GSD / Spring 2016
Collaboration with Wyss Institute With MAPS
New Agreement with University of Bergamo
Talks with Lutron, Amazon, and Microsoft companies for potential research projects
Exhibition on REAL research projects at GSD / Fall 2017
Symposium on Responsive Environments at GSD / Fall 2017

Introduction
The GSD Social Agency Lab has been led since 2011/12 by Michael Hooper and will complete its operations this year. The lab studies the ways in which individuals, institutions and organizations shape social outcomes in cities. The mission of the lab is twofold: 1) to give students at the GSD exposure to, and training in, rigorous, field-based data collection and analytic methods and 2) to support thesis students from across the school working on allied topics. Since 2011/12, the lab has published more than 20 peer-reviewed and professional publications, collaborated with nine research fellows, employed and trained 51 GSD graduate student research assistants, supervised 27 theses/dissertations, and hosted or participated in 41 events or public engagements related to the lab's focal theme. Full details on the work of the lab can be found at gsdsocialagencylab.tumblr.com and in the final report on the lab's work submitted to the school in April 2017.

Over the past academic year, the GSD Social Agency Lab concluded several long-standing projects and began several new projects. Since this year will be the last for the lab, the ongoing projects will be undertaken by the director outside the lab research framework. The work of the lab over the past year is summarized in the sections below, which report on current projects, lab publications and research supervision/theses.

Current Projects
Four projects were undertaken over the past year and will continue to be pursued by the director after lab closure. These projects are summarized below and further information on each can be found on the lab website.

1. Densification from the top-down: The complexity of managing urban change in Ulaanbaatar, Mongolia *(funded by the William F. Milton Fund, the Joint Center for Housing Studies and the American Planning Association)*

2. Post-disaster planning and the long-term shelter impacts of displacement: Lessons from Montserrat *(funded by the David Rockefeller Center for Latin American Studies and the Joint Center for Housing Studies)*

3. The politics of densification: Learning from least-likely cases in Sweden *(funded by Harvard Alumni Real Estate Board and the Joint Center for Housing Studies)*

4. Aboriginal housing policy in Canada: The history and impacts of physical interventionism in Indian reserve housing *(currently under development with funding applications having been submitted)*

Research Outputs: Published and Under Review
Hooper, M. 2017. "When diverse norms meet weak plans: The organizational dynamics of urban rubble clearance in post-earthquake Port-au-Prince, Haiti." *International Journal of Urban and Regional Research* [Under review]

Hooper, M. 2017. "Flatulence, filth and urban form: Do hygiene primes influence perceptions of urban density?" *PLOS One* [Under review]

Pym, M. and M. Hooper. 2017. "Humanitarian Standards in Urban, Post-Disaster Contexts: A Study of Sphere Shelter Standards in Haiti." *Humanitarian Exchange Magazine*, 69: 31-34.

Anderson, R. and M. Hooper. 2017. "Competing Organizational Perspectives on Rapid Urbanization and its Management: A Case Study of Ulaanbaatar, Mongolia." *International Development Planning Review,* 39(2): 187-207.

Anderson, R., M. Hooper and A. Tuvshinbat. 2017. "Towers on the steppe: Compact city plans and local perceptions of urban densification in Ulaanbaatar, Mongolia." *Journal of Urbanism,* 10(2): 217-230.

Publications About the Lab and its Work

Kollar, J. 2016. "Interview with Michael Hooper on thesis research at the Harvard Graduate School of Design." *Addendum,* 1: 2-5.

Bridger, J. and C. Werthmann. 2016. "Michael Hooper on public participation: Simple conceits versus complex realities." In *Metropolis Nonformal,* eds. J. Bridger and C. Werthmann. New York, NY: Applied Research and Design Publishing, 104-107

Bridger, J. and C. Werthmann. 2016. "Four questions: Michael Hooper." In *Metropolis Nonformal,* eds. J. Bridger and C. Werthmann. New York, NY: Applied Research and Design Publishing, 193

Research Advising: Lab Theses Completed and In Progress

Duerksen, Mark. In Progress. "Post-Colonial Urbanism in Nigeria." (PhD Dissertation, Harvard University, Advisors: Suzanne Blier, Emmanuel Akyeampong, Michael Hooper)

Brookins, Devanne. In Progress. "Institutional Reform and Decentralized Land Governance in Ghana: The Role of Social Organization." (PhD Dissertation, Massachusetts Institute of Technology, Advisors: Balakrishnan Rajagopal, Mahmood Mamdani, Michael Hooper)

Potvin, Marianne. In Progress. "Humanitarian Urbanism: Cities, Technology and the Hybrid Practices of Humanitarian Planners." (PhD Dissertation, Harvard University, Advisors: Antoine Picon, Jerold Kayden, Michael Hooper)

Beattie, Nicole. In Progress. "Design Responsibility and Human Health: An Analysis of Sunlight in Chilean Public Housing." (DDes Dissertation, Harvard University, Advisors: Martin Bechtold, Michael Hooper)

Jean-Francois, Jessica. 2017. "Poverty Reduction Strategies for Tourism-Based Economies: Lessons for Small Island Developing States (SIDS) from Montserrat." (MUP Thesis, Advisor: Michael Hooper)

Milos, Christina. 2016. "Anticipating the Spatial Impacts of Oil Sands Production on Livelihoods and Infrastructure in Ondo State, Nigeria." (PhD Dissertation, University of Hannover, Germany, Advisors: Christian Werthmann, Michael Hooper)

Research Assistants Employed in 2016-17

Jessica Jean-Francois (MUP '17)
Shanasia Sylman (MLA '18 / MUP '18)
Estello Raganit (MLA '19)
Tami Banh (MArch II / MLA I AP '18)
Ross Eisenberg (MUP '18)
Cynthia Deng (MArch '20)
Alifa Putri (MUP '18)
Edward Lamson (MUP '18)
Bryce Roland (Centre College, BA '17)
Silvia Danielak (MDes '18)
Alice Hintermann (MUP '18)
Simone Hodgson (MUP '18)
Sam Matthew (MDes '18)
Ashley Thompson (MDes '17)
Omar Carrillo (MUP '17)
Yan Ma (MArch '16)
Meric Ozgen (MArch '17)
Nastaran Arfaei (MArch '16)
Tamotsu Ito (MArch II '16)
Valeria Fantozzi (MArch '17)
Anne Ong Lopez (MPA/ID '16)
Adelene Tan (MArch '16)