J O Y K O

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joykoli.com

EDUCATION

2004 Courant Institute, NYU; Ph.D. in Mathematics

1996 Dartmouth College; B.A. *Magna Cum Laude*

EMPLOYMENT

ACADEMIC APPOINTMENTS

2009-present *Critic,* Rhode Island School of Design
Appointments in Architecture, Grad Studies, Textiles, Industrial Design

2005-2009 *Tamarkin Assistant Professor of Mathematics*, Brown University

2004-05, 2007-08 *NSF Postdoctoral Research Fellow*, Brown University

1998-2003 *Research/Teaching Fellow*, New York University

LEADERSHIP

2021-present PI, Virtual Textiles Research Group (VTRG)

2015 *Founder and Chairperson*, "tool()" Forum, Providence, RI
Conceived and chaired event series convening design innovators who engage, influence, and critique cutting-edge tools available to artists and designers. Showcased innovations in art and design production, education and research.

2014 *Co-chair*, "Public, Private, Protected" Symposium, Berkeley, CA
Co-chaired conference convening computational designers and educations, taking stock of geometric and algorithmic literacy in design education and the evolving dynamic between powerful tools and empowerment of design.

2010 *Chairperson*, Strategic Planning Committee of Smart Geometry Group
Led OGST strategy articulation and codification for international society and process reboot.

MAJOR VISITING APPOINTMENTS

Spring 2008 *Visiting Fellow*, Institut Henri Poincaré, Paris

Summer 2005 *Visiting Researcher*, Chinese Academy of Sciences, Beijing

PROFESSIONAL APPOINTMENTS

2008-present *Founder and Principal*, Generalized Solutions, LLC

1996-1998 *Options Analyst,* The NorthBridge Group, Waltham, MA

CONSULTANCY

Founder and Principal, Generalized Solutions LLC
Consultancy focused on commercial problem solving, harnessing design research. Clients have included Gensler, JGA, Institute for One World Health, Crey Bioresins, Widder Brothers Inc., Angiogenesis Foundation, University of California, xLinea.

GRANTS/AWARDS

2022 RISD Professional Development Grant
"Feeling Fabrics"

2021 RISD Professional Development Grant
"Computation of Woven Textile Behavior and Ornamentation"

2015 RISD Bridge Grant
"Large-scale Data Flows <-> Small-scale Human Behavior"

2015 RISD Professional Development Grant
"Disseminating decod.es: Creating a Living Resource for Design Computation"

2014 U.S. Army Small Business Innovation Grant; A 142-088-0013
"Indigenous Materials for Construction" (Technical Lead)

2004-05, 2007-08 NSF Postdoctoral Fellowship; *Award number: DMS-0402788*

2003-2004 American Association for University Women Dissertation Fellow

2003 NSF EASI Summer Research in China. Redirected funds due to SARS to conduct research at ETH, Zurich.

1998-2004 Research/Teaching Fellowship, Courant Institute, NYU

PROJECTS/ COLLABORATIONS

VIRTUAL REALITY (VR) AND AUGMENTED REALITY (AR)

2020-2022 VR as Remote Teaching Tool (with Evelyn Eastmond, M Eifler)
Development of tools and workflows using social VR platforms and spatial tools familiar to designers to allow for presentation and scene creation in VR. This included creating a "seed" classroom and studio which acted as hub for VR crits as well as jumping off point for bespoke scene creation.

SYSTEMS THINKING AND MATERIAL EXPLORATION

Virtual Textiles Research Group (VTRG)
(details of these research directions I was part of on group's website)

2021-present *Self-shaping Textiles*

2018-2019 *3d-Weaving; Weavecraft Software*

2015-2016 Textiles for Adobe Construction (with Widder Bros, Inc)
Identification of metrics and development of analytical tools to compare the viability and commercial potential of adobe blocks with natural fiber content

2013 Joint Taxonomy (collaborator: Lynnette Widder)
Identification and analysis of key characteristics for joints intended for lightweight panelized construction which were used to design and prototype a series of reversible joints

2011-2012 Ribbed Structures Research (collaborator: Chris Bardt)
Development of a digital platform to prototype and test ribbed structures and explore rib growth in direct response to materials and forces.

2012 The Corner House (collaborator: Lynnette Widder)
Proposal for a thin shell composite envelope system with lightweight structural corners, a glue and lamination-free envelope system amenable to both exergy and passive house approaches and compatible with standard US timber-based residential construction.

2010 Bio-based Composites for Building Infrastructure (with Crey Bioresins, Inc)
Concept designs to provide large-scale solar-integrated roofing for township housing in Pretoria, South Africa. This involved studies for multiple units using bio-based composite materials with a matrix of locally sourced resins and textiles and on-site mold construction. Presented to the Council for Scientific and Industrial Research, Pretoria, South Africa.

DATA AND COMPUTATION

2015-2017 Place-Space Computation
(collaborators: Jessie Braden, Kyle Steinfeld, Lynnette Widder)
Design and development of tools and techniques to study the social performance of the built environment using geo-locational data.

2013-2016 Decod.es: Computational Geometry Library
(collaborator: Kyle Steinfeld)
Design, development and stewardship of a library of code and a set of examples to demystify the core concepts of design computation for an audience of designers. The library is an open-source vector-based computational library implemented in Python with hooks into design modeling platforms. Over 120 examples developed on classic design problems.

2011-2013 Parametric Approaches to Building Construction Detailing
(collaborator: Lynnette Widder)
Articulation of case studies and development of workflows involving off-the-shelf energy assessment software tools and parametric modeling software to support early-stage decision-making for architects and designers in the detailing process.

2005-2008 Water Waves
(collaborator: Walter Strauss)
Design and development of tools for computing and visualizing periodic water waves with vorticity.

ARCHITECTURE

2009 X-Institute
(University of California, Davis)
Conducted process assessment, focus groups, user surveys and interviews, integrated with site audit, benchmarking and needs analysis for innovative collaborative think-tank facility on academic campus.

2009 Panelizing the Arch
(Gensler, for Cotai Project)
Design and implementation of the external panelization of a complex building surface (hotel/casino/mixed use complex), requiring generation of novel algorithms exploiting a generalized Laplace smoothing transform.

2009 The 680m Form: A Parametric Study
(Gensler, for Shanghai Tower Project)
Conceptual form studies to parametrically model a mixed-use double-skin tower, commissioned to be the tallest building in Asia

GLOBAL HEALTH AND MEDICINE

2010-11 Eat to Defeat Cancer (Angiogenesis Foundation)
Led website design and implementation to create a dissemination platform for evidence-based dietary information on cancer-prevention, for global NGO's commitment to the Clinton Global Initiative.

2010-11 Institute for One World Health (with xLinea)
Strategic audit and analysis of the brand heritage, defined the gap between current and desired brand state, articulated compelling value proposition, and proposed tactics and channels to rejuvenate the brand of iOWH, the Gates Foundation-funded, world's first nonprofit pharmaceutical company.

2008-2009 Wound Healing Predictive Model (Harvard Medical School)
Developed a predictive mathematical model for wound healing with commercial application. Validated model with clinical data of recombinant PDGF gel and tissue-engineered skin

PUBLISHED WORK

BOOK

Joy Ko and Kyle Steinfeld
Geometric Computation: Foundations for Design (Routledge, 2018) | DOI

BOOK CHAPTER
Evelyn Eastmond, M Eifler, David Kim, **Joy Ko**
Recovering a Sense of Place in VR in *Repair: Sustainable Design Futures* (editors Markus Berger and Kate Irvin; Routledge, 2022)

PAPERS
E. Meiklejohn, F. Devlin, J. Dunnigan, P. Johnson, B. Hagan, **J. Ko**
Woven Behavior and Ornamentation: Simulation-Assisted Design and Application of Self-Shaping Textiles, SIGGRAPH 2022 Art Paper and published in Proceedings of the ACM on Computer Graphics and Interactive Techniques (2022) 5:24, 1-12 | DOI

E. Meiklejohn, B.Hagan, and **J. Ko**, *Rapid Sketching of Woven Textile Behavior: The Experimental Use of Parametric Modeling and Interactive Simulation in the Weaving Process,* (2022) in J. CAD Special Issue on Computational Modeling, Design and Fabrication of Textiles | DOI

R. Wu, J, Xiaoji Zhang, J. Leaf, X. Hua, A. Qu, C. Harvey, E. Holtzman, **J.Ko**, B. Hagan, D. James, F. Guimbretière, S. Marschner, *Weavecraft: An Interactive Design and Simulation Tool for 3D Weaving,* ACM Transactions on Graphics (2020) 39(6): 1-16 | DOI

C. Harvey, E. Holzmann, **J. Ko**, B. Hagan, S. Marschner, R. Wu *Weaving Objects: Spatial Design and Functionality of 3D Woven Textiles*, SIGGRAPH 2019 Art Paper and published in Leonardo (2019) 52:4, 381-388 | DOI

L. Widder, J. Braden, **J. Ko**, K. Steinfeld, *Studies in Small Scale Data: Three Case Studies on Describing Individuals' Spatial Behaviour in Cities* in EAI Endorsed Transactions on Internet of Things (2018) 18:e1 | DOI

L. Widder, J. Braden, **J. Ko**, *Studies in Eating, Moving and Wasting in New York City* in Proceedings of Opening the Bin, Helsingborg, Sweden (2017)

L. Widder, **J. Ko**, J. Braden, K. Steinfeld, *Spatial Behavior of Individuals in Cities: Case Studies in Data Tracking and Scaling* in Urb-IoT '16 Proceedings of the Second International Conference on IoT in Urban Spaces, Tokyo, (2016) 98-101, given Best Poster Award | DOI

L. Widder, **J. Ko**, *Bio-reinforced Lightweight Reversible Panel Construction for Low-rise Buildings*

L. Widder, **J. Ko**, *Rethinking the Architectural Detailing Process: Good Practice, Computation, and Mash-ups* in Façade Tectonics #14, Los Angeles (2014), 35-48

K. Steinfeld and **J. Ko**, *Decodes: A Platform-Independent Computational Design Environment* in Open Systems: Proceedings of the 18th Conference on Computer-Aided Architectural Design Research in Asia CAADRIA Singapore (2013), 499-508

L. Widder, **J. Ko**, *Designing Reversible Seams for Panelized Lightweight Building Construction* in Proceedings in Cleantech International Scientific Conference for Sustainable Buildings CISBAT Lausanne, Switzerland (2013)

J. Ko, Y. Morishita and L. Widder, *Testing: Deploying Synergies between Sensing and Modeling for Case-specific Thermal Window Retrofit in Timber Buildings* in Proceedings of Sustainable Building SB13 Oulu, Finland

J. Ko, Y. Morishita and L. Widder, *Reciprocities between Sensing and Modeling in Building Envelope Retrofit: A Case Study* in Energy Forum on Solar Building, Bressanone, Italy (2012)

J. Ko, L. Widder, *Towards Systems-Integrated Building Envelope: Computational Assessment of Building Envelope Performance during the Design Process* in Proceedings of the World Sustainability Conference Helsinki, Vol. 2 (2011), 378-9

C. Bardt and M. Dziedziniewicz, and **J. Ko**, *Tools and Design Strategies to Study Rib Growth,* in Computational Design Modeling: Proceedings of the Design Modeling Symposium Berlin, 3rd ed. (2011), 17-25 | DOI

J. Ko, L. Widder, *Overcoming the Additive-Integrative Paradox: Using Responsive Building Modeling to Conceive New Approaches to the Integrated Façade* in Proceedings of Cleantech for Sustainable Buildings CISBAT (2011), Lausanne, Switzerland,189-194 (ISBN: 978-2-8399-0906-8)

J. Ko, L. Widder, *Building Envelope Assessment Tool for Systems-Integrated Design: Understanding and Using the Reciprocity Between Parametric Analysis and the Architectural Construction Detailing Process*, Architecture & Sustainable Development: Proceedings of the Conference on Passive and Low Energy Architecture, Louvain-la-Neuve, Belgium (2011), vol 2; 54-58 (ISBN: 978-2-87463-277-8)

J. Ko, L. Widder, *Engineers/Architects: Defining Collaboration Bases for Improved Use of Parametric Software in Integrated Design*, Proceedings of the 2nd International Exergy, Life Cycle Assessment and Sustainability Workshop and Symposium ELCAS, Nisyros Island, Greece (2011), 094; 476-483 (ISBN: 978-960-243-679-0)

S. Dickman, **J. Ko** and VW. Li, *A Mathematical Model to Predict the Performance of Advanced Therapies in Wound Healing*, Mod. In Med. And Bio. 8 (2009) 234-246

J. Ko and W. Strauss, *Effect of Vorticity on Steady Water Waves*, J. Fluid Mech. 608 (2008), 197-215

J. Ko and W. Strauss, *Large-Amplitude Steady Rotational Water Waves,* Eur. J. Mech. B Fluids 27 (2008), 96-109

S. Bartels, **J. Ko** and A. Prohl.
Numerical Approximation of the Landau-Lifshitz-Gilbert Equation and Finite Time Blowup of Weak Solutions, Math. Comp. 77 (2008), 773-788

J. Ko, *The Construction of a Partially Regular Solution to the Landau-Lifshitz-Glibert Equation in Two Dimensions,* Nonlinearity, 18 (2005), no. 6, pp. 2681-2714.

VW. Li, J. Ma, T. Serena, V. Driver, R. Kirsner, **J. Ko,** WW. Li
Dynamics of Acute Wound Healing Following Topical rhPDGF-BB Therapy, Journal of American Academy of Dermatology, 52 (2005), no. 3, p. 213

THESES

Partially Regular and Singular Solutions to the Landau-Lifshitz (Gilbert) Equation in Two Dimensions, PhD Thesis, New York University (2004)

MRI on the Fly: Accelerating MRI Imaging Using LDA Classification with LDB Feature Extraction, Dartmouth College Computer Science Technical Report PCS-TR96-290 (June 1996) with Michael Bedford Taylor

INVITED PRESENTATIONS

NATIONAL/INTERNATIONAL

08.2022 SIGGRAPH, Vancouver
"Woven Behavior and Ornamentation"
(presented as an Art Paper in the Intelligences: AI and Interactions session]

08.2019 SIGGRAPH, Los Angeles
"Weaving Objects: Spatial Design and Functionality of 3D Woven Textiles"
(presented as an Art Paper session and selected for a Technical Papers Fast Forward session)

06.2017 ISIE-ISSST, University of Illinois, Chicago, IL
"Studies in Eating, Walking, and Wasting in the City" (presenter: L.Widder)

04.2017 Opening the Bin, Lund University, Helsingborg, Sweden
"Studies in Eating, Walking, and Wasting in the City"(presenter: J. Braden)

11.2016 World Summit on Food and Health, Paris
"Place-Space Computation and Crowdsourced Geolocation"

11.2015 AICAD: Exploring Science in the [Art+Design] Studio, SF, CA
"Digital Sense: An Experimental Course in Advanced Technology for Art+Design"
with Brooks Hagan

09.2015 Design Modelling Symposium Copenhagen, Conference
Chaired session and moderated panel discussion on *"Modelling Information: Information Across Scales"*

09.2015 Design Modelling Symposium Copenhagen, Workshop
Selected as 1 of 4 workshops in symposium with theme of "Modelling Behavior". Co-led intensive workshop on "*Large-scale Data Flows <-> Small-scale Human Behavior*" with 12 participants from architecture, urban planning, economics and behavioral psychology, with L. Widder, J. Braden and K. Steinfeld.

05.2015 Earth Institute Workshop, Columbia University, New York City
Co-led a skills workshop "*Trash out of Place*" in which data gathered from city and campus resources together with a hybridized set of digital and observational tools enabled participants to visualize and analyze the spatial context that impacts the food-to-waste transition, with L. Widder and J. Braden

09.2013 Cleantech for Sustainable Buildings, Lausanne, Switzerland
"Designing Reversible Seams for Panelized Lightweight Building Construction"

05.2013 CAADRIA, Singapore
"Decodes: A Platform-Independent Computational Design Environment
(presenter K. Steinfeld)

05.2013 Sustainable Buildings Conference SB13, Oulu, Finland
"Situated Testing: Deploying Synergies between Sensing and Modeling for Case-specific Thermal Window Retrofit in Timber Builidings", (presenter L. Widder)

12.2012 7th Energy Forum on Solar Building Skins, Brixon, Italy
"Reciprocities between Sensing and Modeling in Building Envelope Retrofit" (presenter L. Widder)

10.2011 World Sustainable Building Conference, Helsinki, Finland
"Towards System-Integrated Building Envelope: Facilitating Computational Assessment of the Building Envelope Performance during the Architectural Detailing Process"

10.2011 Design Modelling Symposium Berlin, Germany
"*Tools and Design Strategies for Rib Growth"*

09.2011 Cleantech for Sustainable Buildings, Lausanne, Switzerland
"*Overcoming the Additive/Integrative Dilemma"*(presenter L. Widder)

07.2011 Passive and Low Energy Architecture Conference
Louvain-la-Neuve, Belgium
"*Building Envelope Assessment Tool for Systems-Integrated Design"* with L. Widder

07.2010 SIAM Conference on Life Sciences, Pittsburgh, PA
"*Correlating Theoretical Solutions with Real-world Practice in Mathematical Modeling of Wound Healing Therapies"* with V. Li

03.2010 Smart Geometry Conference, Barcelona, Spain
Panel Organizer and Moderator for "*Making it Add Up: Seeing the Real Benefits of Environmentally-Informed Design"*

01.2010 BE-MSM Workshop, Collaboration in Materials for the Built Environment
Council for Scientific and Industrial Research (CSIR), Pretoria, South Africa
"*Advances in the Design and Construction of Bio-Based Houses"* with R. Wool

04.2009 PDE Seminar, Georgia Tech, Atlanta, GA
"A Computational Tool for Steady Water Waves"

03.2009 Smart Geometry Conference, San Francisco, CA
Invited as a workshop tutor and gave a conference presentation o "Mathematics in Design: Challenges, Solutions and Opportunities"

04. 2008 Parametric Modeling Workshop, Gensler SF, CA
Invited to develop primer and lead workshop on parametric and computational modeling to project teams.

04. 2008 Wound Healing Society, San Diego, CA.
"Using Mathematical Modeling to Predict Performance: Advanced Therapies and Tissue Repair in Real-World Settings."

11. 2007 Oceanography Seminar, University of Rhode Island, Narragansett, RI
"The Effect of Vorticity on Steady Water Waves"

09. 2007 Nonlinear Dynamics Workshop, NUS, Singapore

Invited guest lecturer for seminar in engineering exploring nonlinear phenomena and recent developments in their analyses

04. 2007 International Association for Mathematical and Computers in Simulation Conference, Athens, GA
"Computation of Steady Water Waves and Their Dependence on Vorticity"

12. 2006 Canadian Mathematical Society, Winter Meeting, Toronto, Canada
"Rotational Water Waves Near Stagnation"

05. 2006 Workshop on Limit Problems in Analysis, University of Leiden, Netherlands
"Rotational Water Waves Near Stagnation"

07. 2005 PDE/Analysis Seminar, Morningside Center, Chinese Academy of Sciences, Beijing, China
"Construction of Solutions to Geometric PDEs"

05. 2005 SIAM Conference on Dynamical Systems, Snowbird, UT
"Blowup Solutions to the Harmonic Map Heat Flow and the Landau-Lifshitz-Gilbert Equations"

04. 2005 Workshop on Structured Dynamical Systems, Brown University
"Finite Time Blowup of Weak Solutions to the Landau-Lifshitz-Gilbert"

12. 2004 Applied Analysis Seminar, University of Maryland
"A Stable Numerical Scheme for the Landau-Lifshitz-Gilbert Equation"

05. 2004 SIAM Conference on Mathematical Aspects in Material Science, Los Angeles, CA.
"Partially Regular and Singular Solutions to the LLG in Two Dimensions"

<u>LOCAL/REGIONAL</u>

10.2019 Math+Art Panel, Brown ICERM semester on Illustrating Mathematics

10.2015 Bridge Grant Presentation, RISD
"Large-scale Data Flows <-> Small-scale Human Behavior"

10.2014 RISD Code Studio Code Drop Series
"Computational Geometry" with Carl Lostritto

03.2011 Brown Univ Symposium for Undergraduates in the Mathematical Sciences
"perFORMance: the Role of Math in Integrating Form and Performance in Architecture"

01.2011 STEM-to-STEAM Invited Workshop, RISD
"Key Success Factors to a STEAM career"

01.2009 Digital Foundations Workshop, RISD
Invitation by former RISD President John Maeda
"Mathematics to Support Design Intuition"

11.2008 Department of Architecture, RISD

"Topics in the Intersection of Mathematics and Design: Surface Panelization and Equilibrium Surfaces."

09. 2006 PDE Seminar, Brown University
"Rotational Waves Near Stagnation"

10. 2004 Analysis Seminar, Brown University
"Construction of Discrete L^p-L^q Estimates"

09. 2004 PDE Seminar, Brown University
"Construction of a Partially Regular Solution to the LLG"

11. 2003 Magnetics Seminar, Courant Institute, NYU
"Advances in Demonstrating Blowup Behavior to the Landau-Lifshitz and the Landau-Lifshitz-Glibert Equations"

11. 2002 Magnetics Seminar, Courant Institute, NYU
"A New Construction for a Partially Regular Solution to the Harmonic Map Heat Flow"

TEACHING

CURRICULAR INNOVATIONS

2021-2022 Hybrid Realities, Department of Industrial Design, RISD
Special topics studio course inviting a critical exploration of VR/AR and how it can intervene in and influence the design process.

Spring 2021 Adaptive Ecologies: Fabric Connections, Textiles, RISD x Hyundai
Collaborative research studio course exploring new relationships between advanced technologies, public environments, and personal experiences.

2020-2022 Digital Materiality, Department of Textiles, RISD
Studio course introducing computational concepts geared towards equipping students to leverage the contemporary material culture of textile design. Spring 2020 post-lockdown pivoted to using VR for crits thanks to Evelyn Eastmond, then Senior Design Researcher at Microsoft, and a generous donation of headsets by Facebook Reality Labs. Fall 2020 class participated in a Microsoft user study to advance this type of immersive teaching tool.

2014-2019 Digital Sense, RISD
Intensive interdivisional studio course exploring new ways of "seeing" and "feeling" using computational tools that augment and extend the creative process. Central to the class is a consideration of the computational and digital media landscape and the translation of creative work into and out of virtual environments. Has attracted students from 15 departments across design and fine arts. Co-taught with Brooks Hagan (2014-16) and Evelyn Eastmond (2017-19).

Fall 2015 Advanced Topics in Arch. Design and Computation, RISD
Seminar course devoted to the specific topic of Pattern Logic: Algorithm in Architecture and Design. Starting with a comparison of a variety of theoretical definitions of pattern in the arts, design and sciences, the course traces their evolution to contemporary practices of algorithmic design in architecture.

Fall 2014, Spring 2012 Foundational Topics in Design Computation, Dept. of Architecture, RISD
Seminar course teaching fundamental computational concepts geared towards architectural design, structured around situations that architects commonly encounter in practice and in which computation has been a powerful ally to generate effective solutions.

Summer, 2009-11 Mathematical Forms in Architecture, Brown University
Project-based course exploring architectural problems that have benefited from mathematical and computational insight. Introduced concepts and strategies to handle a range of situations that arise in architectural form-making.

Spring 2010 Performance-Driven Geometry, Department of Architecture, RISD
Seminar course exploring key performance drivers of structure, material, fabrication/construction, environment, and strategies for integrating these considerations into form design constructible at architectural scale.

Winter 2009 Designing Forms, Department of Architecture, RISD
Studio course introducing students to mathematical principles and computational tools employed in generative design and design rationalization.

STUDENTS ADVISED/SUPERVISED

2022 Elizabeth Meiklejohn, Textiles, RISD (MFA '22)
Advised thesis project "World Settings", exploring architectural acoustics and digital and analog noise and perceptual phenomena to shape a collection of interior fabrics that aim to modify room environments acoustically and visually.

Miguel Lastra, Ceramics, RISD (MFA '22)
Advised thesis project "Invasive Species" situating the 'othered' body in various modes of existence and its intersections with the environment. Using analog and digital processes, these headless and hollow bodies are transitory offerings.

Yuta Yang, Jewelry and Metalsmithing, RISD (MFA '22)
Advised thesis project "Zoomorphic Amalgamations", a series of speculative works assisting introverts to adapt in contemporary society. Using sensors and microcontrollers, the pieces aim to visualize the discomfort of social interaction.

2017 Lokesh Zope, Industrial Design, RISD (MID '17)
Advised thesis project "The Emotional Intelligence of Machines", with final output being the production of a number of tools to aid users in envisioning connections between objects and emotions as well as physical prototypes of household items demonstrating meaningful, respectful and delightful interactions.

Zixin Xiong, Industrial Design, RISD (MID '17)
Advised thesis project "Impractical Community", exploring the contemporary world of communication, understanding and preference for function. Final output was a novella and the design and fabrication of two playful objects to facilitate more meaningful conversation.

2016 Daniel Morgan, Industrial Design, RISD (MID '16)
Advised thesis project "Evolutionary Design Experiments", with final output being the design and fabrication of a neoprene wetsuit fabricated with form, scores

and seams driven by performance drivers of thermal retention and lines of maximal extension.

2015 Sichen Sun, Industrial Design, RISD (MID '15)
Advised thesis project "From Large to Small" with final output being the design and fabrication of a parametrically defined rolling "dice chair" constructed with off-the-shelf tubes and 3d-printed joints.

2010-12 Michal Dziedziniewicz, Architecture, RISD (MArch '12)
Supervised research project exploring growth patterns of ribbed reinforcement in rubber sheets with a range of support conditions. Implementation of integration of Rhino and ABAQUS finite elements solver in Python.

2008-09 Matt Ball, Computer Science, Brown University (BS '09)
Advised senior honors thesis on the computation of waves. Implementation of web-based visualization in Python.

2004-05 Joshua Bronson, Computer Science, Brown University (BS '06)
Supervised year-long independent study on computational methods in continuation analysis. Implementation in C++ using LOCA library (Sandia National Laboratories)

2003 Jeff King Lok Ma, Harvard University (BS '06)
Supervised research project conducting studies to define a new metric (velocity) in wound-healing and incorporating shape dynamics which can be incorporated into clinical predictive endpoints

OTHER INSTRUCTION

2005-2009 Courses in Department of Mathematics, Brown University
9 semester-long courses:
Intermediate Calculus in Physics/Engineering (3)
Honors Multivariable Calculus (2)
Ordinary Differential Equations (2)
Partial Differential Equations (2)

1999-2003 Courses in Department of Mathematics, New York University
6 semester-long courses:
Mathematical Thinking Seminar
Calculus II (2)
Multivariable Calculus
Linear Algebra (2)