

HOLLY WASILOWSKI SAMUELSON

Associate Professor of Architecture
Harvard Graduate School of Design
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ACADEMIC POSITIONS

2017-Present	CO-HEAD	MASTER OF DESIGN IN ENERGY AND ENVIRONMENT HARVARD GRADUATE SCHOOL OF DESIGN
2020-Present	ASSOCIATE PROFESSOR	HARVARD GRADUATE SCHOOL OF DESIGN
2013-2020	ASSISTANT PROFESSOR	HARVARD GRADUATE SCHOOL OF DESIGN
2012-2013	LECTURER	HARVARD GRADUATE SCHOOL OF DESIGN
2008-2012	TEACHING ASSISTANT/FELLOW	HARVARD GRADUATE SCHOOL OF DESIGN

EDUCATION

2013	HARVARD GRADUATE SCHOOL OF DESIGN	DOCTOR OF DESIGN Dissertation Topic: <i>Toward Buildings That Work: Reusing Design-Phase Energy Simulation for Operations-Phase Improvements</i> . Advisor: Dr. Christoph Reinhart, Professor & Director of Building Technology Program, MIT School of Architecture, (formerly of Harvard GSD). Committee: Dr. Martin Bechthold, Professor Harvard GSD, John Macomber, Senior Lecturer Harvard Business School, Dr. Leslie Norford, Professor MIT School of Architecture, Building Technology Program.
2009	HARVARD GRADUATE SCHOOL OF DESIGN	MASTER OF DESIGN Advanced placement. Graduated with distinction and highest grade point average of over 200 graduates. Thesis Topic: <i>The Effect of Customized versus Default Load Profiles in Simulated Building Energy Use</i> .
2000	CARNEGIE MELLON UNIVERSITY	BACHELOR OF ARCHITECTURE Tied highest grade point average in history of School of Architecture. University and department honors.
1999	DENMARK INTERNATIONAL STUDY PROGRAM	Semester study abroad in Copenhagen, Denmark
1998	CARNEGIE MELLON UNIVERSITY STUDY ABROAD PROGRAM	Summer study abroad in Rome, Italy
1994-1995	ALLEGHENY COLLEGE	Biology and Chemistry Major

PROFESSIONAL POSITIONS

Full-Time Positions

- 2007-2008 SUSTAINABLE BUILDING CONSULTANT GREEN ROUNDTABLE
Boston, MA. Technical consultant to architects, owners, and engineers on commercial building projects. Selected projects listed below. Managed five staff members.
- 2001-2007 REGISTERED ARCHITECT ADD INC
(now Stantec) Cambridge, MA. Designer for multiple commercial, retail, and multi-family residential projects. Selected projects listed below. Environmental task force committee chair and in-house sustainable design consultant.
- 2000-2001 GRADUATE ARCHITECT CELENTOHENN ARCHITECTURE
Pittsburgh, PA. Boutique firm lead by two Harvard Graduate School of Design alumni/ Carnegie Mellon Faculty.

Part-Time Positions

- 2011-2012 WORKSHOP INSTRUCTOR GREEN CE
Ridgefield, WA. Part-time during graduate school. Taught LEED (Leadership in Energy and Environmental Design) workshops nationally. Audience: design and construction professionals.
- 2007-2011 WORKSHOP INSTRUCTOR SUSTAINABLE PERFORMANCE INSTITUTE
(formerly Green Roundtable), Boston, MA. Part-time during graduate school. Developed and taught professional workshops nationally on sustainable design, LEED, and daylighting buildings. Audience: design and construction professionals.
- 1999 INTERN THE DESIGN ALLIANCE
Pittsburgh, PA
- 1997 INTERN WASILOWSKI ARCHITECTS
Natrona Heights, PA

HONORS / AWARDS

- 2017 **First Place: International Building Performance Simulation Association Student Modeling Competition**, faculty advisor, biennial international competition. San Francisco
- 2014 **Outstanding Young Contributor Award: International Building Performance Simulation Association USA**, biennial national recognition for significant contributions to the field of building performance simulation. Atlanta, GA
- 2014 **Most Innovative Award: Better Buildings Case Competition, U.S. Department of Energy**, faculty advisor. Washington, DC

- 2013 **First Place: International Building Performance Simulation Association Student Modeling Competition**, faculty advisor, biennial international competition. Chambéry, France
- 2011 **Travel Award: International Building Performance Simulation Association conference**, for meritorious papers by student authors. Travel expenses to Sydney, Australia
- 2009 **Gerald M. McCue Medal: Harvard Graduate School of Design**, for the highest academic achievement of post-professional students. Cambridge, MA
- 2009 **Best Paper Prize: ARUP Engineering**, [first author] for the best paper on simulation and design at the biennial International Building Performance Simulation Association Conference. Glasgow, Scotland
- 2009 **Travel Award: International Building Performance Simulation Association conference**, for the six best student papers of the conference. Glasgow, Scotland
- 2007 **Honor Award for Design Excellence: Boston Society of Architects**, Carmax Home Office project. Project role: co-project architect and sustainable design coordinator. Boston, MA
- 2007 **Award of Distinction for Sustainable Design: American Institute of Architects New England**, Carmax Home Office project. Project role: co-project architect and sustainable design coordinator. Boston, MA (For other awards, see project under "Selected Architecture Projects" above.)
- 2002 & 2005 **Employee Honor Award, ADD Inc** (now Stantec), monetary award made annually to 1-3 employees out of 150 for exceptional contribution to a team working environment
- 2000 **Henry Adams Medal: American Institute of Architects**, for the top-ranking architecture graduate at Carnegie Mellon University. Pittsburgh, PA

PROFESSIONAL ACCREDITATION

- 2006 **Architecture Registration**, Massachusetts
- 2005 **Architecture Registration**, National Council of Architecture Registration Boards
- 2005 **Architecture Registration**, Texas
- 2002 **Leadership in Energy and Environmental Design (LEED) Accreditation**, Among the first 0.1% of accredited professionals

INVITED LECTURES & PRESENTATIONS

- 2020 **University of Victoria. *Public lecture.*** sponsored by the Civil Engineering Department, Vancouver Canada, postponed due to pandemic
- 2020 **University of British Columbia. *Public lecture.*** sponsored by the Civil Engineering Department, Vancouver Canada, postponed due to pandemic
- 2020 **Universidad de Sevilla, *Workshop.*** sponsored by the School of Architecture, Sevilla, Spain, postponed due to pandemic
- 2020 **Hanyang University, Seoul, Korea, *Keynote.*** Occupant, Built Environment, and Building Performance Symposium, postponed due to pandemic
- 2020 **Northeastern University. *Public lecture.*** “On Buildings, Energy, and Health in a Changing Climate”
- 2019 **Ryerson University. *Public lecture.*** “On Buildings, Energy, and Health in a Changing Climate”
- 2019 **Roger Williams University. *Public lecture.*** sponsored by the School of Architecture, Art and Historic Preservation, “On Buildings, Energy, and Health in a Changing Climate”
- 2019 **Universidad de Sevilla, Spain. *Keynote.*** International Conference on Courtyard Performance and Thermal Modelling
- 2019 **U. C. Berkeley College of Environmental Design. *Public lecture.*** “Bridging Design & Research”
- 2019 **Carnegie Mellon University School of Architecture. *Public lecture.*** “Bridging Design & Research”
- 2019 **University of Hawaii School of Architecture. *Public lecture.*** “Bridging Design & Research”
- 2018 University of Toronto, “Climatic Design Strategies”
- 2017 **Massachusetts Institute of Technology. *Public lecture.*** sponsored by the MIT Building Technology Program, “Toward More Effective Energy Simulation” <https://architecture.mit.edu/building-technology/lecture/towards-more-effective-building-energy-simulation>

- 2017 Harvard Graduate Consortium of Energy and Environment, “Battle of the Consortium: A Low-Energy Building Design Competition”
- 2016 **WSP/MM Future of Buildings Conference. *Keynote.*** Toronto, Ontario “Calibration of Design-Phase Energy Models”
- 2016 Harvard Business School, “The Empire State Building and State of the Art Energy Savings”
- 2015 **Harvard University. *Public lecture.*** sponsored by: Harvard Brain Science Initiative, Harvard Art Museums, Harvard Museums of Science and Culture, “In and Out of Sync: How Does Light Impact Health?” Location: Harvard University Science Center, Approx. 200 attendees
- 2014 Harvard Graduate Consortium of Energy and Environment, “Energy Efficiency in Early Architectural Design”
- 2013 Massachusetts Institute of Technology, “Models and Measurements”
- 2012 **Lawrence Berkeley National Laboratory. *Public lecture.*** “Bridging Simulation & Practice”
- 2012 **U. C. Berkeley College of Environmental Design. *Public lecture.*** “Bridging Research & Practice”
- 2012 **University of Pennsylvania Department of Architecture. *Public lecture.*** “Building Simulation: From Drawing Board to Reality”
- 2012 **Northeastern University College of Engineering and School of Architecture. *Public lecture.*** “Simulation and the Built Environment”
- 2012 **University of Southern California School of Architecture. *Public lecture.*** “Bridging Practice, Research, & Architecture Education”
- 2011 **U. C. Berkeley College of Environmental Design. *Public lecture.*** “Bridging Practice, Research, and Architecture Education”
- 2008 Massachusetts Institute of Technology, Center for Real Estate. “Real World Sustainability Strategies: The Unsexy Lecture”

PUBLICATIONS

Interviews / Published Quotations

- 2020 “What will your office look like after lockdown?,” Taylor, E., **Vogue**. <https://www.vogue.com/article/what-will-your-office-look-like-after-covid-19-lockdown>
- 2019 “Why indoor air quality matters to our bodies and our brains,” Greenwood, V., **BBC** <https://www.bbc.com/worklife/article/20190724-why-indoor-air-quality-matters-to-our-bodies-and-our-brains>
- 2018 “Your building might be making you sick,” Walsh, C. **Harvard Gazette**

Peer-Reviewed Journal Articles

Under review

- 2020 “Uncovering Mold Risks in Existing Residential Walls in a Changing Climate,” Cabrera, P., **Samuelson, H., *Proceedings of the National Academy of Sciences of the US (PNAS)***, under review
- 2020 “The Increased Threat of Heat Waves During a Pandemic,” Baniassadi, A., Allen, J. G., **Samuelson, H., *Science of the Total Environment***, under review
- 2020 “Health and Climate Benefits of Heat Adaptation Strategies in Single-Family Residential Buildings,” Williams, A., Baniassadi, A., Izaga Gonzalez, P., Buonocore, J., Cedeno Laurent, J. G., **Samuelson, H., *Frontiers in Sustainable Cities***, under review
- 2020 “The Impact of Cultural Assumptions on Simulated Energy, Comfort, and Investment Returns,” Estrella Guillen, E., Vohringer, C., **Samuelson, H., *Building Simulation***, under review

Published

- 2020 “Dynamic Metric of Natural Ventilation Performance for Interactive Modeling—Ventilation Cooling Effectiveness (NVCE),” Yoon, N., Norford, L., Malkawi, A., Piette, M. A., **Samuelson, H., *Building and Environment***, June 2020
- 2020 “Beyond Energy Savings: Investigating the Co-Benefits of Heat Resilient Architecture,” **Samuelson, H., Baniassadi, A., Izaga Gonzalez, P., *Energy***, May 2020
- 2020 “Housing as a Critical Determinant of Heat Vulnerability and Health,” **Samuelson, H., Baniassadi, A., Lin, A., Izaga Gonzalez, P., Brawley, T., Narula, T., *Science of the Total Environment***, February 2020

- 2020 "A New Method for Visualizing and Evaluating Views in Architectural Design," Li, W., **Samuelson, H.**, *Developments in the Built Environment*, January 2020
- 2020 "Transfer learning with deep neural networks for model predictive control of HVAC and natural ventilation in smart buildings," Chen, Y., Tong, Z., Zheng, Y., **Samuelson, H.**, & Norford, L., *Journal of Cleaner Production*, May 2020 (available Dec. 2019)
- 2019 "Comparing Energy and Comfort Metrics for Building Benchmarking," **Samuelson, H.**, Estrella Guillen, E. (co-first authors), Cedeno Laurent, J. G., *Energy and Buildings*, October 2019
- 2019 "Achieving natural ventilation potential in practice: Control schemes and levels of automation," Chen, Y., Tong, Z., Wu, W., **Samuelson, H.**, Malkawi, A., Norford, L., *Applied Energy*, February 2019
- 2019 "Realizing natural ventilation potential through window control: The impact of occupant behavior," Chen, Y., Tong, Z., **Samuelson, H.**, Wu, W., & Malkawi, A., *Energy Procedia*, 2019
- 2018 "Optimal Control of HVAC and Window Systems for Natural Ventilation Through Reinforcement Learning," Chen, Y., Norford, L., **Samuelson, H.**, Malkawi, A., *Energy and Buildings*, March 2018
- 2017 "The Impact of Window Opening and Other Occupant Behavior on Simulated Energy Performance in Residence Halls," Cedeno Laurent, J. G., **Samuelson, H.**, Chen, Y., *Building Simulation*, December 2017
- 2016 "Parametric Energy Simulation in Early Design: High-Rise Residential Buildings in Urban Contexts," **Samuelson, H.**, Claussnitzer, S., Goyal, A. Chen, Y., Romo-Castillo, A., *Building and Environment*, May 2016
- 2016 "Integrated Design Workflow and a New Tool for Urban Rainwater Management," Chen, Y. [student advisee], **Samuelson, H.**, Tong, Z., *Journal of Environmental Management*, April 2016
- 2015 "Analysis of a Simplified Building Energy Model Calibration Procedure for 18 Real-World Case Studies," Samuelson, H.W., Ghorayshi, A., Reinhart, C., *Journal of Building Performance Simulation*, January 2015
- 2012 "Non-Technical Barriers to Energy Model Sharing and Reuse," **Samuelson, H.**, Lantz, A., Reinhart, C., *Building and Environment*, July 2012
- 2011 "Learning by Playing – Teaching Energy Simulation as a Game," Reinhart, C., Dogan, T., Ibarra, D., **Samuelson, H.**, *Journal of Building Performance Simulation*, October 2011

Peer-Reviewed Conference Papers

Under review

- 2020 “Hygrothermal Performance Modeling of Building Envelopes Under Future Climate Conditions,” Tepfer, S. **Samuelson, H.**, *Proceedings of Passive and Low-Energy Architecture (PLEA)*, Coruña, Spain, September 2020
- 2020 “Comparison and Validation of Two Simulation Workflows for Courtyard Microclimates,” López-Cabeza, V., Galan-Marin, C., Rivera-Gómez, C., **Samuelson, H.**, *Proceedings of Passive and Low-Energy Architecture (PLEA)*, Coruña, Spain, September 2020

Published

- 2019 “Simulating Mold Risks under Future Climate Conditions,” Cabrera, P., **Samuelson, H.**, Kurth, M., *Proceedings of Building Simulation the International Building Performance Simulation Association (IBPSA) International Conference*, Rome, Italy, September 2019
- 2019 “Tempering the Temporary: Improving Thermal Safety & Comfort in Relief Shelters,” Tuladhar, S., Jahn, J., **Samuelson, H.**, *Proceedings of Building Simulation the International Building Performance Simulation Association (IBPSA) International Conference*, Rome, Italy, September 2019
- 2017 “Improving Window Selection: A New Workflow and Tool for Architects/Engineers,” He, H., Wang, R., **Samuelson, H.**, Michalatos, P., *Proceedings of Building Simulation the International Building Performance Simulation Association (IBPSA) International Conference*, San Francisco, CA, USA, August 2017
- 2015 “Toward Pre-simulated Guidelines for Low-Energy High-Rise Residential Design in Megacities,” **Samuelson, H.**, Goyal, A., Romo-Castillo, A., Claussnitzer, S., Chen, Y., Bakshi, A., *Proceedings of Simulation for Architecture and Urban Design (SimAUD)*, Washington, DC, April 2015
- 2015 “Integrated Workflow and a New Tool for Urban Rainwater Management,” Chen, Y., **Samuelson, H.**, *Proceedings of Building Simulation the IBPSA International Conference*, Hyderabad, India, December 2015
- 2014 “Post-Occupancy Evaluation and Partial-Calibration of 18 Design-Phase Energy Models,” **Samuelson, H.**, Ghorayshi, A., Reinhart, C., *Proceedings of SimBuild the IBPSA and American Society of Heating Refrigerating and Air-Conditioning Engineers (ASHRAE) Conference*, Atlanta, Georgia, September 2014
- 2011 “Identifying Non-Technical Barriers to Energy Model Sharing and Reuse,” **Samuelson, H.**, Lantz, A., Reinhart, C., *Proceedings of Building Simulation the IBPSA International Conference*, Sydney, Australia, November 2011
- 2011 “Learning by Playing – Teaching Energy Simulation as a Game,” Reinhart, C., Dogan, T., Ibarra, D., **Samuelson, H.**, *Proceedings of Building Simulation the IBPSA International Conference*, Sydney, Australia, November 2011

- 2009 "Modeling an Existing Building in DesignBuilder/EnergyPlus: Custom vs. Default Inputs," **Wasilowski, H.** [maiden name], Reinhart, C., *Proceedings of Building Simulation the IBPSA International Conference*, Glasgow, Scotland, July 2009. Awarded Arup Engineering Best-Paper Prize

Research Reports / Book Contributions

- 2018 "Green Cities: Energy and Urban Form", Funded report for Office for Urbanization, Harvard GSD, 2018, **H. Samuelson**, P. Cabrera, K. Carmody
- 2018 "Tall, Hot, and Zero," Lead editor for funded 170-page research report for Harvard Center for Buildings and Cities, 2018. Ed. **H. Samuelson**, with fifteen coauthors, listed under "Research" above
- 2015 "House Zero: Research Report," Lead editor for funded 60-page executive report and 200+ page extended report for Harvard Center for Buildings and Cities, 2015. Ed. **H. Samuelson**, with twenty contributors listed under "Research" below
- 2015 "Comparing Modes of Operation for Residential Ceiling Fans to Achieve Thermal Destratification," **Samuelson, H.**, 2015
- 2010 "Investigating the Importance of Customized Energy Model Inputs," **Samuelson, H.**, & Reinhart, C., in *Ecological Urbanism*, Eds. Mohsen Mostafavi & Gareth Doherty, Baden Switzerland, Lars Muller Publishers, pp. 472-475, 2010

Publications Featuring Design Work

- 2007 Carmax Home Office Project. Architecture Boston. January/February 2007
- 2002 Carmax Home Office Project. Macht, W. P. "Building Green in the Woods," *Urban Land: Journal of the Urban Land Institute*, Vol 66, No. 8 pp. 150-151
- 2002 Art Interactive gallery. McQuaid, C. "At this gallery viewers become part of the art," *Boston Globe*, October 18, 2002. pp C18, C21

OTHER CONFERENCE/SYMPOSIA PRESENTATIONS

- 2019 "Highly Energy-Efficient Buildings to Net-Zero." ABX Conference, Boston, Massachusetts, November, 2019
- 2019 "Indoor Exposure to Heat in the Age of Mechanical Air Conditioning." ASHRAE Building Performance Analysis Conference, (work presented by co-author) Denver, Colorado, September, 2019
- 2018 "Innovation 2030: Next Generation" Presentation, *American Institute of Architects Conference*, June 2018. One of 12% of session proposals accepted

- 2018 "Clima[c]tic Design Game" *Society for Building Science Educators Symposium*, Iowa, July 2018
- 2017 "Simulating Window Operation" Conference Presentation OB-17 *Symposium on Occupant Behavior and Adaptive Thermal Comfort*, Technical University of Denmark, May 2017
- 2017 Moderator. "Next Generation Tools" *Building Simulation, the IBPSA International Conference*, San Francisco, CA, USA, August 2017
- 2016 Invited Speaker/Panelist, "Capturing the Carbon Dividend, Implementing Cobenefits" *Harvard Global Health Institute*
- 2016 Invited Speaker, "Using Parametric Simulation to Design for Future Contexts", *Heliomorphism Conference*, Harvard Graduate School of Design
- 2014 "Post-Occupancy Evaluation and Partial-Calibration of 18 Design-Phase Energy Models," *SimBuild the IBPSA and ASHRAE Conference*, Atlanta, Georgia, September 2014
- 2014 "Energy Vernacular: A Simulation-Based Framework for Climate-Responsive Design", Syracuse Center of Excellence *Symposium on Advanced Building Systems*, Syracuse, NY, September 2014
- 2014 "The Energy Optimization Challenge: Teaching Climate-Responsive Design as a Game," *Society for Building Science Educators Symposium*, Tucson, Arizona, June 2014
- 2013 Panelist, *Resilience, Adaptability + Sustainability in the Built Environment*, Real Estate Academic Initiative Harvard University, April 2013
- 2013 "Save Shaheen! An Academic Daylight Retrofit Project." *DIVA (Design Iterate Validate Adapt) Day*, New York 2013
- 2011 "New Life for Existing Energy Models." U.S. Green Building Council's *GreenBuild Conference*, Toronto Canada, 2011. One of 130 sessions accepted out of 1,200+ submissions.
- 2011 "Identifying Non-Technical Barriers to Energy Model Sharing and Reuse," *Building Simulation, the IBPSA International Conference*, Sydney, Australia, November 2011
- 2009 "Modeling an Existing Building in DesignBuilder/EnergyPlus: Custom vs. Default Inputs," *Building Simulation the IBPSA International Conference*, Glasgow, Scotland, July 2009
- 2008 "Daylight Simulation," U.S. Green Building Council's *GreenBuild Conference*, 2008. Off-site education session taught with four other students. Drew 400+ attendees, the largest session of the conference

SELECTED RESEARCH

- 2020 **Building Design to Reduce Risk of Infectious Disease Exposure**
- Research Team: Amir Baniassadi, Researcher Harvard Graduate School of Design. Joseph Allen, Assoc. Professor, T.H. Chan School of Public Health, David Sailor, Professor, Arizona State University, School of Geographical Sciences and Urban Planning
Role: P. I.
Status: Ongoing.
- 2019 - 2020 **Protecting Health by Building Design under a Warming Urban Climate**
- Research Team: Amir Baniassadi and Pablo Izaga Gonzales, researchers Harvard Graduate School of Design. Anne Lin, student Harvard Graduate School of Design, Thomas Brawley and Tushar Narula Students University of California Berkeley, Jose Guillermo Cedeno Laurent and Augusta Williams Researchers T.H. Chan School of Public Health
Funded by Climate Change Solutions Fund 2018
Role: P. I.
Status: Ongoing.
- 2019 - 2020 **Climate Change Resilience: Assessing Future Mold-Growth Risks in Housing**
- Research Team: Jesse Keenan, faculty Harvard Graduate School of Design, Sara Tepfer, Pamela Cabrera, Kenner Carmody, and Esteban Estrella, students Harvard Graduate School of Design, Margaret Kurth & Igor Linkov, U. S. Army Corps of Engineers
*Funded by U.S. Army Corps of Engineers;
Joint Center for Housing Studies;
and Harvard Research Enabling Grant,
& Dean's Research Grant Award Program*
Role: P. I.
Status: Ongoing.
- 2019 - 2020 **Thermal Behavior in Transition Spaces**
- Research Team: Carmen Galan Marin, Carlo Rivera, and Victoria Patricia Lopez Cabeza, Universidad de Sevilla
Funded by Spanish Ministry of Science, Innovation, and Universities
Role: Researcher
Status: Ongoing.
- 2018 - 2020 **Tempering the Temporary: Improving Thermal Safety & Comfort in Relief Shelters**
- Research Team: Shreejay Tuladhar & Joelle Jahn, former students, Amir Baniassadi and Pablo Izaga Gonzales, researchers Harvard Graduate School of Design
Role: Advisor
Status: Ongoing.

- 2019 - 2020 **Architectural Design Considerations for Healthy Sleep Environments in Low-Energy Buildings**
 Research Team: Jose Guillermo Cedeno Laurent, T.H. Chan School of Public Health, Esteban Estrella & Jungmin Han, students Harvard Graduate School of Design, Shide Salimi, researcher Harvard Graduate School of Design
Funded by Dean's Fund for Energy and Sustainable Design & Dean's Research Grant Award Program
 Role: P. I.
 Status: Ongoing
- 2019 **Toward Healthy Buildings for Humans and the Planet: Comparing a High-Tech, Low-Tech, and No-Tech Building**
 Research Team: Jose Guillermo Cedeno Laurent, T.H. Chan School of Public Health, and Esteban Estrella, Harvard Graduate School of Design
Funded by Milton Fund
 Role: P. I.
 Status: Ongoing.
- 2016 - 2019 **New Benchmarking and Performance Simulation Methods for Buildings Based on Energy Use, Comfort, and Health**
 Research Team: Jose Guillermo Cedeno Laurent, T.H. Chan School of Public Health, Esteban Estrella, Jungmin Han, Christine Tiffin, Shreejay Tulhadar, students, Harvard Graduate School of Design
Funded by Dean's Fund for Energy and Sustainable Design
 Role: P. I.
 Status: Complete.
- 2019 - 2020 **Simulating View**
 Research Team: Wenting Li
 Role: Advisor
 Status: Complete
- 2018 - 2019 **Importance of Cultural Understanding in Building Energy Analysis and Simulation**
 Research Team: Esteban Estrella & Christine Voehringer, students Harvard Graduate School of Design
 Role: P. I.
 Status: Complete
- 2018 **Green Cities: Considerations for Healthy, Low-Carbon, New Chinese Cities**
 Research Team: Pamela Cabrera & Kenner Carmody, students Harvard Graduate School of Design
Funded by Evergrande/Office for Urbanization
 Role: P. I. for "Green" portion of larger initiative
 Status: Complete

- 2017 **Tall, Hot, Zero: Case Study Analyses for a Low-Energy Residential High-Rise in a Hot, Humid Climate**
 Research Team: Holly Samuelson and Ali Malkawi, Research Advisors
 Pamela Cabrera, Esteban Estrella Guillén, Jungmin Han, Tai Hsin Hsu, Ching-Che Huang, Anqi Huo, Aurora Jensen, Wenbo Shi, Christine Vohringer, Bing Wang, Xiaoran Wang, Xiaoshi Wang, Bin Yan, Nari Yoon, and Wei Zhang, students/post-docs Harvard GSD
Funded by Evergrande/Harvard Center for Green Buildings and Cities.
 Responsible for day-to-day management of 15-person research team
 Role: Co-P.I.
 Status: Complete
- 2014-2016 **Parametric Energy & Passive Survivability Simulation in Early Design: High-Rise Residential Buildings in Urban Contexts**
 Research Team: Sebastian Claussnitzer, Bjarke Ingals Group, Apoorv Goyal, Yujiao Chen, & Alejandra Romo-Castillo, Students Harvard GSD
Funded by Dean's Research Grant Award Program
Harvard Center for Green Buildings and Cities
& Joint Center for Housing Studies
 Role: P.I.
 Status: Complete
- 2014-2015 **House Zero Pre-Design Research**
 Research Team: Ali Malkawi Center Director, Yujiao Chen, Blanca Dasi Espuig, Ching Wen Hsiao, Karol Malik, Matan Mayer, Erica Rioux Gees, Alejandra Romo Castillo, Holly Samuelson, Bin Yan, Arta Yazdanseta, Liuwei Zhao, students/post-docs Harvard GSD
Funded by Harvard Center for Green Buildings and Cities.
 Led pre-design simulation and research for an energy-positive, building retrofit, demonstration project. Responsible for day-to-day management of 11-person research team
 Role: P. I.
 Status: Complete
- 2015 **Heating Season Comfort & Energy Savings Due to Temperature Destratification**
Funded by Big Ass Fans
 Role: Technical Research Advisor
 Status: Complete
- 2010-2014 **Toward Buildings that Work: Reusing Design-Phase Energy Models for Operations-Phase Improvements**
Funded by American Society of Heating Refrigerating and Air-Conditioning Engineers (ASHRAE)
Real Estate Academic Initiative
& International Facility Management Association
 Doctoral dissertation work
 Status: Complete

TEACHING EXPERIENCE

Building [I] Human Interaction/6361

Spring 2019, '20

Role: Solo Instructor. This course investigates the interactions between humans and buildings with a focus on environmental sustainability and, especially, occupant health

Environmental Systems II/6122

Fall 2018, '19

Role: Solo Instructor. This half-semester course, required for first-year Master of Architecture and Master of Design in Energy and Environment students introduces architectural daylighting, acoustics, and active building systems, such as HVAC

Building Simulation/6125 (new numbering)

Spring 2018, '19, '20

Role: Co-Instructor. This half-semester course, required for first-year Master of Architecture and Master of Design in Energy and Environment students introduces energy simulation and computational fluid dynamics in architecture

Environmental Systems in Architecture/6125

Spring 2013, '14, '15, '16, '17

Role: Solo Instructor. This required course for first-year Master of Architecture students provides an introduction to energy and environmental considerations in architecture

Environment, Economics, & Enterprise/5370

Spring 2014, '15, '16, '17, '18, '19, '20

Role: Co-Instructor. This cross-disciplinary course challenges students to create projects in the built environment that are both economically effective and environmentally impactful

Energy Simulation for Design/6470

Fall 2012, '13, '14, '16

Role: Solo Instructor. This course provides an in-depth introduction to the use of energy simulation in the architectural design process. [In 2012 it was called Simulation for Design and included daylighting.]

Daylighting/06479

Fall 2013, '14, '16

Role: Solo Instructor. This half-semester course investigates daylight as a form-generator in architecture and advances students' analog and digital analysis skills

Third Semester Core Architecture Studio/1201

Fall 2011, '12, '13

Role: Consultant for six design studios. Provided lectures, desk critiques, and design reviews to ~70 students regarding thermodynamics, building systems, and ecological design issues

Parental Leave

Fall 2015, '17

Executive Education

Class: Light and Health

2020

Harvard Graduate School of Design, *Healthy Buildings Program*

Class: Energy and Energy Simulation in Buildings

2013, '14, '15, '16, '17, '18, '19, '20

Harvard Business School and Graduate School of Design,
Advanced Management Development Program

Class: Energy and Energy Simulation in Buildings

2013, '14, '15, '16, '17, '18, '19, '20

Harvard Business School and Graduate School of Design,
Real Estate Management

Thesis/Dissertation Advising

26 Completed Master Theses Supervised (Master of Design and Master of Architecture)

3 Ongoing and 6 Completed Doctoral Dissertations Supervised (Primary or Secondary Advisor)

SELECTED PROFESSIONAL PROJECTS

Selected Consulting Projects

- 2007-2008 **Isabella Stewart Gardner Museum Expansion**, Boston, MA
Role: Sustainability consultant to owner (solo consultant from Green Roundtable). Performed design review of Renzo Piano Building Workshop and BuroHappold 50% Design Documents. (Later left project to enter graduate school.)
- 2007-2008 **Suffolk University Residence Hall**, Boston, MA
Staples and T. J. Maxx Prototype Stores, Design standards for multiple stores (with Green Roundtable). Led project teams in healthy building design, energy and water conservation strategies, lighting, daylighting, material selection, LEED certification and envelope design.

Selected Architecture Projects

- 2007 **321 North**, Plantation, FL
33 acres, urban and architectural design, 550,000sf retail, 610,000sf office, 590 residential units, 5000 structured parking spaces. Managed design team through approvals phase for retail and parking portion of project (with ADD Inc, now Stantec). Led LEED for Neighborhood Development pilot project coordination. (Unbuilt)
- 2003-2005 **Carmax Home Office**, Richmond, VA
Co-project architect and sustainable design coordinator for 270,000sf Fortune 500 corporate headquarters (with ADD Inc, now Stantec). LEEDv2.1 Silver certification. Boston Society of Architects Honor Award for Design Excellence 2006, Mid-Atlantic Construction Magazine – Best Office Project of 2005, US Green Building Council James River Chapter – Award of Merit, Virginia Sustainable Building Network – Best Commercial Project of 2006.
- 2002 **Art Interactive**, Cambridge, MA
Personal project (with some coaching from ADD Inc, now Stantec). A 2,500sf exhibition space for interactive art in a historic Jose Luis Sert building in Cambridge, MA. Role: Lead designer, project manager, and construction sub-contractor. Published, Boston Globe October 2002.
- 2001 **100 Acres Master Plan**, Boston, MA
Designer (with ADD Inc, now Stantec). Established urban design and architectural guidelines for 1,600,000sf residential and 2,600,000sf office space in the Fort Point Channel district of Boston.

PROFESSIONAL SERVICE

Leadership Positions

2018 - present	Executive Board Member: Simulation in Architecture and Urban Design (SimAUD) organization
2017 - present	Co-Head: Master of Design in Energy and Environment Program, Harvard Graduate School of Design. Set requirements, develop curriculum, organize lectures/events, recruit and advise students
2017 - present	Core Faculty Leader: Harvard Center for Green Buildings and Cities
2018	Task-Force Committee Member: Executive Education Task Force, Harvard Graduate School of Design. Developed a new strategic plan for the future of all non-degree programs at the school.
2016 - present	Faculty Advisor: Harvard GSD Executive Education Program
2015	Co-Chair: <i>Simulation in Architecture and Urban Design Conference (SimAUD)</i> , Washington, DC
2014	Chair: Scientific Advisory Sub-Committee ASHRAE/IBPSA USA <i>Building Simulation Conference</i>
2011-2013	President: International Building Performance Simulation Association (IBPSA) USA, Boston Chapter. Founding member and first elected president. Set a precedent for all local chapters. Hosted multiple technical symposia on energy modeling, attended locally and by virtual participants on five continents
2013	Board of Advisors: New Generation Energy, Not-for-profit organization achieving energy efficiency and energy generation projects for other not-for-profit organizations
2007-2008	National Council of Architecture Registration Boards (NCARB) Pre-Test Committee, Provided quality control for architecture registration exams
2007-2008	Director: GreenBuild Conference Sub-Committee, Organized 13 events for a conference of 30,000+ attendees. Led approximately 50 volunteers

Competition/Award Juries and Peer-Reviews

- 2018 Project StaSiO (Standard Simulation Outputs) graphic competition with the International Building Performance Simulation Association, online
- 2017 American Institute of Architects Committee on the Environment, Student Competition, Washington DC USA
- 2014-present Harvard University Climate Change Solutions Fund Grant
- 2013 US Green Building Council MA Green Building Awards, Boston, MA USA
- 2012-present **External Reviewer** for: Building and Environment Journal, Energy and Buildings Journal, ASHRAE Journal, ASHRAE/IBPSA Building Simulation Conference, Passive and Low Energy Architecture (PLEA) International Conference, GreenBuild Conference, SimBuild Conference, Architectural Engineering Institute Conference, Routledge Architecture book submissions, Springer book submission