

Roya Rezaee, PhD, LEED AP, CPHC

Co-director of Energy Lab, Perkins&Will
Part-time Lecturer at Georgia Tech, SoA
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EDUCATION

- Doctor of Philosophy** Apr 2016
Major: High Performance Building, Minor: Model Based System Engineering
School of Architecture, Georgia Institute of Technology
Atlanta, Georgia, GPA: 4.0/4.0
- Graduate Certificate in Building Science** Dec 2009
University of Southern California, School of Architecture
Los Angeles, California
- Masters of Architecture** Sep 2006
Major in Architectural Technology, Iran University of Science and Technology (IUST)
Tehran, Iran
- Bachelor of Architecture** Sep 2003
School of Art and Architecture, Shiraz University
Shiraz, Iran
- High School Diploma in Physics and Mathematics** Sep 1999
NODET: National Organization for Developing Exceptional Talents
Shiraz, Iran

PROFESSIONAL EXPERIENCE

- Perkins&Will, Boston, MA and Atlanta, GA** Jan 2016 - Present
Position: Co-Director of Energy Lab
- Building Performance Consultant
 - Energy and environmental analysis, comfort assessment, daylight and glare analysis, thermal and hygrothermal modeling, CFD, life cycle analysis
 - Parametric design, multi-objective optimization, data analysis, risk assessment, BIM
 - Building Performance Tool Developer
 - SPEED: Simulation Platform for Energy Efficient Design
 - EUI Generator: Energy Use Intensity Target and Benchmark Generator
 - WAVT: Water Analysis and Visualization Tool
- Georgia Institute of Technology, School of Architecture, Atlanta, GA** Aug 2019 - Present
Course: Building Simulation in Design Practice
- ARUP, Chicago, IL** May 2014 - August 2014
Position: Intern in Smart Building:
- Improve building integrated automation system
 - Increase space utilization and collaboration system
 - Smart solution to reduce plug loads and other miscellaneous equipment loads
- Perkins+Will, New York, NY** May 2012 - August 2012
Position: Intern in Design Research:
- New approach to LEED-ND
 - Urban-scale sustainability
 - “Transparency”: Sustainable and healthy building material

PROFESSIONAL CERTIFICATIONS + ORGANIZATIONS

LEED Accredited Professional

United States Green Building Council, 2010

CPHC

Passive House Institute, USA, 2016

Certification in “Energy Savings in Buildings”

Iranian Organization for Engineers, Ministry of Housing and Urban Development, 2008

Certification in “The Implication of Structure in Architecture”

Iranian Organization for Engineers, Ministry of Housing and Urban Development, 2008

Certification in “Space Frame Structures”

Iranian Organization for Engineers, Ministry of Housing and Urban Development, 2008

Certification in “The Design of Details in Construction”

Iranian Organization for Engineers, Ministry of Housing and Urban Development, 2008

ACADEMIC AND RESEARCH EXPERIENCE

Graduate Research Assistant

- Application of inverse modeling to energy performance based architectural design at the early stage; PhD dissertation under supervision of Assistant Professor Jason Brown and Professor Godfried Augenbroe, School of Architecture, Georgia Institute of Technology, Fall 2014- Spring 2016
- Assessment and quantification of HVAC uncertainty; under supervision of Professor Godfried Augenbroe, School of Architecture, Georgia Institute of Technology, Fall 2014
- Early design decision support; quantification of uncertainty and assessment of confidence in building energy analysis; under supervision of Professor Jason Brown, School of Architecture, Georgia Institute of Technology, Spring 2013- Spring 2014
- Creating custom 3D environments for the NADS MiniSim, Georgia Tech campus driving simulation and research, Digital Building Lab, Georgia Institute of Technology, Aug 2012- May 2013

Graduate Teaching Assistant

- Design space construction (Design decision-making framework using optimization), School of Architecture, Georgia Institute of Technology, Fall 2015
- Introduction to architectural design, Shiraz University, Spring 2007
- Free hand drawing, Shiraz University, Spring 2007
- Building construction, Shiraz University, Fall 2006

Teaching

- Practicing architectural design, Sepidan Azad Islamic University, Fall 2006
- Perspective in architecture, Sepidan Azad Islamic University, Fall 2006

Other Significant Research and Course Works, Georgia Institute of Technology, Jan 2011-April 2016:

- Advanced building energy modeling and new approaches to building performance simulation tools
- Climate adaptive façade; focusing on double-skin facade
- Net zero energy housing
- Advanced environmental systems and thermodynamics in buildings
- Uncertainty analysis and risk assessment in building energy analysis
- Multidisciplinary analysis and optimization in building design decision-making
- Automated simplification and optimization of building geometry data exchange from CAD to energy analysis tools; under supervision of Professor Charles Eastman

PROFESSIONAL SKILLS

Performance Simulation Tools:

EnergyPlus, eQuest, Ecotect, IES-VE, HEED, AGI, THERM, WINDOW, WUFI, DesignBuilder, OpenStudio, Design-Advisor, IDA, DIVA, Honeybee and Ladybug, Dymola (Modelica-based)

Building Modeling Tools:

AutoCAD, 3ds Max (+ MAXScript), Revit, Rhino, Sefaira,
And parametric tools such as Grasshopper and Dynamo

Data Analysis and Other Related Tools:

ModelCenter, R, SPSS, JMP, MagicDraw, LaTeX, and Asymptote

Familiarity with languages

Java, C++, MATLAB, EXPRESS (Data modeling language for buildings), SysML, Modelica (modeling language)

AWARDS AND HONORS

Best Paper Award, Georgia Tech Career, Research, and Innovation Development Conference, travel grant of \$1500, March 2015.

Association of Professors and Scholars of Iranian Heritage (APSIH) Award, Graduate Student Scholarship, \$1000, Spring 2010

Houtan Persian Student Scholarship, grand for the promotion of Persian culture, \$2500, Fall2010

Member of Gamma Beta Phi, Georgia Tech Chapter

Proposing, designing and performing the “Persian Culture Exhibition” at University of Southern California, April 2010

Aided in establishment of a research center at the University of Shiraz, Faculty of Art and Architecture, 2008

Defending Master of Art Thesis with honors, “The Costume and Anthropology Museum in Shiraz; with emphasize on Tensile Structure and ecological design,” Advisor: Dr. Raphael. Johannes.

Appreciative certification for the Best Thesis, "The Second Festival of Best Ideas of Shiraz University Students", Fall 2003

Nationwide Master of Architecture Entrance Examination, Ranked top one percent, Iran, May 2003.

PEERREVIEWED PUBLICATIONS

Rezaee, R., Brown, J., Haymaker, J., & Augenbroe, G. (2019) “*A Novel Inverse Data Driven Modelling Approach to Performance-Based Building Design during Early Stages.*” Advanced Engineering Informatics Journal-Elsevier

Rezaee, R., Brown, J., Haymaker, J., & Augenbroe, G. (2018) “*A new approach to performance-based building design exploration using linear inverse modeling*”. Journal of Building Performance Simulation, 1-27

Rezaee, R., Brown, J., & Augenbroe, G., Kim, J. (2014). “*Assessment of uncertainty and confidence in building design exploration.*” *Artificial Intelligence for Engineering Design, Analysis and Manufacturing, Special issue on Generative and Evolutionary Design Exploration*, Cambridge University Press.

John Haymaker, A. I. A., Bernal, M., Marshall, M. T., Okhoya, V., Szilasi, A., **Rezaee, R.**, & Ewing, P. (2018). "Design Space Construction: A Framework to Support Collaborative, Parametric Decision Making." *Journal of Information Technology in Construction*

Rezaee, R., Brown, J., & Augenbroe, G., Kim, J. (2014). "A new approach to the integration of energy assessment tools in CAD for early stage of design decision-making considering uncertainty." *10th European Conference on Product & Process Modelling Proceeding*, Vienna, Austria.

Rezaee, R., Vakilinejad, R., Shahzadeh, M. (2008). "Shavadan, as an Ecological Solution of Architecture in Hot Climate", *ECO-Architecture, Second International Conference on Harmonization between Architecture and Nature Proceeding*, Algarve, Portugal.

Rezaee, R., Shahzadeh, M. (2007). "The Use of Plastic Materials in Buildings", "*Memar journal*", Iran

Rezaee, R. (2007). "Self-Cleaning Glasses", *Memar journal*, Iran

Fallah, M., **Rezaee, R.**, (2007). "Sustainable Building Materials", *Gozaresh Journal*, Iran

SELECTED CONFERENCE PRESENTATIONS

Rezaee, R., Marshall, T., Bernal, M., Saha, N., Haymaker, J. (2019). "*Constructing and Exploring Building Configurations Based on Design and Multi Performance Criteria.*" *IBPSA Building Simulation Conference*, Rome, Italy.

Rezaee, R., Bennett, A. (2017). "*Collaborative Research, Tool-Making, and the Water Challenge.*" *GreenBuild Conference*, Boston, MA. [Presented]

Rezaee, R., Brown, J., & Augenbroe, G. (2014). "Building energy performance estimation in early design decision: quantification of uncertainty and assessment of confidence." *Construction Research Congress Proceeding*, Atlanta, GA. [Presented]

Rezaee, R., Brown, J., & Augenbroe, G. (2015). "The application of Bayesian inverse approach to the early stage of the performance-based building design." *IBPSA Building Simulation Conference*, Hyderabad, India. [Presented]

Rezaee, R., Bennett, A. (2017). "Collaborative Research, Tool-Making, and the Water Challenge." *GreenBuild Conference*, Boston, MA. [Presented]

WORKSHOPS & LECTURES

Workshops:

- **Design Space Construction**, Defining, optimizing, and communicating performance-based building design spaces, ACADIA 2017, Boston, MA
- **Sensitivity Analysis and Data Visualization to Support Decision-making in Large Design Spaces**, SimAUD 2019, Atlanta, GA

Guest Lecturer:

- **Building Technology Seminar**, *Massachusetts Institute of Technology, School of Architecture*. Instructor: Caitlin Mueller, November 2015
- **Alternative Business Model**, *Northeastern University, School of Architecture*. Instructor: Jeremy Munn, March 2017
- **Housework: Renewable Energy and New Urban Housing Typologies**, *Georgia Institute of Technology, School of Architecture*. Instructors: Michael Gamble, Daniel Baerlecken, Jason Brown, Spring 2018