

Qi Li, Ph.D.

Postdoctoral Appointee, Argonne National Laboratory
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Education

Georgia Institute of Technology, Atlanta, GA

Ph.D. in Architecture, High Performance Buildings, School of Architecture, August 2017

Georgia Institute of Technology, Atlanta, GA

M.S. in Statistics, School of Industrial and Systems Engineering, December 2015

Tsinghua University, Beijing, China

B.Eng. in Building Environment & Equipment Engineering, July 2012

Work Experience

Argonne National Laboratory, Lemont, IL

Postdoctoral Appointee, Energy Systems Division, December 2017 – Present

Worked on DOE project “Validation and Uncertainty Characterization for Energy Simulation”, including development of a Python package for automated uncertainty propagation, parallel Monte Carlo simulations with Latin Hypercube sampling, model validation, and sensitivity analysis of EnergyPlus models, and development of probabilistic performance metrics to validate building energy models under uncertainty and measures to improve model accuracy by using detailed measurement data in a test facility.

Georgia Institute of Technology, Atlanta, GA

Graduate Research Assistant, High Performance Buildings Lab, August 2012 – August 2017

Performed research on uncertainty quantification for empirical validation of building energy models, framework development for implementing uncertainty quantification in standard building simulation tools, Bayesian calibration of building energy model under uncertainty, and urban-scale building energy modeling.

University of Cambridge, Cambridge, U.K.

Research Assistant, Department of Engineering, May 2016 – March 2017

Proposed a prototype-based method for efficient modeling of large buildings with radiator systems, and identified influential factors on energy efficiency of radiator systems operations through statistical modeling, uncertainty propagation, and sensitivity analysis.

Perkins+Will, Atlanta, GA

Architecture Intern, Energy Lab, May 2015 – November 2015

Performed thermal and daylighting analyses for design projects, and developed a workflow and prototype user interface for a web-based b simulation platform for early stage building form and envelop design.

Publications

- Li, Q., Augenbroe, G. & Muehleisen, R., 2017. A Framework for Empirical Validation of Building Performance Simulation under Uncertainty. *Proceedings of the 15th International Conference of the International Building Performance Simulation Association*. pp. 631–640.
- Li, Q., 2017. Addressing data informativeness in risk-conscious building performance simulation applications. PhD thesis. Georgia Institute of Technology.
- Li, Q., Augenbroe, G. & Brown, J., 2016. Assessment of linear emulators in lightweight Bayesian calibration of dynamic building energy models for parameter estimation and performance prediction. *Energy and Buildings*, 124, pp.194–202.
- Li, Q., Gu, L., Augenbroe, G., Wu, C.F.J., et al., 2015. A generic approach to calibrate building energy models under uncertainty using Bayesian inference. *Proceedings of the 14th International Conference of the International Building Performance Simulation Association*. Hyderabad, India, pp. 2947–2955.
- Li, Q., Quan, S.J., et al., 2015. Building energy modelling at urban scale: Integration of reduced order energy model with geographical information. *Proceedings of the 14th International Conference of the International Building Performance Simulation Association*. pp. 190–198.
- Li, Q., Gu, L., Augenbroe, G., Wu, C.F.J., et al., 2015. Calibration of dynamic building energy models with multiple responses using Bayesian inference and linear regression models. *Energy Procedia*, 78(JUNE), pp.979–984.
- Quan, S.J., Li, Q., Augenbroe, G., Brown, J. & Yang, P.P.-J., 2015. A GIS-based energy balance modeling system for urban solar buildings. *Energy Procedia*, 75, pp.2946–2952.
- Quan, S.J., Li, Q., Augenbroe, G., Brown, J. & Yang, P.-J., 2015. Urban data and building energy modeling: a GIS-based urban building energy modeling system using the Urban-EPC engine. In S. Geertman et al., eds. *Planning Support Systems and Smart Cities SE - 24. Lecture Notes in Geoinformation and Cartography*. Springer International Publishing, pp. 447–469.
- Kang, Y., Augenbroe, G., Li, Q., et al., 2017. Effects of scenario uncertainty on chiller sizing method. *Applied Thermal Engineering*, 123, pp.187–195.

Presentations

A Framework for Empirical Validation of Building Performance Simulation under Uncertainty. *The 15th International Conference of the International Building Performance Simulation Association (IBPSA)*. San Francisco, United States. 2017.

A Generic Approach to Calibrate Building Energy Models under Uncertainty Using Bayesian Inference. *The 14th International Conference of the International Building Performance Simulation Association (IBPSA)*. Hyderabad, India. 2015.

Building energy modelling at urban scale: Integration of reduced order energy model with geographical information. *The 14th International Conference of the International Building Performance Simulation Association (IBPSA)*. Hyderabad, India. 2015.

Honors and Awards

ARCC King Student Medal, School of Architecture, Georgia Institute of Technology, 2018
Student Travel Awards, Building Simulation 2017, the 15th International Conference of IBPSA
PhD Program Fellowship, School of Architecture, Georgia Institute of Technology, 2012