

# Stanford

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## Rishee Jain

Assistant Professor of Civil and Environmental Engineering

### CONTACT INFORMATION

- **Administrator**

Emilia Alex - Program Administrator

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### Bio

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#### BIO

Professor Jain's research focuses on the development of data-driven and socio-technical solutions to sustainability problems facing the urban built environment. His work lies at the intersection of civil engineering, data analytics and social science. Recently, his research has focused on understanding the socio-spatial dynamics of commercial building energy usage, conducting data-driven benchmarking and sustainability planning of urban buildings and characterizing the coupled dynamics of urban systems using data science and micro-experimentation. For more information, see the active projects on his lab (Stanford Urban Informatics Lab) website.

#### ACADEMIC APPOINTMENTS

- Assistant Professor, Civil and Environmental Engineering

#### HONORS AND AWARDS

- CAREER Award, National Science Foundation (2019)
- Science, Engineering and Education for Sustainability (SEES) Fellow, National Science Foundation (2014)

#### PROFESSIONAL EDUCATION

- PhD, Columbia University , Civil Engineering
- MS, Columbia University , Civil Engineering
- BS, University of Texas at Austin , Civil, Environmental & Architectural Engineering

#### LINKS

- Urban Informatics Lab Website: <http://www.uil.stanford.edu/>

### Research & Scholarship

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#### PROJECTS

- Data-driven Sustainable Upgradation of Dharavi Informal Settlement (Mumbai, India) - Stanford University

## Teaching

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### COURSES

#### 2019-20

- Building Systems Design & Analysis: CEE 156, CEE 256 (Win)
- Intro to Urban Sys Engrg: CEE 243 (Aut)

#### 2018-19

- Building Systems: CEE 156, CEE 256 (Win)
- Intro to Urban Sys Engrg: CEE 243 (Aut)
- Network Analysis for Urban Systems: CEE 345 (Spr)

#### 2017-18

- Intro to Urban Sys Engrg: CEE 243 (Aut)
- Network Analysis for Urban Systems: CEE 345 (Spr)

#### 2016-17

- Intro to Urban Sys Engrg: CEE 243 (Aut)
- Network Analysis for Urban Systems: CEE 245 (Spr)

### STANFORD ADVISEES

Poojan Patel

#### Doctoral Dissertation Reader (AC)

Alissa Cooperman, Anne Hulsey, Robert Ruhlandt

#### Postdoctoral Faculty Sponsor

Marco Miotti

#### Doctoral Dissertation Advisor (AC)

Alex Nutkiewicz, Jonathan Roth, Andrew Sonta

#### Master's Program Advisor

Abdul Aleem, Brian Alexander, Rohan Aras, Aakanksha Chaudhary, Boeun Choi, Thomas Dougherty, Anthony Hall, Xitai Jiang, Dunia Karzai, Jolan Martin, Jinal Mehta, Kopal Nihar

#### Doctoral Dissertation Co-Advisor (AC)

Ranjitha Shivaram

#### Doctoral (Program)

Abigail Andrews, Rohan Aras

## Publications

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### PUBLICATIONS

- **Drivers of Data and Analytics Utilization within (Smart) Cities: A Multimethod Approach** *JOURNAL OF MANAGEMENT IN ENGINEERING*  
Ruhlandt, R., Levitt, R., Jain, R., Hall, D.  
2020; 36 (2)

- **Energy-cyber-physical systems** *APPLIED ENERGY*  
Jin, M., Jain, R., Spanos, C., Jia, Q., Norford, L. K., Kjaergaard, M., Yan, J.  
2019; 256
- **Computational Approaches to Enable Smart and Sustainable Urban Systems** *JOURNAL OF COMPUTING IN CIVIL ENGINEERING*  
Jain, R. K., Abraham, D.  
2019; 33 (6)
- **Understanding the adoption and usage of data analytics and simulation among building energy management professionals: A nationwide survey** *BUILDING AND ENVIRONMENT*  
Srivastava, C., Yang, Z., Jain, R. K.  
2019; 157: 139–64
- **Urban Data Integration Using Proximity Relationship Learning for Design, Management, and Operations of Sustainable Urban Systems** *JOURNAL OF COMPUTING IN CIVIL ENGINEERING*  
Gupta, K., Yang, Z., Jain, R. K.  
2019; 33 (2)
- **DUE-A: Data-driven Urban Energy Analytics for understanding relationships between building energy use and urban systems**  
Yang, Z., Gupta, K., Jain, R. K., Yan, J., Yang, H. X., Li, H., Chen  
ELSEVIER SCIENCE BV.2019: 6478–83
- **Optimizing Neighborhood-Scale Walkability**  
Sonta, A. J., Jain, R. K., Cho, Y. K., Leite, F., Behzadan, A., Wang, C.  
AMER SOC CIVIL ENGINEERS.2019: 454–61
- **Spatial and Temporal Modeling of Urban Building Energy Consumption Using Machine Learning and Open Data**  
Roth, J., Bailey, A., Choudhary, S., Jain, R. K., Cho, Y. K., Leite, F., Behzadan, A., Wang, C.  
AMER SOC CIVIL ENGINEERS.2019: 459–67
- **Energy modeling of urban informal settlement redevelopment: Exploring design parameters for optimal thermal comfort in Dharavi, Mumbai, India** *APPLIED ENERGY*  
Natkiewicz, A., Jain, R. K., Bardhan, R.  
2018; 231: 433–45
- **Data-driven Urban Energy Simulation (DUE-S): A framework for integrating engineering simulation and machine learning methods in a multi-scale urban energy modeling workflow**  
Natkiewicz, A., Yang, Z., Jain, R. K.  
ELSEVIER SCI LTD.2018: 1176–89
- **Understanding building occupant activities at scale: An integrated knowledge-based and data-driven approach**  
Sonta, A. J., Simmons, P. E., Jain, R. K.  
ELSEVIER SCI LTD.2018: 1–13
- **A review of occupant energy feedback research: Opportunities for methodological fusion at the intersection of experimentation, analytics, surveys and simulation** *APPLIED ENERGY*  
Khosrowpour, A., Jain, R. K., Taylor, J. E., Peschiera, G., Chen, J., Gulbinas, R.  
2018; 218: 304–16
- **DUE-B: Data-driven urban energy benchmarking of buildings using recursive partitioning and stochastic frontier analysis** *ENERGY AND BUILDINGS*  
Yang, Z., Roth, J., Jain, R. K.  
2018; 163: 58–69
- **Data-Driven, Multi-metric, and Time-Varying (DMT) Building Energy Benchmarking Using Smart Meter Data**  
Roth, J., Jain, R. K., Smith, I. F., Domer, B.  
SPRINGER INTERNATIONAL PUBLISHING AG.2018: 568–93
- **Inferring Occupant Ties Automated Inference of Occupant Network Structure in Commercial Buildings**  
Sonta, A. J., Jain, R. K., Ramachandran, G. S., Batra, N.  
ASSOC COMPUTING MACHINERY.2018: 126–29

- **OESPG: Computational Framework for Multidimensional Analysis of Occupant Energy Use Data in Commercial Buildings** *JOURNAL OF COMPUTING IN CIVIL ENGINEERING*  
Sonta, A. J., Jain, R. K., Gulbinas, R., Moura, J. M., Taylor, J. E.  
2017; 31 (4)
- **Data-driven planning of distributed energy resources amidst socio-technical complexities** *Nature Energy*  
Jain, R. K., Qin, J., Rajagopal, R.  
2017
- **Data-driven Urban Energy Simulation (DUE-S): Integrating machine learning into an urban building energy simulation workflow**  
Natkiewicz, A., Yang, Z., Jain, R. K., Yan, J., Wu, J., Li, H.  
ELSEVIER SCIENCE BV.2017: 2114–19
- **Intestinal Enteroendocrine Lineage Cells Possess Homeostatic and Injury-Inducible Stem Cell Activity** *Cell Stem Cell*  
Yan, K., Gevaert, O., Zheng, G., Anchang, B., Probert, C., et al  
2017; 21 (1): 78 - 90.e6
- **A Data Integration Framework for Urban Systems Analysis Based on Geo-Relationship Learning**  
Yang, Z., Gupta, K., Gupta, A., Jain, R. K., Lin, K. Y., ElGohary, N., Tang, P.  
AMER SOC CIVIL ENGINEERS.2017: 467–74
- **Towards Automated Inference of Occupant Behavioral Dynamics Using Plug-Load Energy Data**  
Sonta, A. J., Simmons, P. E., Jain, R. K., Lin, K. Y., ElGohary, N., Tang, P.  
AMER SOC CIVIL ENGINEERS.2017: 290–97
- **Poster Abstract: Towards City-Scale Building Energy Performance Benchmarking**  
Yang, Z., Roth, J., Jain, R. K., ACM  
ASSOC COMPUTING MACHINERY.2016: 241–42
- **Data-Driven Benchmarking of Building Energy Performance at the City Scale**  
Yang, Z., Roth, J., Jain, R. K., ACM  
ASSOC COMPUTING MACHINERY.2016
- **Poster abstract: A data-driven design framework for urban slum housing - Case of Mumbai**  
Debnath, R., Bardhan, R., Jain, R. K., ACM  
ASSOC COMPUTING MACHINERY.2016: 239–40
- **Modeling the determinants of large-scale building water use: Implications for data-driven urban sustainability policy** *SUSTAINABLE CITIES AND SOCIETY*  
Kontokosta, C. E., Jain, R. K.  
2015; 18: 44-55
- **BizWatts: A modular socio-technical energy management system for empowering commercial building occupants to conserve energy** *APPLIED ENERGY*  
Gulbinas, R., Jain, R. K., Taylor, J. E.  
2014; 136: 1076-1084
- **The impact of combined water and energy consumption eco-feedback on conservation** *ENERGY AND BUILDINGS*  
Jeong, S. H., Gulbinas, R., Jain, R. K., Taylor, J. E.  
2014; 80: 114-119
- **Big Data plus Big Cities: Graph Signals of Urban Air Pollution** *IEEE SIGNAL PROCESSING MAGAZINE*  
Jain, R. K., Moura, J. M., Kontokosta, C. E.  
2014; 31 (5): 130-136
- **Forecasting energy consumption of multi-family residential buildings using support vector regression: Investigating the impact of temporal and spatial monitoring granularity on performance accuracy** *APPLIED ENERGY*  
Jain, R. K., Smith, K. M., Culligan, P. J., Taylor, J. E.  
2014; 123: 168-178
- **Network Ecoinformatics: Development of a Social Ecofeedback System to Drive Energy Efficiency in Residential Buildings** *JOURNAL OF COMPUTING IN CIVIL ENGINEERING*

Gulbinas, R., Jain, R. K., Taylor, J. E., Peschiera, G., Golparvar-Fard, M.  
2014; 28 (1): 89-98

- **Can social influence drive energy savings? Detecting the impact of social influence on the energy consumption behavior of networked users exposed to normative eco-feedback** *ENERGY AND BUILDINGS*

Jain, R. K., Gulbinas, R., Taylor, J. E., Culligan, P. J.  
2013; 66: 119-127

- **Investigating the impact eco-feedback information representation has on building occupant energy consumption behavior and savings** *ENERGY AND BUILDINGS*

Jain, R. K., Taylor, J. E., Culligan, P. J.  
2013; 64: 408-414

- **Block Configuration Modeling: A novel simulation model to emulate building occupant peer networks and their impact on building energy consumption** *APPLIED ENERGY*

Chen, J., Jain, R. K., Taylor, J. E.  
2013; 105: 358-368

- **Assessing eco-feedback interface usage and design to drive energy efficiency in buildings** *ENERGY AND BUILDINGS*

Jain, R. K., Taylor, J. E., Peschiera, G.  
2012; 48: 8-17