ANDREW SONTA

550 West 120th Street, Suite 1401
New York, NY 10027
as6321@columbia.edu
andrewsonta.com

ACADEMIC EXPERIENCE

Postdoctoral Research Scientist Jan. 2021–
Columbia University, Data Science Institute
Will be working in the Smart Cities focus area of the Data Science Institute

Stanford Graduate Fellow 2015–2020
Stanford University, Urban Informatics Lab
Conducting research on modeling occupant behavior in buildings, understanding network structure of building occupants, and improving building energy efficiency; exploring urban-scale extensions in the area of walkability

NSF Research Experience for Undergraduates (REU) 2014
Northwestern University
Contributed to lab experiments and computational modeling of the mechanics of saturated soils, including authorship of a peer-reviewed journal publication

Wanxiang Fellow 2013
Northwestern University, Peking University, Wanxiang Polytechnic Institute
Fellowship focused on renewable energy technology and policy in China

EDUCATION

PhD, Civil & Environmental Engineering Jan. 2021
Stanford University
Advisor: Rishee Jain
Committee: Michael Lepech, Martin Fischer
Dissertation: *Integrating social and environmental perspectives in building design and operation*

MS, Civil Engineering March 2017
Stanford University

BS, Civil Engineering, *summa cum laude* June 2015
Northwestern University
Minor: Economics
Certificates: Architectural Engineering & Design, Sustainability & Energy

TEACHING AND MENTORING EXPERIENCE

Adjunct Professor Fall 2019
University of San Francisco
- Teaching *Environmental Control Systems (ARCD 312)* in the Architecture and Community Design Program; ECS introduces students to energy and comfort issues in buildings and the built environment

Guest Lecturer 2017–2019
Stanford University and University of San Francisco
- Engineering Design and Testing, USF: Lecture on life-cycle assessment (2019)
- Network Analysis for Urban Systems, Stanford: Lecture on network inference (2017, 2018)

Graduate Mentor 2017–pres.
Stanford University, Urban Informatics Lab
- Mentored a master's student during academic year 2017–2018 who led the effort on a validation study and data analysis; resulted in co-authorship on a peer-reviewed article in *Advanced Engineering Informatics*
- Mentored two undergraduate students during summer 2019 on data collection, building energy simulation analysis, and data analysis; resulted in posters presented to Stanford researchers
- Mentoring a master's student during academic year 2019–2020 who led the effort on an extension of my PhD research; resulted in a peer-reviewed conference presentation and a journal publication in preparation

Course Developer & Instructor 2017–2018
Stanford University
- Developed and taught 6 terms of a 1-unit seminar series: *Hard Earth: Graduate Student Talks Exploring Tough Environmental Dilemmas*
- Planned quarterly themes and worked with graduate students on their talks
- Led discussion sessions

Teaching Assistant Spring 2017
Stanford University
- Teaching assistant for the first-ever offering of *Network Analysis for Urban Systems*
- Helped design course structure and final project
- Graded homework, held office hours

Course Developer & Instructor 2017–2019
Stanford University Splash
- Developed 2-hour class–*Designing Cities of the Future*—taught quarterly with lab-mates for high school students
- Focused content on data-driven urban systems analysis

JOURNAL ARTICLES

J1. **A. Sonta**, T. R. Dougherty, and R. K. Jain. (*submitted*). "Data-driven optimization of building layouts for energy efficiency."

J2. **A. Sonta** and R. K. Jain. (2020). "Learning socio-organizational network structure in buildings using ambient sensing data," *Data-Centric Engineering, 1*, E9.

J3. E. Azar, W. O'Brien, S. Carlucci, T. Hong, **A. Sonta**, J. Kim, M. Andargie, T. Abuimara, M. El Asmar, R. K. Jain, M. Ouf, F. Tahmasebi, and J. Zhou. (2020). "Simulation-aided occupant-centric building design: A critical review of tools, methods, and applications," *Energy and Buildings, 224*, 110292.

J4. **A. Sonta** and R. K. Jain. (2019). "Building relationships: Using embedded plug load sensors for occupant network inference," *IEEE Embedded Systems Letters, 12 (2)*, 41–44. [**Invited Paper**].

J5. **A. Sonta**, P. E. Simmons, and R. K. Jain. (2018). "Understanding building occupant activities at scale: An integrated knowledge-based and data-driven approach," *Advanced Engineering Informatics, 37*, 1–13.

J6. **A. Sonta**, R. K. Jain, R. Gulbinas, J. M. F. Moura, and J. E. Taylor. (2017). "$OESP_G$: Computational framework for multidimensional analysis of occupant energy use data in commercial buildings," *Journal of Computing in Civil Engineering, 31*, 04017017.

J7. S. Gao, Y. D. Zhang, **A. Sonta**, and G. Buscarnera. (2016). "Evolution of the water retention characteristics of granular materials subjected to grain crushing," *Journal of Geotechnical and Geoenvironmental Engineering, 142*.

PEER-REVIEWED CONFERENCE PAPERS & PRESENTATIONS

C1. T. R. Dougherty, **A. Sonta**, and R. K. Jain. (*accepted*). "Intelligent network topology based post-pandemic reintroduction policies for offices," in *Proceedings of the 7th ACM International Conference on Systems for Energy-Efficient Built Environments (BuildSys 2020)*, (Yokohama, Japan).

C2. **A. Sonta** and R. K. Jain. (2019). "Data-driven building layout optimization for energy efficiency," in *International Conference on Applied Energy*, (Västerås, Sweden), Elsevier. [**Invited for submission to *Applied Energy***]

C3. **A. Sonta** and R. K. Jain. (2019). "Optimizing neighborhood-scale walkability," in *International Conference on Computing in Civil Engineering*, (Atlanta, GA), pp. 454-461, American Society of Civil Engineers.

C4. **A. Sonta** and R. K. Jain. (2018). "Inferring occupant ties: Automated inference of occupant network structure in commercial buildings," in *Proceedings of the 5th ACM International Conference on Systems for Energy-Efficient Built Environments (BuildSys 2018)*, (Shenzhen, China), pp. 126–129, ACM. [**Invited for special issue in *IEEE Embedded Systems Letters***]

C5. Y. D. Zhang, J. S. Park, S. Gao, **A. Sonta**, B. Horin, and G. Buscarnera. (2018). "Effect of grain crushing and grain size on the evolution of water retention curves," in *PanAm Unsaturated Soils 2017*, (Dallas, TX), pp. 268–278, American Society of Civil Engineers.

C6. **A. Sonta**, P. E. Simmons, and R. K. Jain. (2017). "Towards automated inference of occupant behavioral dynamics using plug-load energy data," in *Congress on Computing in Civil Engineering, Proceedings*, (Seattle, WA), pp. 290–297, American Society of Civil Engineers.

CONFERENCE POSTER PRESENTATIONS

P1. **A. Sonta** and R. K. Jain. (2019). "Inferring occupant ties in dynamic office environments," *International Conference on Computing in Civil Engineering*, (Atlanta, GA).

INVITED TALKS

Data Science for Sustainability 2019
Millbrae, CA

The 5th International Symposium on Occupant Behaviour (OB-19) and 2nd Expert's Meeting of the IEA-EBC Annex 79 2019
San Antonio, TX

Stanford University Sustainable Urban Systems Seminar 2019
Stanford, CA

The 4th International Symposium on Occupant Behaviour (OB-18) and 1st Expert's Meeting of the IEA-EBC Annex 79 2018
Ottawa, Ontario, Canada

Precourt Institute for Energy Student Lecture Series 2018
Stanford, CA

San Francisco Department of the Environment 2017
San Francisco, CA

GRANTS AND FELLOWSHIPS

National Science Foundation, Cyber-Physical Systems 2018–2021
Building Information, Inhabitant, Interaction, and Intelligent Integrated Modeling (BI^5M)
Role: Co-lead author of proposal. PI: Rishee Jain. ($280,000)

Center for Integrated Facility Engineering Seed Grant 2019–2020
Building for the Occupant: Optimizing Building Layouts for Energy Efficiency and Organizational Performance
Role: Lead author of proposal. PI: Rishee Jain. ($39,113)

Center for Integrated Facility Engineering Seed Grant 2016–2017
Beyond the Building: Urban Information Modeling (UIM)
Role: Lead author of proposal. PI: Rishee Jain. ($55,000)

Stanford Graduate Fellowship ($243,000) 2015–2018

LEADERSHIP AND ACTIVITIES

Stanford Engineering Summer Service Learning Program 2018
Stanford University and Today's Youth Asia, Kathmandu, Nepal
Worked with an interdisciplinary team of 6 engineers on the design of sustainable and earthquake-resistant housing in Dolakha, Nepal

Graduate Life Committee 2016–2018
Stanford University Department of Civil & Environmental Engineering
Student representative elected to discuss student issues with departmental leadership

Sustainable Design & Construction Leadership Committee 2015–2016
Stanford University
Treasurer and Golf Tournament Chair

Northwestern University Dance Marathon 2014–2015
Northwestern University
Executive Committee | Productions Chair (Raised $1.2 million for beneficiary)

ACADEMIC SERVICE

Organizations	American Society of Civil Engineers, Student Member Energy Information Agency EBC Annex 79, Member Stanford Energy Club, Officer & Member
Reviewer	Building Simulation Automation in Construction IEEE Access Intelligent Buildings International

HONORS AND AWARDS

Preparing Future Professors Program 2018–2019
Stanford University
Competitive mentorship program with the University of San Francisco focused on training PhD students for careers in academia, with an emphasis on teaching

Woods Institute Rising Environmental Leaders Program 2017–2018
Stanford University
Competitive leadership training program focused on environmental policy in Washington, DC and Sacramento, CA

Fellow — Digital X Workshop (U.S. Representative) 2018
Norman Foster Foundation
One of ten fellows from around the world selected to participate in a week-long workshop hosted by Norman Foster focused on digital design

Civil Engineering Senior Award 2015
Northwestern University
Award given to graduating senior with highest academic achievement

Tau Beta Pi Engineering Honor Society (elected as junior) 2014
American Institute of Steel Construction Scholarship 2014
Associated Steel Erectors Scholarship 2014
Gamma Sigma Alpha Greek Honor Society 2013
Hillier L Baker III Memorial Scholarship 2013
Northwestern Scholarship 2011

SKILLS

Programming	Python, R, MatLab, C++, Java
Engineering	Revit/Dynamo, Rhino/Grasshopper, AutoCad
Design	Adobe Illustrator/InDesign/Photoshop