

ANDREW SONTA

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EDUCATION

- PhD, Civil & Environmental Engineering** exp. 2020
Stanford University
Advisor: Rishee Jain
Committee: Michael Lepech, Martin Fischer
Thesis: Building relationships: Inferring, analyzing, and optimizing human-building networks for energy efficiency and collaboration
- MS, Civil Engineering** 2017
Stanford University
- BS, Civil Engineering, *summa cum laude*** 2015
Northwestern University
Minor: Economics
Certificates: Architectural Engineering & Design, Sustainability & Energy

RESEARCH EXPERIENCE

- Stanford Graduate Fellow** 2015–pres.
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

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

2017–2019

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

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. J. Sonta** and R. K. Jain. (*in prep*). “Learning human network structure in buildings.”
- J2. E. Azar, W. O’Brien, S. Carlucci, T. Hong, **A. J. Sonta**, J. Kim, M. Andargie, T. Abuimara, M. El Asmar, R. K. Jain, M. Ouf, F. Tahmasebi, and J. Zhou. (*submitted*). “Simulation-aided occupant-centric building design: A critical review of tools, methods, and applications.”
- J3. **A. J. Sonta** and R. K. Jain. (2019). “Building relationships: Using embedded plug load sensors for occupant network inference,” *IEEE Embedded Systems Letters*. [**Invited Paper**]
- J4. **A. J. 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.
- J5. **A. J. 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.

- J6. S. Gao, Y. D. Zhang, **A. J. 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. **A. J. 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**]
- C2. **A. J. 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.
- C3. **A. J. Sonta** and R. K. Jain. (2018). “Inferring occupant ties: Automated inference of occupant network structure in commercial buildings,” in *Proceedings of the 5th Conference on Systems for Built Environments*, (Shenzhen, China), pp. 126–129, ACM. [**Invited for special issue in IEEE Embedded Systems Letters**]
- C4. Y. D. Zhang, J. S. Park, S. Gao, **A. J. 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.
- C5. **A. J. 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. J. Sonta** and R. K. Jain. (2019). “Inferring occupant ties in dynamic office environments,” *International Conference on Computing in Civil Engineering*, (Atlanta, GA).

INVITED TALKS

- 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

- Center for Integrated Facility Engineering (CIFE) Seed Grant (\$39,113)** 2019
Stanford University
“Building for the Occupant: Optimizing Building Layouts for Energy Efficiency and Organizational Performance”
- Center for Integrated Facility Engineering (CIFE) Seed Grant (\$55,000)** 2016
Stanford University
“Beyond the Building: Urban Information Modeling (UIM)”
- Stanford Graduate Fellowship (\$243,000)** 2015
Stanford University

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 Administration EBC Annex 79, Member
Stanford Energy Club, Officer & Member
- Reviewer* Building Simulation
Automation in Construction

HONORS AND AWARDS

Preparing Future Professors Program	2018–2019
<i>Stanford University</i>	
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
<i>Stanford University</i>	
Competitive leadership training program focused on environmental policy in Washington, DC and Sacramento, CA	
Fellow — Digital X Workshop (U.S. Representative)	2018
<i>Norman Foster Foundation</i>	
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
<i>Northwestern University</i>	
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

<i>Programming</i>	Python, R, MATLAB, C++, Java
<i>Engineering</i>	Revit/Dynamo, Rhino/Grasshopper, AutoCad
<i>Design</i>	Adobe Illustrator/InDesign/Photoshop