

BEN RACHUNOK

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EDUCATION

- Purdue University**, West Lafayette, IN, USA 2020
Ph.D. in Industrial Engineering
- North Carolina State University**, Raleigh, NC, USA 2016
Bachelor of Science in Industrial & Systems Engineering

RESEARCH EXPERIENCE

- Stanford University**, Stanford, CA, USA 2020-
Postdoctoral Researcher (Supervisor: Dr. Sarah Fletcher)
Civil & Environmental Engineering
- Purdue University**, West Lafayette, IN, USA 2016-2020
Research Assistant (Advisor: Dr. Roshanak Nateghi)
Dissertation Title: *Analytical methods for Computing the Resilience, Recovery, And Transformation of Communities in the Age of Big Data*
- Sandia National Labs**, Albuquerque, NM, USA 2017-
R&D Intern (Supervisor: Dr. Andrea Staid)
Center for Computing Research, Discrete Math & Optimization

RESEARCH INTERESTS

Methodological

Statistical modeling, machine learning, risk and resilience assessment, sociotechnical systems analysis, decision-making under uncertainty

Application Areas

Climate change adaptation, civil systems engineering, natural hazard impacts, climate and environmental justice, maladaptive decision-making

JOURNAL PUBLICATIONS

Published

- Obringer R, **Rachunok B**, Silva D, Arbabzadeh M, Nateghi R, Madani K. The Overlooked Environmental Footprint of Internet Use. *Resources, Conservation and Recycling*. [DOI: 10.1016/j.resconrec.2020.105389]
- Choi M, **Rachunok B**, Nateghi R. Short-term Solar Irradiance Forecasting Using Convolutional Neural Networks and Cloud Imagery. *Environmental Research Letters*. [DOI: 10.1088/1748-9326/abe06d]
- Bennett J, **Rachunok B**, Flage R, Nateghi R. Decoding Regional Climate Attitudes by Integrating Social Media and Survey Data. *PLoS ONE*. [DOI: 10.1371/journal.pone.0245319]
- Alemazkoor N, **Rachunok B**, Staid A, Chavas D, Tootkaboni M, Louhghalam A, Nateghi R. Hurricane-induced Power Outage Risk is Driven by Changes in Storm Frequency. *Scientific Reports*. [DOI: 10.1038/s41598-020-72207-z] 2020
- Kumar R*, **Rachunok B***, Silva D, Nateghi R*. Asymmetric Temperature Response of Electricity Demand Points to Severe Underestimation of Load Projections in California. *Scientific Reports*. [DOI: 10.1038/s41598-020-67695-y] *(Equal contributions) 2020

- Rachunok B**, Staid A, Watson D, Woodruff D. Evaluation of Parametric Wind Power Scenarios. *Applied Energy*. 2020
[DOI: 10.1016/j.apenergy.2020.114986]
- Paulvannan Kanmani A, Obringer R, **Rachunok B**, Nateghi R. Assessing Global Environmental Sustainability Via an Unsupervised Clustering Framework. *Sustainability*. 2020
[DOI: 10.3390/su12020563]
- Rachunok B**, Nateghi R. The Sensitivity of Electric Power Infrastructure Resilience to the Spatial Distribution of Disaster Impacts. *Reliability Engineering and System Safety*. 2019
[DOI: 10.1016/j.res.2019.106658]
- Rachunok B**, Bennett J, Nateghi R. Twitter and Disasters: A Social Resilience Fingerprint. *IEEE Access*. 2019
[DOI: 10.1109/ACCESS.2019.291479]

Under Review

- Rachunok B**, Nateghi R. Quantifying Community Transformation to Break Resilience Traps. *Nature Communications*.
- Rachunok B**, Bennett J, Flage R, Nateghi R. A Path Forward for Leveraging Social Media to Improve the Study of Community Resilience. *International Journal of Disaster Risk Reduction*.

CONFERENCE PUBLICATIONS

- Rachunok B**, Nateghi R. Interdependent Infrastructure System Risk and Resilience to Natural Hazards. *Proceedings of the 2019 IISE Annual Conference*. H.E. Romeijn, A. Schaefer, and R. Thomas (Eds.). 2019
[arXiv: 1904.05763]
- Rachunok B**, Staid A, Watson JP, Woodruff D, Yang D. Stochastic Unit Commitment Performance Considering Monte Carlo Wind Power Scenarios. *2018 IEEE International Conference on Probabilistic Methods Applied to Power Systems (PMAPS)*. 2018
[DOI: 10.1109/PMAPS.2018.8440563]

INVITED PRESENTATIONS

- INFORMS Annual Meeting**. [Virtual]. *Quantifying Community Transformation*. 2020
- International Conference on Computational Social Science (IC²S²)**. Cambridge, MA [Virtual]. *Be Careful Where You Get Your Tweets: Bias in Analysis from Tweet Acquisition Source*. 2020
- Natural Hazards Center, Researcher's Meeting**. Boulder, CO [Virtual]. *Natural Hazard Twitter Analyses Depend Heavily On Tweet Sources*. 2020
- Oklahoma University INFORMS Student Chapter Summer Research Series**. Virtual. *Social Resilience Fingerprinting*. 2020
- Society for Risk Analysis Annual Meeting**. Crystal City, VA. *Social Resilience Fingerprinting*. 2019
- INFORMS Annual Meeting**. Seattle, WA. *Social Resilience Fingerprinting*. 2019
- Institute for Industrial and Systems Engineers Annual Conference**. Orlando, FL. *Interdependent Infrastructure System Risk & Resilience to Natural Hazards*. 2019
- Society for Risk Analysis Annual Meeting**. New Orleans, LA. *Electric Power Infrastructure Resilience*. 2018

INFORMS Annual Meeting. Phoenix, AZ. <i>The Sensitivity of Electric Power Infrastructure Resilience to the Spatial Distribution of Disaster Impacts.</i>	2018
IEEE International Conference on Probabilistic Methods Applied to Power Systems. Boise, ID. <i>Stochastic Unit Commitment Performance Considering Monte Carlo Wind Power Scenarios.</i>	2018
Society for Risk Analysis Annual Meeting. Crystal City, VA. <i>Transportation Network Recovery Analysis, an Equilibrated Perspective.</i>	2017
INFORMS Annual Meeting. Houston, TX. <i>Modeling Uncertainty, The Cost of Wrong Assumptions.</i>	2017
Purdue Environmental and Ecological Engineering Seminar Series. West Lafayette, IN. <i>Risk Analysis for Power Systems Planning.</i>	2017
Institute for Industrial and Systems Engineers Annual Conference. Anaheim, CA. <i>UAVs Provide Lifesaving Medical Care.</i>	2016
North Carolina State University Research Symposium. Raleigh, NC. <i>Simulating UAVs as a Healthcare Delivery Method.</i>	2016

MEDIA

“Remote workers are greener, but their tech still has a real cost” <i>Tech Crunch</i>	2021
“The Internet's Carbon Footprint Issue Isn't Tied to Individuals” <i>Gizmodo</i>	2021
“Twitter ‘fingerprint’ helps decode how individuals respond to crises” <i>Prevention Web: UN office of Disaster Risk Reduction</i> <i>Purdue University News</i> <i>ACM Technews</i> <i>Purdue Today Newsletter</i>	2019
“Parsing Tweets to Strengthen Community Disaster Resilience” <i>Purdue Engineering Review</i>	2019

TEACHING EXPERIENCE

Lecturer

IE 590: Predictive Risk Analytics, Purdue University	2018
IE 330: Probability and Statistics II (Guest), Purdue University	2018-2019

Teaching Assistant

IE 431: Industrial Engineering Design, Purdue University	2017-2018
IE 343: Engineering Economics, Purdue University	2016

Undergraduate Lecturer

E115: Introduction to Computing Environments, NC State University	2015-2016
ISE110: Microsoft Excel & Visual Basic, NC State University	2015

WORK EXPERIENCE

Purdue University , <i>Research Assistant</i> , West Lafayette, IN Research related to NSF, and Purdue internal grants.	2017-
Sandia National Labs , <i>R&D Intern</i> , Albuquerque, NM Develop stochastic programming scenario generation methods Evaluate the effects of ramp events in stochastic unit commitment problem Maintain and test open source power grid evaluation software	2017-

Institute for Transportation Research and Education, *Research Intern*, Raleigh, NC 2016
 Develop Java and PHP/HTML applications which implement research methods developed at the institute

Robert Bosch GMBH, *Process Analyst Co-Op*, Charleston, SC 2014
 Implemented SAP enterprise software in a large foreign trade zone
 Manage packaging logistics for a foreign trade zone
 Communicate between customers and suppliers to design safe, sustainable and economical packaging programs

HONORS AND AWARDS

Outstanding Research Award, Honorable Mention, *Purdue University* 2020

Outstanding Service Award, *Purdue University* 2020

Student Spotlight, *SRA Engineering& Infrastructure Specialty Group* 2018

Travel Award, *Purdue University Graduate Student Government* 2018

Travel Award, *Society of Risk Analysis* 2018

Lee Chaden Fellowship, *Purdue University* 2018

Travel Grant, *Purdue Climate Change Research Center* 2018

Estus and Vashti Magoon Award, *Purdue University* 2018

Operations Research Track, Undergraduate Student Paper Competition, 1st place, *IISE Annual Conference*, Anaheim, CA 2016

SERVICE AND OUTREACH

Reviewer

Nature Communications 2020-
Journal of Risk Analysis 2018-
IEEE Access 2018-
Journal of Management in Engineering 2019-
Journal of Infrastructure Systems 2019-
Utility Policy 2019-

University Service

Graduate Student Government, *Purdue University*
 Senate Chair, Executive Board Member 2017-

OTHER CERTIFICATIONS AND TRAINING

Open Science Grid Consortium
 Open Science Grid User School 2018

AFFILIATIONS

Society for Risk Analysis (SRA) 2017-
 Engineering and Infrastructure Group
 Student & Young Professionals Committee, Founding Member

Purdue Climate Change Research Center 2017-
Graduate Affiliate
INFORMS
Decision Analysis 2017-
Public Sector OR 2018-
Institute of Industrial and Systems Engineers (IISE)
Member 2018-

SKILLS

Programming

Fluent: R, Java, Python, VBA, LaTeX, bash

Familiar: PHP, HTML, SQL, SAS

Tools/Applications

Adobe CS, Mac/Windows/UNIX systems, ArcGIS, MS Office

Updated 1/29/2021