Bu ZHAO
Ph.D., Eric and Wendy Schmidt AI in Science Postdoctoral Fellow
School of Civil and Environmental Engineering
Cornell University, Ithaca, United States
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EDUCATION

School for Environment and Sustainability, University of Michigan 2018 – 2021
Ph.D., Major in Environment and Sustainability, Advisor: Prof. Ming Xu
The Michigan Institute for Computational Discovery and Engineering, University of Michigan 2019 – 2021
Ph.D., Joint Major in Scientific Computing
Department of Statistics, University of Michigan 2020 – 2021
Master of Arts, Major in Statistics
School of Environment, Tsinghua University 2015 –2018
Master of Engineering, Major in Environmental Science and Engineering
Institute of Data Science, Tsinghua University 2015 –2016
Certificate program in Big Data Science
International Relationship and Pacific Studies, UC San Diego 2013 – 2013
Certificate program, Future Global Leaders (FGLs) Program
Department of Engineering Physics, Tsinghua University 2011 – 2015
Bachelor of Engineering, Major in Engineering Physics

EMPLOYMENT

Assistant Professor 2024
Department of Environmental and Sustainable Engineering
College of Nanotechnology, Science, and Engineering, University at Albany, SUNY
Eric and Wendy Schmidt AI in Science Postdoctoral Fellow 2023
School of Civil and Environmental Engineering, Cornell University
Volunteer Visiting Research Fellow 2023
Department of Environmental and Sustainable Engineering
College of Nanotechnology, Science, and Engineering, University at Albany, SUNY
Postdoctoral Research Fellow 2022 – 2023
School for Environment and Sustainability, University of Michigan
Lecturer 2022 – 2023
School for Environment and Sustainability, University of Michigan

TEACHING EXPERIENCES

Instructor, University of Michigan 2023
Course: EAS 573, Environmental Footprinting and Input-Output Analysis
Lecturer, Fudan University 2022
Second Environmental Ecosystem Engineering and Data Science Summer School
Co-Instructor, University of Michigan 2022
Instructor: Dr. Ming Xu Course: EAS 573, Environmental Footprinting and Input-Output Analysis
Lecturer, Beijing Normal University 2021
Environmental Ecosystem Engineering and Data Science Summer School
Graduate Student Instructor, University of Michigan 2020
Instructor: Dr. Ming Xu Course: EAS 573, Environmental Footprinting and Input-Output Analysi

PROFESSIONAL SERVICES

Scientific Managing Editor 2021 – Presents
Journal: Resources, Conservation & Recycling
Review Editor 2022 – Presents
Journal: Frontiers in Environmental Science
Invited Referee

- *Journal Manuscripts*: ACS Sustainable Chemistry & Engineering; Resources, Conservation & Recycling; Resources Conservation & Recycling Advances; Journal of Industrial Ecology; Journal of Cleaner Production; Science of the Total Environment; Frontiers in Environmental Science

- *Conference Manuscripts*: International Conference on Resource Sustainability - Cities (2019), Adelaide, Australia; International Conference on Resource Sustainability (icRS 2021), Dublin, Ireland; International Conference on Resource Sustainability (icRS 2022)

RESEARCH GRANTS

- An Agent-based Method to Predict National Input-Output Accounts in China for Economic and Environmental Applications, **Lieberthal-Rogel Center for Chinese Studies**, $10,000. (PI: Prof. Ming Xu)
- High-resolution urban air pollution mapping using fleet vehicles as mobile monitors, **DiDi Chuxing**, $150,000. (PI: Prof. Ming Xu, co-PI: Prof. Ji Zhu)

TRAVEL GRANTS

Travel Grant
Rackham Graduate School, University of Michigan

Travel Grant
ISIE Conference Scholarship, International Society for Industrial Ecology

INVITED TALK

"Data-Driven Environmental System Analysis: Addressing Data Gap in Life Cycle Assessment by Using Artificial Intelligence" 2022
Second Environmental Ecosystem Engineering Summer School, Fudan University

"Data Science Methods to Address Challenges in Sustainable Consumption and Production" 2022
School of Resource and Environment, Nanchang University

"Estimation of Unit Process Data for Life Cycle Assessment Using Machine Learning Approach" 2021
International Industrial Ecology Day, International Society for Industrial Ecology

PUBLICATIONS & WORK-IN-PROGRESS

- Guo, R., Zhang, Q., Yu, X., Qi, Y., **Zhao, B***. **A deep spatio-temporal learning network for continuous citywide air quality forecast based on dense monitoring data**. *Journal of Cleaner Production*, 2023, 414, 137568. (Corresponding author)
- Qiao, X., Sun, M., Wang, Y., Zhang, D., Zhang, R., **Zhao, B**., Zhang, J*. **Strong relations of peroxyacetyl nitrate (PAN) formation to alkene and nitrous acid during various episodes**. *Environmental Pollution*, 2023, 326, 121465. (Sixth author)
- Wang, Y., Liu, L., Qiao, X., Sun, M., Guo, J., Zhang, J*, **Zhao, B**. **Projections of National-Gridded Emissions of Hydrofluoroolefins (HFOs) in China**. *Environmental Science & Technology*. 2023, 57, 23, 8650–8659. (Seventh author)
- Chen, X., Shuai, C.*, **Zhao, B**., Zhang, Y., Li, K. **Imputing Environmental Impact Missing Data for the Industrial Sector for Chinese Cities: A Machine Learning Approach**. *Environmental Impact Assessment Review*, 2023, 100, 107050. (Third author)
- **Zhao, B**., Nguyen, V., Colacino, J., Xu, M., Jolliet, O*. **Evaluation of Combined Non-linear Associations between Physiological Indicators and All-Cause Mortality Using Survival Tree and Random Survival Forest Models**. *International Journal of Epidemiology*, 2023, under review. (First author)
- **Zhao, B**., Yu, Z., Wang, H., Shuai, C., Qu, S., Xu, M*. **Data Science in Circular Economy: Trends, Current Situation, and Future**. 2023, in preparation. (First author)
- **Zhao, B**., Shuai, C., Qu, S., Xu, M*. **Use Deep Learning to Fill Data Gaps in Environmental Footprint Accounting**. *Environmental Science & Technology*, 2022, 56(16), 11897-11906 (First author)
- Chen, X., **Zhao, B.**, Shuai, C*., Qu, S., Xu, M. **Global spread of water scarcity risk through trade**. *Resources, Conservation and Recycling*, 2022, 187, 106643. (Second author)
- Shuai, C., **Zhao, B**., Chen, X., Liu, J., Zheng, C., Qu, S., Zou, J., Xu, M. **Quantifying the impacts of COVID-19 on Sustainable Development Goals using machine learning models**. *Fundamental Research,* 2022, https://doi.org/10.1016/j.fmre.2022.06.016 (Second author)
- Guo, R., Qi, Y., **Zhao, B**., Pei, Z., Wen, F., Wu, S., & Zhang, Q. **High-Resolution Urban Air Quality Mapping for Multiple Pollutants Based on Dense Monitoring Data and Machine Learning**. *International journal of environmental research and public health*, 2022, 19(13), 8005. (Third author)
- **Zhao, B**., Shuai, C., Hou, P., Qu, S., Xu, M*. **Estimate Unit Process Data for Life Cycle Assessment Using a Decision Tree-Based Approach**. *Environmental Science & Technology*, 2021, 55(12), 8439-8446 (First author)

- **Zhao, B**., Yu, L., Wang C., Shuai, C., Zhu, J., Qu, S., Xu, M*. **Urban Air Pollution Mapping Using Fleet Vehicles as Mobile Monitors and Machine Learning**. *Environmental Science & Technology*, 2021, 55(8), 5579-5588. (First author)
- Shuai, C., Yu, L., Chen, X., **Zhao, B.**, Qu, S., Zhu, J., Liu, J., Miller, S., Xu, M*. **Principal indicators to monitor Sustainable Development Goals**. *Environmental Research Letters*, 2021,16(12), 124015. (Fourth author)
- Hou, P., **Zhao, B**., Jolliet, O., Zhu J., Wang, P., Xu, M*. **Rapid Prediction of Chemical Ecotoxicity Through Genetic Algorithm Optimized Neural Network Models**. *ACS Sustainable Chemistry & Engineering*, 2020, 8 (32), 12168-12176 (Second author)
- **Zhao, B.**, Li, Y., Sun, M., Zhu, J., Shi, L*. **Industrial Symbiosis Network Construction between Cement and Coal-Fired Power Industries and the Case Study**. *Research of Environmental Sciences*, 2019, 32(2): 190-196. (First author)
- Zhang, B., **Zhao, B.**, Zuo, P., Huang, Z., Zhang, J*. **Influencing factors and prediction of ambient Peroxyacetyl nitrate concentration in Beijing, China**. *Journal of Environmental Sciences*, 2019, 77, 189-197. (Co-first author)
- Zhang, B., **Zhao, B.**, Xu, C., Zhang, J*. **Emission inventory and provincial distribution of short-chain chlorinated paraffins in China**. *Science of the Total Environment*, 2017, 581-582:582. (Co-first author)
- Zhang, B., **Zhao, B.**, Yu, M., Zhang, J*. **Emission inventory and environmental distribution of decabromodiphenyl ether in China**. *Science of the Total Environment*, 2017, 599–600:1073-1081. (Co-first author)
- Zhang, B., **Zhao, B.**, Zuo, P., Huang, Z., Zhang, J*. **Ambient peroxyacyl nitrate concentration and regional transportation in Beijing**. *Atmospheric Environment*, 2017, 166, 543-550. (Co-first author)
- **Zhao, B.**, Ni, S., Yong, N., Ma, X., Shen, S., Ji, X*. **A Preliminary Study on Spatial Spread Risk of Epidemics by Analyzing the Urban Subway Mobility Data**. *Journal of Biosciences and Medicines*, 2015, 03(9):15-21. (First author)

CONFERENCE PARTICIPATION & ORGANIZATION

2023 International Conference on Resource Sustainability (icRS 2023) 2023
- Organization Committee

2022 International Conference on Resource Sustainability (icRS 2022) 2022
- Conference Co-Chair

2021 International Conference on Cleaner Production and Sustainability (CPS 2021) 2021

International Conference on Resource Sustainability (icRS 2021), Dublin, Ireland 2021

2021 ISES Annual Meeting of the International Society of Exposure Science (ISES) 2021

International Conference on Resource Sustainability – Sustainable Pavement Technologies (icRS SPT 2021), Tirupati, India 2021

The 10th International Conference on Industrial Ecology (ISIE 2019), Beijing, China 2019

International Conference on Resource Sustainability - Cities (icRS Cities 2019), Adelaide, Australia 2019
- Awards: Most Welcomed Poster

The 5th International Conference on Environment Simulation and Pollution Control, Beijing, China 2017
- Awards: Best Presentation Award

PROFESSIONAL AFFILIATIONS

- International Society for Industrial Ecology (ISIE), Member 2019 - present
- Chinese-American Professors in Environmental Engineering and Science (CAPEES) 2022 - present

INTERNSHIP EXPERIENCES

Summer Internship, AI Labs, DiDi Chuxing 2019

Part-Time Assistant, Siemens Management Consulting 2016

Research Assistant, China Energy Conservation and Environmental Protection Group 2016

Research Assistant, Monitoring Center of Radioactive Environment, M.E.P. 2014

PROFESSIONAL SKILLS

- Programming Languages: C/C++, R, Python (Pytorch), Julia, MatLab
- Engineering Applications: Gephi, ArcGIS, SimaPro