Jianzhao Bi

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Education

Emory University — August 2020
Doctor of Philosophy in Environmental Health Sciences (GPA: 4.0/4.0) — *Atlanta, Georgia*

Tsinghua University — July 2016
Master of Science in Atmospheric Science (Grade: 91/100) — *Beijing, China*

Wuhan University — June 2014
Bachelor of Engineering in Remote Sensing Science and Technology (GPA: 3.8/4.0) — *Wuhan, China*

Research Experience

DEOHS, University of Washington — August 2020 – present
Postdoctoral Fellow — *Seattle, Washington*

- Improve wildfire smoke prediction and kidney health analysis with nationwide health data and advanced approaches
- Analyze associations between air pollution exposure and neurodegenerative disease outcomes
- Hindcast historical and forecast near-term ambient air pollution with advanced artificial intelligence algorithms
- Transfer high-resolution air pollution exposure models built in developed areas to resource-restricted environments
- Investigate air pollution infiltration and indoor air quality at a large spatial scale with public low-cost sensors

Department of Environmental Health, Emory University — August 2016 – August 2020
Research Assistant — *Atlanta, Georgia*

- Examined the acute effects of short-term exposure to $PM_{2.5}$ on kidney disease outcomes
- Analyzed temporal changes in acute response of cardiorespiratory diseases to changing $PM_{2.5}$ mixture
- Evaluated impacts of snow and cloud covers on satellite-derived $PM_{2.5}$ concentration levels
- Assessed added value of low-cost sensor data to high-resolution $PM_{2.5}$ exposure prediction

Center for Earth System Science, Tsinghua University — September 2014 – July 2016
Research Assistant — *Beijing, China*

- Estimated NO_x emission and chemical lifetime in metropolitan areas and industrial centers
- Analyzed meteorological factors affecting NO_x chemical lifetime in metropolitan areas

Honors and Awards

- **ISEE 34th Annual Conference Travel Award,** *Athens, Greece* — 2022
- **JESEE Young Investigator Meeting Award,** *2021 ISES Annual Conference* — 2021
- **ISEE 33rd Annual Conference Registration Award,** *Virtual* — 2021
- **ISEE 32nd Annual Conference Travel Award,** *Virtual* — 2020
- **ISES-ISIAQ 2019 Joint Conference Travel Award,** *Kaunas, Lithuania* — 2019
- **China National Scholarship**, *Wuhan University, China* — 2013
- **Georgia Alumni Association Scholarship**, *Wuhan University, China* — 2012
- **First Prize Scholarship for Academic Excellence**, *Wuhan University, China* — 2011 – 2013

Grants

Active

- **ECHO in Agricultural Washington and Rural Environments**
  - Major Goals: This program recruits a new pregnancy cohort, ECHO AWARE (ECHO in Agricultural Washington and Rural Environments) which will enrich the national ECHO cohort with representation of immigrant rural communities, including Latino farmworker families. This program propels ECHO-wide science on prenatal and early life air pollution exposure, a driver of substantial pediatric disease burden that is being accelerated by climate change, culminating in manuscripts that may directly inform US EPA policy.
  - Project Number: 1 UG3 OD035528-01

- PD/PI: Catherine Karr
- Source of Support: National Institutes of Health
- Primary Place of Performance: University of Washington
- Project/Proposal Start and End Dates: 9/1/2023 – 8/31/2030
- Estimated Award Amount: $14,245,159

Pending

- **Improved estimation of wildfire smoke exposures: Characterizing kidney disease risk**
  - **Impact Score: 25**
  - Major Goals: This project proposes improved exposure estimation approaches to wildfire smoke impacts to conduct better epidemiologic assessment of kidney health risks, in the setting of a career development proposal. I will create novel wildfire-derived $PM_{2.5}$ exposure estimates with spatiotemporally complete coverage to characterize the effects of wildfire $PM_{2.5}$ exposure on individuals with or at risk of chronic kidney disease and end-stage kidney disease, a large population extremely vulnerable to natural disasters, including wildfire smoke.
  - Project Number: 1 K99 ES034800-01A1
  - PD/PI: Jianzhao Bi
  - Source of Support: National Institute of Environmental Health Sciences (K99/R00)
  - Primary Place of Performance: University of Washington
  - Project/Proposal Start and End Dates: Pending
  - Estimated Award Amount: $20,000 per year (K phase); $249,000 per year (R phase)

Past

- **Spatiotemporal high-resolution prediction of wildfire smoke exposure: Leveraging satellite remote sensing and low-cost sensor data**
  - Major Goals: The goal of this study is to build a "proof-of-concept" framework for spatiotemporally high-resolution (daily, 1-km) wildfire $PM_{2.5}$ exposure estimates based on satellite and low-cost sensor data with a novel spatial machine learning algorithm, and to apply the framework to the entire western U.S., including WA, OR, CA, NV, MT, ID, WY, UT, AZ, CO, and NM. The estimated wildfire $PM_{2.5}$ exposure will support future smoke-related epidemiological and environmental justice analyses.
  - Project Number: –
  - PD/PI: Jianzhao Bi
  - Source of Support: Population Health Initiative (PHI) Pilot Research Grant
  - Primary Place of Performance: University of Washington
  - Project/Proposal Start and End Dates: 1/1/2023 – 8/31/2023
  - Total Award Amount (Including Indirect Costs): $39,671
- **Historical fine particulate matter exposure prediction for dementia-related epidemiologic analysis**
  - Major Goals: This project develops reliable U.S. nationwide, spatially resolved $PM_{2.5}$ exposure estimates from 1980 to 2019 based on a novel spatiotemporal air pollution prediction algorithm and different types of long-term measurements, including ground-level $PM_{2.5}$, visibility, and satellite-derived aerosol optical depth data. The historical $PM_{2.5}$ exposure estimates will serve as the foundation of our future epidemiologic analysis of $PM_{2.5}$ and dementia with a large multi-city cohort in the U.S. (MESA Air).
  - Project Number: UL1 TR002319
  - PD/PI: Jianzhao Bi
  - Source of Support: Institute of Translational Health Sciences (ITHS) Early Investigator Catalyst Award
  - Primary Place of Performance: University of Washington
  - Project/Proposal Start and End Dates: 9/1/2022 – 2/28/2023
  - Total Award Amount (Including Indirect Costs): $4,926

Publications

* indicates (co-)corresponding author

32. (Under Review) **Bi, J.**, Burnham, D., Zuidema, C., Schumacher, C., Gassett, A. J., Szpiro, A. A., Kaufman, J. D., & Sheppard, L. (2023). Evaluating low-cost monitoring designs for $PM_{2.5}$ exposure assessment with a spatiotemporal modeling approach. *Environmental Pollution*.

31. (Under Review) Gupta, S., Park, Y., **Bi, J.**, Zufle, A., Liu, Y., & Wildani, A. (2023). Transfer across space via characteristic feature: A case study for $PM_{2.5}$ prediction. *ACM SIGSPATIAL 2023*.

30. (Under Review) Zhang, D., Wang, W., Xi, Y., **Bi, J.**, Hang, Y., Zhu, Q., Pu, Q., Chang, H., & Liu, Y. (2023). Wildfire worsens population exposure to $PM_{2.5}$ pollution in the Continental United States. *Environmental Science & Technology*.

29. (Accepted) Gupta, S., **Bi, J.**, Liu, Y., & Wildani, A. (2023). Boosting for regression transfer via importance sampling. *International Journal of Data Science and Analytics*.

28. Hsu, S., **Bi, J.**, & De Boer, I. (2023). Invited Perspective: Still hazy? Air pollution and acute kidney injury. *Environmental Health Perspectives*, 131(4), 041302.

27. **Bi, J.***, D'Souza, R. R., Moss, S., Senthilkumar, N., Russell, A. G., Scovronick, N. C., Chang, H. H., & Ebelt, S. (2023). Acute effects of ambient air pollution on asthma emergency department visits in ten U.S. states. *Environmental Health Perspectives*, 131(4), 047003.

26. Kim, S-Y., Blanco, M. N., **Bi, J.**, Larson, T. V., & Sheppard, L. (2023). Exposure assessment for epidemiology: a scoping review of emerging monitoring platforms and designs. *Environmental Research*, 223, 115451.

25. Blanco, M. N., **Bi, J.**, Austin, E., Larson, T. V., Marshall, J. D., & Sheppard, L. (2023). Impact of mobile monitoring network design on air pollution exposure assessment models. *Environmental Science & Technology*, 57(1), 440-450.

24. **Bi, J.***, Zuidema, C., Clausen, D., Kirwa, K., Young, M. T., Gassett, A. J., Sampson, P. D., Larson, T. V., Szpiro, A. A., Sheppard, L., & Kaufman, J. D., (2022). Within-city variation in ambient carbon monoxide concentrations: Leveraging low-cost monitors in a spatiotemporal modeling framework. *Environmental Health Perspectives*, 130(9), 097008.

23. Zhu, Q., **Bi, J.**, Liu, X., Li, S., Wang, W., Zhao, Y., & Liu, Y., (2022). Satellite-based long-term spatiotemporal patterns of surface ozone concentrations in China: 2005-2019. *Environmental Health Perspectives*, 130(2), 027004.

22. Vu, B., **Bi, J.**, Wang, W., Huff, A., Kondragunta, S., & Liu, Y. (2022). Application of geostationary satellite and high-resolution meteorology data in estimating hourly $PM_{2.5}$ levels during the Camp Fire episode in California. *Remote Sensing of Environment*, 271, 112890.

21. **Bi, J.***, Knowland, K. E., Keller, C. A., & Liu, Y. (2022). Combining machine learning and numerical simulation for high-resolution $PM_{2.5}$ concentration forecast. *Environmental Science & Technology*, 56(3), 1544–1556.

20. Gladson, L., Garcia, N., **Bi, J.**, Hyung, J-L., Liu, Y., & Cromar, K. (2022). Evaluating the utility of high-resolution spatiotemporal air pollution data in estimating local $PM_{2.5}$ exposures in California from 2015–2018. *Atmosphere*, 13(1), 85.

19. Wang, W., Liu, X., **Bi, J.**, & Liu, Y. (2022). A machine learning model to estimate ground ozone concentrations in California using TROPOMI data and high-resolution meteorology. *Environment International*, 158, 106917.

18. **Bi, J.***, Carmona, N., Blanco, M. N., Gassett, A. J., Seto, E., Szpiro, A. A., Larson, T. V., Sampson, P. D., Kaufman, J. D., & Sheppard, L. (2022). Publicly available low-cost sensor measurements for $PM_{2.5}$ exposure modeling: Guidance for monitor deployment and data selection. *Environment International*, 158, 106897.

17. Zhang, D., Du, L., Wang, W., Zhu, Q., **Bi, J.**, Scovronick, N., Naidoo, M., Garland, R. M., & Liu, Y. (2021). A machine learning model to estimate ambient $PM_{2.5}$ concentrations in industrialized highveld region of South Africa. *Remote Sensing of Environment*, 266, 112713.

16. He, M., Do, V., Liu, S., Kinney, P. L., Fiore, A., Jin, X., DeFelice, N., **Bi, J.**, Liu, Y., Insaf, T. Z., & Kioumourtzoglou, M-A. (2021). Short-term $PM_{2.5}$ and cardiovascular admissions in NY State: Assessing sensitivity of exposure model choice. *Environmental Health*, 20(1), 93.

15. Wu, N., Geng, G., Yan, L., **Bi, J.**, Li, Y., Tong, D., Bo, Z., & Zhang, Q. (2021). Improved spatial representation of a highly resolved emission inventory in China: Evidence from TROPOMI measurements. *Environmental Research Letters*, 16(8), 084056.

14. **Bi, J.***, Barry, V., Weil, E. J., Chang, H. H., & Ebelt, S. (2021). Short-term exposure to fine particulate air pollution and emergency department visits for kidney diseases in the Atlanta metropolitan area. *Environmental Epidemiology*, 5(4), e164.

13. Wallace, L., **Bi, J.**, Ott, W. R., Sarnat, J., & Liu, Y. (2021). Calibration of low-cost PurpleAir outdoor monitors using an improved method of calculating $PM_{2.5}$. *Atmospheric Environment*, 256, 118432.

12. **Bi, J.**, Wallace, L. A., Sarnat, J. A., & Liu, Y. (2021). Characterizing outdoor infiltration and indoor contribution of $PM_{2.5}$ with citizen-based low-cost monitoring data. *Environmental Pollution*, 276, 116763.

11. Xiao, Q., Liang, F., Ning, M., Zhang, Q., **Bi, J.**, He, K., Lei, Y., & Liu, Y. (2021). The long-term trend of $PM_{2.5}$-related mortality in China: The effects of source data selection. *Chemosphere*, 263, 127894.

10. Wang, L., **Bi, J.**, Meng, X., Geng, G., Huang, K., Li, J., Tang, L., & Liu, Y. (2020). Assessment of the long-term efficacy of $PM_{2.5}$ pollution control policies across the Taiwan Strait. *Remote Sensing of Environment*, 251, 112067.

9. Stowell, J., **Bi, J.**, Al-Hamdan, M., Lee, H-J., Lee, S-M., Freedman, F., Kinney, P., & Liu, Y. (2020). Estimating $PM_{2.5}$ in Southern California using satellite data: Factors that affect model performance. *Environmental Research Letters*, 15(9), 094004.

8. **Bi, J.***, D'Souza, R. R., Rich, D. Q., Hopke, P. K., Russell, A. G., Liu, Y., Chang, H. H., & Ebelt, S. (2020). Temporal changes in short-term associations between cardiorespiratory emergency department visits and $PM_{2.5}$ in Los Angeles, 2005 to 2016. *Environmental Research*, 190, 109967.

7. **Bi, J.**, Wildani, A., Chang, H. H., & Liu, Y. (2020). Incorporating low-cost sensor measurements into high-resolution $PM_{2.5}$ modeling at a large spatial scale. *Environmental Science & Technology*, 54(4), 2152-2162.

6. **Bi, J.**, Stowell, J., Seto, E. Y. W., English, P. B., Al-Hamdan, M. Z., Kinney, P. L., Freedman, F. R., & Liu, Y. (2020). Contribution of low-cost sensor measurements to the prediction of $PM_{2.5}$ levels: A case study in Imperial County, California, USA. *Environmental Research*, 180, 108810.

5. She, Q., Choi, M., Belle, J. H., Xiao, Q., **Bi, J.**, Huang, K., Meng, X., Geng, G., Kim, J., He, K., Liu, M., & Liu, Y. (2020). Satellite-based estimation of hourly $PM_{2.5}$ levels during heavy winter pollution episodes in the Yangtze River Delta, China. *Chemosphere*, 239, 124678.

4. Huang, K., **Bi, J.**, Meng, X., Geng, G., Lyapustin, A., Lane, K. J., Gu, D., Kinney, P. L., & Liu, Y. (2019). Estimating daily $PM_{2.5}$ concentrations in New York City at the neighborhood-scale: Implications for integrating non-regulatory measurements. *Science of The Total Environment*, 697, 134094.

3. Jin, X., Fiore, A. M., Civerolo, K., **Bi, J.**, Liu, Y., van Donkelaar, A., Martin, R. V., Al-Hamdan, M., Zhang, Y., Insaf, T. Z., & Kioumourtzoglou, M-A. (2019). Comparison of multiple $PM_{2.5}$ exposure products for estimating health benefits of emission controls over New York State, USA. *Environmental Research Letters*, 14(8), 084023.

2. Vu, B. N., Sánchez, O., **Bi, J.**, Xiao, Q., Hansel, N. N., Checkley, W., Gonzales, G. F., Steenland, K., & Liu, Y. (2019). Developing an advanced $PM_{2.5}$ exposure model in Lima, Peru. *Remote Sensing*, 11(6), 641.

1. **Bi, J.**, Belle, J. H., Wang, Y., Lyapustin, A. I., Wildani, A., & Liu, Y. (2019). Impacts of snow and cloud covers on satellite-derived $PM_{2.5}$ levels. *Remote Sensing of Environment*, 221, 665-674.

Invited Talks

6. "Using satellite and low-cost sensor data for large-scale ambient air pollution prediction", *ISES Webinar*, International Society of Exposure Science, Virtual, August 2022

5. "Studies of air quality exposures and acute kidney diseases", *Renal Grand Rounds*, School of Medicine, Emory University, Atlanta, Georgia, April 2022

4. "Publicly available low-cost sensor measurements for $PM_{2.5}$ exposure modeling: guidance for monitor deployment and data selection", *Sensor and Technology Fair*, ISES 2021 Annual Meeting, Virtual, September 2021

3. "Short-term effects of air pollution on asthma emergency department visits and hospital admissions in multiple U.S. states: a pooled analysis", *CDC Asthma and Community Health Branch Lecture Series*, Centers for Disease Control and Prevention, Atlanta, Georgia, June 2021

2. "Characterizing infiltration and indoor contribution of $PM_{2.5}$ based on volunteer-generated monitoring data at large spatial and temporal scales", *Work in Progress Seminar Series (WIPS)*, University of Washington, Seattle, Washington, October 2020

1. "Improvement of $PM_{2.5}$ exposure assessment and its application in health research", School of Civil and Environmental Engineering, Georgia Institute of Technology, Atlanta, Georgia, November 2019

Presentations

28. (Poster) "New statistical approach for generating historical $PM_{2.5}$ exposure estimates in the US for 1980-2019 for epidemiological research", *ISES 2023 Annual Meeting*, Chicago, Illinois, August 2023
27. (Poster) "Acute effects of ambient air pollution on asthma emergency department visits in 10 U.S. states", *ISEE NAC Conference 2023*, Corvallis, Oregon, June 2023
26. (Oral) "Within-city variation in ambient carbon monoxide concentrations: Leveraging low-cost monitors in a spatiotemporal modeling framework", *AGU Fall Meeting 2022*, Chicago, Illinois, December 2022
25. (Poster) "Combining machine learning and numerical simulation for near-real-time high-resolution $PM_{2.5}$ concentration forecast ", *AGU Fall Meeting 2022*, Chicago, Illinois, December 2022
24. (Oral) "Acute effects of ambient air pollution on asthma emergency department visits in 10 U.S. states", *ISEE 2022 Conference*, Athens, Greece, September 2022
23. (Poster) "Within-city variation in ambient carbon monoxide concentrations: Leveraging low-cost monitors in a spatiotemporal modeling framework", *ISEE 2022 Conference*, Athens, Greece, September 2022
22. (Oral) "Within-city variation in ambient carbon monoxide concentrations: Leveraging low-cost monitors in a spatiotemporal modeling framework", *ISES 2022 Annual Meeting*, Lisbon, Portugal, September 2022
21. (Oral) "Combining machine learning and numerical simulation for high-resolution $PM_{2.5}$ concentration forecast", *ISES 2022 Annual Meeting*, Lisbon, Portugal, September 2022
20. (Poster) "Within-city variation in ambient carbon monoxide concentrations: Leveraging low-cost monitors in a spatiotemporal modeling framework", *NIEHS EHSCC Annual Meeting*, New York, New York, July 2022
19. (Poster) "Publicly available low-cost sensor measurements for $PM_{2.5}$ exposure modeling: Guidance for monitor deployment and data selection", *2022 Air Sensors International Conference*, Pasadena, California, May 2022
18. (Oral) "Openly accessible low-cost measurements for $PM_{2.5}$ exposure modeling: Guidance for monitor deployment with a similarity metric", *39^{th} AAAR Annual Conference*, Virtual, October 2021
17. (Oral) "Openly accessible low-cost measurements for $PM_{2.5}$ exposure modeling: Guidance for monitor deployment with a similarity metric", *Meteorology and Climate Modeling for Air Quality Conference (MAC-MAQ 2021)*, Virtual, September 2021
16. (Oral) "Openly accessible low-cost measurements in $PM_{2.5}$ exposure modeling: Guidance for monitor deployment", *ISES 2021 Annual Meeting*, Virtual, September 2021
15. (Lightning Talk) "Openly accessible low-cost measurements in $PM_{2.5}$ exposure modeling: Guidance for monitor deployment", *ISEE 2021 Conference*, Virtual, August 2021
14. (Lightning Talk) "Characterizing infiltration and indoor contribution of $PM_{2.5}$ based on volunteer-generated monitoring data at large spatial and temporal scales", *AGU Fall Meeting 2020*, Virtual, December 2020
13. (Oral) "Characterizing infiltration and indoor contribution of $PM_{2.5}$ based on volunteer-generated monitoring data at large spatial and temporal scales", *38^{th} AAAR Annual Conference*, Virtual, October 2020
12. (Poster) "Characterizing infiltration and indoor contribution of $PM_{2.5}$ based on volunteer-generated monitoring data at large spatial and temporal scales", *ISES 2020 Annual Meeting*, Virtual, September 2020
11. (Poster) "Short-Term Exposure to Fine Particulate Air Pollution and Emergency Department Visits for Renal Diseases in the Atlanta Metropolitan Area", *ISEE 2020 Conference*, Virtual, August 2020
10. (Lightning Talk) "Temporal changes in short-term associations between cardiorespiratory emergency department visits and $PM_{2.5}$ in Greater Los Angeles, 2005 to 2016", *ISEE 2020 Conference*, Virtual, August 2020
9. (Poster) "Integration of Low-Cost Sensor Measurements into High-Resolution $PM_{2.5}$ Exposure Modeling", *ISEE 2020 Conference*, Virtual, August 2020
8. (Poster) "Incorporating low-cost sensor measurements into high-resolution $PM_{2.5}$ modeling at a large spatial scale", *Exposome Symposium 2020*, New York City, New York, March 2020
7. (Poster) "Incorporating low-cost sensor measurements into high-resolution $PM_{2.5}$ modeling at a large spatial scale", *2^{nd} Annual Clinical Climate Change Conference*, New York City, New York, January 2020

6. (Poster) "Incorporating low-cost sensor measurements into high-resolution $PM_{2.5}$ modeling at a large spatial scale", *AGU Fall Meeting 2019*, San Francisco, California, December 2019
5. (Oral) "Contribution of low-cost sensor measurements to the prediction of $PM_{2.5}$ levels", *ISES-ISIAQ 2019 Joint Annual Meeting*, Kaunas, Lithuania, August 2019
4. (Poster) "Impacts of snow and cloud covers on satellite-derived $PM_{2.5}$ concentrations", *AGU Fall Meeting 2018*, Washington, D.C., December 2018
3. (Poster) "Combining low-cost sensor measurements and satellite aerosol optical depth to enhance the full-coverage $PM_{2.5}$ prediction in Imperial County, CA", *AGU Fall Meeting 2018*, Washington, D.C., December 2018
2. (Oral) "Incorporating snow and cloud fractions in Random Forest to estimate high-resolution $PM_{2.5}$ exposures in New York State", *ISES-ISEE 2018 Joint Annual Meeting*, Ottawa, Canada, August 2018
1. (Poster) "Citywide validation and improvement of the MAIAC aerosol product in Lima, Peru", *ISES 2017 Annual Meeting*, Research Triangle Park, North Carolina, October 2017

Mentoring

- **Doctoral Research Project Mentor** 2022 – 2023
  Yunhan Wu, B.S.P.H. *University of Washington*
  - Project Title: Contribution of R-LINE traffic pollution dispersion model to high-resolution NO_2 prediction
  - Guide the mentee to conduct complex statistical modeling for NO_2 exposure
  - Facilitate comprehensive literature review for dispersion and air pollution modeling
  - Hold weekly individual meetings for problem-solving and progress assessment
  - Work closely with a larger group of scientists to regularly evaluate project results
- **Doctoral Research Project Co-Mentor** 2021 – 2022
  Victoria Knutson, B.A. *University of Washington*
  - Project Title: U.S. national prediction models for spatiotemporal $PM_{2.5}$ component exposures
  - Helped the main mentor design plausible project plans and evaluation metrics
  - Facilitated the development complex statistical models for $PM_{2.5}$ component modeling
  - Provided actionable feedback for the mentee in understanding project results and problems
  - Assisted in the mentee's literature review and scientific manuscript writing

Teaching

- **Guest Lecturer** 2023
  Environmental and Occupational Health Sciences Seminar (ENV H 580) *University of Washington*
  - Discussed state-of-the-art air pollution research with the departmental community (students, faculty, and staff) in a guest lecture session, entitled "Using Satellite and Low-Cost Sensor Data for Large-Scale Ambient Air Pollution Prediction"
- **Teaching Assistant** 2018 – 2019
  Introduction to Environmental Remote Sensing (EH 587) *Emory University*
  - Designed laboratory modules for graduate students: conducted need analysis, devised customized instructional materials, and developed project-based learning activities to increase students' engagement
  - Identified learning goals, designed assessment instrument, and provided actionable feedback for students
  - Tracked and maintained record of students' learning progress, provided instructional support on final projects and group discussions
- **Teaching Assistant** 2019
  Perspectives in Environmental Health (EH 500) *Emory University*
  - Worked closely with the lead instructor to incorporate student-centered teaching techniques and managed 100 graduate students for optimal learning
  - Conducted weekly in-person office hours to provide individualized support for students
  - Facilitated students' learning by designing assessment instrument and providing corrective feedback
- **Teaching Assistant** 2018
  Fundamentals of Exposure Science (EH 510) *Emory University*
  - Collaborated with peer TAs to develop and implement lesson plan for 50+ graduate students
  - Maintained productive and inclusive learning environment by using effective classroom management strategies
  - Assisted with course evaluations by collecting quantitative and qualitative evidence of teaching effectiveness

Service

- **Session Co-Chair** 2023
  Poster Discussion: Air Pollution *ISEE North America Chapter Conference*
- **Session Co-Chair** 2021
  Use of (Low-Cost) Sensors in Environmental Epidemiology – Opportunities and Challenges *ISEE Annual Conference*
- **Committee Member** 2020
  General Scientific Meetings Committee *ISES Annual Conference*
- **Conference Volunteer** 2015
  Scientific Steering Committee *Global Emissions InitiAtive (GEIA) Conference*

Peer Reviews

- **Environment International** (28)
- **Atmosphere** (10)
- **Environmental Research** (10)
- **Air Quality, Atmosphere and Health** (7)
- **Environmental Health Perspectives** (7)
- **Atmospheric Pollution Research** (6)
- **Environmental Science & Technology** (5)
- **Environmental Pollution** (4)
- **International Journal of Epidemiology** (4)
- **IJERPH** (3)
- **Remote Sensing of Environment** (3)
- **Scientific Reports** (3)
- **Atmospheric Environment** (2)
- **Building and Environment** (2)
- **Environmental Health** (2)
- **JA&WMA** (2)
- **npj Climate and Atmospheric Science** (2)
- **BMJ Open** (1)
- **Environmental Science & Technology Letters** (1)
- **Journal of Environmental Management** (1)
- **Remote Sensing** (1)

Skills and Languages

- **Programming:** R (sf, tidyverse, Shiny, ggplot2), Python (keras, pytorch, sklearn), Matlab, IDL, SAS, Bash, C, Java, SQL, HTML/CSS, Javascript
- **Tools & Software:** Amazon Web Services, Google Cloud Platform, Google Earth Engine, QGIS, ArcGIS, ERDAS, ENVI, HighCharts, ECharts, LaTeX
- **General:** I learn whatever tool is relevant for the task
- **Languages:** Mandarin (Native), English (Proficient), Japanese (Proficient)