

BORA JIN

Department of Applied Mathematics and Statistics, Colorado School of Mines, Golden, CO 80401

Office: Stratton Hall, 201

bora.jin@mines.edu

<https://jinbora0720.github.io/>

RESEARCH INTERESTS

Spatial statistics, Bayesian methods, Hierarchical models, Graphical models, Latent factor models, Environmental health

PROFESSIONAL EXPERIENCE

- Aug, 2026 – **Colorado School of Mines**
Assistant Professor of Applied Mathematics and Statistics
- 2023 – 2026 **Johns Hopkins University**
Postdoctoral fellow in the department of Biostatistics
Advisor: Abhirup Datta

EDUCATION

- 2023 **Duke University**
Ph.D. in Statistics
Advisors: Amy H. Herring, David Dunson
- 2015, 2017 **Korea University**
B.A., M.A. in Statistics

PUBLICATIONS

[†] indicates equal contribution.

PUBLIC-FACING RESEARCH OUTPUTS

1. [Baltimore Air Quality Dashboard](#): Launched October 2025; primary developer; **Jin, B.**, Agrawal, P., Sato, K., Lemson, G., Hao, L., DeCarlo, P., Koehler, K., and Datta, A.

UNDER REVIEW

1. **Jin, B.** and Datta, A. "Identification and consistent estimation in source apportionment using geometry." [arXiv](#).
2. **Jin, B.**, Salmerón, B.D., McClosky, D., Hagan, D., Dickerson, R.R., Spada, N.J., Deanes, L.N., Aubourg, M.A., Ramprasad, T., Schmidt, L.E., Sawtell, G.G., Heaney, C.D., and Datta, A. "Source apportionment of air pollution burden using geometric non-negative matrix factorization and high-throughput multi-pollutant air sensor data in Curtis Bay, Baltimore, USA." *Under revision in Environmental Science & Technology*. [arXiv](#).

JOURNAL ARTICLES

1. **Jin, B.**, Peruzzi, M., and Dunson, D. (2026). Bag of DAGs: Inferring directional dependence in spatiotemporal processes. *Bayesian Analysis*, 21(1): 401–422. [DOI](#).
2. **Jin, B.**, Herring, A.H., and Dunson, D. (2024). Spatial predictions on physically constrained domains: Applications to Arctic sea salinity data. *Annals of Applied Statistics*, 18(2): 1596–1617. [DOI](#).
3. **Jin, B.**, Dunson, D., Rager, J.E., Reif, D., Engel, S.M., and Herring, A.H. (2023). Bayesian matrix completion for hypothesis testing. *Journal of the Royal Statistical Science: Series C*, 72(2):254–270. [DOI](#).

WORKING PAPERS

1. **Jin, B.**, Finley, A.O., and Datta, A. “Bayesian spanning tree-based multivariate spatial model.” *In preparation*. [Presentation slides](#).
2. **Jin, B.**, Eyni, A., Waugh D., and Datta, A. “Filling the meteorological desert: Calibrated low-cost sensors map neighborhood heat in Baltimore.” *In preparation*.
3. **Jin, B.**[†], Aubourg, M.A.[†], Salmerón, B.D., Hagan, D., Dickerson, R.R., Spada, N.J., Ramprasad, T., Livi, K., Chen, J., Schmidt, L.E., Sanchez-Gonzalez, C., Sawtell, G.G., Datta, A., and Heaney, C.D. “Practical multi-methods approach to characterize coal dust and air pollution burden in communities bordering coal export terminals.” *In preparation*.
4. **Jin, B.**, Hagan, D., and Datta, A. “GeomNMF: Identifiable non-negative matrix factorization in Python for environmental source apportionment.” *In preparation*.

MASTER’S THESIS

- **Jin, B.** (2017). “Bayesian inference to multiple equations in a SUR framework”. [Korea University Library](#).

HONORS AND AWARDS

2023	ASA ENVR Student Paper Award
2023	ENAR Distinguished Student Paper Award
2022	ISBA EnviBayes Student Paper Award
2022	ASA ENVR Student Paper Award

2021	ISBA Best Student/Postdoc Contributed Paper Award
2018 – 2020	Study Abroad Scholarship by Korean National Institute for International Education
2016	First Prize in the Graduate Paper Session at the Korean Statistical Society's Annual Conference
2016	Yangcheon Foundation Scholarship for Academic Excellence
2016	So-Mang Presbyterian Church Scholarship for Academic Merit
2015	Second Prize in the Graduate Poster Session at the Korean Statistical Society's Annual Conference
2011 – 2014	Dean's Award for Academic Merit at Korea University
2012	Korean Ministry of Gender Equality and Family Affairs Minister's Honor Award
2011	Seoul National University President's Prize

TEACHING EXPERIENCE

Aug – Dec, 2026	Instructor for Multivariate Analysis (MATH437/537, Fall 2026), Department of Applied Mathematics and Statistics, Colorado School of Mines
Jan – Apr, 2023	Teaching Assistant for Special Topics: Latent Process Modeling (STA790-1, Spring 2023), Department of Statistical Science, Duke University
Aug – Dec, 2022	Course Organizer for Introduction to Data Science and Statistical Thinking (STA199, Fall 2022), Department of Statistical Science, Duke University
May – Jun, 2022	Instructor of Record for Introduction to Data Science and Statistical Thinking (STA199, Summer 2022), Department of Statistical Science, Duke University
Aug – Dec, 2021	Teaching Assistant for Case Studies in the Practice of Statistics (STA440, Fall 2021), Department of Statistical Science, Duke University
Apr 28, 2021	Guest Lecturer for Spatial Statistics (STAT141, Spring 2021), Department of Statistics, Harvard University
Jan – May, 2021	Teaching Assistant for Theory and Methods of Statistical Learning and Inference (STA432, Spring 2021), Department of Statistical Science, Duke University
Jan – May, 2019	Teaching Assistant for Statistics (STA250, Spring 2019), Department of Statistical Science, Duke University
Sep – Dec, 2015	Teaching Assistant for Introduction to Probability Theory (STAT201, Fall 2015) and Topics in Mathematical Statistics (STAT412, Fall 2015), Department of Statistics, Korea University

MENTORING EXPERIENCE

- May, 2021 Graduate Mentor for Introduction to Undergraduate Research in Statistical Science Workshop, Department of Statistical Science, Duke University
- Jan, 2013 Undergraduate Mentor for Gifted and Talented Middle School Students from Low-Income Groups, Samsung Dream Class, South Korea

STATISTICAL CONSULTING EXPERIENCE

- Jun – Aug, 2016 Client: Korean Environment Ministry, Prediction of carbon emissions from industrial complex areas under different afforestation practices.
- Mar – Aug, 2016 Client: College of Nursing at Chungnam National University, Clustering of cancer patients' symptoms.
- Oct – Mar, 2015 Client: MezzoMedia, Development of a Korean morphological analyser for emotionality of language in online platforms.

WORK EXPERIENCE

- Jan – Jul, 2018 Intern, Division of Budget and Finance, International Atomic Energy Agency, Vienna, Austria
- Feb – Aug, 2017 Intern, Basel/Rotterdam/Stockholm Conventions, United Nations Environment, Geneva, Switzerland
- Jun – Jul, 2014 Intern, Banking and Finance, Market Surveillance Department, Korea Exchange, Seoul, South Korea

PROFESSIONAL ACTIVITIES

- Jan 18, 2022 Panel, Gender Gap in Higher Education Discussion by Statistical Science Major Union, Duke University, Online

EDITORIAL ACTIVITIES

- Reviewer *Biometrics*
- Reviewer *Journal of the Royal Statistical Society: Series B*
- Reviewer *Environmental Health Perspectives*

Reviewer *ASA SBSS Student Paper Competition Committee*

Reviewer *ASA ENVR Student Paper Competition Committee*

PRESENTATIONS

SCIENTIFIC MEETINGS

- Aug, 2023 “Spatial predictions on physically constrained domains,” JSM, Canada
- Mar, 2023 “Spatial predictions on physically constrained domains,” ENAR 2023 Spring Meeting, United States
- Oct, 2022 “Bag of DAGs: Inferring directional dependence in spatiotemporal processes,” 13th International Conference on Bayesian Nonparametrics (BNP), Chile
- Aug, 2022 “Bag of DAGs: Flexible nonstationary modeling of spatiotemporal dependence,” JSM, United States
- Jun, 2022 “Scalable Gaussian processes on physically constrained domains,” ISBA World Meeting, Canada
- Mar, 2022 “Bag of DAGs: Flexible nonstationary modeling of spatiotemporal dependence,” Monthly meeting at Section on Environmental Sciences of ISBA, Online
- Sep, 2021 “Scalable Gaussian processes on physically constrained domains,” Bayesian Young Statisticians Meeting (BAYSM), Online
- Aug, 2021 “Bag of DAGs: Flexible & scalable modelling of spatiotemporal dependence,” Joint Statistical Meetings (JSM), Online
- Jul, 2021 “Bag of DAGs: Flexible & scalable modelling of spatiotemporal dependence,” World Meeting of the International Society for Bayesian Analysis (ISBA), Online
- Jun, 2021 “Scalable Gaussian processes on physically constrained domains,” The International Environmetrics Society - GRASPA Conference, Online
- Jun, 2021 “Scalable Gaussian processes on physically constrained domains,” Symposium on Data Science and Statistics (SDSS), Online
- Nov, 2016 “Bayesian inference to multiple equations in seemingly unrelated regression framework,” Korean Statistical Society’s Annual Conference, South Korea
- Jun, 2016 “Bayesian inference to multiple equations in seemingly unrelated regression framework,” Korea University - Hokkaido University Joint Conference in Statistics, South Korea

Nov, 2015 “Bayesian approaches to instrumental variable models with multiple endogenous regressors,” Korean Statistical Society’s Annual Conference, South Korea

INVITED TALKS

Aug, 2025 “Geostatistical modeling with graphs,” JSM, United States

Dec, 2023 “Bag of DAGs: Inferring directional dependence in spatiotemporal processes,” CFE-CMStatistics 2023, Germany & virtual

Sep, 2023 “Spatial predictions on physically constrained domains,” Bayesian Learning and Spatio-Temporal modeling (BLAST) working group, United States

Aug, 2023 “Bayesian Matrix Completion for Chemical Activity using ToxCast data,” United States Environmental Protection Agency Seminar Series, Online

Feb, 2022 “Bayesian Matrix Completion for Chemical Activity using ToxCast data,” Integrated Toxicology & Environmental Health Program Seminar Series, Online