BORA JIN

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RESEARCH INTERESTS

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

EDUCATION AND TRAINING

PRESENT	**Johns Hopkins University** Postdoctoral fellow in the department of Biostatistics Advisor: Abhirup Datta
2023	**Duke University** Ph.D. in Statistics Advisors: Amy H. Herring, David Dunson
2015, 2017	**Korea University** B.A., M.A. in Statistics

PUBLICATIONS

PUBLIC-FACING RESEARCH OUTPUTS

1. Baltimore Air Quality Dashboard: Launched October 2025; primary developer.

JOURNAL ARTICLES

1. **Jin, B.**, Peruzzi, M., and Dunson, D. (2024). Bag of DAGs: Inferring directional dependence in spatiotemporal processes. *Bayesian Analysis Advance Publication*, 1–22. 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.

UNDER REVIEW

1. **Jin, B.** and Datta, A. "Identification in source apportionment using geometry." *In review (2025).* arXiv.

WORKING PAPERS

1. **Jin, B.**, Finley, A.O., and Datta, A. "Bayesian spanning tree-based multivariate spatial model." *Expected submission: November 2025.* Presentation slides.
2. **Jin, B.**, Salmerón, B.D., McClosky, D., Hagan, D., Dickerson, R.R., Aubourg, M., Auvil, R., Schmidt, L, Sawtell, G.G., Heaney, C., and Datta, A. "Community air monitoring meets geometric non-negative matrix factorization: Source attributions in Curtis Bay." *Expected submission: November 2025.*
3. **Jin, B.**, Eyni, A., Waugh D., and Datta, A. "Filling the meteorological desert: Calibrated low-cost sensors map neighborhood heat in Baltimore." *In preparation (2025).*

MASTER'S THESIS

- **Jin, B.** (2017). "Bayesian inference to multiple equations in a SUR framework". Korea University Library.

TEACHING EXPERIENCE

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*

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

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

REFERENCES

Abhirup Datta	Professor in Biostatistics at Johns Hopkins University abhidatta@jhu.edu +1 (410) 502-2988
Amy H. Herring	Sara & Charles Ayres Distinguished Professor in Statistical Science, Global Health, and Biostatistics and Bioinformatics at Duke University amy.herring@duke.edu +1 (919) 684-4210
David Dunson	Arts and Sciences Distinguished Professor in Statistical Science and Mathematics at Duke University dunson@duke.edu +1 (919) 684-8025
Mine Çetinkaya-Rundel	Professor of the Practice in Statistical Science at Duke University mc301@duke.edu Regarding my teaching ability