Bumjun Park

Ph.D. Student, Department of Biotatistics, University of Washington

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Education

Ph.D. in Biostatistics — *University of Washington*, *(expected)* 2028

B.S. in Statistics — *University of Wisconsin-Madison*, May 2023
(Cert. in Mathematics & Econ. Analytics)

Research Interests

Functional Data Analysis, High-Dimensional Statistics, Network Analysis, Spatial Statistics

Publications

Park, B., Kang, H., & Zahasky, C. (2024). "Statistical Mapping of PFOA and PFOS in Groundwater Throughout the Contiguous United States". *Environmental Science & Technology*, 58, 44, 19843–19850. (manuscript) (code)

Research Experience

Research Assistant — *Fred Hutch Cancer Center*, *Sep, 2024 - (present)*
Advisor: **Jing Ma**

- Conducted data-driven graphical and network analyses, developing methods to estimate multiple microbiota topologies from a single dataset.
- Contributed to theoretical statistical modeling through literature review and code development

Independent Study — *University of Washington*, *March, 2024 - (present)*
Advisor: **Amy Willis**

- Conducted a group study on differential abundance analysis methods in microbiome research, verifying their algebraic foundations, assumptions, and implementation.
- Explored methods for imputing missing data by leveraging known covariance structures, such as phylogenies.

Research Assistant — *University of Washington*, *Sep, 2023 - (present)*
Advisor: **Eardi Lila**

- Studied multivariate functional data analysis methods for predicting ischemic strokes, working with the research group under Professor Mahmud Mossa-Basha, Department of Radiology.
- Investigated and developed quantitative models to reclassify Embolic Strokes of Undetermined Source (ESUS) using cerebral vessel wall MRI data.

Data Analyst *Nelson Institute of Env. Studies, UW-Madison*
Advisor: **Jonathan Patz** *Sep, 2022 - May, 2023*

- Preprocessed and analyzed data for environmental policy, air quality, and epidemiology projects.
- Applied spatial random forest models to investigate the relationship between malaria prevalence and factors such as vegetation coverage, insecticide-treated net distribution, precipitation, and livestock populations in Kenya.

Undergraduate Research Assistant *UW-Madison*
Advisor: **Chris Zahasky** *May, 2022 - May, 2023*

- Implemented web-scraping algorithms to collect PFAS concentration data from sources such as the U.S. Air Force and Wisconsin Department of Natural Resources.
- Developed geo-statistical visualizations and built an Inhomogeneous Poisson Process model to predict PFAS concentrations while accounting for opportunistic sampling.

Undergraduate Research Assistant *UW-Madison*
Advisor: **Stephen Gammie** *Feb, 2022 - May, 2023*

- Analyzed RNA-sequencing gene expression data from Alzheimer's disease models to identify differentially expressed genes.
- Processed gene expression data for Alzheimer's and Parkinson's disease patients, implementing machine learning models to classify diseases using top-scoring differential gene pairs.

Presentations

Presentation *UW Biostats Student Seminar*
Oct, 2024

Park, B. "Function on Function Regression on Sparse Observations: Multivariate Functional PCA on Vessel Wall Imaging Data"

Poster *AWRA Wisconsin Section*
Mar, 2023

Park, B., Kang, H., Gnesda, W., & Zahasky, C. "Groundwater Contamination of Per- and Polyfluoroalkyl Substances in the United States - Insights from an Ecological Sampling Bias Correction Method"

Poster *Planetary Health Alliance Annual Meeting*
Nov, 2022

Leffler, T., Hoffman, R., **Park, B.**, Patz, J. "Malaria Risk and Forest Cover Change in Kenya: A Geospatial Analysis"

Skills

Programming: R, Julia
Software: LaTeX, git, GIS