J.E. Borgert

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PROFESSIONAL POSITIONS

Postdoctoral Research Associate — **Chapel Hill, NC**
The University of North Carolina at Chapel Hill — *March 2025 –*

Postdoctoral Mathematical Statistician — **Clay Center, NE**
U.S. Meat Animal Research Center — *July 2024 – March 2025*

Graduate Research Assistant — **Chapel Hill, NC**
The University of North Carolina at Chapel Hill — *August 2020 – August 2024*

Technology Analyst — **New York, NY**
Morgan Stanley — *Summer 2017 & 2018*

EDUCATION

The University of North Carolina at Chapel Hill — **Chapel Hill, NC**
Ph.D. Statistics and Operations Research — *2019 – 2024*
Advised by Jan Hannig and J.S. Marron

University of Florida — **Gainesville, FL**
B.S. Mathematics — *2015 – 2019*
Magna Cum Laude

RESEARCH INTERESTS

Applications of statistics in clinical & translational medicine, Applications of statistics in genetic prediction and selection, Data integration, Fiducial inference, Foundations of statistics, Functional data analysis, Machine learning for complex & high-dimensional data, Variance component models, Topological data analysis

PUBLICATIONS

[1] **J. E. Borgert** and R. M. Thallman, "Multiple Trait Mixed Model Equations with Singular (Co)variance Parameter Matrices," *In preparation*.

[2] R. M. Thallman, B. N. Engle, **J. E. Borgert**, J. W. Keele, W. M. Snelling, C. Gondro, and L. A. Kuehn, "A Biologically Motivated Nonlinear Latent Variable Genetic Model," 202x, *Submitted for review*.

[3] R. M. Thallman, **J. E. Borgert**, B. N. Engle, J. W. Keele, W. M. Snelling, C. Gondro, and L. A. Kuehn, "A Vision of How Low-coverage Sequence Data Should Contribute to Genetic Evaluation in the Future," 202x, *Submitted for review*.

[4] Y. M. Golightly, **J. E. Borgert**, S. Xiang, E. Wellsandt, L. Arbeeva, R. F. Loeser, S. P. Messier, A. E. Nelson, and J. Marron, "Influence of Sociodemographic and Clinical Features on Ground Reaction Force Variability Among Individuals with Symptomatic Knee Osteoarthritis," 202x, *Submitted for review*.

[5] **J. E. Borgert**, J. Hannig, J. D. Tucker, L. Arbeeva, A. N. Buck, Y. M. Golightly, S. P. Messier, A. E. Nelson, and J. S. Marron, "Elastic Shape Analysis of Movement Data," 2024, *Accepted with major revisions at JASA*. [Online]. Available: https://arxiv.org/abs/2409.13938

[6] **J. E. Borgert** and J. Hannig, "A Bernstein-von Mises Theorem for Generalized Fiducial Distributions," 2024, *R&R at Bayesian Analysis.* [Online]. Available: https://arxiv.org/abs/2401.17961

[7] **J.E. Borgert**, "Foundational Methods for Object Oriented Data Analysis and Statistical Inference," Ph.D. dissertation, The University of North Carolina at Chapel Hill, 2024.

[8] A. M. Kostic, L. Arbeeva, X. Jiang, Y. M. Golightly, S. P. Messier, R. F. Loeser, **J.E. Borgert**, D. De Marchi, J. Marron, M. R. Kosorok *et al.*, "Determining Optimal Diet/Exercise Treatment Assignment for Patients

with Symptomatic Knee Osteoarthritis Using Baseline Gait Forces," *Osteoarthritis and Cartilage*, vol. 32, pp. S65–S66, 2024.

[9] **J. E. Borgert** and J. S. Marron, "Comments on: Shape-based functional data analysis," *TEST*, 2024. [Online]. Available: https://doi.org/10.1007/s11749-023-00914-6

[10] L. Arbeeva, **E. Borgert**, T. Keefe, A.-C. Bay-Jensen, R. Loeser, Y. Golightly, J. Marron, and A. Nelson, "A machine learning approach to identify patterns of variation among collagen biomarkers and clinical features in a community-based cohort," *Osteoarthritis and Cartilage*, vol. 31, no. 5, pp. 677–678, 2023.

[11] W. Hamilton, **J. E. Borgert**, T. Hamelryck, and J. Marron, "Persistent topology of protein space," *Research in Computational Topology 2*, p. 223, 2022.

[12] B. R. Miller, A. M. Morse, **Jacqueline E Borgert**, Z. Liu, K. Sinclair, G. Gamble, F. Zou, J. R. Newman, L. G. Leon-Novelo, F. Marroni *et al.*, "Testcrosses are an efficient strategy for identifying cis-regulatory variation: Bayesian analysis of allele-specific expression (BayesASE)," *G3*, vol. 11, no. 5, 2021.

PRESENTATIONS

A Bernstein-von Mises Theorem for Generalized Fiducial Distributions — **Contributed Talk**
IMS International Conference on Statistics and Data Science — *December 2024*

Elastic Shape Analysis of Human Movement Data — **Invited Talk**
The Mathematical Laws of Morphology and Biomechanics Seminar Series — *November 2024*

Foundational Thinking in Statistics — **Invited Talk**
NCERA225: Implementation and Strategies for National Beef Cattle Genetic Evaluation — *November 2024*

Foundational Methods for Object Oriented Data Analysis and Statistical Inference — **PhD Defense**
Statistics & Operations Research Department, University of North Carolina at Chapel Hill — *April 2024*

Foundational Methods for Object Oriented Data Analysis and Statistical Inference — **Invited Talk**
U.S. Meat Animal Research Center — *February 2024*

Modes of Variation and Data Integration for Manifold Data — **Poster**
IMSI Object Oriented Data Analysis in Health Sciences: Theory and Applications Workshop — *July 2023*

A Bernstein-von Mises Theorem for Generalized Fiducial Distributions — **Poster**
Bayesian, Fiducial, Frequentist Conference — *May 2023*

Persistent Topology of Protein Space — **Invited Talk**
Joint Mathematical Meetings — *April 2022*

Persistent Topology of Protein Space — **Poster**
IMSI Topological Data Analysis Workshop — *April 2021*

AWARDS and FUNDING

- NIH K24 Trainee (PI: Amanda Nelson), University of North Carolina at Chapel Hill — *2022 – 2024*
- NSF Mathematical Sciences Graduate Research Fellowship Honorable Mention — *2020*
- Munroe and Rebecca Cobey Graduate Fellow, University of North Carolina at Chapel Hill — *2019 – 2024*
- Dean's List, University of Florida — *2016 – 2019*

TEACHING EXPERIENCE

STOR 155: Data Models and Inference (Instructional Assistant) **Chapel Hill, NC**
The University of North Carolina at Chapel Hill *Fall 2020*

STOR 455: Methods of Data Analysis (Instructional Assistant) **Chapel Hill, NC**
The University of North Carolina at Chapel Hill *2019 – 2020*

PROFESSIONAL & DEPARTMENTAL SERVICE

- Referee for *Statistics and Computing* *1 time*
- Referee for *Journal of Statistical Theory and Practice* *1 time*
- Referee for *Journal of Multivariate Analysis* *1 time*
- Referee for *Journal of Computational and Graphical Statistics* *1 time*
- Referee for *Sankhya A, The Indian Journal of Statistics* *1 time*
- UNC STOR Graduate Liaison *2022 – 2024*
- UNC STOR Graduate Seminar, Organizer *2021 – 2022*