

# J.E. (Elyse) Borgert

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## PROFESSIONAL POSITIONS

<b>Research Statistician Developer</b> <i>JMP Statistical Discovery</i>	<b>Cary, NC</b> <i>Current</i>
<b>Postdoctoral Research Associate</b> <i>The University of North Carolina at Chapel Hill</i>	<b>Chapel Hill, NC</b> 2025 – 2026
<b>Postdoctoral Research Scientist</b> <i>U.S. Meat Animal Research Center</i>	<b>Clay Center, NE</b> 2024 – 2025
<b>Graduate Research Assistant</b> <i>The University of North Carolina at Chapel Hill</i>	<b>Chapel Hill, NC</b> 2020 – 2024

## EDUCATION

<b>The University of North Carolina at Chapel Hill</b> <i>Ph.D. Statistics and Operations Research</i> Advised by Jan Hannig and J.S. Marron	<b>Chapel Hill, NC</b> 2019 – 2024
<b>University of Florida</b> <i>B.S. Mathematics</i> Magna Cum Laude	<b>Gainesville, FL</b> 2015 – 2019

## RESEARCH INTERESTS

Applications of statistics in: {clinical & translational medicine, human movement science, animal breeding models for genetic prediction and selection}, Data integration, Fiducial inference, Foundations of statistics, Functional data analysis, Mixed effects models, Nonparametric statistics, Shape statistics

## PUBLICATIONS

### *Preprints*

- [1] **J. E. Borgert** and J. Hannig, “A Bernstein-von Mises Theorem for Generalized Fiducial Distributions,” *Under subsequent review at Bayesian Analysis*, arXiv: 2401.17961 [math.ST].
- [2] 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,” *Under review at Osteoarthritis and Cartilage Open*, Manuscript available upon request.
- [3] B. N. Engle, R. M. Thallman, **J. E. Borgert**, J. W. Keele, W. M. Snelling, C. Gondro, and L. A. Kuehn, “A Biologically Motivated Nonlinear Latent Variable Genetic Model,” *Accepted with revisions at Journal of Animal Science*, Manuscript available upon request.
- [4] A. N. Buck, **J. E. Borgert**, H. Lee, L. Arbeeva, Y. M. Golightly, S. P. Messier, B. G. Pietrosimone, A. E. Nelson, and J. S. Marron, “Vertical Ground Reaction Force Variation and Clinical Outcomes in Individuals with Knee Osteoarthritis and High Body Mass Index: A Machine Learning Analysis of the IDEA Trial,” *R&R at Arthritis Care & Research*, Manuscript available upon request.
- [5] **J. E. Borgert** and R. M. Thallman, “Multiple trait mixed model equations with singular (co)variance matrices,” *In preparation*, Draft available upon request.

### *In print*

- [6] **J.E. Borgert**, J. Hannig, J. D. Tucker, L. Arbeevea, A. N. Buck, Y. M. Golightly, S. P. Messier, A. E. Nelson, and J. Marron, “Elastic shape analysis of movement data,” *Journal of the American Statistical Association*, vol. 121, no. 553, pp. 126–136, 2026.
- [7] A. M. Kostic, L. Arbeevea, X. Jiang, Y. M. Golightly, S. P. Messier, R. F. Loeser, **J. E. Borgert**, J. Marron, M. R. Kosorok, and A. E. Nelson, “Determining Optimal Diet/Exercise Treatment Assignment for Patients with Symptomatic Knee Osteoarthritis Using Baseline Gait Forces,” *Osteoarthritis and Cartilage Open*, p. 100 691, 2025.
- [8] 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,” *Journal of Animal Science*, skaf294, 2025.
- [9] **J. E. Borgert** and J. S. Marron, “Comments on: Shape-based functional data analysis,” *TEST*, 2024. DOI: 10.1007/s11749-023-00914-6.
- [10] W. Hamilton, **J. E. Borgert**, T. Hamelryck, and J. Marron, “Persistent topology of protein space,” *Research in Computational Topology 2*, p. 223, 2022.
- [11] B. R. Miller, A. M. Morse, **J. 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.

### *Peer-reviewed Abstracts*

- [12] A. N. Buck, **J. E. Borgert**, H. Lee, L. Arbeevea, Y. M. Golightly, R. F. Loeser, S. P. Messier, B. Pietrosimone, A. E. Nelson, and J. Marron, “Vertical Ground Reaction Force Variability is Associated with Clinical Features in Individuals with Knee OA and Overweight/Obesity: A Novel Machine Learning Analysis of the IDEA Trial,” *Osteoarthritis and Cartilage*, vol. 33, S160–S161, 2025.
- [13] A. M. Kostic, L. Arbeevea, 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, S65–S66, 2024.
- [14] L. Arbeevea, **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.

### *Dissertation*

- [15] **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.

## PRESENTATIONS

### **Elastic Shape Analysis of Movement Data**

*Rice University*

**Invited Seminar**

*February 2026*

### **Elastic Shape Analysis of Movement Data**

*IMS International Conference on Statistics and Data Science*

**Topic-Contributed Talk**

*December 2025*

### **Elastic Shape Analysis of Movement Data**

*University of Florida*

**Invited Seminar**

*December 2025*

<b>Elastic Shape Analysis of Movement Data</b> <i>Florida State University</i>	<b>Invited Seminar</b> <i>November 2025</i>
<b>Elastic Shape Analysis of Movement Data</b> <i>Joint Statistical Meetings</i>	<b>Topic-Contributed Talk</b> <i>August 2025</i>
<b>Elastic Shape Analysis of Human Movement Data</b> <i>University of Nebraska Medical Center</i>	<b>Invited Seminar</b> <i>May 2025</i>
<b>A Bernstein-von Mises Theorem for Generalized Fiducial Distributions</b> <i>IMS International Conference on Statistics and Data Science</i>	<b>Contributed Talk</b> <i>December 2024</i>
<b>Elastic Shape Analysis of Human Movement Data</b> <i>The Mathematical Laws of Morphology and Biomechanics Seminar Series</i>	<b>Invited Seminar</b> <i>November 2024</i>
<b>Foundational Thinking in Statistics</b> <i>NCERA225: Implementation and Strategies for National Beef Cattle Genetic Evaluation</i>	<b>Invited Talk</b> <i>November 2024</i>
<b>Foundational Methods for Object Oriented Data Analysis and Statistical Inference</b> <i>Statistics &amp; Operations Research Department, University of North Carolina at Chapel Hill</i>	<b>PhD Defense</b> <i>April 2024</i>
<b>Foundational Methods for Object Oriented Data Analysis and Statistical Inference</b> <i>U.S. Meat Animal Research Center</i>	<b>Invited Seminar</b> <i>February 2024</i>
<b>Modes of Variation and Data Integration for Manifold Data</b> <i>IMSI Object Oriented Data Analysis in Health Sciences: Theory and Applications Workshop</i>	<b>Poster</b> <i>July 2023</i>
<b>A Bernstein-von Mises Theorem for Generalized Fiducial Distributions</b> <i>Bayesian, Fiducial, Frequentist Conference</i>	<b>Poster</b> <i>May 2023</i>
<b>Persistent Topology of Protein Space</b> <i>Joint Mathematical Meetings</i>	<b>Invited Talk</b> <i>April 2022</i>
<b>Persistent Topology of Protein Space</b> <i>IMSI Topological Data Analysis Workshop</i>	<b>Poster</b> <i>April 2021</i>

## AWARDS & FUNDING

Graduate Student Travel Award, University of North Carolina at Chapel Hill	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

## TEACHING ACTIVITIES

<b>STOR 155: Data Models and Inference (Instructional Assistant)</b> <i>The University of North Carolina at Chapel Hill</i>	<b>Chapel Hill, NC</b> <i>Fall 2020</i>
<b>STOR 455: Methods of Data Analysis (Instructional Assistant)</b> <i>The University of North Carolina at Chapel Hill</i>	<b>Chapel Hill, NC</b> <i>2019 – 2020</i>

## PROFESSIONAL & DEPARTMENTAL SERVICE

Referee for <i>Journal of the American Statistical Association</i>	<i>1 manuscript</i>
Referee for <i>Journal of Multivariate Analysis</i>	<i>1 manuscript</i>
Referee for <i>Journal of Computational and Graphical Statistics</i>	<i>2 manuscripts</i>
Referee for <i>Statistics and Computing</i>	<i>1 manuscript</i>
Referee for <i>Stat</i>	<i>1 manuscript</i>
Referee for <i>Sankhya A, The Indian Journal of Statistics</i>	<i>1 manuscript</i>
Referee for <i>Journal of Statistical Theory and Practice</i>	<i>1 manuscript</i>
UNC STOR Graduate Liaison	<i>2022 – 2024</i>

