Stephen Berg

Department of Statistics
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Education

Ph.D. in Statistics June 2020
University of Wisconsin-Madison, Madison, WI
Thesis: Modeling and computation for multivariate spatial categorical data and related theory with applications to historical ecology
Advisors: Professor Jun Zhu and Professor Murray K. Clayton

M.S. in Statistics April 2017
University of Wisconsin-Madison, Madison, WI
Honors: commended for exemplary performance on the 2017 Statistics M.S. examination

B.S. in Mathematics May 2013
Iowa State University
Honors: *summa cum laude*, Phi Beta Kappa

Research Interests

Spatial statistics	Markov chain Monte Carlo methods
Spatiotemporal statistics	Markov random field models
Environmental statistics	Stochastic approximation

Academic Honors and Awards

- Honorable mention award for quality performance as a student lecturer, UW Statistics Department, 2019
- Marian Danniells Mathematics Undergraduate Scholarship recipient, Iowa State University, 2013
- Iowa State University Dean's List, 2009-2013
- Iowa State University Honors Program member, 2009-2013
- National Merit Scholar

Publications and Preprints

Berg, S., Zhu, J., Clayton, M.K., Shea, M.E., Mladenoff, D.J. "A latent discrete Markov random field approach to identifying and classifying historical forest communities based on spatial multivariate tree species counts." *The Annals of Applied Statistics.* 2019.

Fernandes-Taylor, S., **Berg, S.**, Gunter, R., Bennett, K., Smith, M.A., Rathouz, P.J., Greenberg, C.C., Kent, K.C. "Thirty-day readmission and mortality among Medicare ben-

eficiaries discharged to skilled nursing facilities after vascular surgery." *The Journal of Surgical Research*, vol. 221, pp. 196–203, 2018.

Berg, S., Zhu, J., Clayton, M.K. "Control variates and Rao-Blackwellization for deterministic sweep sampling". *In progress.* 2019.

Conference Presentations

Joint Statistical Meetings, Denver, July 2019
Contributed poster: "A latent discrete Markov field approach for identifying and classifying historical forest communities based on spatial multivariate tree species counts". **Berg, S.**, Zhu, J., Clayton, M.K., Shea, M.E., Mladenoff, D.J.

UW-Madison Statistics Department Student Seminar, December 2018
Speaker for student seminar: Workshop on "Using Rcpp to write an R package"

US-IALE Annual Meeting (United States chapter of International Association for Landscape Ecology), Chicago, April 2018
Research collaborator, conference oral presentation: "Are Ecotones Zones of Intermingling or Interdigitation? Pattern and Scale of Tree Species Co-occurrence in Wisconsin's Tension Zone." Shea, M.E., Mladenoff, D.J., Clayton, M.K., **Berg, S.**, Elza, H.

Teaching Experience

Graduate student lecturer Fall 2018, Fall 2019
Department of Statistics, University of Wisconsin-Madison
- Graduate-level (Statistics 571: Statistical Methods for Bioscience I). Primary instructor for the course in Fall 2018 and Fall 2019.

Teaching assistant Fall 2014–Spring 2015
Department of Statistics, University of Wisconsin-Madison
- Undergraduate level: Introduction to Statistics (Stat 301), Spring 2015
- Undergraduate level: Introduction to Statistics for Engineers (Stat 224), Fall 2014

Research Experience

Research assistant 2016–present
Department of Statistics, University of Wisconsin-Madison
- Research assistant, advised by Professor Jun Zhu and Professor Murray Clayton. Working on spatial statistics problems in ecology, including landscape ecology and wildlife disease modeling.

Research collaborator 2016–present
Collaborator: Dr. Daniel Walsh, USGS National Wildlife Health Center (2019–present)
- Investigating effects of environmental covariates and management policies on chronic wasting disease in Wisconsin deer
- Developing statistical methodology for analyzing ecology data via differential equation models

Collaborators: Monika E. Shea and Professor David J. Mladenoff, Department of Forest and Wildlife Ecology, University of Wisconsin-Madison (2016–present)

- Analyzing vegetation data in the historical Wisconsin Public Land Survey database
- Developing statistical and computational methodology for latent Markov random field models

NHLBI Biostatistics Trainee August 2015–August 2016
Department of Statistics, University of Wisconsin-Madison

- Research rotation with Professor Paul Rathouz and a collaborator from the Department of Surgery, assisted with analysis of Medicare readmission data and contributed to a published research paper. (January–August 2016)
- Research rotation with Professor Jun Zhu, analyzed a dataset involving DNA methylation in breast cancer (August 2015–December 2015)

Research assistant May 2015–August 2015
Department of Statistics, University of Wisconsin-Madison

- Research assistant, advised by Professor Jun Zhu. Developed and documented CRAN package `automultinomial` for the analysis of spatially correlated categorical data.

Software

`automultinomial`-R package for regression and inference with spatially correlated discrete data, on CRAN and GitHub
(`https://github.com/stephenberg/automultinomial`)

`bcd`-Rcpp implementation of group lasso variable selection via block coordinate descent for common regression models
(`https://github.com/stephenberg/bcd`)

Computing skills

Programming languages: Proficient in R, C++, MATLAB, and Fortran. Some experience with Java, Julia, SAS, and Stata.

Platforms: Experienced with Unix/Linux and Windows platforms.

Others: Proficient in LaTex and Microsoft Office.

References

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