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

Shea, M.E., Clayton, M.K., Townsend, P.A., **Berg, S.**, Elza, H., Mladenoff, D.J. "Identifying eco-tone location using the co-occurrence property". *Journal of Vegetation Science*, pp. 196-203, 2020.

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 beneficiaries 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 Markov chains". *Under review.* 2020.

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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