

Yawen Guan, Ph.D.

Assistant Professor

Department of Statistics, University of Nebraska - Lincoln

E-mail: yguan12@unl.edu

Website: <https://sites.google.com/a/ncsu.edu/yguan/>

EDUCATION

The Pennsylvania State University, University Park, PA

- Ph.D., Statistics Aug. 2017
Advisor: Dr. Murali Haran, Professor and Department Head, Statistics
Thesis Title: "Reduced-dimensional Non-Gaussian Spatial Models and Statistical Methods for Studying the West Antarctic Ice Sheet"
- B.S., Finance and Mathematics May 2012

PROFESSIONAL APPOINTMENTS

University of Nebraska - Lincoln

- Assistant Professor, Department of Statistics Jul. 2019 - Current

Statistical and Applied Mathematical Sciences Institute (SAMSI) and North Carolina State University

Aug. 2017 - Jul. 2019

- Postdoctoral Fellow, SAMSI Program on Mathematical and Statistical Methods for Climate and the Earth System (CLIM)
- Postdoctoral Fellow, NCSU Department of Statistics
Advisor: Dr. Brian Reich, Associate Professor.

RESEARCH INTERESTS

Spatial and Spatiotemporal Statistics; Bayesian Statistics; Random Projection Method; Computer Model Emulation and Calibration; Environmental Statistics;

HONORS AND AWARDS

Penn State University

- Poster Award at the Rao Prize Conference 2017
- Recipient of the J. Keith Ord Scholarship in Statistics for research and mentoring in the area of spatial and environmental statistics 2016
- Recipient of the Jack and Eleanor Pettit Scholarship in Science 2016

Travel Awards

- Statistics for the Environment: Research, Practice & Policy (ENVR 2018) 2018
- IMA workshop on Forecasting from Complexity 2018
- STATMOS/SAMSI workshop on Climate Statistics 2017
- STATMOS workshop on Climate and Weather Extremes 2016
- Rossbypalooza workshop: Climate meets Statistics at UChicago 2016

- STATMOS workshop on High Performance Computing for Spatial Statistics 2015
- International conference on Extreme Value Analysis 2015
- STATMOS workshop on Spatial Statistics 2015

REFEREED PUBLICATIONS

- 9 **Guan, Y.**, Reich, B.J., Mulholland, J.A. and Chang, H.H. (2019) Multivariate Spectral Downscaling for PM2.5 Species. Submitted.
- 8 Wang, H., **Guan, Y.** and Reich, B.J. (2019) Nearest-Neighbor Neural Networks for Geostatistics. Submitted. [View on arXiv](#)
- 7 **Guan, Y.**, Johnson, M., Katzfuss, M., Mannshardt, E., Messier, K.P., Reich, B.J. and Song, J.J. (2019) Fine-scale Spatiotemporal Air Pollution Analysis using Mobile Monitors on Google Street View Vehicles. Under minor revision for *Journal of the American Statistical Association*. [View on arXiv](#)
- 6 **Guan, Y.**, Sampson, C., Tucker, J. D., Chang, W., Mondal, A., Haran, M. and Sulsky, D. (2019) Computer Model Calibration based on Image Warping Metrics: an Application for Sea Ice Deformation, *Journal of Agricultural, Biological, and Environmental Statistics*. [View on arXiv](#)
- 5 Berrocal, V.J., **Guan, Y.**, Musykens, A., Wang, H., Reich, B.J. and Chang, H.H. (2019) A Comparison of Spatial Statistical Methods for Creating National Maps of Ambient Air Pollution. Submitted. [View on arXiv](#).
- 4 **Guan, Y.** and Haran, M. (2018) A Computationally Efficient Projection-Based Approach for Spatial Generalized Linear Mixed Models, *Journal of Computational and Graphical Statistics*. [View on arXiv](#)
- 3 **Guan, Y.**, Haran, M., and Pollard, D. (2017) Inferring Ice Thickness from a Glacier Dynamics Model and Multiple Surface Datasets, *Environmetrics*. [View on arXiv](#)
- 2 Ruckert, K.L., **Guan, Y.**, Bakker, A.M.R., Forest, C.E., Keller, K. (2016) The Effects of Time-Varying Observation Errors on Semi-Empirical Sea-Level Projections. *Climatic Change*. [Link to article](#)
- 1 Ruckert, K., Shaffer, G., Pollard, D., **Guan, Y.**, Wong, T.E., Forest, C.E. and Keller, K. (2017) Assessing the Impact of Retreat Mechanisms in a Simple Antarctic Ice Sheet Model Using Bayesian Calibration. *PLOS ONE*. [Link to article](#)

BOOK CHAPTERS

- Ruckert, K., and **Guan, Y.** (2016) Calibration Convergence and Markov Chain Monte Carlo, *Risk Analysis in the Earth Sciences: A Lab Manual with Exercises in R*.

WORKING PAPERS

- **Guan, Y.** and Haran, M. (2019+) Fast Maximum Likelihood Inference for High-Dimensional Non-Gaussian Spatial Data.
- **Guan, Y.**, Reich, B. and Yang, S. (2019+) Spectral Causal Analysis for Spatial Data.
- Song J., **Guan, Y.**, Berrocal, V. and Yang, S. (2019+) Causal Inference in the Presence of Unmeasured Spatial Confounder.

- Majumder, S., Reich, B., **Guan, Y.** (2019+) Spatiotemporal Modeling for PM2.5 caused by Wildfire.

MENTORING

North Carolina State University, North Carolina USA Aug. 2017 - current

Co-mentor

Co-mentor two Ph.D. students in Statistics with Prof. Brian Reich on topics “A Deep Learning Approach for Spatial Temporal Data” and “Spatiotemporal Modeling for PM2.5 caused by Wildfire”.

Institute of Advanced Analytics, NC State University, North Carolina USA

SAMSI Undergraduate Modelling Workshop

May 2018

Project Leader

Designed and led a week-long project on “Data Analysis on Air Pollutant Exposures”. Mentored a team of 6 undergrad students with Statistics and Mathematics majors.

Penn State University, Pennsylvania USA

Summer 2016

Mentor

Mentored 4 undergraduate researchers to conduct research on spatial statistics methods for studying the Antarctic ice sheet.

TEACHING

North Carolina State University, North Carolina USA

Assistant Instructor

Fall 2018

Spatial Statistics for Ph.D. students in Statistics. Lectured selected topics on “Introduction to Bayesian Methods”, “MCMC sampling techniques”, “Mean and Covariance for Gaussian Process” and “Gaussian Process Representations”.

Penn State University, Pennsylvania USA

Course Instructor

Fall 2016

Statistical Concepts and Reasoning: Introduction to the art and science of decision making in the presence of uncertainty.

Course Instructor

Fall 2015

Statistical Analysis for Engineering Statistics: probability concepts; nature of statistical methods; elementary distribution and sampling theory; fundamental ideas relative to estimation and testing hypotheses.

Teaching Assistant

2012 - 2014

Teaching assistant for courses on Elementary Statistics, Stochastic Modeling, and Stochastic Processes & Monte Carlo Methods. Responsible for running labs, assisting students during office hours and grading

RESEARCH EXPERIENCE

Statistical and Applied Mathematical Sciences Institute (SAMSI)

and North Carolina State University, North Carolina USA

Aug. 2017-current

Postdoctoral Fellow, funded by NSF and NIH, with Prof. Brian Reich

Develop spatial temporal methods for modeling air quality data obtained from monitoring stations, numerical model and Google Street View Vehicles. Worked on a calibration method using cutting-edge image warping techniques for sea ice openings.

Penn State University, Pennsylvania USA 2013-2017

Graduate Research Assistant, funded by NSF, with Prof. Murali Haran

Developed fast-computational methods for non-Gaussian spatial data with applications for environmental study and methods for inferring ice thickness from a glacier dynamics model and multiple datasets on West Antarctica.

Penn State University, Pennsylvania USA 2014-2015

Graduate Research Assistant, funded by NSF under grant to Network for Sustainable Climate Risk Management, with Profs. Murali Haran and Klaus Keller

Investigated and quantified simple climate model uncertainties, performed statistical analysis on sea-level projection, and developed training materials on Bayesian method and Markov Chain Monte Carlo.

PRESENTATIONS

Invited Presentations

Spatiotemporal air pollution analysis using mobile monitors on Google Street View vehicles

- International Conference on Advances in Interdisciplinary Statistics and Combinatorics (AISC 2018), Greensboro, NC, October 2018

Multivariate Spectral Downscaling for Multiple Air Pollutants

- Statistics for the Environment: Research, Practice & Policy (ENVR 2018), Asheville, NC, October 2018
- The 28th Annual Conference of the International Environmetrics Society (TIES 2018), Guanajuato, Mexico, July 2018
- Symposium on Data Science & Statistics (SDSS 2018), Reston, VA, May 2018
- Environmental Protection Agency, Durham, NC, March 2018

Fast Maximum Likelihood Inference for Spatial Generalized Linear Mixed Models

- Invited poster Section on Statistics and the Environment at the Joint Statistical Meeting (JSM 2017), Baltimore, MD, August 2017.

A Projection-Based Approach for Spatial Generalized Linear Mixed Models

- Department of Statistics, Purdue University, West Lafayette, IN, November 2016.
- LANS Informal Seminar, Argonne National Laboratory, Argonne, IN, November 2016.
- IMAGE Brown Bag Seminar, National Center for Atmospheric Research (NCAR), Boulder, CO, September 2016.

Statistical Methods for Studying the West Antarctic Ice Sheet

- Department of Mathematics and Computer Science, Muhlenberg College, Allentown, PA, October 2016.

A Study of Models for High-dim Spatial Binary Data (Continuous Domain)

- STATMOS Invited Poster Session at Joint Statistical Meeting, Seattle, WA, August 2015.

Other Presentations

Fast Maximum Likelihood Inference for Spatial Generalized Linear Mixed Models

- Joint Statistical Meeting, Vancouver, Canada, August 2018.

Multivariate Spectral Downscaling for Multiple Air Pollutants

- Poster presentation at Institute for Mathematics and its Applications (IMA) workshop on Forecasting from Complexity, Minneapolis, MN April 2018.

Metrics for Evaluating Sea Ice Models

- SAMSI Postdoctoral Fellow Seminars, Durham, NC, October 2017.

Inferring Ice Thickness from a Glacier Dynamics Model and Multiple Surface Datasets

- American Geophysical Union Fall Meeting, December 2017.

An efficient projection-based approach for latent Gaussian process models

- Statistical Modeling and Computing Seminar, University Park, PA, February 2016.

Effects of Residual Cross-correlation and Heteroscedastic Observational Errors on Simple Climate Model Calibration

- Sustainable Climate Risk Management Meeting, University Park, PA, May 2015.

A Study of Models for High-dim Spatial Binary Data (Discrete Domain)

- Spatial Statistics Workshop, Texas A&M University, TX. Jan 2015.

ADMINISTRATIVE, TEACHING AND OTHER SERVICES

SAMSI, North Carolina Aug. 2017 -Aug. 2018

Subgroup Leader, Environmental Health and Ice Dynamics working groups

Administrator, Environmental Health Working Group.

Proposed research ideas, performed data exploration, visualization and analysis, and organized working group meetings.

North Carolina Central University, North Carolina USA Mar. 2018

Taught a hands-on course on “Introduction to R” at the Statistics in the Criminal Justice System Workshop for undergraduate students.

SAMSI, North Carolina USA Feb. 2018

Taught a hands-on course on “Introduction to R” at SAMSI undergraduate workshop.

Penn State University, Pennsylvania USA Mar. 2016

Graduate Student Panelist

Aimed for helping new graduate students transitioning to graduate programs.

Schreyer Institute, Penn State University, Pennsylvania USA

Fall 2016

Panelist

Panelist on “Engaging Students” at the Schreyer Institutes conference for graduate students and postdocs.

SKILLS / QUALIFICATIONS

Proficient in the R programming language and Minitab, familiar with MATLAB, C/C++, and openMP.

Updated July 2019