John L. Paige

Contact Information

Department of Statistics
University of Washington
Padelford B-317
Seattle, WA, 98195

m: (503) 957-8291
e: paigejo@uw.edu

Education

University of Washington, Seattle, Washington
Ph.D. Candidate, Statistics (Expected Graduation: December 2020)

- Research interests: spatial statistics, small area estimation, computational statistics, Bayesian statistics, survey statistics, INLA
- Coursework: Statistical Learning, Statistical Inference, Stochastic Modeling, Applied Regression, Wavelets, Nonparametric Statistics, Spatial Statistics, Convex Optimization, Survey Statistics, Consulting

Macalester College, St. Paul, MN
B.A. Major: Honors Applied Mathematics & Statistics (*magna cum laude*), May 2014
B.A. Minor: Computer Science (*magna cum laude*), May 2014

- Coursework: Mathematical statistics, real analysis, Bayesian statistics, probability theory, numerical linear algebra, combinatorial optimization, graph theory, software design and development, differential equations, algorithms

Research Experience

University of Washington, Seattle, Washington
Research Assistant, October 2017–Present

- Title: Effects of Preferential Sampling on Kenya Under Five Mortality Rate Prediction Bias
- Testing biasing effect of not accounting for preferential sampling for spatial statistical models of Under Five Mortality Rates in Kenya
- Implementing state of the art small area estimation spatial statistical models
- Implementing and comparing ground-breaking spatial statistical package (LatticeKrig) in Bayesian framework using INLA R package
- Supervisors: Prof. Jon Wakefield, Prof. Geir-Arne Fuglstad, and Prof. Andrea Riebler

University of Washington, Seattle, Washington
Research Assistant, October 2015–April 2019

- Title: Assessing Cascadia Subduction Zone Earthquake Uncertainty—Past, Present, and Future
- Created novel spatial statistical model for Cascadia subduction zone M9 earthquakes
- Flexible model that can infer what past earthquakes looked like and predict future earthquakes
- Presented at the 2017 workshop: "Challenges in the Statistical Modeling of Stochastic Processes for the Natural Sciences"
- Collaborated with Seismologists, Applied Mathematicians, and Paleogeologists in multidisciplinary M9 research group
- Submitted manuscript to Mathematical Geosciences awaiting reviews
- Supervisor: Prof. Peter Guttorp

National Center for Atmospheric Research, Boulder, Colorado
Visiting Scientist, March 2015–August 2015

- Co-author of 'fields', a major spatial statistics package for R
- Developed faster optimization methods and streamlined main functions
- Created new methods for data visualization and for spatial correlation analysis
- Supervisor: Dr. Doug Nychka

Lawrence Berkeley National Laboratory, Berkeley, California
Research Associate, September 2014–March 2015

- Used dimension reduction techniques to analyze arctic temperature feedbacks
- Published in *Geoscientific Model Development*: https://doi.org/10.5194/gmd-8-1943-2015
- Created MATLAB program for use with climate model remote sensing simulator
- Supervisor: Dr. Daniel Feldman

National Center for Atmospheric Research, Boulder, Colorado
Research Intern, May 2015–August 2015

- Intern in Summer Internships in Parallel Computational Sciences
- Developed GPU-accelerated methods for 'fields', a major spatial statistics package for R
- Parallelized likelihood calculations with Message Passing Interface (MPI) in C and R
- Supervisor: Dr. Doug Nychka

Macalester College Department of Statistics, St. Paul, Minnesota
Statistics Honors Thesis, September 2013–May 2014

- Title: A Comparison of Arctic Temperature Feedbacks in CMIP5 Climate Models
- Studied climate model predictions of Arctic cloud and albedo feedbacks using MATLAB and BASH
- Wrote efficient, robust MATLAB code to perform power analysis of terabytes of climate simulation data with autoregressive order one model
- Presented work at American Geophysical Union conference in 2013
- Supervisor: Prof. Chad Topaz

Lawrence Berkeley National Laboratory, Berkeley, California
Research Intern, Summer 2013

- Studied climate model predictions of Arctic cloud and albedo feedbacks using MATLAB and BASH
- Wrote efficient, robust MATLAB code to perform power analysis of terabytes of climate simulation data with autoregressive order one model
- Presented work at American Geophysical Union conference in 2013
- Supervisor: Dr. Daniel Feldman

Macalester College Department of Statistics, St. Paul, Minnesota
Student Researcher, Summer 2011–Spring 2013

- Developed a model to automatically predict mode of transportation using smartphone sensor data
- Created stochastic models for aphid nonlinear swarm dynamics using data from multi-particle tracking software
- Wrote code in MATLAB, Mathematica, and R for modeling, exploratory analysis, image transformations
- Presented research at Macalester College and Joint Mathematics Meetings in 2013
- Work published in PLOS one with DOI 10.1371/journal.pone.0083343
- Supervisor: Prof. Chad Topaz

Teaching Experience

University of Washington, Seattle, Washington
Pre-Doctoral Instructor, Summer B Term 2020

- Statistics 395: Probability II

University of Washington, Seattle, Washington
Teaching Assistant, June 2017–December 2017

- Statistics 220: Principles of Statistical Reasoning
- Statistics 502 (graduate level): Experimental Design

Data Analytics Bootcamp for High Schoolers, Boulder, Colorado
Statistics Teacher, Summer of 2015, 2016

- Taught concepts in Statistics and R in two multi-day workshops for high school students

Private Practice, Multiple Locations
Statistics Tutor, Spring 2015–Present

- Privately tutored students coming from many different backgrounds one-on-one introductory to advanced undegraduate level statistics

University of Washington, Seattle, Washington
Statistics Tutor, September 2015–Present

- Drop-in tutoring for undergraduate as well as some graduate statistics students in a variety of departments

Publications

Paige, J. (2020b). "Design- and Model-Based Approaches to Small-Area Estimation in a Low and Middle Income Country Context: Comparisons and Recommendations". In: *Journal of Survey Statistics and Methodology*. To appear.

Feldman, D., Collins, W., **Paige, J.,** (2015). "Pan-spectral observing system simulation experiments of shortwave reflectance and long-wave radiance for climate model evaluation". In: *Geoscientific Model Development* 8, p. 1943.

Paige, J., Nychka, D., Hammerling, D., (2015). *'fieldsMAGMA': A MAGMA-accelerated extension to the 'fields' spatial statistics R package*. Tech. rep. National Center for Atmospheric Research.

Paige, J. (2015). *Incorporating MAGMA into the 'fields' spatial statistics package*. Tech. rep. National Center for Atmospheric Research.

Nilsen, C. (2013). "Social aggregation in pea aphids: experiment and random walk modeling". In: *PloS one* 8, e83343.

Presentations

Paige, J. (2020a). "Bayesian Modeling Of Multiscale Spatial Dependence in Non-Gaussian Data". In: *Statistics seminars at Department Of Mathematical Sciences, NTNU*.

Paige, J., Guttorp, P., Schmidt, D., (2019a). "Characterizing the spatial uncertainty of coseismic slip for past and future CSZ full-margin events". In: *Seismological Society of America*. Oral presentation.

Paige, J., Guttorp, P., Schmidt, D., (2019b). "Inferring past and future Cascadia Subduction Zone coseismic slips using locking rate and subsidence estimates". In: *M9 stakeholders meeting*. Poster presentation.

Paige, J., Guttorp, P., (2017). "A Fault in Time and Space: Spatial models for past and future Cascadia earthquakes". In: *Challenges in the Statistical Modeling of Stochastic Processes for the Natural Sciences*. Poster presentation.

Mayhew, B., **Paige, J.,** (2013). "A stochastic dynamic model for pea aphid aggregations". In: *Joint Mathematics Meetings*. Poster presentation.

Paige, J., Feldman, D., (2013). "An Assessment Of Arctic Cloud-Albedo Feedbacks and Prospects for Satellite Instrument Constraint". In: *American Geophysical Union*. Poster presentation.

Honors and Awards

Jan. 2020 – Feb. 2020	NTNU Department of Mathematical Sciences Invited Guest Researcher
October 2016 – Present	NSF Graduate Research Fellow
July 2017	Selected Attendee, Challenges in the Statistical Modeling of Stochastic Processes for the Natural Sciences
March 2016 – March 2017	Co-Director, University of Washington Spatial Statistics Reading Group
Fall 2014 – Spring 2014	Mac IT Scholar
Spring 2011 – Spring 2012	Co-Webmaster, Macalester Development Group
Fall 2011	Winner, Macalester Math Scavenger Hunt
June 2009	Sole recipient, High school computer science award

Skills

Advanced: R, LaTeX, MATLAB, Java, Excel, Git, INLA
Intermediate: C, C++, BASH, tcsh, cluster/supercomputing, MPI, Python, Stan, Mathematica, Scala, ImageJ, GIMP

Public Software

- *fields*
  - Spatial Statistics software in R on CRAN
- *ELK*
  - Extended Lattice Krig (ELK) is available in GitHub at https://github.com/paigejo/ELK, and extends the Lattice Krig spatial model to non-Gaussian observations within latent Gaussian models in a Bayesian setting using INLA.
- *fieldsMAGMA*
  - Multi-GPU accelerated Spatial Statistics software in R using MAGMA computing library
- https://rstudio.stat.washington.edu/shiny/jp/shinyJP/
  - Dirichlet Process and Polya Tree visualization RShiny web application
- https://github.com/paigejo
  - Github profile

Service

- UW Department of Statistics PhD student Admission Screening Committee (2018)
- UW Department of Statistics PhD student peer mentor (2017–present)
- UW Spatial Statistics Reading Group Co-Director (March 2016–March 2017)
- UW Spatial Statistics Reading Group member and presenter (October 2015–present)

On the Web

- Personal website
  - http://jpaigestats.com/
- Google scholar profile
  - https://scholar.google.com/citations?user=bNtwV_AAAAAJ&hl=en&oi=ao
- Github profile
  - https://github.com/paigejo
- Dirichlet Process and Polya Tree visualization RShiny web application
  - https://rstudio.stat.washington.edu/shiny/jp/shinyJP/

- Presentation and research at the National Center for Atmospheric Research
  - https://www2.cisl.ucar.edu/siparcs/calendar/accelerating-fields-package-theory-and-computation-kriging-surfaces
- Macalester College front page web feature on some members of the class of 2014
  - http://www.macalester.edu/news/2014/11/the-class-of-2014-after-mac/
- Macalester College web feature on aphid swarming research
  - https://www.macalester.edu/news/2014/01/death-devastation-math/
- Macalester College Mathematics, Statistics, and Computer Science department front page on winning the math scavenger hunt in 2011
  - http://www.macalester.edu/news/2014/01/death-devastation-math/