

JOHN L. PAIGE

CONTACT INFORMATION

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Norwegian University of Science and Technology
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EDUCATION

University of Washington, Seattle, Washington
Ph.D., Statistics, December 2020)

- *Advisor*: Prof. Jon Wakefield
- *Dissertation Title*: Statistical Methods for Geospatial Modeling with Stratified Cluster Survey Data
- GPA: 3.7
- Research interests: spatial statistics, computational statistics, survey statistics, statistical validation

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

- GPA: 3.8 (*magna cum laude*); GPA in Major and Minor: 3.9

RESEARCH EXPERIENCE

Norwegian University of Science and Technology, Trondheim, Norway

Postdoctoral Fellow, January 2021–Present

- *Title*: Spatial Aggregation with Respect to a Population Distribution
- *Supervisors*: Prof. Andrea Riebler, Prof. Geir-Arne Fuglstad
- Assisting with supervision of Ph.D. student Umut Altay on accounting for locational uncertainty, including editing papers, suggesting research directions, editing code, contributing code, academic writing
- Studying effects of finite population variability on spatial models and their predictions of areal/population aggregates
- Planning curricula, lectures, grading, designing exercises and exams
- Grading Master's students exams and projects, and Ph.D. students' independent study oral exams
- I plan to supervise a Master's project

University of Washington, Seattle, Washington

Research Assistant, October 2017–December 2020

- *Title*: Effects of Stratified Sampling on Kenya Neonatal Mortality Rate
- *Advisors*: Prof. Jon Wakefield, Prof. Geir-Arne Fuglstad, Prof. Andrea Riebler
- Testing biasing effect of not accounting for preferential sampling for spatial statistical models of Under Five Mortality Rates in Kenya
- Implemented and compared small area estimation spatial statistical models, explored effects of survey stratification (published in *Journal of Survey Statistics and Methodology*)
- Extended ground-breaking spatial statistical package (LatticeKrig) for large datasets to non-Gaussian responses in Bayesian framework using INLA R package (submitted to *Computational Statistics and Data Analysis*)
- Developed new spatial model accounting for finite population distributions and fine scale variability in areally aggregated predictions (will submit to *Spatial Statistics*)

University of Washington, Seattle, Washington

Research Assistant, October 2015–September 2017

- *Title:* Assessing Cascadia Subduction Zone Earthquake Uncertainty—Past, Present, and Future
- *Advisor:* Prof. Peter Guttorp
- 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

National Center for Atmospheric Research, Boulder, Colorado

Visiting Scientist, March 2015–August 2015

- *Supervisor:* Dr. Doug Nychka
- Contributed code to ‘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

Lawrence Berkeley National Laboratory, Berkeley, California

Research Associate, September 2014–March 2015

- *Supervisor:* Dr. Daniel Feldman
- 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

National Center for Atmospheric Research, Boulder, Colorado

Research Intern, May 2015–August 2015

- *Supervisor:* Dr. Doug Nychka
- 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

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
- *Advisor:* Prof. Chad Topaz
- 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

Lawrence Berkeley National Laboratory, Berkeley, California

Research Intern, Summer 2013

- *Supervisor:* Dr. Daniel Feldman
- 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

Macalester College Department of Statistics, St. Paul, Minnesota

Student Researcher, Summer 2011–Spring 2013

- *Advisor*: Prof. Chad Topaz
- 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

TEACHING
EXPERIENCE

Norwegian University of Science and Technology, Trondheim, Norway

Lecturer, Spring 2022–Autumn 2024

- TMA4300: Computer Intensive Statistical Methods, Spring 2023 (planned)
- TMA4625: Stochastic Modeling, Autumn 2024 (planned)

Co-Lecturer, Spring 2022, Autumn 2023

- TMA4300: Computer Intensive Statistical Methods, Spring 2022
- TMA4625: Stochastic Modeling, Autumn 2023 (planned)

University of Washington, Seattle, Washington

Teaching Assistant, June 2017–December 2017, September 2020–December 2020

- Statistics 220: Principles of Statistical Reasoning (twice)
- 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 a multi-day workshop for high school students

Private Practice, Multiple Locations

Statistics Tutor, Spring 2015–Spring 2018

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

University of Washington, Seattle, Washington

Statistics Tutor, September 2015–Spring 2018

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

PEER REVIEWED
PUBLICATIONS

Paige, J., Fuglstad, G.-A., Riebler, A., Wakefield, J., (2022a). “Bayesian multiresolution modeling of georeferenced data: An extension of ‘LatticeKrig’”. In: *Computational Statistics & Data Analysis* 173, p. 107503.

Paige, J., Fuglstad, G.-A., Riebler, A., Wakefield, J., (2022c). “Spatial aggregation with respect to a population distribution: Impact on inference”. In: *Spatial Statistics*, p. 100714. ISSN: 2211-6753. DOI: <https://doi.org/10.1016/j.spasta.2022.100714>. URL: <https://www.sciencedirect.com/science/article/pii/S2211675322000756>.

Paige, J., Fuglstad, G.-A., Riebler, A., Wakefield, 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*.

- 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* 8.7, p. 1943.
- Nilsen, C., **Paige, J.**, Warner, O., Mayhew, B., Sutley, R., Lam, M., Bernoff, A. J., Topaz, C. M., (2013). “Social aggregation in pea aphids: experiment and random walk modeling”. In: *PloS one* 8.12, e83343.
- PEER REVIEWED
TECHNICAL REPORTS
- Wu, Y., Li, Z. R., Mayala, B. K., Wang, H., Gao, P., **Paige, J.**, Fuglstad, G.-A., Moe, C., Godwin, J., Donohue, R. E., Croft, T. N., Wakefield, J., (2021). *Spatial Modeling for Subnational Administrative Level 2 Small-Area Estimation*. Tech. rep. DHS Spatial Analysis Reports No. 21. URL: <https://dhsprogram.com/publications/publication-SAR21-Spatial-Analysis-Reports.cfm>.
- Paige, J.**, Lyngaas, I., Ramakrishnaiah, V., Hammerling, D., Kumar, R., Nycha, D., (2015). *Incorporating MAGMA into the 'fields' spatial statistics package*. Tech. rep. National Center for Atmospheric Research.
- 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.
- PREPRINTS
- Altay, U., **Paige, J.**, Riebler, A., Fuglstad, G.-A., (2022a). “Accounting for Spatial Anonymization in DHS Household Surveys”. Preprint available at <https://arxiv.org/pdf/2202.11035.pdf>.
- Paige, J.**, Fuglstad, G.-A., Riebler, A., Wakefield, J., (July 2022b). “Spatial Aggregation with Respect to a Population Distribution”. eprint: 2207.06700. URL: <https://arxiv.org/pdf/2207.06700.pdf>.
- Li, Z. R., Martin, B. D., Dong, T. Q., Fuglstad, G.-A., **Paige, J.**, Riebler, A., Clark, S., Wakefield, J., (2020). “Space-time smoothing of demographic and health indicators using the R package SUMMER”.
- Paige, J.**, Fuglstad, G.-A., Riebler, A., Wakefield, J., (May 2020a). “Bayesian Multiresolution Modeling Of Georeferenced Data”. eprint: 2005.11805. URL: <https://arxiv.org/pdf/2005.11805.pdf>.
- Paige, J.**, Fuglstad, G.-A., Riebler, A., Wakefield, J., (2019). “Design- and Model-Based Approaches to Small-Area Estimation in a Low and Middle Income Country Context: Comparisons and Recommendations”. eprint: 1910.06512. URL: <https://arxiv.org/pdf/1910.06512.pdf>.
- PROCEEDINGS
- Altay, U., **Paige, J.**, Riebler, A., Fuglstad, G.-A., (2022b). “Spatial Modelling with Covariates for Survey Data with Positional Uncertainty”. In: *Proceedings of the 36th International Workshop Statistical Modelling July 18-22, 2022 - Trieste, Italy*. EUT Edizioni Università di Trieste.
- Paige, J.**, Riebler, A., Fuglstad, G.-A., Wakefield, J., (2022d). “Aggregating from Point to Areal Prevalences: A Complete Population Model”. In: *Proceedings of the 36th International Workshop Statistical Modelling July 18-22, 2022 - Trieste, Italy*. EUT Edizioni Università di Trieste.
- DISSERTATION
- Paige, J.** (2020). “Statistical Methods for Geospatial Modeling with Stratified Cluster Survey Data”. PhD thesis. University of Washington.
- R PACKAGES
- Li, Z. R., Martin, B. D., Hsiao, Y., Godwin, J., **Paige, J.**, Wakefield, J., Clark, S. J., Fuglstad, G.-A., Riebler, A., (2021). *SUMMER: Small-Area-Estimation Unit/Area Models and Methods for Estimation in R*. R package version 1.2.0. URL: <https://github.com/richardli/SUMMER>.
- Nychka, D., Furrer, R., **Paige, J.**, Sain, S., (2005). *fields: Tools for spatial data*. National Center for Atmospheric Research.
- INVITED TALKS
AND PRESENTATIONS
- ETH, Zurich, December 2022

- Title: Accounting for Geomasking and Jittering in Fusion of MICS and DHS Surveys with Application to Nigerian Women’s Secondary Education Completion Prevalence
- Will give **invited** talk at an ETH Statistics seminar on recent work involving spatial data fusion of MICS and DHS surveys while accounting for both geomasking and jittering for the two datasets respectively. Both datasets are used together to estimate women’s secondary education completion prevalence in Nigeria.
- Colorado School of Mines, October 2021
 - Title: Bayesian Multiresolution Modeling of Georeferenced Data: An Extension of ‘LatticeKrig’
 - Gave 40 minute **invited** talk at the Graduate Spatial Statistics Seminar about work extending LatticeKrig spatial model for large datasets to non-Gaussian responses with updates for more recent improvements such as large dataset application, and nonlinear covariate and parallelization support
- NTNU, January 2020
 - Title: Bayesian Modeling of Multi-Scale Spatial Dependence in Non-Gaussian Data
 - Gave 40 minute **invited** talk at the Statistics Seminar at NTNU’s IMF about work accounting for non-Gaussian responses with flexible modeling of spatial covariances, extending the LatticeKrig spatial model in such settings and under a Bayesian context.
- International Workshop of Statistical Modelling (IWSM), July 2022
 - Title: Aggregating from point to areal prevalences: A complete population model
 - Gave 20 minute talk at IWSM about producing areal estimates of prevalence while accounting for cluster/enumeration area level random effects with unknown locations.
- International Society for Bayesian Analysis (ISBA), June 2022
 - Title: Spatial Aggregation with Respect to a Population Distribution
 - Poster presentation at ISBA about producing areal estimates of prevalence while accounting for cluster/enumeration area level random effects with unknown locations.
- University of Washington, June 2021
 - Sole Ph.D. graduation speaker for the UW Statistics Department
- Seismological Society of America, April 2019
 - Title: Characterizing the Spatial Uncertainty of Coseismic Slip for Past and Future CSZ Full-Margin Events
 - Gave 15 minute presentation summarizing work with Prof. Peter Guttorp in poster presentation to professors, and scientists at SSA 2019 conference
- Banff International Research Station (BIRS), Summer 2017
 - Workshop title: Challenges in the Statistical Modeling of Stochastic Processes for the Natural Sciences
 - Presented work with Prof. Peter Guttorp in poster presentation to students, professors, and scientists
- National Center for Atmospheric Research, Summer 2014

OTHER TALKS
AND PRESENTATIONS

- Presented for 15 minutes to college and graduate students as well as scientists
- Presentation available for viewing at: <https://www2.cisl.ucar.edu/siparcs/calendar/accelerating-fields-package-theory-and-computation-kriging-surfaces>
- Assisted Dr. Doug Nychka in accelerating the ‘fields’ spatial statistics package in R using multi-GPU and multi-CPU computing libraries
- Macalester College, April 2014
 - Performed 20 minutes presentation of Honors Thesis and 35 minute thesis defense to students and professors
- American Geophysical Union (AGU), December 2013
 - Presented at poster session on work from the previous summer at Lawrence Berkeley National Laboratory continued in my Honors Thesis
- Lawrence Berkeley National Lab, Summer 2013
 - Presented summer research at Lawrence Berkeley National Laboratory poster session in front of student and scientists alike
 - Studied climate model predictions of Arctic cloud and albedo feedbacks using MATLAB and BASH with Dr. Daniel Feldman
- Joint Mathematics Meetings (JMM), December 2012
 - Poster presentation of aphid swarming research conducted at Macalester College
- Macalester College, Fall 2011, 2012
 - Poster presentation of summer research to Macalester students and faculty
 - Analyzed aphid group swarm behavior using multi-particle tracking software, MATLAB, Mathematica, and R
 - Created stochastic mathematical model for swarm behavior using nonlinear fits, statistically analyzed interacting and non-interacting swarm models

HONORS AND AWARDS

June 2021	Sole Ph.D. Graduation Speaker, University of Washington Department of Statistics
2016 – 2020	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

SKILLS

Advanced: R, INLA, TMB, LaTeX, MATLAB, Git
Intermediate: C, C++, BASH, tcsh, parallel and cluster computing, MPI, Python, Stan, Mathematica, Scala, ImageJ, Java, GIMP, Inkscape, RShiny

PUBLIC SOFTWARE

- *SUMMER*
 - SUMMER: Small-Area-Estimation Unit/Area Models and Methods for Estimation in R
 - <https://cran.r-project.org/web/packages/SUMMER/index.html>
 - <https://github.com/paigejo/SUMMER>
 - Monthly downloads: 284 (as of 13 Feb., 2022)

- *ELK*
 - Extended Lattice Krig: A Bayesian Extension of LatticeKrig to Non-Gaussian Responses
 - <https://github.com/paigejo/ELK>
- *fields*
 - Spatial Statistics software in R
 - <https://cran.r-project.org/web/packages/fields/index.html>
 - Monthly downloads: 39,946 (as of 13 Feb., 2022)
- *fieldsMAGMA*
 - Multi-GPU accelerated Spatial Statistics software in R using MAGMA computing library
 - https://bitbucket.org/jpaige/fieldsmagma_all/src/master/
- *RShiny Web Applications*
 - Dirichlet Process and Pólya Tree visualization RShiny web application
 - * <https://rstudio.stat.washington.edu/shiny/jp/shinyJP/> (RShiny server no longer running)
- *Github repositories*
 - <https://github.com/paigejo>

ON THE WEB

- Personal website
 - <http://jpaigestats.com/>
- Github profile
 - <https://github.com/paigejo>
- Google Scholar
 - https://scholar.google.com/citations?user=bNtwV_AAAAAJ&hl=en
- Dirichlet Process and Pólya Tree visualization RShiny web application
 - <https://rstudio.stat.washington.edu/shiny/jp/shinyJP/> (RShiny server no longer running)
- 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 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/>

INTERESTS

Audiobooks, chess, basketball, squash, skiing, hiking, music, microbrews, travel, cheese tasting