JESSICA PIERACCINI KUNKE

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EDUCATION

University of Washington — Seattle, WA
Ph.D. Candidate, Statistics; GPA 3.79 — Expected June 2025
- Achievement Rewards for College Scientists (ARCS) Fellowship, 2020
- Thesis (in progress): Using networks to address sampling bias in social and environmental population size estimation
- Preliminary/qualifying exam project: reproducing and evaluating the AdaPT method for selective inference
- Advisor: Tyler H. McCormick

University of Chicago — Chicago, IL
M.S. Statistics; GPA 3.7 — June 2020
- NSF Research Traineeship (NRT) Grant Trainee, 2018-2020, PI Elisabeth Moyer
- Awarded 2018-2019 Senior Consultant, Department of Statistics Consulting Program
- Thesis: A Nonstationary Gaussian Process Model for Forecasting Solar Irradiance at Earth's Surface
- Advisors: Mihai Anitescu, Peter McCullagh

Harvard University — Cambridge, MA
A.M. Earth and Planetary Science; GPA 4.0 — March 2016
- National Defense Science and Engineering Graduate (NDSEG) Fellowship, 2013

Northwestern University — Evanston, IL
B.A. Integrated Science Program, Earth and Planetary Science, Mathematics; GPA 3.82 — June 2010
- National Oceanic and Atmospheric Administration (NOAA) Hollings Scholarship, 2008, provides ~100 students nationally each year with academic financial assistance and a paid summer internship in scientific research

RESEARCH INTERESTS

Networks ◆ **Spatiotemporal processes** ◆ **Survey statistics** ◆ **Human trafficking and violence prevention** ◆ **Ecology**

PUBLICATIONS

Kunke, J.P., I. Laga, X. Niu, T.H. McCormick, Comparing the Robustness of Simple Network Scale-Up Method (NSUM) Estimators. Accepted for publication 2024 Jan 9 in Sociological Methodology.

Laga, I., **J.P. Kunke,** T.H. McCormick, X. Niu, The Role of Scaling and Estimating the Degree Ratio in the Network Scale-up Method. Currently under review as of Jan 2024.

Kunke, J.P., A. Visokay, T.H. McCormick (2023), Respondent-Driven Sampling: An Overview in the Context of Human Trafficking, CHANCE, 36:4, 15-21, DOI: 10.1080/09332480.2023.2290949.

Wang, Z., C. Peterson, Q. Zhou, R. Subramanian, **J. Kunke**, A. Baker, D. Hammerling (2021), Characterizing Internal Variability and Detecting Changes in Model and Computational Parameters in a Century-Long CESM Ensemble (No. NCAR/ TN-569+STR). DOI: 10.5065/m291-1410.

AWARDS

ASA GSS/SRMS/SSS Student Paper Competition, 2024
UW Excellence in Teaching Award Finalist, 2023
Dorothy M. Gilford Teaching Award for outstanding performance by a graduate teaching assistant, 2022
Achievement Rewards for College Scientists (ARCS) Fellowship (three years), 2020
NSF Research Traineeship (NRT) Grant Trainee (two years), PI Elisabeth Moyer, 2018
Senior Consultant Award, Department of Statistics Consulting Program, University of Chicago, 2018 and 2019
National Defense Science and Engineering Graduate (NDSEG) Fellowship (three years), 2013
National Oceanic and Atmospheric Administration (NOAA) Hollings Scholarship (two years), 2008

PRESENTATIONS

Joint Statistical Meetings (JSM) — Portland, OR, August 2024
Student award presentation, Comparing the Robustness of Simple Network Scale-Up Method (NSUM) Estimators

Women in Statistics and Data Science (WSDS) — Bellevue, WA, 27 October 2023
Panel proposer and chair, Frontiers, challenges and progress in human trafficking-related statistics

Joint Statistical Meetings (JSM) — Toronto, CA, 9 August 2023

Poster, Network scale-up model (NSUM) estimators: Is the average of ratios or ratio of averages more robust?

Joint Statistical Meetings (JSM) Washington D.C., 10 July 2022
Presentation, Average of ratios or ratio of averages? Revisiting simple network scale-up estimators

University of Chicago Environmental Data Science Lunch Series Remote, 2 June 2022
Presentation, Introduction to causal inference for environmental applications

Chicago-Area SIAM Student Conference (CASSC) Remote, 6 November 2020
Presentation, A nonstationary Gaussian process model for forecasting solar irradiance at Earth's surface (MS thesis)

RESEARCH EXPERIENCE

University of Washington, Department of Statistics Seattle, WA
Graduate Researcher with Tyler McCormick March 2021 - Present
- (Collaboration with Stanford Human Trafficking Data Lab) Developing a decision support model to aid Brazilian labor office prosecutors in prioritizing which trafficking tips to investigate
- (Collaboration with Penn State University) Improving network scale-up methods for estimating the size of populations that are hard to reach with traditional surveys

Argonne National Laboratory, MCS Division Lemont, IL
Visiting Student (MS Thesis) August 2019 - June 2020
Graduate Research Aide June - August 2019
- Designed and evaluated a Gaussian process model for solar power forecasting given previous satellite observations

Harvard University, Department of Earth and Planetary Science Cambridge, MA
Graduate Student June 2013 - May 2016
- Performed simulations using cloud-resolving models such as SAM and WRF-Chem to diagnose particular sources of error in current global model parameterizations and to develop and test potential improvements

NOAA Great Lakes Environmental Research Laboratory (GLERL) Ann Arbor, MI
Summer Research Assistant June-August 2010
- Read newspaper archives, contacted locals and experts to reconstruct history of Saginaw Bay beach and water quality problems
- Met with potential collaborators to develop possible research proposals for the Multiple Stressors project

Hollings Scholarship Intern June-August 2009
- Conducted experiment to determine *Spirogyra* algal growth parameters under varying light and temperature conditions
- Participated in water sample collection, benthic and shoreline surveys, and other field work for the Multiple Stressors project

Northwestern University Evanston, IL
Independent Study Researcher March – June 2009, January – June 2010
- Project 1: Researched the process a community follows to plan and construct an offshore wind farm, collaborated with three other students, delivered a report to a local community group outlining the steps in that process
- Project 2: Investigate the magnitude and possible causes of changes in Evanston City greenhouse gas emissions as calculated in their annual emissions inventory, submitted a report to the city and the public about findings

Semester in Environmental Science, Marine Biological Laboratory Woods Hole, MA
Student Researcher (class of 14 students) August – December 2008
- Worked in teams weekly to conduct intensive field and lab work in ecosystem analysis
- Analyzed results and presented findings to the research staff in weekly oral presentations and written reports

NU Department of Civil and Environmental Engineering Evanston, IL
Undergraduate Researcher, Gray Research Group June-August 2007
- Tested ability of photocatalytic coating on ceramic filters to prevent biological and chemical fouling of the filters
- Performed biofouling experiments designed by research group, collaborated in improving the experimental design

SKILLS

Scientific Computing: Quarto, R, Python, Stata, LaTeX, git, bash, Matlab, Fortran, HTML, CSS, SQL, Slurm
Languages: Italian (fluent), Russian (beginner)
Miscellaneous: Completed level 11 of NWSMTA Achievement in Music exams (theory and performance)

CONSULTING EXPERIENCE

Northern Arizona University Institute for Tribal Environmental Professionals (ITEP) Seattle, WA (remote)
Instructor and consultant May 2023-Present
- Organize workshops for tribal environmental professionals nationally to review/learn R and data management skills

- Develop curriculum materials and lessons specifically for tribal environmental professionals' needs and contexts
- Participate in drop-in office hours for one-on-one and small-group consulting on tribal professionals' specific data needs
- One-on-one and small-group ongoing consulting with environmental professionals from individual tribes

ASA Statistics Without Borders Seattle, WA (remote)
Team Lead, SWB 169 August 2021 – February 2022
- Met with SWB volunteers weekly, with SWB project/client manager and non-profit client every 1-2 weeks
- Worked ~90 hours individually and with the team
- Developed data analysis with client to handle challenging data limitations, carefully documented analysis decisions for client's future reference

Data Carpentries and Northern Arizona University Institute for Tribal Environmental Professionals Seattle, WA (remote)
Workshop Instructor, NAU-ITEP workshop November 2020, November 2021
- Individual and small-group sessions, ~20 hours total across two workshops
- Develop solutions with the client for data cleaning, analysis, and visualization in R, generating reports using R Markdown, improving data workflows and data management

University of Chicago, Department of Statistics Chicago, IL
Graduate Student Consultant, Statistics Consulting Program September 2018 - July 2020
- Awarded Senior Consultant both years
- Led one project, co-led two projects, contributed as team member for one project
- Worked ~300-400 hours across four projects
- Project 1: Analyze the limiting behavior of coefficient estimates in two models of ecological analysis
- Project 2: Where does class matter in voting outcome?
- Project 3: Do patients with medication discrepancies have greater odds of poorly controlled hypertension (in a particular country)? Are there associations between uncontrolled hypertension and other potential risk factors such as comorbidities, pill burden, or history of alcohol use? Can we tell something about the relative effects of different types of errors (doctor/prescriber, pharmacy, and patient errors)
- Project 4: Examine temporal shifts in bivalve geographic distributions and their relationship to sea ice seasonal cycles

TEACHING EXPERIENCE

Data Carpentries, Northern Arizona University Institute for Tribal Environmental Professionals Seattle, WA (remote)
Workshop Instructor, NAU-ITEP workshop November 2020, November 2021
- Presented R and R markdown skills with practice examples to tribal environmental leaders
- Provided consulting to attendees to troubleshoot particular obstacles in their own analyses and workflows
- Continue to provide follow-up consulting as needed

Data Carpentries and Stony Brook University Seattle, WA (remote)
Supporting Instructor, Python for Ecologists workshop 11-13 October 2021
- Respond to questions during lessons, work with participants in breakout rooms individually to address questions/sticking points

University of Washington Seattle, WA
Predoctoral instructor, STAT 394 Probability Theory I Summer A-term 2022 (hybrid)
- Gave lecture, held office hours, prepared homework assignments and exams, graded exams

Instructor, Center for Statistics and the Social Sciences, Math Camp Summers 2022 and 2023 (hybrid)
- Provided math review lectures/practice for social science graduate students to prepare for upcoming quantitative courses
- Collaborated with teaching assistant Erin Lipman to design and lead labs as an introduction to R

Teaching Assistant, CSSS 567 Statistical Analysis of Social Networks (Instructor: Tyler McCormick) Fall 2021 (hybrid)
- Audience: primarily graduate students in social sciences, economics, statistics
- Designed and instructed live coding lab lessons in R, wrote and graded weekly assignments based on labs, held office hours

Reader/Grader, FISH 454 Ecological Modeling (Instructor: Connie Okasaki) Fall 2021 (hybrid)
- Audience: aquatic/fisheries science graduate students
- Content: theory and implementation of deterministic and stochastic population models
- Held office hours, answered student questions during labs, graded lab assignments, attended lectures, assisted with classroom setup

Teaching assistant, CSSS Math Camp (Instructor: Peter Gao) September 2021 (remote)
- Prepared social science graduate students for math and statistics coursework
- Developed R lab materials, guided students through practice problems, gathered feedback to implement now and next year

Teaching Assistant, CSSS 592 Applied Longitudinal Data Analysis for Social Sciences (Instructor: Elena Erosheva) Fall 2020 (remote)
- Audience: social science graduate students

- Developed and graded assignments, prepared practice problems and notes, held office hours, conducted labs

University of Chicago Chicago, IL
Workshop Organizer and Instructor September 2019
- Organized, co-taught two-week statistics workshop for early-career researchers in other fields
- Taught introductions to theory and methods in linear regression, statistical modeling, model diagnostics, Gaussian process models
- Developed notes and R code examples; exchanged feedback with fellow instructors on everyone's lessons

Fusion Academy Evanston Evanston, IL
STEM Teacher August 2017 – June 2018
- Taught students math and science one-on-one at an accredited private middle/high school
- Mentored students in social and behavioral skills

SAGA Innovations Chicago, IL
Math Tutor/Mentor, Bogan High School August 2016 – June 2017
- Tutored 11 high school freshmen and sophomores for daily 50-minute sessions in algebra and geometry during the school day
- Achieved 100% pass rate in first semester, with 92% of students receiving C or above

Harvard University Cambridge, MA
Teaching Assistant (Fellow) Fall 2013, Spring 2015
- EPS 281r: Great Papers in the Earth Sciences, graduate course taught by Peter Huybers and Eli Tziperman
  - Met with student groups about their presentations to provide feedback; attended and contributed to class discussions
- EPS 200: Atmospheric Chemistry, graduate course taught by Daniel Jacob and Steven Wofsy
  - Held weekly TA session to cover key concepts and address student questions, graded, provided final presentation feedback

PROFESSIONAL AND ADDITIONAL SERVICE

University of Washington, Department of Statistics Seattle, WA
Member, Diversity, Inclusion, Community and Equity (DICE) Fall 2022 – Present
- Peer Application Review Service (PARS), Fall 2022: review mentees' graduate school application materials (open to anyone applying for statistics graduate programs, not just at UW), provide feedback
- Transparency for department recruitment and retention
- Proposing and voting on candidates for the Blackwell Seminar
- PARS, Fall 2023: review Round 1 applications for PhD program
- Organize data for PARS recruitment, Fall 2023
- Member, subcommittee to review department job applicants from diversity perspective

Peer mentor, Pacific Alliance for Low-income Inclusion in Statistics and Data Science (PALiISaDS) Fall 2022 – Present
- Meet with two undergraduate mentees weekly for two years
- Help mentees identify and progress toward professional goals, navigate hidden curriculum of academia
- Provide feedback on graduate school and internship applications
- Connect mentees to relevant additional mentors and resources
- Attend mentoring workshops and other group events

Co-leader, Statisticians and Biostatisticians of Underrepresented Genders Fall 2023 – Present
- Organize social events and opportunities for mentorship
- Collaborate with mathematics and applied mathematics departments for joint events

Graduate Student Representative June 2022 – May 2023
- Plan and lead orientation for incoming masters and doctoral students, September 2022
- Serve as liason between graduate students and faculty/department
- Gather systematic feedback from graduate student body, present results to faculty meeting, resulting in joint faculty-student committee to review the feedback the following year
- Recruit and participate in student committee to interview and provide feedback on tenure-track faculty candidates
- Organize social events and arrange peer mentor-mentee pairs for new students
- Plan and lead visit day for prospective graduate students, March 2023
- Increase connections with other UW departments by hosting joint social and professional events

Mentor, Directed Reading Program Winter 2022
- Mentored an undergraduate student 2-4 hours per week in an introduction to survey statistics and R
- Developed notes and practice questions, set project goals with the student each week, provided feedback on report and presentation, invited student to lab meetings and other professional development opportunities

Committee member, Student feedback on department job candidates Fall 2021
- Meet with and provide detailed feedback on tenure-track faculty candidates

Consortium for the Advancement of Undergraduate Statistics Education (CAUSE)
Planning committee member, Justice Equity Diversity Inclusion (JEDI) website Fall 2023 – Present

- Meet monthly to discuss improvements to this website of JEDI-focused statistics education resources
- Solicit feedback from colleagues about website utility and accessibility
- Spread knowledge of this resource through conferences, emails, and presentations

Boston Area Rape Crisis Center (BARCC) Boston, MA
Rape Crisis Hotline Counselor and Research Intern August 2014 – June 2016

- Provided confidential crisis counseling to survivors, significant others, and care providers in weekly and extra shifts
- Completed 40-hour training in crisis counseling
- Answered 160 calls over 96 shifts in two years
- Gathered community awareness volunteers' feedback on their experiences, studied their responses, and reported back to them and the staff to help them improve volunteer satisfaction and program effectiveness

Science in the News, Harvard University Cambridge and Longwood, MA
Public Presenter, Seminar Organizer, Webmaster January 2013 – May 2015

- Collaborated with other graduate students to present on math in nature to the general public (1.5 hrs, 50-100 people); was invited to give the talk again to another group
- Developed and maintained the organization website and contributed to the organization's outreach vision
- Recruited graduate student speakers for public seminars and gave extensive feedback and practice to improve their skills in communicating with a general audience; trained new seminar series organizers for the following year