

Aidan W. Kerns

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Profile

Ph.D. Candidate in Statistics with deep expertise in Bayesian modeling, spatiotemporal statistics, stochastic processes, and simulation-based inference. Proven record of conducting applied research in cryptologic data science, spatial epidemiology, and network-based modeling. Skilled in designing and implementing algorithms for detection, estimation, and prediction in complex and secure environments. Adept at collaborating across interdisciplinary teams to derive insight from large, noisy, or high-dimensional data sources.

Education

Kansas State University

Ph.D., Statistics

B.S., Statistics and Data Science

Minor: Mathematics

Manhattan, KS

Expected Dec 2025

May 2021

Project Experience

Department of Animal Science & Industry, College of Agriculture

Gaussian process regression for incomplete methane emissions records

Kansas State University

Sep 2024 – Apr 2025

- Provided statistical consultation and model development, resulting in dissertation level analysis.
- Implemented a novel model for analyzing incomplete data collected from GreenFeed system.

Department of Agronomy, College of Agriculture

Predicting yield, protein, oil with spatiotemporally misaligned and sparse data

Kansas State University

Jul 2024 – May 2025

- Consolidated multiple sources of data using data fusion methods to account for misaligned and sparse data.
- Developed a model-based approach to account for multiple sources of variability, improving predictive performance.

Department of Applied Human Sciences, College of HHS

Comparing civilian and military suicide rates; IRB-12276

Kansas State University

Sep 2024 – Present

- Compared the reported rates of suicide, stratified by characteristics (age, gender, military branch), to civilian rates obtained from the CDC and weighted to represent demographic composition of military.
- Served as a bridge between university researchers and military researchers to tie statistical methodologies with key research questions.

Diagnostic Medicine & Pathobiology, College of Vet. Med.

Risk assessment for FMD in cattle going to auction market in Kansas

Kansas State University

Oct 2024 - Present

- Developed a stochastic model for the number of infected, undetected, and shipped farms to auction market within a given catchment area to identify high risk scenarios.
- Constructed an R Shiny application for state animal health officials (SAHOs) to obtain real-time risk assessments.

A retrospective spatiotemporal analysis of CWD in Kansas

Sep 2024 – Present

- Explored spatial, temporal, and spatiotemporal patterns of county-level chronic wasting disease across Kansas.
- Performed nonparametric hypothesis tests to determine temporal and spatial independence.

Work Experience

Kansas State University, Department of Statistics

Research Assistant – Consulting Statistician

Manhattan, KS

May 2023 – Present

- Designed probabilistic models and applied stochastic simulation to optimize decision-making under uncertainty in dynamic systems.
- Developed Bayesian models, Markov Chain Monte Carlo (MCMC), and stochastic processes for inference and prediction in market-like systems.
- Built scalable SAS and R code for high-frequency data analysis, optimization algorithms, and quantitative modeling.
- Modeled economic behaviors analogous to derivatives trading and market microstructure in live-stock trade networks.

Teaching Assistant – Applied Bayesian Modeling and Prediction

Jan 2025 – May 2025

- Assisted students, largely doctoral students from other disciplines, in developing and implementing applied Bayesian models using a variety of software; R, SAS, Python, JAGS, STAN.
- Supported project-based learning with an emphasis on hierarchical modeling and use of experimental or real-world data.
- Guest lectured over select topics, such as the Bayesian linear model and variable/model selection methods.

Teaching Assistant – Spatiotemporal Statistics

Jan 2024 – May 2024

- Provided instructional support for a graduate course in spatial and spatiotemporal statistical methodology, inference, and prediction.
- Lectured on a variety of topics, such as spatial prediction, kriging, spatiotemporal covariance structures.
- Assisted with lectures, grading, and technical guidance using R, Python, and ArcGIS.

Lecturer – Introduction to Statistics

Aug 2023 – May 2024

- Taught four sections of introductory statistics, fulfilling university's quantitative requirements for College of Arts and Sciences students.
- Developed and delivered lectures, weekly assignments, and structured assessments.
- Emphasized reproducible data analysis in R and Excel, reinforcing theoretical course content.

Corteva Agriscience

Statistician

May 2022 – May 2023

Johnston, IA

- Applied statistical optimization and predictive modeling for large-scale agricultural datasets, enhancing operational decisions.
- Automated data pipelines using R, SAS, and Python to incorporate time-series analysis and spatial statistics.

Skywide Logic

Data Science Intern

May 2021 – Oct 2021

Newport Beach, CA

- Led a data analysis team to design and execute surveys, applying statistical modeling to health and behavioral data from over 250 respondents.
- Automated data processing pipelines in Python, enabling efficient reporting of psychological and health-related insights.

AgReliant Genetics

Data Analyst

Jun 2020 – Apr 2021

Westfield, IN

- Built SQL-based data infrastructure linking genotype, phenotype, and environmental data for analysis in R and SAS.
- Collaborated with data science and product teams to streamline statistical reporting and phenotypic summarization.

Technical Skills

- Statistical Programming: R, Python, Stan, JAGS, BUGS
- Scientific Computing: C++, Julia, Bash scripting
- Machine Learning: XGBoost, random forests, clustering
- Spatial/Network Analysis: QGIS, sf, igraph, spatstat
- Systems/Tools: Git, Linux/Unix, LaTeX, GitHub Pages
- Certifications: SAS 9.4 Base & Advanced, KSU Graduate Student Leadership Development (GSLDP), CITI Program IRB Researchers and personnel on IRB protocols, CITI Program Responsible Conduct of Research (RCR)

Publications and Preprints

- **Kerns, A.W.**, et al. (2025). *Bayesian Variable Selection and Lagged Covariate Effects in Population Dynamics of Daphnia magna*. Data Science in Science (Under revision)
- **Kerns, A.W.**, et al. (2025). *Local PGF for Spatial Point Processes: A Simulation-Based Estimator for Intensity*. The American Statistician (Under review).
- **Kerns, A.W.** (2025). *Redraw the Vote: Evaluating Redistricting Effects with a Difference-in-Difference Placebo Test in Presence of Incumbency*. The American Statistician (Under review)
- **Kerns, A.W.**, et al. (2025). *Modeling FMD risk in cattle*. BMC Vet. Research (Under review)
- Brady, A., **Kerns, A.W.**, et al. (2025). *a retrospective spatiotemporal analysis of CWD in Kansas*. PLOS One (Under revision)
- Bosche, L., **Kerns, A.W.**, et al. (2025). *Nitrogen nutrition index as an in-season N diagnostic method for maize yield response to N fertilization*. Field Crops Research. (Published)