Shih-Ni Prim
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EDUCATION

PhD North Carolina State University, Statistics 2022-present
Advisors: Ryan Martin, Jonathan Williams, and Brian Reich
Cumulative GPA: 4.0
Expected graduation date: August 2026

MR North Carolina State University, Statistics Dec 2022
Cumulative GPA: 4.0

PhD University of Iowa, Musicology May 2016
Dissertation: "Maurice Abravanel and the Utah Symphony's Performances and Recordings of Gustav Mahler's Symphonies (1951–1979)" (Advisor: Nathan Platte)

MM Florida State University, Musicology May 2009
Thesis: "Gustav Mahler's *Das Lied von der Erde*: An Intellectual Journey across Cultures and Beyond Life and Death" (Advisor: Douglass Seaton)

MM University of North Carolina at Greensboro, Saxophone Performance May 2006

MA University of North Carolina at Chapel Hill, Comparative Literature May 2004
Thesis: "Music-Myth into Comedy: How Shaw Used Wagner to Transform Mozart's Legend" (Advisor: William Harmon)

AWARDS

ISBA EnviBayes Student Paper Competition Award 2026
- For the paper "A Spectral Confounder Adjustment for Spatial Regression with Multiple Exposures and Outcomes"

Glaxo Smith Kline (GSK) Fellowship 2025

B. B. Bhattacharyya Excellence Award 2023–2024
North Carolina State University, Department of Statistics

RESEARCH INTERESTS

Imprecise probability, possibilistic inferential models, foundations of statistics, Bayesian inference and hierarchical modeling, spatial statistics, tensor decomposition and regression, surrogate modeling for computer experiments, Gaussian process, active learning, climate and environmental applications

PEER-REVIEWED PAPERS

In review

Martin, R, **Prim, S.-N.**, and Williams, J. "Decision-making with possibilistic inferential models," arXiv: 2112.13247. Submitted to *International Journal of Approximate Reasoning.*

Prim, S.-N., Guan, Y., Yang, S., Rappold, A. G., Hill, K. L., Tsai, W.-L., Keeler, C. and Reich, B. J. (2025) "A Spectral Confounder Adjustment for Spatial Regression with Multiple Exposures and Outcomes," arXiv:2506.09325. Under revision for *Journal of the American Statistical Association*.

Chan MD, **Prim S.-N.**, Cramer C, Ruiz J. (2023), "Nonrandomized trials in clinical oncology," in Handbook for Designing and Conducting Clinical and Translational Research: Translational Radiation Oncology, edited by Adam E. M. Eltorai, Jeffrey A. Bakal, Daniel W. Kim, David E. Wazer, Academic Press, pp. 313–284.

Helis CA, **Prim S.-N.**, Cramer CK, Strowd R, Lesser GJ, White JJ, Tatter SB, Laxton AW, Whitlow C, Lo H, Debinski W, Ververs JD, Black PJ, Chan MD (2022), "Clinical outcomes of dose-escalated re-irradiation in patients with recurrent high-grade glioma," Neuro-Oncology Practice, 9, 390–401.

WORKING PAPERS

Prim, S.-N., Quinlan K. R., Hawkins P., Movva, J., and Booth, A. S. "Actively Learning Joint Contours of Multiple Computer Experiments," arXiv:2512.13530.

Phlips, E., **Prim, S.-N.**, and Nelson, N. "Harmful Algal Blooms in the Indian River Lagoon 1997-2024, the Influences of Extreme Conditions and Ecosystem Disruptions."

ONLINE RESOURCES

Nelson N, **Prim S.-N.**, Saia S, Grieger K, Huseth A (authors vary by chapter) (2025), A Machine Learning Primer for Natural Resources Management, accessed online via go.ncsu.edu/mlprimer.

CONFERENCE PRESENTATIONS

Prim S.-N., Guan, Y., Yang, S., Rappold, A. G., Hill, K. L., Tsai, W.-L., Keeler, C. and Reich, B. J. "A Spectral Confounder Adjustment for Spatial Regression with Multiple Exposures." Joint Statistical Meetings (JSM), Aug 5, 2025. (Contributed Poster Presentation)

Prim S.-N., Guan, Y., Yang, S., Rappold, A. G., Hill, K. L., Tsai, W.-L., Keeler, C. and Reich, B. J. "A Spectral Confounder Adjustment for Spatial Regression with Multiple Exposures." International Workshop on Applied Probability, June 10, 2025. (Invited Presentation)

Prim S.-N., Quinlan K, Booth A. "Active Learning with Deep Gaussian Processes for Aero Database Construction." International Conference on Advances in Interdisciplinary Statistics and Combinatorics, October 13, 2024. (Invited Presentation)

PROFESSIONAL POSITIONS

Data Science and AI Academy, NC State University, Raleigh, NC Aug to Dec 2025
Data Science Research Consultant

- Provide drop-in and scheduled consultations about statistical analysis and modeling
- Consult on student and faculty data science requests
- Work with researchers on a broad range of projects involving data and analysis

Research Collaborator of Lawrence Livermore National Laboratory Aug 2024 to present

- Advisors: Kevin Quinlan and Annie Booth
- Research project: Actively Learning Joint Contours of Multiple Computer Experiments
- Examined predictive accuracy of Deep Gaussian Processes versus ordinary Gaussian Processes as surrogate models for aerodynamic data

Environmental Protection Agency, Research Triangle Park, NC Aug 2024 to Sep 2025
Oak Ridge Institute for Science and Education (ORISE) Fellow

- Mentors: Ana Rappold and Brian Reich
- Research project: A Multivariate Spectral Model with Adjustment for Unmeasured Confounders for Multiple Outcomes and Multiple Exposures
- Proposed a spectral, fully Bayesian model to adjust for spatial confounding and ensure causal interpretation of effects
- Constructed fully Bayesian MCMC algorithms in R with different priors and capacity (multivariate vs univariate outcomes) to compare model performance

Lawrence Livermore National Laboratory, Livermore, CA May to Aug 2024
Data Science Summer Institute Intern

- Conducted literature review on surrogate modeling, contour estimation, and active learning
- Presented at end-of-summer presentation for interns

North Carolina State University, Raleigh, NC Aug 2022 to May 2024
Research Trainee at Duke Clinical Research Institute

- Helped with developing and evaluating analytic methods based on WIN statistics
- Shadowed meetings of clinical research and received training on ethics of research

North Carolina State University, Raleigh, NC Summer 2022, Jul 2023 to May 2024
Research Assistant

- Principal Investigators: Natalie Nelson (Biological and Agricultural Engineering) and Brian Reich (Statistics)
- Used statistical and machine learning models to analyze spatiotemporal data to examine inference about harmful algal blooms
- Data cleaning and preprocessing, data analysis, statistical modeling, manuscript drafting

Wake Forest Baptist Health, Winston-Salem, NC 2021 to 2022
Volunteer Research Statistician / Intern

- Conducted Kaplan Meier Survival Analysis and Cox Proportional Hazard Model on retrospective data of patients with glioblastoma
- Created tables and plots and help with writing and editing for publication
- Helped collect MRI images and clinical data for studies that utilize machine learning for classification

TEACHING AND ADVISING

North Carolina State University, Raleigh, NC Jan 2026 to present
Section instructor, Department of Statistics

- Lead in-class activities for introduction to statistics classes

North Carolina State University, Raleigh, NC May to Aug 2025
Graduate Mentor

- Mentor students for their data science projects at RuralWorks (NC State) and Summer Research and Innovation Programs (NC School of Science and Mathematics)
- Duties: One-on-one meetings, office hours

North Carolina State University, Raleigh, NC May to Aug 2022
Teaching Assistant, Department of Statistics

- Assist with two graduate courses: Fundamentals of Statistical Inference I and Fundamentals of Linear Models and Regression
- Duties: Grade homework and hold weekly office hours

Wake Forest University, Winston-Salem, NC Aug 2017 to Dec 2017
Adjunct Faculty, Department of Music

- Independently designed and taught the course "Introduction to Western Music," which covered western music history from the Middle Ages to the Twentieth Century
- Used music as artifacts to help students think about history in the appropriate contexts and cultivate critical thinking
- Provided necessary study aids including detailed guidelines and rubrics for writing assignments and study guides for exams
- Used a scaffolding method to help students write research papers

University of Iowa, Iowa City, IA 2011 to 2016
Writing Tutor, Writing Center

- Online tutoring (Fall 2013–Spring 2016)
  - Provided feedback for papers through online tutoring (10 hours per week)
- Online and Face-To-Face tutoring (Fall 2011, Spring 2012)
  - Met with 4 students for 4 hours of in-person tutoring sessions per week
  - Provided feedback for papers through online tutoring

University of Iowa, Iowa City, IA 2009 to 2012
Teaching Assistant, School of Music

- Undergraduate History of Music I & II (Fall 2011, Spring 2012)
  - Gave one-hour lectures in weekly discussion sessions
  - Helped students review class materials
  - Helped the professor design quizzes, exams, and reviewing tables
  - Graded assignments, performance papers, exams, and quizzes
- Graduate Music History I & II (Fall 2010, Spring 2011, Fall 2011)
  - Helped students review class materials
  - Helped the professor design quizzes, exams, and reviewing tables
  - Guest lectured at the request of the professor
- Introduction to Graduate Studies (Fall 2010, Spring 2011)
  - Assisted the professor design research assignments
  - Checked students' answers in assignments
  - Helped students review class materials
  - Guest lectured at the request of the professor

- Great Musicians (Music Appreciation) (Fall 2009, Spring 2010)
    - Gave two one-hour lectures in weekly discussion sessions
    - Helped students review class materials
    - Graded assignments, concert reports, exams, and quizzes

COMPUTER SKILLS

Programming: R, Python
Certificate: SAS Certified Specialist: Base Programming Using SAS 9.4 (Issued May 2020)
Tools: High performance computing, Git version control, parallel computing

LANGUAGES

English, Mandarin, German, French, Italian