



TRACY MORRISON

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SUMMARY

Ph.D. student in Statistics (Expected 2026) with a B.S. in Actuarial Science and experience applying regression, Bayesian hierarchical modeling, and machine learning to large, complex datasets. Skilled in building multivariate predictive models, addressing bias and missingness, and communicating technical results to cross-functional stakeholders. Proficient in R, Python, SQL, and SAS with strong interest in property/casualty insurance applications, including pricing/underwriting and claims analytics.

EDUCATION

Ph.D.: Statistics *Expected in 2026*

University of Missouri - Columbia, MO

Successfully completed Doctoral Qualifying Examinations (2022)

- Research Interests: Survey Methodology, Bayesian Hierarchical Modeling, Small-Area Estimation, Spatio-temporal Statistics, Causal Inference
- Relevant Coursework: Bayesian Inference, Statistical Computing, Regression Modeling, Machine Learning, Survey Sampling
- Planned Coursework (Spring 2026): STAT 9100 – Statistics in AI: Neural Estimation, Generative Models, and Next-Gen AI

M.S.: Applied Statistics 2021

Minnesota State University - Mankato, MN

B.S.: Actuarial Science 2016

Kwame Nkrumah University of Science And Technology - Kumasi, Ghana

EXPERIENCE

Graduate Research Assistant / University of Missouri - Columbia, USA *06/2023 - Current*

- Designed and implemented multivariate Bayesian hierarchical models for small-area estimation, enabling stable regional estimates under survey bias and measurement uncertainty.
- Developed projection-truncation Gibbs sampling methods to estimate constrained hierarchical models (CHALM/SCHALM) with spatial structure and benchmarking constraints
- Built spatio-temporal analytic datasets (demographic, geographic, time-varying covariates) and applied regression and spatial modeling to evaluate localized outcome differences and drivers.
- Conducted research and development to test model assumptions, compare alternative specifications, and improve robustness under missingness and data integration challenges.
- Delivered model results through clear technical documentation, visualizations, and presentations for academic and cross-disciplinary collaborators.

Graduate Teaching Assistant / University of Missouri - Columbia, USA *01/2021 - Current*

- Led R-based statistical programming and Excel labs covering data wrangling, regression modeling, inference, and visualization for 100+ students.
- Created assignments involving real-world survey and demographic datasets to reinforce concepts in inference and estimation.
- Strengthened course materials with applied data-cleaning workflows and structured feedback to improve student project quality.

Graduate Teaching and Research Assistant / Minnesota State University - Mankato, USA

06/2021 - 08/2021

- Led five inquiry-based lab sections introducing statistical concepts and R programming; developed lab activities and evaluated student performance.
- Facilitated peer-led discussion of research articles to strengthen statistical literacy and evidence-based reasoning.

Reinsurer / State Insurance Company Limited - Accra, Ghana

01/2016 - 01/2017

- Applied statistical techniques for risk prediction and premium estimation using insurance datasets to support underwriting and portfolio decisions.
- Analyzed large structured policy data to estimate exposure variation and summarize patterns across segments.
- Communicated analytic findings through management presentations and written summaries to support data-informed recommendations.

APPLIED DATA SCIENCE & RESEARCH PROJECTS

Constrained Bayesian Hierarchical Modeling for Small-Area Estimation (Ongoing)

- Developed constrained hierarchical models incorporating benchmarking and inequality constraints; implemented Gibbs sampling for estimation .
- Evaluated robustness using Bayesian shrinkage, imputation strategies, and sensitivity checks tied to data quality and reliability.

Spatial Analysis of Missouri COVID-19 Indicators

- Constructed county-level datasets integrating multiple public sources; implemented spatial autoregressive (SAR) and conditional autoregressive (CAR) models to evaluate geographic disparities and policy effects.

Handwritten Digit Classification (MNIST)

- Built machine learning models (SVM, neural networks) using Python and scikit-learn and designed a feature-engineering pipeline achieving 98% accuracy.

VOLUNTEERING AND LEADERSHIP

Co-Facilitator, Grad Circles Program — University of Missouri Graduate School (2023)

- Led small group discussions supporting graduate student development in STEM.
- Designed sessions on research communication and project management.

Volunteer Consultant, ASA DataFest™ — University of Missouri (2023)

- Mentored undergraduate teams through data analysis and visualization projects using R and SQL.
- Guided exploratory analysis, bias reduction, and result communication.

SKILLS

- **Languages:** R, Python, SQL, SAS
- **Tools:** NumPy, pandas, ggplot2, scikit-learn, PyMC, Hive (familiar), Git, Microsoft Excel
- **Techniques:** Bayesian Modeling, Survey Sampling & Design, Causal Inference, Regression Modeling, Missing Data Imputation, Shrinkage Estimation, Exploratory Data Analysis