


Daniel Tuyisenge, Ph.D. Candidate (Statistics)

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Summary

PhD candidate in Statistics with a research focus on development and application of statistical tolerance intervals in survey data. Through courses work and collaborative work, I have some experience on post training analysis, model robustness, and rigorous assessment of failure modes using statistical and optimization based methods. I am interested in development of statistical model that can be used to evaluate machine learning models at the same time providing interpretability with a focus on building controllable and trustworthy foundation models. I am motivated by research that strengthens the theoretical and empirical foundations of safe AI.

Education

Department of Statistics, University of Kentucky, Lexington, KY

Ph.D., Statistics May 2021– May 2026 (expected)

- *Dissertation:* Application of Tolerance Intervals in Survey Data Analysis
- *Advisor:* Dr. Derek S. Young
- M.S., Statistics en route 2023

Department of Mathematical Sciences, Ball State University, Muncie, IN

M.A., Actuarial Science 2016–2018

Wofford College, Spartanburg, SC

B.S., Applied Mathematics & Physics 2012–2016

- Minor: Computer Science
- Study Abroad: University of Glasgow, Scotland, UK (Spring 2015)

Skills

Programming

- Python (pandas, numpy, scikit-learn)
- R (tidyverse, ggplot2, lme4, mgcv)
- SQL; SAS; Git/GitHub
- Jupyter, R Markdown, L^AT_EX
- HPC/SLURM, parallel computing

Statistical & ML Methods

- A/B testing and experiment design
- Causal inference (Fixed Effect and matching)
- Linear/GLM/GLMM and multivariate models
- ML: trees, boosting, RF, GAMs
- Sampling, bootstrap, simulation
- Robust methods and tolerance regions

Analytical & Professional Skills

- Translating product questions into models/metrics
- Scalable, reproducible pipelines (Python/R/SQL)
- Data extraction, cleaning, and validation
- Clear communication to technical and non-technical teams
- Cross-team collaboration and mentoring

Research Experience

Predictive Analytics and Data Science (PADS) Hub, University of Kentucky

Research Assistant 2022–Present

Analyze client datasets at the PADS Hub, using R and SAS to build and validate predictive models that transform complex sensor and healthcare data into reproducible, interpretable workflows supporting data-driven decision-making.

Recovery Analysis (Suntory Global Spirits / Jim Beam)

Summer 2025

Which factors predict recovery, weather impacts, and leak risk?

- Modeled recovery and leak risk across warehouse types to quantify weather-driven variation and identified key predictors influencing yield.
- Recommended process adjustments and monitoring strategies that informed the company's sustainability and efficiency planning.

Autism Classification System of Functioning (ACSF), UK HealthCare *Summer 2024*
How to summarize functioning levels from assessment data?

- Compared parent-reported and algorithm-generated ACSF classifications using weighted kappas and ICC; found 27% (Typical) and 19% (Best) agreement.
- Provided actionable revisions to the scoring algorithm, leading to planned improvements for the web-based ACSF tool used in pediatric diagnostics.

Inpatient Hospitalization & Polypharmacy, UK HealthCare *Spring 2023*
What patterns link polypharmacy to inpatient utilization?

- Integrated 6,794 encounters and 948,006 medication records to analyze predictors of hospitalization among high-risk patients.
- Identified patterns in medication use and demographic risk factors to enhance clinical decision-making and medication safety.

Predicting Corrosive Condensation Events (Suntory Global Spirits / Jim Beam)
Summer 2022

How to detect and mitigate condensation risk from sensor data?

- Analyzed temperature, humidity, dew point, and GPP sensor data across 9 warehouses; identified spatial-temporal patterns leading to condensation events.
- Results supported targeted ventilation upgrades, reducing corrosion-related maintenance costs.

NIH Grant Statistical Review *2022–2023*
Are proposed analyses and study designs statistically sound?

- Reviewed NIH KY-INBRE-style research proposals, evaluated analytic validity, and advised on sample size, randomization, and model assumptions.

Teaching Experience

Dr. Bing Zhang, Department of Statistics, University of Kentucky

Teaching Assistant / Primary Instructor

2022–2025

- STA 296: Statistical Methods and Motivations (Fall 2022)
- STA 210: Making Sense of Uncertainty (F23, S24, F24, S25)

MYSA School, Washington, DC

Teacher

2018–2021

- Taught Algebra I, Algebra II, Pre-calculus, and General Physics

Selected Conference Presentations

1. **Statistical Tolerance Intervals for Randomized Response Designs.** *Joint Statistical Meetings (JSM)*, Nashville, TN. Oral presentation, August 2025 (15 minutes).
2. **Multivariate Ratio Edits Based on Parametric and Nonparametric Tolerance Intervals.** *Midwest Optimization Meeting*, Grand Forks, ND. Oral presentation, October 31 – November 1, 2025 (15 minutes).

Selected Publications

Peer-Reviewed Journals

- 1 D. Tuyisenge and D. S. Young, “Statistical tolerance intervals for randomized response designs,” *Survey Methodology*, 2025, Manuscript submitted for publication.

Leadership & Service

Statistics Graduate Students Association (SGSA), University of Kentucky

President 2023–2024

- Led departmental initiatives including a Data Science Competition, an industry recruiting visit (Medpace and STATKing), and faculty research panel discussions
- Secured Graduate School Congress funding to support student professional development, networking, and travel opportunities.
- Represented graduate students in monthly faculty meetings and mentored first-year students on coursework, research, and academic growth.

Jambo Africa (African Student Association) — Wofford College

President 2015–2016

- Supervised a four-member executive team and managed the annual budget to coordinate cultural and community events.
- Organized campus-wide programs with 500+ attendees celebrating African culture and student engagement.

Honors & Awards

1. NSF Travel Award, Midwest Optimization Meeting (MOM 2025), Grand Forks, ND 2025
2. SAS Travel Award, Midwest SAS Users Group (MWSUG 2025), Cincinnati, OH 2025
3. 2nd Place, Data Science Competition, University of Kentucky SGSA 2022
4. Semi-finalist, Society of Actuaries (SOA) Student Research Case Study Challenge (Ball State University team) 2018
5. Leadership Award, Jambo Africa (African Student Association), Wofford College 2016
6. Rwanda Presidential Scholarship, Wofford College 2013–2016

References

Available upon request