Taylor Grimm

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Education

Baylor University *Waco, TX*
Ph.D. in Statistics, GPA: 3.97/4.00 May 2025 (Expected)

Dissertation: "Improved Real-time Fault Detection in Multivariate Processes: Handling Autocorrelation, Contamination, and Small Sample Sizes"

Advisor: Dr. Mandy Hering

Baylor University *Waco, TX*
M.S. in Statistics, GPA: 3.94/4.00 December 2022

Brigham Young University *Provo, UT*
B.S. in Statistical Science, minor in Mathematics, GPA: 3.99/4.00 April 2021

Experience

Baylor University *Waco, TX*
Graduate Assistant - Research July 2022 - Present

- Collaborated with interdisciplinary experts to comprehend data and processes, perform robust analyses, and effectively communicate results.
- Designed and evaluated multivariate statistical methods to improve anomaly detection in complex processes.
- Developed interactive R Shiny applications to assist in exploratory data analysis of multiple variables across several datasets.

Graduate Assistant - Statistical Consulting January 2022 – July 2022

- Provided statistical consulting services to clients across diverse disciplines, delivering actionable insights and quality reports.
- Adapted to different problems by applying various statistical methods and ensuring statistical rigor.

Graduate Assistant - Data Science Workshop Development August 2021 – December 2021

- Assisted in the development of a data science workshop (using R) for water/wastewater treatment professionals.
- Created practice problems and solutions for topics ranging from data wrangling and visualization to statistical and machine learning models.

Brigham Young University *Provo, UT*
Statistics Research Assistant June 2020 – May 2021

- Built and used multivariate Bayesian models (using R and Stan) to analyze and understand noisy environmental data.
- Contributed as second author to the development of a manuscript, resulting in publication in a reputable journal.

Relevant Coursework

- Multivariate analysis
- Computational statistics (R)
- SAS programming
- High-dimensional data analysis
- Bayesian theory and methods
- Design of Experiments/Clinical Trials
- Time series
- Advanced data-driven methods

Publications

Published/Accepted

2. **Grimm, T. R.**, Branch, A., Thompson, K. A., Salveson, A., Zhao, J., Johnson, D., Hering, A. S., and Newhart, K. B. (2024). Long-term statistical process monitoring of an ultrafiltration water treatment process. *ACS ES&T Engineering*, 4 (6), 1492-1506. https://doi.org/10.1021/acsestengg.4c00042

1. Heiner, M., **Grimm, T.**, Smith, H., Leavitt, S. D., Christensen, W. F., Carling, G. T., and St. Clair, L. L. (2023). Multivariate receptor modeling with widely dispersed Lichens as bioindicators of air quality. *Environmetrics*, 34 (3), e2785. https://doi.org/10.1002/env.2785

In Progress

3. **Grimm, T. R.**, Newhart, K. B., and Hering, A. S. (2024+). Nonparametric threshold estimation of autocorrelated statistics in multivariate statistical process monitoring. *Under review.*

2. **Grimm, T. R.**, Villez, K. Newhart, K. B., and Hering, A. S. (2024+). A review of methods for handling limited or contaminated historical data in statistical process monitoring.

1. **Grimm, T. R.**, Newhart, K. B., and Hering, A. S. (2024+). A robust self-starting Bayesian approach for multivariate phase II monitoring.

Research Experience and Interests

- Outlier/anomaly detection
- Multivariate statistics
- Time series
- Machine learning
- Bayesian methods

Presentations

- "Nonparametric Threshold Estimation for Autocorrelated Monitoring Statistics", Joint Statistical Meetings, American Statistical Association, Portland, OR. (August 2024)
- "Multivariate Fault Detection for Water Reuse: An Ultrafiltration Case Study", Water Quality Technology Conference, American Water Works Association, Dallas, TX. (November 2023)
- "Nonparametric Threshold Estimation of Autocorrelated Statistics in Multivariate Statistical Process Monitoring", Southern Regional Council on Statistics, Baylor University, Waco, TX. (June 2023) †
- "Bayesian Multivariate Receptor Modeling with Lichens as Biomonitors", Student Research Conference, Brigham Young University, Provo, UT. (February 2021)

† : poster

Skills

- **Advanced:** R
  - tidyverse (dplyr, ggplot2, etc.), Keras (TensorFlow), RMarkdown/Quarto, shiny, rstan, rjags, caret, tidymodels, torch
- **Proficient:** LaTeX, Git/GitHub, SAS, Python (pandas, numpy, scikit-learn)

Languages

- **English:** Native
- **Tagalog:** Advanced

Scholarships and Awards

- Boyd Harshburger Travel Award (Southern Regional Council On Statistics) 2023
- Outstanding 1st Year PhD Student (Department of Statistical Science, Baylor University) 2021–2022
- Graduate School Fellowship (Baylor University) 2021
- Academic Scholarship — Brigham Young and Wessell/Marshall Memorial (Brigham Young University) 2018–2021
- Eagle Scout (Boy Scouts of America) 2015