Derik T. Boonstra Ph.D. Candidate

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Research Interest

Sufficient Dimension Reduction; High-Dimensional Data Analysis; Genomics; Machine Learning and Feature Selection; Multivariate Statistics; Computational Statistics

Education

Ph.D., *Statistics, Baylor University* 2023 - May 2026 (Expected)

- Concentrations: Data Science and Biostatistics
- Advisors: Dean M. Young, Ph.D. and Rakheon Kim, Ph.D.
- Dissertation: "The Introduction of Dimension Reduction Subspace Ordering and New Heteroscedastic Sufficient Dimension Reduction Methodologies"

M.S., *Statistics, Baylor University* 2022 - 2023

B.B.A., *Baylor University* 2019 - 2022

- Majors: Business Fellows (Honors), Statistics, Finance, & Accounting
- Honors Thesis: "Statistical Properties of Financial Market Data Structures"

Profession Experience

Baylor University Waco, TX
Teacher of Record 2023 - Present

Baylor University Waco, TX
Graduate Teaching Assistant 2022 - 2023

Baylor University Waco, TX
NSF MoWaTER Data Science Fellow Summer 2022

Alexander Lankford & Hiers Inc. Lufkin, TX
Taxation Intern Summer 2020

St. Luke's Health - Memorial Hospital Lufkin, TX
Financial Clerk Summer 2018

Teaching

Baylor University

QBA 3305: *Introduction to Business Analytics* Fall 2025 - Present

- Teacher of Record. Independently developed all lecture materials, assignments, projects, and examinations. Taught undergraduate business students R programming for statistical methodologies as part of a departmental initiative to expose students to modern-trends in data science for business analytics.

STA 1380: *Elementary Statistics* Fall 2023, Spring 2024, Fall 2024, Spring 2025

- Teacher of Record advised by Amy B. Maddox, Ph.D. Developed all assignments and examinations. Taught core statistical concepts including probability models, hypothesis testing, and regression with data analysis and visualization using JMP.

STA 1380: *Elementary Statistics (Supplemental Instructor)* Fall 2022, Spring 2023

- Taught recitation courses for STA 1380 and assisted with grading examinations.

Publications & Manuscripts

Boonstra, D. T., Kim, R., and Young, D. M. (2025). "Subspace Ordering for Maximum Response Preservation in Sufficient Dimension Reduction", *Under Review at Journal of the American Statistical Association*

Boonstra, D. T., Kim, R., and Young, D. M. (2025)."Precision Matrix Regularization in Sufficient Dimension Reduction for Improved Quadratic Discriminant Classification", *Under Review at Computational Statistics and Data Analysis*, 2025, doi:10.48550/arXiv.2506.19192

Manuscripts in Progress

Boonstra, D. T., Kim, R., and Young, D. M. "Heteroscedastic Invariant Sufficient Dimension Reduction"

Boonstra, D. T., Kim, R., and Young, D. M. "Sufficient Dimension Reduction Methods for High-Dimensional Data Are Overly Complicated"

Boonstra, D. T., Kim, R., and Young, D. M. "Ordering Dimension Reduction Subspaces via a Quadratic Discriminant Optimal Error Rate"

Awards & Scholarships

- Baylor Outstanding Graduate Student Instructor Recognition Fall 2023, Spring 2024, Fall 2024
- Baylor Presidents Scholarship 2019 - 2022
- Achievement Gold Baylor Scholarship 2019 - 2022
- Robert & Sara E Carnahan Scholarship 2019 - 2022
- Richard/Fern Davis Scholarship 2019 - 2022
- Bruce McMillan Jr Scholarship 2019 - 2022
- Baylor LEAD LLC Scholarship 2019 - 2020

Certifications

- Institute of Management Accountants Data Analytics Certificate

Open-source statistical software

D. T. Boonstra, Sufficient Dimension Reduction (`sdr`). Available on Github.

- An `R` package for modern sufficient dimension reduction techniques including dimension selection, feature selection, and subspace ordering.

Professional Affiliations

American Statistical Association (ASA) 2022 - Present

- Section on Statistics and Data Science Education
- Section on Statistical Computing
- Section on Statistics in Genomics and Genetics
- Business and Economic Statistics Section

Technical Competencies

- Programming: R (including R Markdown, Quarto, and Shiny app development), Python, SAS, MATLAB, Wolfram (Mathematica), Bash, html, css
- Version Control: Git, GitHub user @D3r1kBoonstra
- Applications: Posit, TEX, LATEX, BIBTEX, Vim, JMP, SPSS, Microsoft Office