

W. Zachary Horton

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Data scientist with a PhD and experience establishing an investment firm's standards for risk analysis as its portfolio ROI grew by 45% and the amount entrusted by clients increased 100x.

SUMMARY OF ACCOMPLISHMENTS AND CORE STRENGTHS

- **Data Science:** Joined as a startup fintech company's fourth employee, reduced its risk exposure by 50% and forecasting error by 20%, and helped it expand into markets in Asia and South America. Provided data analysis and validation for major clients at a health insurance company, and enabled them to optimize pricing models. Also developed biomechanical waveform models at a leading university.
- **Quantitative Research:** Combined machine learning models and statistical methods in company-first ways. Used linear regression, GARCH, time-series, random forest, gradient boosting, and others.
- **Customer Relations:** Increased clients' confidence by improving the security of their portfolios through risk-mitigation strategies. Made a user interface more user-friendly by simplifying it and collecting user feedback. Consulted with manufacturing company on improving disaster forecasting.
- **Communication:** Gave several award-winning conference presentations (e.g. Springer Best Talk at j-ISBA BAYSM 2023), and successfully presented to a large group of donors and campus administrators. Played a key part in writing 11 papers in statistics and biomechanics. Taught a graduate-level analytics course.

*Data Science • Machine Learning • Applied Science • Quantitative Research • Bayesian Statistics
Regression • Forecasting • Big Data Methods • GLM • HMM • Time-Series • Spatial Models • Survival Analysis
NLP • Generative AI • Neural Networks • Gradient Boosting • Gaussian Process • Nonparametrics
Python • R • Julia • STAN • JAGS • Tableau • GGPlot • SQL • Polars • Excel • JMP • SAS*

PROFESSIONAL EXPERIENCE

Double River Investments, Lehi, UT

Quantitative Researcher and Data Scientist (Feb.2020–Present)

Joined as the company's fourth employee and built their first comprehensive suite of metrics for strategy performance, volatility, and risk exposure as the portfolio's ROI rose by 45%, the amount entrusted by clients increased 100x, and the company grew from the U.S. to Asia, Latin America, and Africa. Developed machine learning algorithms and provided data science insights as the resident statistical expert.

- Combined predictions from several models, including linear regression, GARCH, time-series, random forest, and gradient boosting using a Bayesian ensemble.
- Helped expand return forecasting beyond single assets by implementing a cross-sectional risk factor model.
- Built a Hidden Markov Model to detect market regime changes, leading to a 50% decrease in volatility and a 67% improvement in the Sharpe ratio over buy-and-hold.
- Broadened the scope of trading signals by testing industry-specific fundamental values including retail sales and oil/gas projections.

- Increased testing efficiency by 75% by writing a script that simplified parallel backtesting on a cloud-based platform.
- Maximized forecasting accuracy by developing a routine that found and eliminated the largest outliers. Used an efficient QR decomposition algorithm to reduce computational burden of rolling windows.
- Established early standards for clear and comprehensive reporting, including both numerical metrics and data visualization.

University of North Carolina, Exercise and Sports Science Department, Chapel Hill, NC

Academic Collaborator (Aug.2020–Present)

Helped conduct biomechanical research to ultimately determine the best treatments for patients post-surgery. Expanded the scope of statistical models from basic group comparisons to functional mixed effects regressions and developed the machine learning algorithms required to fit the models.

- Decreased the potential for overfit using a penalized B-spline model to analyze biomechanical waveform data. Programmed in R and Julia.
- Achieved a 4x speed improvement by implementing a multivariate Bayesian conjugate prior model and using parallel matrix routines.
- Lowered barriers of entry for other researchers by migrating the backend from C++ to Julia, leading to easier setup and cross-platform compatibility.
- Improved the R package UI by collecting user feedback and simplifying the input process.
- Further lowered barriers for research by enabling the UI to automatically process dependencies.
- Coauthored 11 papers by contributing written statistical method descriptions, and providing responses to reviewer questions with explanations and justifications.

Aon – Health and Benefits, Denver, CO

Actuarial Consulting Intern (May.2017–Aug.2017)

Provided data science and data validation that enabled clients to set prices for health policies and determine required reserve amounts.

- Contributed to actuarial modeling for the third largest client. Validated input data and calculations, and found critical errors. Forecasted reserves needed to pay claims and suggested changes to adjust for new client risks.
- Took responsibility for a full pricing project related to a city fire department's health insurance. Used VBA to complete the project 3x faster than expected.
- Confirmed results from new web-based system were consistent with Excel output and wrote educational materials on using the system.

EDUCATION

PhD, Statistical Science, University of California, Santa Cruz, CA (Sep.2019–Dec.2024)

– ARCS Scholar (2021/2023), Koerner Family Fellow (2022)

MS, Statistics, Brigham Young University, Provo, UT (Aug.2017–Aug.2019)

– Integrated MS/BS program, 2nd place in 3MT Competition

BS, Actuarial Science, Brigham Young University, Provo, UT (Jan.2015–Aug.2019)

– Overall GPA 3.94, Major GPA 4.0, Graduated Magna Cum Laude
