

Spencer Hilligoss

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Education

PhD in Statistics

University of California, Irvine

*Sep 2023 – Present
(Expected December 2027)*

- **Coursework:** Advanced Probability, Machine Learning, Statistical Consulting
- **Research Topics:** Time-series Forecasting, Deep Learning, Generative Modeling, Causal Inference
- **Supervised by:** Dr. Annie Qu and Dr. Tianchen Qian
- **GPA:** 3.929/4.0

B.S. in Statistics and Operations Research, B.A. in Economics

University of North Carolina at Chapel Hill

Aug 2019 – May 2023

- **Coursework:** Probability, Statistical Machine Learning, Real Analysis, Stochastic Modeling, Dynamic Decision Making, Financial Markets, Micro and Macro Economic Theory
- **GPA:** 3.7/4.0

Fellowships and Awards

University of California, Irvine

- T32 STEER in Biomedical Sciences Fellow *Aug 2025 - Present*
- Diversity Recruitment Fellowship *Aug 2023*

Harvard University, Opportunity Insights

- PREDOC Summer Program: Using Big Data to Solve Economic and Social Problems *Summer 2022*

Published Work

Hilligoss, S., Qu, A. (2026). “Causal Mediation Pathways in Continuous Postprandial Glucose Monitoring for Type 1 Diabetes Patients.” *npj Metabolic Health and Disease*, 4, 35. [doi:10.1038/s44324-026-00127-z](https://doi.org/10.1038/s44324-026-00127-z) 

Manuscripts in Progress

Hilligoss, S., Saha, A., Qian, T. (2026). “Selective Inference for Time-Varying Causal Effect Moderation via the Ordered Lasso.” *Manuscript in Preparation*.

Research and Work Experience

The Lasting Impact of HOLC Redlining on Minorities in New York

June 2022 - Aug 2022

Harvard University, Research and Policy Institute

- Built a reproducible big-data workflow in R to merge HOLC redlining maps with demographic and socioeconomic datasets and construct neighborhood-level exposure measures.
- Estimated regression-based effects of historical redlining on present-day minority outcomes using large-scale, geographically linked data; ran robustness/sensitivity checks.
- Synthesized results in a short research paper and presented findings in a web-based symposium.

Sentiment-Enhanced LSTM Forecasting (DJIA)

Sep 2024 - Dec 2024

University of California, Irvine

- Engineered a daily feature set combining market data with text-based sentiment signals (news/social text) and aligned features to next-day index returns.
- Implemented and trained LSTM forecasting models; compared against baseline time-series models using rolling/expanding-window backtests and out-of-sample error metrics.
- Analyzed model behavior (feature lags, overfitting controls, and stability across regimes) and documented results with clear, reproducible experiments.

Presentations

- “Time-Varying Effects of Meals and Insulin on Postprandial Glucose Response Using Autoencoder-Based Causal Representations.” Pre-ENAR Seminar, University of California, Los Angeles. *March 2026*
- “Time-Varying Effects of Meals and Insulin on Postprandial Glucose Response Using Autoencoder-Based Causal Representations.” Qu Lab Seminar, University of California, Santa Barbara. *November 2025*

Teaching Experience

Guest Lecturer, University of California, Irvine

- STATS 295: Special Topics in Machine Learning *Winter 2025*
 - Handling Data in R and Python, Web Scraping (January 2025)
 - PyTorch Tutorial for Deep Learning (February 2025)

Mentorship

Undergraduate Research Mentor, University of California, Santa Barbara

- Bryson Harris: financial time series modeling (weekly research meetings).
- Daniel You: generative diffusion modeling with an application to soccer tactics (weekly research meetings).

Computing Tools

Python (PyTorch, NumPy, Pandas, scikit-learn); R; Git; Linux; HPC/Slurm; Stata; Excel