Will Hartog

203-823-7588 | whartog@stanford.edu | https://www.linkedin.com/in/william-hartog-950117167/ | whartog.github.io

Education

Stanford University — **Stanford, CA**
Ph.D. Candidate in Statistics | Advised by Lihua Lei — **September 2021 - June 2026**
Harvard University — **Cambridge, MA**
A.B. Cum Laude with High Honors in Mathematics and Statistics | Secondary in Music — **August 2017 - May 2021**

Awards

Achievement Rewards for College Scientists (ARCS) Fellowship — 2024-2026
CIRTL@Stanford Teaching Certificate, Practitioner Level — July 2025
Centennial Teaching Assistant (CTA) Award — May 2025
IMS International Conference on Statistics and Data Science (ICSDS) Travel Award — December 2024

Research Experience

Stanford University — Stanford, CA
Research with Lihua Lei — September 2022 - Present

- Extended existing framework to control family-wise error rate (FWER) with e-values, a recently developed notion of statistical evidence that is more robust than p-values (preprint: https://arxiv.org/abs/2501.09015)
- Developed a dynamic programming approach to compute the e-value closed test on any direct acyclic graphs (DAG), improving the computational complexity from exponential to polynomial in the size of number of hypotheses

Research with Lihua Lei and Peter Grünwald — August 2024 - Present

- Working on proving the asymptotic validity of the quasi-RIPr procedure for testing composite nulls with nuisance paramters

Research with Lihua Lei and DoorDash — February 2024 - Present

- Developing short-term proxies for long-term metrics leveraging database of historical experiments
- Writing simulations in Python to test efficacy of methods in variety of data generating process settings

Harvard Business School — Boston, MA
Research Assistant — August 2020 - September 2021
PRIMO Research Fellow — June 2020 - August 2020

- Under supervision of Professor Josh Lerner, performed data cleaning and visualization on large earnings calls and patents datasets, developing procedure for correlation-based clustering on two-word bigrams
- Participated in competitive HBS undergraduate research program, with a total of seventeen fellows

Talks and Posters

Stanford Causal Science Center Conference — Stanford University, November 2025
CODE@MIT — MIT, November 2025

- **Many Hands Make Light Work: Long-Term Effect Inference for the Experiment Reservoir:** Joint work with Lihua Lei, Mandar Rahurkar, Navdeep Sahni, and Yixin Tang; new method for predicting long-term effects from short-term experiment data using a historical database (reservoir) of experiments.

International Conference on Multiple Comparison Procedures — Philadelphia, PA, August 2025
e-Readers Group — Online, May 2025
International Seminar on Selective Inference — Online, April 2025

- **Family-wise Error Rate Control with e-values:** Joint work with Lihua Lei; revised version of FWER Control Closure Algorithms for e-values, with additional interpretations

International Conference on Statistics and Data Science — Nice, France, December 2024

- **FWER Control Closure Algorithms for e-values:** Joint work with Lihua Lei; general version of Multiple A/B Testing with always valid e-values

Stanford Causal Science Center Conference on Experimentation — Stanford University, May 2024
CODE@MIT — MIT, November 2023

Experimentation and Causal Inference Stanford University, June 2023

- **Multiple A/B Testing with always-valid e-values:** Joint work with Lihua Lei; presented algorithms to compute the graphical approach for FWER control with e-values using a weighted average local test

Statistics Department Retreat Stanford University, May 2025, May 2024, May 2023

- **Bradley-Terry Models for Medium-Dimensional Data:** Presented on a Bradley-Terry analysis of a March Madness bracket between tea snacks and the theoretical implications of the exact specification of a single elimination tournament bracket
- **Multiverse-Powered Inference:** Presented on a survey of the hypothetical possibilities for statistics given Doctor Strange's multiverse-sampling powers; inspired by the Marvel superhero movie Avengers: Infinity War
- **Once Upon a Stream: Mining for Significance:** Presented on an instance of the discussion of multiple testing and selective inference in the mainstream, testing for cheating in a 2020 Minecraft speedrun

Teaching Experience

Stanford University — Stanford, CA

Primary Instructor

Stats 217: Introduction to Stochastic Processes I June 2024- August 2024, June 2023 - August 2023

- Prepared and taught masters-level introductory course in stochastic processes, including discrete- and continuous-time Markov chains, branching processes, and Poisson processes

Stats 100: Mathematics of Sports January 2024 - March 2024, April 2023 - June 2023

- Designed and taught undergraduate-level course in sports statistics, covering a variety of principles and methods applicable in sports analytics, including linear and logistic regression, shrinkage, Markov and Poisson models
- Created slides and R examples from variety of sources and created homeworks and homework templates for the R language
- Guided students through final project and curated website for display of projects

Teaching Assistant

Stats 218: Introduction to Stochastic Processes II	April 2025 - June 2025
Stats 116: Introduction to Probability	September 2022 - December 2022
Stats 216V: Introduction to Statistical Learning	June 2022 - August 2022
Stats 100: Mathematics of Sports	January 2022 - March 2022
Stats 202: Data Mining and Analysis	September 2021 - December 2021

Harvard University — Cambridge, MA

Teaching Assistant

Math S1a: Calculus I	June 2021 - August 2021
Math 154: Probability Theory	January 2021 - May 2021
Stat 110: Introduction to Probability	September 2020 - December 2020
Math 101: Sets, Groups and Topology	September 2019 - December 2019
Math S1ab: Calculus I and II	June 2019 - August 2019
Math 21b: Linear Algebera	September 2018 - December 2018

Professional Development

Stanford Center for Teaching and Learning — Stanford, CA

CIRTL Teaching Certificate Program January 2023 - July 2025

- Completed the Center for the Integration of Research, Teaching and Learning (CIRTL) Teaching Certificate Program at the Practitioner level
- As part of program, engaged in many teaching development programs and activities, including a teaching consultation, evidence-based teaching class, IDEAL pedagogy seminar, Teaching as Research (TAR) program, and more

Preparing Future Teaching Professors Fellow December 2024 - March 2025

- Participated in competitive career and teaching development course and program
- Matched with mentor Professor James Wilson at the University of San Francisco to shadow his class and gain experience with teaching at a primarily undergraduate institution, including giving a guest lecture

Teaching as Research September 2023 - Present

- Participated in Stanford Graduate Summer Institute workshop on Teaching as Research (TAR) project development

- Developed and implemented TAR project in Stats 100 in Winter 2024, with the purpose of investigating and measuring how open-ended project-like homeworks and traditional problem sets differ in their efficacy in teaching statistical concepts

Cal Polytechnic State University San Luis Obispo, CA
Workshop Attendee April 2025

- Received funding for and attended "Teaching Statistical Thinking with GAISE" workshop at Cal Poly on teaching statistcal thinking with hands-on activities and online tools

Industry Experience

Lyft San Francisco, CA
Data Science Intern, Pricing June 2025 - September 2025

- Worked on the base pricing team to improve the accuracy of a model used for predicting the effect of a price changes
- Using Python and SQL, leveraged data visualization and statistical analysis and intuition to identify an improved training procedure that produced a significant gain in accuracy
- Communicated and collaborated with team members and other project stakeholders to contextualize and execute the project

Service & Activities

Stanford Department of Statistics Stanford, CA
Statistics Curriculum Transformation Project January 2024 - Present

- Worked on team redeveloping the introductory probability sequence, specifically to develop section structure and materials

Applied Statistics Qualifying Exam Coach June 2024 - August 2024

- Led review and problem-solving sessions for the summer quarter to prepare first year statistics doctoral students for their qualifying exam in applied statistics. Everyone passed!

Academic Review Work
Annals of Statistics, Biometrical Journal

Stanford Biomedical Data Science Stanford, CA
Data Science Mentor January 2023 - March 2025

- In each of Winter 2023 and 2025, acted as a graduate mentor for a local community college student majoring in data science
- Provided advice and guidance for statistics coursework and learning statistical and coding concepts

Women and Allies in Statistics (WAIS) Stanford, CA
Member, Event Leader October 2024 - Present

- Participated in and helped lead student group supporting graduate students, especially women, in their academic journeys
- Co-led writing of a successful grant application to receive fifteen hundred dollars in funding for WAIS speaker series for the 2025-2026 academic year.

Skills & Interests

Skills: Python, R, SQL, Microsoft Excel, Mathematica

Interests: Ultimate frisbee, Tennis, French horn, Crosswords, Jigsaw puzzles, Phillies baseball, Sea shanties