Will Hartog

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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 — 2024-2025
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

- Developed a framework for controlling family-wise error rate (FWER) with e-values, a recently developed notion of statistical evidence that is more robust than p-values
- 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

DoorDash — San Francisco, CA
Contract Researcher — February 2024 - Present

- With advisor, 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

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 2024

- **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

Statistics Department Retreat — Stanford University, May 2023

- **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: 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 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

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!

Stanford Center for Teaching and Learning Stanford, CA

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

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

Academic Review Work

Annals of Statistics, Biometrical Journal

Stanford Biomedical Data Science Stanford, CA

Research 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

Skills & Interests

Skills: Python, R, Microsoft Excel, Mathematica

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