Christian T. Covington

PhD Candidate in Biostatistics, Harvard T.H. Chan School of Public Health

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Research Interests

Model misspecification, Model uncertainty, Bayesian statistics

Education

Harvard T.H. Chan School of Public Health September 2022 – Present
PhD in Biostatistics
Advisor: Jeffrey W. Miller
Boston, MA

University of Waterloo September 2020 – June 2022
MMath in Computer Science
Advisors: Xi He and Gautam Kamath
Waterloo, ON, Canada

Cornell University January 2014 – May 2016
BA in Statistical Science
Magna Cum Laude and Distinction in Statistical Science
Ithaca, NY, USA

Honors & Awards

Harvard University Distinction in Teaching 2023, 2024
University of Waterloo Graduate Excellence Award 2020 – 2022
David R. Cheriton Graduate Scholarship 2020 – 2022
Dr. Derick Wood Graduate Scholarship 2020 – 2021
Hunter R. Rawlings III Cornell Presidential Research Scholar 2014 – 2016

Publications

Papers in Submission

Bayesian model criticism using uniform parameterization checks
Christian T. Covington, Jeffrey W. Miller
- Reading group presentation at Flatiron Institute (2025)
- Poster at Columbia University Optimization and Statistical Learning Workshop (2025)

Papers in Progress

A powerful goodness-of-fit test using the probability integral transform of order statistics
Christian T. Covington, Jeffrey W. Miller

Isolating evidence of model misspecification using uniform parameterization checks
Christian T. Covington, Jeffrey W. Miller

Multiverse Analysis for Causal Inference
Christian Covington, Tyler VanderWeele, Maya Mathur

Published Papers

Unbiased Statistical Estimation and Valid Confidence Intervals Under Differential Privacy
Christian Covington, Xi He, James Honaker, Gautam Kamath
Statistica Sinica: Special Issue on Data Privacy (2025)

- Poster at Social Statistics Speed Session at the Joint Statistical Meetings (2021)
- Poster at ICML Theory and Practice of Differential Privacy Workshop (2021)

Differences in patient perceptions of integrated care among black, hispanic, and white Medicare beneficiaries
Emilia J Ling, Molly Frean, Jody So, Maike Tietschert, Nancy Song, Christian Covington, Hassina Bahadurazada, Sonia Khurana, Luis Garcia, Sara J Singer
Health Services Research (2021)

Patient experiences of integrated care in Medicare accountable care organizations and Medicare Advantage versus traditional fee-for-service
Molly Frean, Christian Covington, Maike Tietschert, Hassina Bahadurzada, Jodi So, Sara J Singer
Medical Care (2021)

Invertible promoters mediate bacterial phase variation, antibiotic resistance, and host adaptation in the gut
Xiaofang Jiang, A. Brantley Hall, Timothy D. Arthur, Damian R. Plichta, Christian T. Covington, Mathilde Poyet, Jessica Crothers, Peter L. Moses, Andrew C. Tolonen, Hera Vlamakis, Eric J. Alm, Ramnik J. Xavier
Science (2019)

Variation in Patients' Perceptions of Integrated Care Among Medicare Beneficiaries By Level of Need
Nancy Song, Molly Frean, Christian Covington, Maike Tietschert, Emilia Ling, Hassina Bahadurzada, Michaela Kerrissey, Mark Friedberg, Sara Singer
AcademyHealth Annual Research Meeting (2019)

Teaching Experience

BST 240: Probability II Fall 2024, Fall 2025
Teaching Fellow
Harvard University

BST 210: Applied Regression Analysis Fall 2023
Teaching Fellow
Harvard University

Professional Experience

BridgeBio August 2025 – Present
Research Extern
Palo Alto, CA

- Conducted research on the genetic basis of pancreatitis

Apple May 2021 – August 2021
Summer Intern
Cupertino, CA

- Developed differentially private algorithms for product teams

Harvard University July 2019 – August 2020
Research Fellow: Privacy Tools Project
Cambridge, MA

- Part of core development team for the SmartNoise Rust library
- Created software implementation of and extended theoretical results for differentially private Snapping Mechanism

Broad Institute August 2018 – June 2019
Associate Computational Biologist
Cambridge, MA

- Wrote computational pipelines for preparation and analysis of biological data, including RNA-Sequencing and CRISPR screens
- Created centralized storage and documentation of lab's computational resources
- Contributed to automated system for CRISPR repair template design

Harvard Laboratory for Systems Medicine July 2017 – August 2018
Data Scientist
Cambridge, MA

- Contributed to R package ehR to assist in analyzing electronic medical record data
- Built machine learning models for research on physician testing decisions

Harvard Business School July 2016 – June 2017
Research Associate
Boston, MA

- Helped develop simulations of dynamic strategic interactions

Service

Reviewing

ICML, Philosophical Transactions of the Royal Society A, NeurIPS

Mentoring

Betania Adane (High School Student)
Next Position: Undergraduate at Stanford University

- Mentored through Harvard Undergraduate OpenBio Lab's Summer Research Institute
- Research project was designated as one of the top five original works in the program and selected for publication in *The Young Researcher*