Harrison Goldstein
Assistant Professor, University at Buffalo

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Current Position

University at Buffalo, SUNY
Department of Computer Science and Engineering
Assistant Professor

Education and Past Academic Positions

University of Maryland, College Park
Victor Basili Postdoctoral Research Fellow
Advised by Leonidas Lampropoulos

University of Pennsylvania
Ph.D. in Computer Science
Advised by Benjamin C. Pierce

Cornell University
M.Eng., B.S. in Computer Science
Advised by Adrian Sampson

Publications, Talks, and Grants

Dissertation

Property-Based Testing for the People
Harrison Goldstein *advised by* Benjamin C. Pierce
University of Pennsylvania, Defended May 24, 2024

Referreed Conference Publications

OOPSLA'25 **Tuning Random Generators: Property-Based Testing as Probabilistic Programming**
R. Tjoa, P. Garg, **H. Goldstein**, T. Millstein, B. C. Pierce, G. Van den Broek
Obj.-Oriented Programming, Systs., Langs., and Apps. (OOPSLA) 2025. 25 pages.

OOPSLA'25 **QED in Context: An Observation Study of Proof Assistant Users**
Jessica Shi, Cassia Torczon, **Harrison Goldstein**, Benjamin C. Pierce, Andrew Head
Obj.-Oriented Programming, Systs., Langs., and Apps. (OOPSLA) 2025. 25 pages.

UIST'25 **FEDT: Supporting experiment design and execution in HCI fabrication research**
V. Savage, **H. Goldstein**, N. Püsök, J. Ren, B. Dutt, C. Nandi, L. Oehlberg
User Interface Software and Technology (UIST) 2025. 13 pages.

UIST'24 **Tyche: Making Sense of Property-Based Testing Effectiveness**
Harrison Goldstein, Jeffrey Tao, Zac Hatfield-Dodds, Benjamin C. Pierce, Andrew Head
User Interface Software and Technology (UIST) 2024. 13 pages.

PLDI'24 **Stream Types**
J. W. Cutler, C. Watson, E. Nkurumeh, P. Hilliard, **H. Goldstein**, C. Stanford, B. C. Pierce
Programming Language Design and Impl. (PLDI) 2024. 24 pages.

PLDI'24 **Daedalus: Safer Document Parsing**
I. Diatchki, M. Dodds, **H. Goldstein**, B. Harris, D. Holland, B. Razet, C. Schlesinger, S. Winwood
Programming Language Design and Implementation (PLDI) 2024. 24 pages.

ICSE'24 **Property-Based Testing in Practice**
Distinguished **Harrison Goldstein**, Joseph W. Cutler, Daniel Dickstein, Benjamin C. Pierce, Andrew Head
International Conference on Software Engineering (ICSE) 2024. 23 pages.

ICFP'23 **Reflecting on Random Generation**
Distinguished **Harrison Goldstein**, Samantha Frohlich, Meng Wang, Benjamin C. Pierce
International Conference on Functional Programming (ICFP) 2023. 34 pages.

OOPSLA'22 **Parsing Randomness**
Harrison Goldstein, Benjamin C. Pierce
Obj.-Oriented Programming, Systs., Langs., and Apps. (OOPSLA) 2022. 25 pages.

ESOP'21 **Do Judge a Test by its Cover: Combining Combinatorial and Property-Based Testing**
Harrison Goldstein, John Hughes, Leonidas Lampropoulos, Benjamin C. Pierce
European Symposium on Programming (ESOP) 2021. 27 pages.

Workshop Papers and Experience Reports

PLATEAU'25 **Designing Proof Deautomation in Rocq**
Jessica Shi, Cassia Torczon, **Harrison Goldstein**, Benjamin C. Pierce, Andrew Head
PLATEAU Workshop 2025. 12 pages.

OCaml'24 **Mica: Automated Differential Testing for OCaml Modules**
Ernest Ng, **Harrison Goldstein**, Benjamin C. Pierce
OCaml Workshop 2024. 2 pages.

ICFP'23 **Etna: An Evaluation Platform for Property-Based Testing (Experience Report)**
J. Shi, A. Kelles, **H. Goldstein**, B. C. Pierce, L. Lampropoulos
International Conference on Functional Programming (ICFP) 2023. 17 pages.

HATRA'22 **Some Problems with Properties: A Study on Property-Based Testing in Industry**
Harrison Goldstein, Joseph W. Cutler, Adam Stein, Benjamin C. Pierce, Andrew Head
Human Aspects of Types and Reasoning Assistants (HATRA) 2022. 8 pages.

SysML'18 **Programming Language Support for Natural Language Interaction**
Alex Renda, **Harrison Goldstein**, Sarah Bird, Chris Quirk, Adrian Sampson
Conference on Machine Learning and Systems (SysML) 2018. 3 pages.

Demos

SCF'24 **Supporting Characterization Experiments in Fabrication Research**
V. Savage, N. Püsök, **H. Goldstein**, C. Nandi, J. Yi Ren and L. Oehlberg
Symposium on Computational Fabrication (SCF) 2024.

UIST'23 **Tyche: In Situ Analysis of Random Testing Effectiveness**
Harrison Goldstein, Benjamin C. Pierce, Andrew Head
User Interface Software and Technology (UIST) 2023.

Talks and Podcasts

Talk **Property-Based Testing for the People**
Invited **Harrison Goldstein**
Cornell + UT Software Engineering Seminar

Talk **The Best New Programming Language is a Proof Assistant**
Harrison Goldstein
DC Systems 006

Podcast
Invited
Haskell Interlude #59
Samantha Frohlich, Wouter Swierstra, **Harrison Goldstein**
Haskell Interlude Podcast, December 2024

Talk
Invited
My PhD Compass: 6 Ways to Guide a PhD Towards Success
Harrison Goldstein
PL Mentoring Workshop @ ICFP, September 2024

Podcast
Invited
Disseminate #55
Jack Waudby, **Harrison Goldstein**
Disseminate Podcast, June 2024

Talk
Usable Property-Based Testing
Harrison Goldstein
Amazon Web Services, June 2024

Talk
Invited
Consider Collaboration
Samantha Frohlich, **Harrison Goldstein**
PL Mentoring Workshop @ POPL, January 2024

Talk
Invited
Advancing Property-Based Testing in Theory and Practice
Harrison Goldstein
Microsoft Research, UC Berkeley, Galois, Inc., UCSC, University of Bristol

Talk
Property-Based Testing in Practice
Harrison Goldstein
Jane Street Programming Languages Colloquium, December 2023

Podcast
Invited
TheForkJoin #2
Oliver Flatt, Rachit Nigam, **Harrison Goldstein**
TheForkJoin Podcast, July 2024

Talk
Some Problems with Properties
Harrison Goldstein
NJPLS, October 2022

Talk
Reflecting on Random Generation
Harrison Goldstein
NJPLS, May 2022

Posters

ICFP'21
Ungenerators
Harrison Goldstein
ICFP 2021

POPL'20
Algebraic Combinatorial Testing
Harrison Goldstein
POPL 2020

Misc.

Draft
Delimited Continuations and Monads
Harrison Goldstein
Unpublished PhD Milestone Draft, April 2021

SIGBOVIK'21
Everybody Clap Your Hands: The Cha-Cha Slide is Turing Complete
Harrison Goldstein
Conf. of the ACH Special Interest Group on Harry Q. Bovik (SIGBOVIK) 2021. 5 pages.

Blog Post **Conferences after COVID: An Early Career Perspective**
J. W. Cutler, **H. Goldstein**, A. K. Hirsch, J. Hong, C. Nandi
SIGPLAN PL Perspectives Blog, March 2021

Funded Grant Proposals

NSF #2402449 SHF: Medium: Usable Property-Based Testing
2023-2024
Made significant contributions, in the form of both research project ideas and grant writing, to help secure a NSF Medium grant. This grant helped to fund my dissertation work, and it will continue to fund follow-on projects.
Team: Benjamin Pierce (co-PI), Andrew Head (co-PI), **Harrison Goldstein** (contributor)

Amazon Research Award: TYCHE: An IDE for Property-Based Testing
Spring 2023
Secured funding from AWS to fund my ongoing work on user interfaces for property-based testing. This award includes the opportunity to collaborate with contacts at AWS, including Michael Hicks, on interfaces that support real industrial workloads.
Team: **Harrison Goldstein** (primary author), Benjamin Pierce (co-PI), Andrew Head (co-PI)

Awards and Honors

John C. Reynolds Doctoral Dissertation Award 2025
ACM Special Interest Group on Programming Languages

Morris and Dorothy Rubinoff Award 2024
University of Pennsylvania, Department of Computer and Information Science

Victor Basili Postdoctoral Fellowship
University of Maryland, Computer Science Department

Certificate in Engineering Leadership
Cornell Engineering Leadership Certification Program

1250 Day Crossword Streak
New York Times Games

Teaching and Advising

Graduate Advisees

Collaborator and Research Mentor, Cassia Torczon

Collaborator and Research Mentor, Thia Richey

Collaborator and Research Mentor, Segev Elazar Mittelman

Collaborator and Research Mentor, Alperen Keles

Collaborator and Research Mentor, Pierce Darragh

Collaborator and Research Mentor, Joseph W. Cutler

Collaborator and Research Mentor, Jessica Shi

Co-Advisor, Ernest Ng

Courses

UB CIS 702 "Effective and Usable Formal Methods"
Graduate Seminar

Penn CIS 552 "Advanced Programming"
Prof. Stephanie Weirich
Head TA 2020-2021

Penn CIS 810 "Writing and Speaking with Style"
Prof. Benjamin C. Pierce
Head TA 2021

Cornell CS 3110 "Functional Programming"
Prof. Nate Foster
Head TA 2017

Cornell Engineering Leadership
Profs. Erica Dawson and Werner Zorman
Head TA 2017

Cornell CS 2112 “Object-Oriented Design and Data Structures (Honors)”
Prof. Dexter Kozen
TA 2016

Service

Conference Organizing and Reviewing

Steering Committee Member, Upstate PL — Ongoing

PC Member, OOPSLA 2026 — Upcoming

PC Member, PLDI 2025

PC Member, PLATEAU 2025

Steering Committee Member, NJPLS

Student Reviewer, PLATEAU 2024

Co-Organizer, Celebration for Benjamin Pierce’s 60th Birthday

PC Member, HATRA 2023

Organizer, NJPLS 2023

Social Chair, POPL 2021

A/V Coordinator, ICFP 2021

Mentorship

Speaker, PL Mentoring Workshop @ ICFP 2024

Ph.D. Mentor, SIGPLAN-M

Ph.D. Mentor, Penn CIS Mentoring

Speaker, PL Mentoring Workshop @ POPL 2024

Research Mentor, REPL REU 2023

Research Mentor, DeepSpec REU

Misc.

Editor in Chief, PLClub Blog 2021-2024

Employment

University at Buffalo, SUNY
Assistant Professor 2025–

University of Maryland, College Park
Victor Basili Postdoctoral Fellow 2024-2025
Working with Prof. Leonidas Lampropoulos on topics related to usable property-based testing.

Galois, Inc.
Research Intern 2023
Worked on two research papers related to the SafeDocs DARPA program. Provided expertise on testing that helped situate the papers in the broader research context.

Amazon Web Services
Research Intern 2020
Worked on Zelkova, a tool for analyzing and proving properties about AWS access policies. Encoded logical constraints from access policies as SMT formulas, in order to infer policy implications.

Broadway Technology
Software Engineer and Software Engineering Intern 2017–2019
Built mission-critical internal tools for the company's financial personnel, in particular facilitating a transition to new financial tracking software. Designed and implemented data connectors, financial calculations, web interfaces, and more.

Susquehanna International Group, LLC
Technology Intern 2016
Helped to implement a safety system, protecting the firm from anomalous trading behaviors. Built an engine for executing business rules as monitors for live trading activities.

Last Second Beach, LLC
Chief Technology Officer 2015–2016
Helped to lead a small, early stage start-up, focused on providing one-price vacations. Built a demo iOS application, helping the company to win a $25,000 grant as part of a Business Plan Competition.