harrisongoldste.in
me@harrisongoldste.in
@hgoldstein95

Education

Ph.D. in Computer Science
University of Pennsylvania
2019-2024

M.Eng. in Computer Science
Cornell University
2018 — GPA 4.02

B.S. in Computer Science
Cornell University
2014-2018 — GPA 4.08

Teaching

Penn CIS 552
Head TA 2020-2021

Penn CIS 810
Head TA 2021

Cornell CS 3110
Head TA 2017

Cornell Eng. Leadership
Head TA 2017

Cornell CS 2112
TA 2016

Awards and Honors

Victor Basili Postdoctoral Fellowship
University of Maryland

Certificate in Engineering Leadership
Cornell ECLP

1st Place, Business Plan Competition
Cornell Sch. of Hotel Admin.

Harrison Goldstein

Postdoctoral Fellow

I am a postdoc working with Leo Lampropoulos and Benjamin Pierce. My work combines programming languages, software engineering, and human-computer interaction to improve the tools that developers use to build software. The bulk of my work so far has focused on *property-based testing*.

Selected Publications

Property-Based Testing for the People
Dissertation

Tyche: Making Sense of Property-Based Testing Effectiveness
UIST 2024 Research Paper

Property-Based Testing in Practice **Distinguished Paper**
ICSE 2024 Research Paper

Reflecting on Random Generation **Distinguished Paper**
ICFP 2023 Research Paper

Parsing Randomness
OOPSLA 2022 Research Paper

Grants

NSF #2402449 SHF: Medium: Usable Property-Based Testing
National Science Foundation

TYCHE: An IDE for Property-Based Testing
Amazon Research Award 2023

Employment

Victor Basili Postdoctoral Fellow
University of Maryland, College Park 2024-2026

Research Intern
Galois, Inc. 2023

Research Intern
Amazon Web Services 2020

Selected Service Roles

Steering Committee Member
NJPLS Ongoing

Speaker
PLMW (POPL'24, ICFP'24)

Research Mentor
REPL REU 2023, 2024

PC Member
HATRA 2023

Research Mentor
DeepSpec REU

Organizer
NJPLS 2023

Social Chair
POPL 2021

A/V Coordinator
ICFP 2021

Harrison Goldstein

Postdoctoral Fellow

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Publications, Talks, and Grants

Dissertation

Property-Based Testing for the People
Harrison Goldstein
advised by Benjamin C. Pierce
approved by Stephanie Weirich (committee chair), Andrew Head, Mayur Naik, Hila Peleg
Defended May 24, 2024

Refereed Conference Publications (7 total, 5 first author, 2 distinguished papers, 5 PL, 1 SE, 1 HCI)

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

PLDI'24 *PL*
Stream Types
Joseph W. Cutler, Christopher Watson, Emeka Nkurumeh, Phillip Hilliard, **Harrison Goldstein**, Caleb Stanford, Benjamin C. Pierce
Programming Language Design and Impl. (PLDI) 2024. Article 204, pages 1412–1436.

PLDI'24 *PL*
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. Article 180, pages 816–840.

ICSE'24 *SE*, **Distinguished**
Property-Based Testing in Practice
Harrison Goldstein, Joseph W. Cutler, Daniel Dickstein, Benjamin C. Pierce, Andrew Head
International Conference on Software Engineering (ICSE) 2024. Article 187, pages 1–13.

ICFP'23 *PL*, **Distinguished**
Reflecting on Random Generation
Harrison Goldstein, Samantha Frohlich, Meng Wang, Benjamin C. Pierce
International Conference on Functional Programming (ICFP) 2023. Article 200, 34 pages.

OOPSLA'22 *PL*
Parsing Randomness
Harrison Goldstein, Benjamin C. Pierce
Object-Oriented Programming, Systs., Langs., and Apps. (OOPSLA) 2022. Article 128, 25 pages.

ESOP'21 *PL*
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. Vol 12648, pages 264–291.

Workshop Papers and Experience Reports (4 total, 1 first author, 2 PL, 1 PL+HCI, 1 PL+ML)

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

ICFP'23
PL

Etna: An Evaluation Platform for Property-Based Testing (Experience Report)
Jessica Shi, Alperen Kelles, **Harrison Goldstein**, Benjamin C. Pierce, Leonidas Lampropoulos
International Conference on Functional Programming (ICFP) 2023. Article 218, 17 pages.

HATRA'22
PL+HCI

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. Non-archival, 8 pages.

SysML'18
PL+ML

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. Non-archival, 3 pages.

Demos

SCF'24
PL+HCI

Demonstrating FEDT: Supporting Characterization Experiments in Fabrication Research
V. Savage, N. Püsök, **H. Goldstein**, C. Nandi, J. Yi Ren and L. Oehlberg
SCF 2024 Demo

UIST'23
HCI

Tyche: In Situ Analysis of Random Testing Effectiveness (Demo)
Harrison Goldstein, Benjamin C. Pierce, Andrew Head
User Interface Software and Technology (UIST) 2023, Demo Track. Article 96, pages 1–3.

Speaking

Talk
Invited

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

Podcast
Invited

Harry Goldstein | Property-Based Testing | #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 Episode 2
Oliver Flatt, Rachit Nigam, **Harrison Goldstein**
TheForkJoin

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

Drafts and Blog Posts

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

Confernces after COVID: An Early Career Perspective
Joseph W. Cutler, **Harrison Goldstein**, Andrew K. Hirsch, Jaemin Hong, Chandrakana 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)

Education

Ph.D. in Computer Science, University of Pennsylvania
2019–2024

M.Eng. in Computer Science, Cornell University
2018 — GPA 4.02

B.S. in Computer Science, Cornell University
2014–2018 — GPA 4.08

Teaching and Advising

Courses

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
Prof. Nate Foster
Head TA 2017

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

Cornell CS 2112
Prof. Dexter Kozen
TA 2016

Graduate Advisees

Collaborator and Research Mentor, Joseph W. Cutler

Collaborator and Research Mentor, Jessica Shi

Co-Advisor, Ernest Ng

Service

Conference Organizing and Reviewing

Steering Committee Member, NJPLS — Ongoing

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

Awards and Honors

Victor Basili Postdoctoral Fellowship
University of Maryland, Computer Science Department

Distinguished Paper (Property-Based Testing in Practice)
ICSE 2024

Distinguished Paper (Reflecting on Random Generation)
ICFP 2023

Certificate in Engineering Leadership
Cornell Engineering Leadership Certification Program

1st Place, Business Plan Competition
Cornell School of Hotel Administration

Employment

Victor Basili Postdoctoral Fellow
University of Maryland, College Park 2024-2026
Working with Prof. Leonidas Lampropoulos on topics related to usable property-based testing.

Research Intern
Galois, Inc. 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.

Research Intern
Amazon Web Services 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.

Software Engineer and Software Engineering Intern
Broadway Technology 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.

Technology Intern
Susquehanna International Group, LLC 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.

Chief Technology Officer
Last Second Beach, LLC 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.