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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 and human-computer interaction to address software engineering problems. My current focus is on property-based testing.

Selected Publications

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

Etna: An Evaluation Platform for Property-Based Testing
ICFP 2023 Experience Report

Parsing Randomness
OOPSLA 2022 Research Paper

Conferences after COVID: An Early-Career Perspective
PL Perspectives SIGPLAN Blog Post

Employment

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

Research Intern
Galois, Inc. 2023

Research Intern
Amazon Web Services 2020

Software Engineer and Software Engineering Intern
Broadway Technology 2017-2019

Technology Intern
Susquehanna International Group, LLC 2016

Selected Service Roles

Steering Committee Member
NJPLS Ongoing

Research Mentor
DeepSpec REU

Speaker
PLMW (POPL'24, ICFP'24)

Organizer
NJPLS 2023

Research Mentor
REPL REU 2023, 2024

Social Chair
POPL 2021

PC Member
HATRA 2023

A/V Coordinator
ICFP 2021

Harrison Goldstein

Postdoctoral Fellow

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Publications and Talks

Papers

1. *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. Pending publication, 13 pages.
2. *Mica: Automated Differential Testing for OCaml Modules*
Ernest Ng, **Harrison Goldstein**, Benjamin C. Pierce
OCaml Workshop 2024. Non-archival, 2 pages.
3. *Stream Types*
Joseph W. Cutler, Christopher Watson, Emeka Nkurumeh, Phillip Hilliard, **Harrison Goldstein**, Caleb Stanford, Benjamin C. Pierce
Programming Language Design and Implementation (PLDI) 2024. Article 204, pages 1412–1436.
4. *Daedalus: Safer Document Parsing*
Iavor Diatchki, Mike Dodds, **Harrison Goldstein**, Bill Harris, David Holland, Benoit Razet, Cole Schlesinger, Simon Winwood
Programming Language Design and Implementation (PLDI) 2024. Article 180, pages 816–840.
5. *Property-Based Testing in Practice* **Distinguished Paper**
Harrison Goldstein, Joseph W. Cutler, Daniel Dickstein, Benjamin C. Pierce, Andrew Head
International Conference on Software Engineering (ICSE) 2024. Article 187, pages 1–13.
6. *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.
7. *Reflecting on Random Generation* **Distinguished Paper**
Harrison Goldstein, Samantha Frohlich, Meng Wang, Benjamin C. Pierce
International Conference on Functional Programming (ICFP) 2023. Article 200, 34 pages.
8. *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.
9. *Parsing Randomness*
Harrison Goldstein, Benjamin C. Pierce
Object-Oriented Programming, Systems, Languages, and Apps. (OOPSLA) 2022. Article 128, 25 pages.
10. *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.
11. *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.
12. *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.

Talks

1. *Harry Goldstein | Property-Based Testing | #55* [Podcast]
Jack Waudby, **Harrison Goldstein**
Disseminate Podcast, June 2024
2. *Usable Property-Based Testing* [Talk]
Harrison Goldstein
Amazon Web Services, June 2024
3. *Consider Collaboration* [Talk]
Samantha Frohlich, **Harrison Goldstein**
PL Mentoring Workshop @ POPL, January 2024
4. *Advancing Property-Based Testing in Theory and Practice* [Talk]
Harrison Goldstein
Microsoft Research, September 2023
and UC Berkeley PLAIT Lab, September 2023
and Galois, Inc., October 2023
and UCSC LSD Seminar, October 2023
and University of Bristol, January 2024
5. *Property-Based Testing in Practice* [Talk]
Harrison Goldstein
Jane Street Programming Languages Colloquium, December 2023
6. *TheForkJoin Episode 2* [Podcast]
Oliver Flatt, Rachit Nigam, **Harrison Goldstein**
TheForkJoin
7. *Some Problems with Properties* [Talk]
Harrison Goldstein
NJPLS October 2022
8. *Reflecting on Random Generation* [Talk]
Harrison Goldstein
NJPLS May 2022

Other Content

1. *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
2. *Demonstrating FEDT: Supporting Characterization Experiments in Fabrication Research*
Valkyrie Savage, Nóra Püsök, **Harrison Goldstein**, Chandrakana Nandi, Jia Yi Ren and Lora Oehlberg
SCF 2024 Demo
3. *Ungenerators (Poster)*
Harrison Goldstein
ICFP 2021
4. *Delimited Continuations and Monads*
Harrison Goldstein
Unpublished PhD Milestone Draft, April 2021
5. *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
6. *Algebraic Combinatorial Testing (Poster)*
Harrison Goldstein
POPL 2020

Employment

1. *Victor Basili Postdoctoral Fellow*
University of Maryland, College Park 2024-2026
Working with Prof. Leonidas Lampropoulos on topics related to usable property-based testing.
2. *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.
3. *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.
4. *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.
5. *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.
6. *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.

Service

Conference Organizing and Reviewing

1. *Steering Committee Member*, NJPLS — Ongoing
2. *Reviewer*, PLATEAU 2024
3. *PC Member*, HATRA 2023
4. *Organizer*, NJPLS 2023
5. *Social Chair*, POPL 2021
6. *A/V Coordinator*, ICFP 2021

Mentorship

1. *Ph.D. Mentor*, SIGPLAN-M
2. *Ph.D. Mentor*, Penn CIS Mentoring
3. *Speaker*, PL Mentoring Workshop @ POPL 2024
4. *Research Mentor*, REPL REU 2023
5. *Research Mentor*, DeepSpec REU

Misc.

1. *Editor in Chief*, PLClub Blog 2021-2024

Education

1. *Ph.D.* in Computer Science, University of Pennsylvania
2019–2024
2. *M.Eng.* in Computer Science, Cornell University
2018 — GPA 4.02
3. *B.S.* in Computer Science, Cornell University
2014–2018 — GPA 4.08

Teaching and Advising

Courses

1. *Penn CIS 552 “Advanced Programming”*
Prof. Stephanie Weirich
Head TA 2020–2021
2. *Penn CIS 810 “Writing and Speaking with Style”*
Prof. Benjamin C. Pierce
Head TA 2021
3. *Cornell CS 3110*
Prof. Nate Foster
Head TA 2017
4. *Cornell Engineering Leadership*
Profs. Erica Dawson and Werner Zorman
Head TA 2017
5. *Cornell CS 2112*
Prof. Dexter Kozen
TA 2016

Graduate Advisees

1. *Collaborator and Research Mentor*, Joseph W. Cutler
2. *Collaborator and Research Mentor*, Jessica Shi
3. *Co-Advisor*, Ernest Ng

Grant Writing

1. *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)
2. *Amazon Research Award: Automated Reasoning*
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

1. *Victor Basili Postdoctoral Fellowship*
University of Maryland, Computer Science Department
2. *Distinguished Paper (Property-Based Testing in Practice)*
ICSE 2024
3. *Distinguished Paper (Reflecting on Random Generation)*
ICFP 2023
4. *Certificate in Engineering Leadership*
Cornell Engineering Leadership Certification Program
5. *1st Place, Business Plan Competition*
Cornell School of Hotel Administration