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## Education

Ph.D. in Computer Science  
**University of Pennsylvania**

M.Eng. in Computer Science  
**Cornell University**

B.S. in Computer Science  
**Cornell University**

## 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**

# 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

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

**Galois, Inc.**  
Research Intern 2023

**Amazon Web Services**  
Research Intern 2020

## 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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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*.

## 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

- 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. 24% accepted.
- 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. 28% accepted.
- 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. 28% accepted.
- ICSE'24  
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. 23 pages. 22% accepted.
- ICFP'23  
Distinguished      **Reflecting on Random Generation**  
**Harrison Goldstein**, Samantha Frohlich, Meng Wang, Benjamin C. Pierce  
International Conference on Functional Programming (ICFP) 2023. 34 pages. 37% accepted.
- OOPSLA'22      **Parsing Randomness**  
**Harrison Goldstein**, Benjamin C. Pierce  
Obj.-Oriented Programming, Sys., Langs., and Apps. (OOPSLA) 2022. 25 pages. 31% accepted.
- 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. 44% accepted.

### Workshop Papers and Experience Reports

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

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- 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 **Demonstrating FEDT: 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.

## 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

### **Conferences 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 “Functional Programming”**  
Prof. Nate Foster  
Head TA 2017

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

**Cornell CS 2112 “Object-Oriented Design and Data Structures (Honors)”**  
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 60<sup>th</sup> 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

### Certificate in Engineering Leadership

Cornell Engineering Leadership Certification Program

### 1<sup>st</sup> Place, Business Plan Competition

Cornell School of Hotel Administration

# Employment

## **University of Maryland, College Park**

*Victor Basili Postdoctoral Fellow 2024-*

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.