Joseph W. Cutler

Philadelphia, PA, USA.

Education

- Univeristy Of Pennsylvania, Philadelphia, PA. Ph.D., *Computer Science*. 2021 - (ongoing, expected 2026) Advisor: Benjamin C. Pierce
- Wesleyan University, Middletown, CT.
 B.A., Computer Science (with High Honors) and Mathematics. 2017 2021 GPA: 3.98/4.0

Work and Research Experience

- **NVIDIA**, Machine Learning Compilers Research Intern. (Summer 2024) Worked on a language for specifying rewrite-based optimizations within a GPU compiler.
- Amazon Web Services, Applied Scientist Intern. (Summer 2022) Worked on the Cedar policy language underlying AWS verified permissions. Helped shape the Cedar type system, implemented the reference typechecker and formally proved type safety with the Dafny verifier.
- Correct Computation, Technical Intern. (Summer 2021) Worked on Affix, an OCaml tool based on dynamic analysis which generates C source code models from binaries.
- Max Planck Institute for Software Systems, Research Intern. (Summer 2020) Research with Prof. Deepak Garg on refinement type-based techniques for resource analysis. Implemented λ -amor, a highly expressive refinement type system for amortized analysis.
- Flatiron School, Software Development Intern. (Summer 2015, 2016, Winter 2017) Full-stack web development with Ruby on Rails and React. Built analytics dashboards, a machine learning system to automatically categorize issue tickets, and user account infrastructure.

Conference Papers

- (PLDI 2024) Stream Types
 Joseph W. Cutler, Christopher Watson, Emeka Nkurumeh, Phillip Hilliard, Harrison Goldstein, Caleb Stanford, Benjamin C. Pierce.
- (OOPSLA 2024) Cedar: A New Language for Expressive, Fast, Safe, and Analyzable Authorization Cutler*, Disselkoen, Eline, He, Headley, Hicks, Hietala, Ioannidis, Kastner, Mamat, McAdams, McCutcheon, Rungta, Torlak, Wells.
- (ICSE 2024) Property-Based Testing in Practice (**Distinguished Paper Award**) Harrison Goldstein, **Joseph W. Cutler**, Daniel Dickstein, Benjamin C. Pierce, Andrew Head.
- (ICFP 2020) Denotational Cost Semantics for Amortized Analysis Joseph W. Cutler, Daniel R. Licata, and Norman Danner.

* Authors listed alphabetically

Workshop Papers

- (DAFNY 2024) Improving the Stability of Type Safety Proofs in Dafny Joseph W. Cutler, Michael Hicks, Emina Torlak.
- (HATRA 2022) Some Problems with Properties: A Study on Property-Based Testing in Industry Harrison Goldstein, Joseph W. Cutler, Adam Stein, Andrew Head, Benjamin C. Pierce.

Talks

- Delta: Ordered Types for Stream Processing, LSD Seminar @ UC Santa Cruz, Remote. (February 2, 2024)
- Delta: Ordered Types for Stream Processing, Jane Street Programming Languages Colloqium, New York, NY. (December 15, 2023)
- The Essence of Structured Streaming Computation, Stream Processing Seminar @ Chalmers, Remote. (October 9, 2023)
- The Essence of Structured Streaming Computation, Analysis of Computer Systems Seminar @ NYU, New York, NY. (October 5, 2023)
- The Essence of Structured Streaming Computation, ROSE Seminar @ Yale, New Haven, CT. (October 4, 2023)
- Stream Types, PL Lunch @ Princeton. Princeton, NJ. (September 12, 2023)
- Bunched and Ordered Types for Stream Processing, New Jersey Programming Languages and Systems Seminar. College Park, MD. (October 21, 2022)
- Finding Good Generators with Multi-Armed Bandits, Programming Languages Design and Implementation (Student Research Competition, Graduate Category, 3rd Place), San Diego, California (June 15th, 2022)
- Denotational Recurrence Extraction for Amortized Analysis, Object-oriented Programming, Systems, Languages, and Applications (OOPSLA), Chicago, IL (October 21, 2021)
- Denotational Recurrence Extraction for Amortized Analysis, International Conference of Functional Programming, Virtual (August 2020)

Awards

- NSF Graduate Research Fellowship. (2021-2024)
- Phi Beta Kappa. (2021)
- 3rd Place, Student Research Competition (Graduate Category). (PLDI 2022)
- Michael Rice Prize, Awarded to a Wesleyan senior for excellence in computer science. (2021)
- Shortt Prize, Awarded to a Wesleyan junior for excellence in mathematics. (2020)
- Robertson Prize, Awarded to a Wesleyan sophomore for excellence in mathematics. (2019)

Service

- Organizer, Benjamin Pierce's 60th Birthday (Summer 2023)
- REPL REU Mentor (Summer 2023)
- External Reviewer, LICS (2022)
- PLClub Seminar Organizer (2022 2023)
- Penn CIS TGIF Social Coordinator (2022)
- Penn Engineering Dean's Doctoral Advisory Board (2022 Current)

Teaching

- TA for Penn CIS 7000: Writing and Speaking with Style (Spring 2023)
- TA for Penn CIS 5520: Advanced Programming (Fall 2022)
- TA for Wesleyan COMP 360: Applied Logic & Logic Programming (Fall 2020)
- TA for Wesleyan COMP 323: Programming Language Implementation (Spring 2020)
- TA for Wesleyan COMP 212: Computer Science II. (S/F 2018, S 2019, S/F 2020, S 2021)
- TA for Wesleyan COMP 112: Introduction To Programming. (Summer 2018)
- TA for Wesleyan MATH 261: Abstract Algebra (Fall 2020)
- TA for Wesleyan MATH 223: Linear Algebra. (Fall 2019)

Service

- Logic In Computer Science (LICS) 2023, External Reviewer.
- Principles of Programming Languages (POPL) 2023, Subreviewer.

Mentoring

- Thia Richey, PhD Student, 2024-Current.
- William Sturgeon, Independent Study, Spring 2024.
- Emeka Nkurumeh, REPL Summer Program, Summer 2023.
- Tanner Duve, Independent Study, Fall 2022.

Last updated on August 29, 2024 $\,$