

Education

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

Work and Research Experience

- **Jane Street**, Software Engineer (2026 – Current)
- **Jane Street**, Quantitative Trading Intern (Summer 2026)
- **Jane Street**, Software Engineering Intern. (Summer 2025)
Ultra-Low-Latency Trading and OCaml Compiler teams.
- **Nvidia**, Machine Learning Compilers Research Intern. (Summer 2024)
Worked on a language for specifying GPU compiler optimizations.
- **Amazon Web Services**, Applied Scientist Intern. (Summer 2022)
Proved type safety of the Cedar authorization language.
- **Correct Computation**, Technical Intern. (Summer 2021)
Worked on a dynamic binary analysis tool.

Conference Papers

- (Submitted) *Modular GPU Programming with Typed Perspectives*
Manya Bansal, Daniel Sainati, **Joseph W. Cutler**, Saman Amarasinghe, Jonathan Ragan-Kelly
- (OOPSLA 2026) *Fail Faster: Staging and Fast Randomness for High-Performance PBT*
Cynthia Richey ★, **Joseph W. Cutler** ★, Harrison Goldstein, Benjamin C. Pierce
★ Authors Contributed Equally
- (POPL 2026) *Typing Strictness*
Daniel Sainati, **Joseph W. Cutler**, Benjamin C. Pierce, Stephanie Weirich
- (CGO 2025) *Pattern Matching in AI Compilers and its Formalization*
Joseph W. Cutler, Alex Collins, Bin Fan, Mahesh Ravishankar, Vinod Grover.
- (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★, Disselkoben, Eline, He, Headley, Hicks, Hietala, Ioannidis, Kastner, Mamat, McAdams, McCutcheon, Rungta, Torlak, Wells.
★ Authors listed alphabetically
- (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.

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.

Awards

- *Jane Street Graduate Research Fellowship Honorable Mention.* (2025)
- *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)

Invited Talks

- *Fail Faster: Staging and Fast Randomness for High-Performance PBT*, **NYC Systems Seminar**, New York NY. (June 18, 2025)
- *Fail Faster: Staging and Fast Randomness for High-Performance PBT*, PL Seminar @ **Berkeley**, Remote. (April 30, 2025)
- *Fail Faster: Staging and Fast Randomness for High-Performance PBT*, PLSE Seminar @ **Toronto**, Remote. (April 24, 2025)
- *Fail Faster: Staging and Fast Randomness for High-Performance PBT*, Research Seminar @ **Wesleyan**, Middletown CT. (April 7, 2025)
- *Getting The Most Out of POPL*, **PLMW @ POPL 2025**, Cambridge, MA. (January 21, 2025)
- *Getting Fusion in Order*, Programming Languages @ **Harvard**, Cambridge, MA. (November 1, 2024)
- *Delta: Ordered Types for Stream Processing*, **Uber**, Seattle, WA. (August 14, 2024)
- *Delta: Ordered Types for Stream Processing*, PLSE Lunch @ **Washington**, Seattle, WA. (July 9, 2024)
- *Delta: Ordered Types for Stream Processing*, DL Compilers Research Group @ **Nvidia**, Redmond, WA. (May 12, 2024)
- *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 Colloquium, 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*, **NJPLS**. College Park, MD. (October 21, 2022)

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

- *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)

Mentoring

- Daniel Sainati, PhD Student, 2024-2026.
- Thia Richey, PhD Student, 2024-2026.
- William Sturgeon, Independent Study, Spring 2024.
- Emeka Nkurumeh, REPL Summer Program, Summer 2023.
- Tanner Duve, Independent Study, Fall 2022.