Joshua M. Cohen

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RESEARCH INTERESTS

Formal Verification, Proof Assistants, Functional Programming, Algorithms

EDUCATION

Princeton University	Princeton, NJ
• PhD in Computer Science, Advisor: Andrew W. Appel	2020 – Present
University of Pennsylvania	Philadelphia, PA
• MSE in Computer Science, GPA: 4.0/4.0	2018 – 2020
• BA in Mathematics and Computer Science (*summa cum laude*), GPA: 3.98/4.0	2016 – 2020

PUBLICATIONS

- **Joshua M. Cohen** and Philip Johnson-Freyd. "A Formalization of Core Why3 in Coq". In: *Proceedings of the ACM on Programming Languages* 8. POPL (Jan. 2024)

- **Joshua M. Cohen** and Andrew W. Appel. "Specifying and Verifying a Real-World Packet Error-Correction System". In: *Verified Software. Theories, Tools and Experiments.* 2024

- **Joshua M. Cohen**, Qinshi Wang, and Andrew W. Appel. "Verified Erasure Correction in Coq with MathComp and VST". in: *CAV 2022: 34th International Conference on Computer-Aided Verification.* 2022

- Joachim Breitner, Antal Spector-Zabusky, Yao Li, Christine Rizkallah, John Wiegley, **Joshua Cohen**, and Stephanie Weirich. "Ready, Set, Verify! Applying hs-to-coq to Real-World Haskell Code". In: *Journal of Functional Programming* 31 (2021)

TALKS

- *Towards a Verified Intermediate Verification Language.* IFIP Working Group 2.3 Programming Methodology. May 2024.

- *A Formalization of Why3 in Coq.* New Jersey Programming Languages and Systems Seminar (NJPLS). May 2023.

- *Verified Erasure Correction in Coq with MathComp and VST.* New Jersey Programming Languages and Systems Seminar (NJPLS). May 2022.

EMPLOYMENT

Sandia National Labs - Formal Methods R&D Intern	Summer 2022 – Present
• Developing formal semantics for the Why3 intermediate verification language.	
AWS - Applied Scientist Intern	Summer 2021
• Proved correctness theorems about the IAM policy evaluation using Dafny.	

AWS - Software Development Engineering Intern   Summer 2019
- Developed internal tools for AWS Key Management Service HSM team.
- Used several cryptography libraries to interface with Yubikeys.

KPMG - Data & Analytics Intern   Summer 2018
- Developed Microsoft Office add-in for automated document generation using Javascript, HTML, and Office-JS API.

Teaching

Teaching Assistant - Princeton University
- Programming Languages (COS 510)   Spring 2023
- Theory of Algorithms (COS 423)   Fall 2022

Teaching Assistant - University of Pennsylvania
- Introduction to Algorithms (CIS 320)   Fall 2019, Spring 2020
- Programming Languages and Techniques I (CIS 120)   Spring 2018, Fall 2018, Spring 2019

Service

ICFP 2024 Artifact Evaluation Committee

Honors and Awards

Gordon Wu Fellowship in Engineering - Princeton University
Benjamin Franklin Scholar - University of Pennsylvania
IEEE Eta Kappa Nu Honor Society Member - University of Pennsylvania

Skills

Verification - Coq, VST, Dafny, Verifast, Liquid Haskell
Programming - OCaml, C, Java, Python, Haskell