Joshua Cohen

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RESEARCH INTERESTS

Formal verification, algorithms, proof assistants, functional programming

EDUCATION

Princeton University	Princeton, NJ
• PhD in Computer Science, Advisor: Andrew Appel	2020-Current
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

RESEARCH EXPERIENCE

Research Assistant (with Sanjeev Khanna) — January 2020 - August 2020

- Worked on designing and analyzing algorithms for distributed graph coloring.

Research Assistant (with Stephanie Weirich) — August 2019 - December 2019

- Verified classical graph algorithms from Haskell's Functional Graph Library in Coq using hs-to-coq.
- Studied various implementations of purely functional graph algorithms and how to connect imperative-style proofs with functional code.

Research Assistant (with Stephanie Weirich) — January 2019 - May 2019

- Verified most of Haskell's Data.Map data structure and library in Coq using hs-to-coq.
- Used the specification to prove properties needed for separate GHC verification project.

PUBLICATIONS

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." Journal of Functional Programming, Volume 31, 2021.

EMPLOYMENT

AWS - Applied Scientist Intern — Summer 2021

- Proved correctness theorems in Dafny about the IAM policy evaluator.

AWS - SDE 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 - University of Pennsylvania   Fall 2019, Spring 2020
- Introduction to Algorithms (CIS 320)
- Held office hours and graded assignments.

Teaching Assistant - University of Pennsylvania   Spring 2018, Fall 2018, Spring 2019
- Programming Languages and Techniques I (CIS 120)
- Taught weekly recitations, held office hours, and graded assignments.

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

Coq, Dafny, Haskell, Java, Python, C, Ocaml, LaTeX