

Graduating summer 2025
elefthei@seas.upenn.edu
+1 (267) 968-3532

Lef IOANNIDIS

elefthei.me
github.com/elefthei
linkedin.com/in/elefthei

EDUCATION

- CURRENT** PHD IN COMPUTER SCIENCE, *University of Pennsylvania*, Philadelphia, PA
Research: “*Programming languages for formally verified cryptographic proof systems*” in PLClub, DSL.
Advised by Sebastian ANGEL & Steve ZDANCEWIC. Graduation in summer 2025.
- 2015, 2019 BSC, MENG IN COMPUTER SCIENCE, *Massachusetts Institute of Technology*, Cambridge, MA
Research: “*Extracting and optimizing low-level bytecode from high-level verified Coq*” in PDOS.

EMPLOYMENT

- SUMMER '22 Research Scientist Intern, AMAZON, Automated Reasoning Group, Arlington, VA
– Contributed in the **type system** formalization of the Cedar authorization language.
– Implemented a novel **type inference** algorithm for Cedar including singleton and capability types.
- 2018 - 2019 Investment Engineer, BRIDGEWATER Associates, Westport, CT
– Created **APIs** for **big-data** analysis and **visualization** used by Quantitative Research.
– Implemented complex risk-controls and hedging **algorithms** used daily by Trade Generation.
– Taught the **Scala** and **SQL** programming languages to more than 100 traders and engineers.
- 2016 - 2018 Principal Software Engineer, UNIFYID (acquired by PROVE), San Francisco, CA
– Designed and implemented the **back-end** with 30 **microservices** on **AWS**.
– Implemented a **Machine Learning** service for high-throughput inference (*3000 req/sec*).
– Developed public-key and client certificate systems for **end-to-end encryption**.
- 2015 - 2016 Software Security Engineer, APPLE, Cupertino, CA
– Contributor to the **LLVM compiler** and the **Swift** programming language.
– Implemented **cryptographic algorithms** for DRM.

TECHNOLOGIES AND LANGUAGES

- Languages: C++, Python, SQL, Rust, Haskell, Scala, OCaml, Coq, C, Go, Java, Javascript, Elm.
Software: Docker, Kubernetes, AWS, Azure, Terraform, Grafana, MongoDB, Postgres, Kafka, Spark.
General: Compilers, Language design, Performance engineering, Formal verification, Cryptography, Smart Contracts, Zero-knowledge proofs, Distributed systems, Cloud security, Microservices.

PATENTS & PUBLICATIONS

- Oct. 2024.** “Cedar: A New Language for Expressive, Fast, Safe, and Analyzable Authorization”. In: *Proceedings of the ACM on Programming Languages* OOPSLA.
- Dec. 2024.** “Choice Trees: Representing and reasoning about nondeterministic, recursive, and impure Programs in Coq”. In: *Journal of Functional Programming, Special POPL 2025 edition*.
- June 2024.** “Reef: Fast Succinct Non-Interactive Zero-Knowledge Regex Proofs”. In: *33rd USENIX Security Symposium*.
- Dec. 2024.** “Structural temporal logic for mechanized program verification”. In: under submission.
- June 2022.** “Efficient representation of numerical optimization problems for SNARKs”. In: *31st USENIX Security Symposium*.
- Mar. 2020.** “Privacy-preserving system for machine-learning training data”. US Patent 10,601,786.
- Nov. 2019.** “Extracting and optimizing formally verified code for systems programming”. In: *NASA Formal Methods: 11th International Symposium*.
- Apr. 2017.** “Auto-scalable microservices for Machine Learning with Docker”. In: *Dockercon 2017 Annual Docker User Conference*.