Eleftherios Ioannidis

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Software Engineering

Skills:	Formal Verification, Compilers, Cryptography, Programming Languages, Writing, Teaching.
Languages:	Scala, Rust, Haskell, C/C++, Python, Coq, OCaml, Go, Java, Javascript.
Software:	Linux, Docker, AWS, Dafny, Z3, SQL, Git, LLVM.

Industry Experience

May '22 - Aug '22 Research Scientist Intern at Amazon, Automated Reasoning Group, Arlington, VA
Designed and prototyped a type system and type inference for the Cedar Authorization language

Mar '19 - Sep '20 Investment Engineer at Bridgewater Associates, Westport, CT
Developed trading algorithms, risk-controls, designed and implemented domain-specific programming languages for financial data science embedded in Scala. Taught Scala to > 100 new engineers.

May '16 - Oct '17 Software Architect at UnifyID, San Francisco, CA
Designed and implemented the microservice back-end for implicit authentication. Implemented end-to-end encryption and scalable real-time machine-learning services. Acquired by Prove, June 2021.

Sep '15 - May '16 Security Engineer at Apple, *FairPlay group*, Cupertino, CA
Application Security, LLVM compiler, cryptography (NDA).

Publications

Dec 2023 Reef: Fast Succinct Non-Interactive Zero-Knowledge Regex Proofs,
with Sebastian Angel, Elizabeth Margolin, Srinath Setty & Jess Woods.
USENIX Security 2024, Philadelphia, PA.

Oct 2021 Efficient Representation of Numerical Optimization Problems for SNARKs,
with Sebastian Angel, Andrew J. Blumberg and Jess Woods.
USENIX Security 2022, Boston, MA.

Mar 2020 Scala eDSLs for domain-specific business logic,
Northeast Scala Symposium (NEScala 2020), Brooklyn, NY (online).

Apr 2019 MCQC: Extracting and optimizing formally verified code,
NASA Formal Methods Symposium (NFM 2019), Houston, TX.

Education

Current PhD in Computer Science, *University of Pennsylvania*, Philadelphia, PA
Research: *Correct compilers for zero-knowledge proofs, formal verification of distributed systems.*
Fourth-year PhD student advised by Sebastian Angel & Steve Zdancewic.
Research on verified compilers for zkSNARKs and verification of liveness and safety properties of distributed systems. Graduation expected in 2025.
Teaching: DeepSpec REU student mentor, Compilers TA, Software foundations TA.

Jan 2019 Master's in Engineering, *MIT CSAIL*, Cambridge, MA
Research: *Extracting and optimizing low-level bytecode from high-level verified Coq.*
Advised by Frans Kaashoek & Nickolai Zeldovich, built a compiler from Coq to C++.
Teaching: Computer Security TA, Operating System TA

Jun 2015 Bachelor's in Computer Science, *MIT CSAIL*, Cambridge, MA
Thesis: *Parallel optimizations for the Halide DSL language*, advised by Saman Amarasinghe.