

Lef (Eleftherios) IOANNIDIS

elefthei@seas.upenn.edu, +1 (267) 968-3532

"I work in the reliability, security and privacy of computer systems, by combining techniques from type theory, formal verification and cryptographic zero-knowledge proofs."

INDUSTRY EXPERIENCE

- MAY '22 - AUG '22 Research Scientist Intern, 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, 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 traders and engineers.
- MAY '16 - OCT '17 Software Architect, 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 in 2021.
- SEP '15 - MAY '16 Security Engineer, APPLE, *FairPlay group*, Cupertino, CA
Static Analysis, Security, LLVM compiler, cryptography (NDA).

PUBLICATIONS

- IN SUBMISSION *About time: Structural, mechanized, temporal logic verification in Coq*,
POPL 2025, Denver, CO.
- IN SUBMISSION *Choice Trees: Representing and Reasoning About Nondeterministic, Recursive, and Impure Programs in Coq*.
Journal of Functional Programming, Special POPL 2025 edition.
- APR 2024 *Cedar: A New Language for Expressive, Fast, Safe, and Analyzable Authorization*,
SPLASH 2024, Pasadena, CA.
- DEC 2023 *Reef: Fast Succinct Non-Interactive Zero-Knowledge Regex Proofs*,
USENIX Security 2024, Philadelphia, PA.
- OCT 2021 *Efficient Representation of Numerical Optimization Problems for SNARKs*,
USENIX Security 2022, Boston, MA.
- 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: *Programming languages for formally verified and cryptographically verifiable computation.*
Advised by Sebastian ANGEL & Steve ZDANCEWIC. Graduation in summer 2025.
- 2015, 2019 BSc, MENG IN ELECTRICAL ENGINEERING AND COMPUTER SCIENCE, *MIT*, Cambridge, MA
Research: *Extracting and optimizing low-level bytecode from high-level verified Coq.*
Advised by Frans KAASHOEK & Nickolai ZELDOVICH.

PROGRAMMING SKILLS

- Skills: Programming Language design, Type theory, Verification, Compilers, Security, Cryptography.
- Languages: Rust, Scala, Haskell, OCaml, Coq, C, C++, SQL, Python, Go, Java, Javascript.