Eli Grubb

Cryptography & Systems Engineer

EliGrubb.com • GitHub: github.com/EliGrubb
Eli@EliGrubb.com • (801) 786-9886
Salt Lake City, UT

Technical Skills

Languages: Rust, C, C++, Go, Python
Privacy & Cryptography: Zero-knowledge proofs, homomorphic encryption, secure multiparty computation, encrypted search, private information retrieval, ORAM
Data Systems: SQL, PostgreSQL, MongoDB, SQLite, encrypted databases
Infrastructure: OS internals, networking, key management, performance profiling, CI/CD

Professional Experience

October 2021 - Present

Unisys, Remote - *System Software Engineer, Cryptography*

- Engineered enhancements to OS cryptographic libraries to support post-quantum cryptography and secure transport (TLS 1.3), optimizing performance and reliability.
- Maintained internal PKI infrastructure, including a network of Certificate Authorities for cross-team integration testing.
- Improved cryptographic code reliability in mission-critical systems.
- Led CI/CD modernization, partnered with infrastructure teams to introduce software validation to developer workflows.

May 2019 - May 2021

University of Maryland, College Park - *Graduate Research Assistant*

- Conducted applied cryptography research at the Maryland Cybersecurity Center, translating cryptographic research into practical implementations.
- Developed applied cryptography tools and frameworks, with emphasis on security under adversarial and network-constrained conditions.
- Developed experimental cryptographic tooling for use in academic and applied security research.

June 2020 - August 2020

SRI International, Remote - *Graduate Research Intern*

- Prototyped modular integration layer for abstracting ZKP libraries in Rust.
- Improved ZK system extensibility through low-level cryptographic optimization and benchmarking.

September 2019 - December 2019

IMDEA Software Institute, Madrid - *Visiting PhD Student*

- Achieved 4× performance improvement in zero-knowledge proof computation through cryptographic prover optimization.

Research & Projects (selected)

blind-insight-rs - *Secure Encrypted Search Client*

- Built a secure, Rust-native interface and CLI for Blind Insight's encrypted data store, handling encrypted via low-level cryptographic primitives.
- Designed a query abstraction layer to improve usability and developer experience.

zk-rust - *Zero-Knowledge Integration Layer*

- Created modular ZK proof integration layer for protocol composability, abstracting communication between zero-knowledge protocols.

emulab-docker - *Secure Container Infrastructure*

- Enhanced large-scale embedded and cloud test systems with Docker for cyber-experimentation at scale.
- Published results at USENIX Workshop on Cyber Security Experimentation and Test.

Education

2018 - 2021 (no degree received)

University of Maryland, College Park - *Ph.D. Candidate in Computer Science*

Focus: Applied Cryptography, Secure Distributed Systems, Zero-Knowledge Protocols.

Course Highlights: Computer and Network Security, Applied Crypto, Computer Networks, Secure Distributed Computation, Cryptography Research Seminar.

2014 - 2018

University of Utah - *B.S. in Computer Science*

Course Highlights: Advanced Operating Systems, Database Systems, Distributed Systems, Software Verification, Number Theory, Data Mining.