Eli Grubb

Software Engineer

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Ogden, UT • *Open to relocation*

Technical Skills

Languages: C, Zig, Rust, C++, Python
Infrastructure: Debugging (lldb, gdb), key management/PKI, secure system design, profiling (perf, strace, flame graphs, Apple Instruments), OS internals, CI/CD.
Privacy, Security, Cryptography: Zero-knowledge proofs, homomorphic encryption, secure multi-party computation, encrypted search, private information retrieval, and other privacy enhancing technologies (PETs).

Professional Experience

October 2021 - Present

Unisys, Remote - *System Software Engineer, Cryptography*

- Enhanced cryptography libraries of ClearPath/MCP Operating System to support post-quantum cryptography and secure transport (TLS 1.3).
- Owned internal PKI infrastructure for cross-team integration testing.
- Partnered with compliance & infrastructure teams to integrate SBOM supply chain validation into release CI/CD toolchain, enabling regulatory readiness.
- Mentored 3 junior engineers on library architecture and best practices, including pair-programming, code reviews, and secure design reviews.
- Designed new provider-agnostic architecture for modular use of secure key-management and cryptography, enabling rapid post-quantum/hybrid KEM algorithm deployment to customers.
- Built new memory dump diagnostic tooling, improving system observability and reducing developer hours spent on customer-reported memory leaks by 55%.

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 and deployed applied cryptography tools with a focus on large-scale system performance and security under adversarial conditions.

June 2020 - August 2020

SRI International, Remote - *Graduate Research Intern*

- Developed privacy-preserving protocols in Rust, with emphasis on modularity and performance in real-world systems.

September 2019 - December 2019

IMDEA Software Institute, Madrid - *Visiting PhD Student*

- Optimized cryptographic prover implementation, achieving 4× performance improvement increasing real-world utility.

Projects & Research (selected)

Zecrecy - *A Simple, Secure, Secret Sanitization Library*

- Designed and implemented a Zig-native secret-management library.
- Built with an ergonomic API that encourages privacy-by-design for integration with real systems. Auto-zeroes sensitive data when no longer in use.
- github.com/eligrubb/zecrecy; CI (GitHub Actions), unit tests included.

emulab-docker - *Secure Container Infrastructure*

- Enhanced large-scale cyber-experimentation testbeds (POWDER and CloudLab) by building secure container infrastructure with wide compatibility, enabling distributed systems experiments at scale.
- Deployed experiments to demonstrate scalability, orchestrating 5000+ Docker images across 25+ physical nodes. Published results at USENIX Workshop on Cyber Security Experimentation and Test.

Education

2018 - 2021 (Completed coursework and research; pivoted to industry)

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

Focus: Applied Cryptography, Secure Distributed Systems, Privacy-Enhancing Technologies.

Course Highlights: Computer and Network Security, Secure Distributed Computation.

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.