Alex Ledger

Resume

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Personal Statement

I am a software developer with a focus on building privacy and security tools and applications. I have experience building privacy-enhancing technologies and writing secure, cryptographic code.

Work Experience

2016–Present **Associate Staff**, *MIT Lincoln Lab*, Lexington, MA.

- Designed and implemented a framework for secure multiparty computation, a privacy-enhancing, cryptography-based technology for computing analytics while preserving the privacy of inputs.
- The design and implemention involved novel cryptographic optimizations, concurrent and parallelized code, and a uniquely tailored test harness.

2016 **Software Engineer Intern**, *Sailfan*, Portland, OR.

- Researched and developed algorithms and software to detect features in images and compute statistics in domains with a limited training set.
- Implemented a RESTful interface for clients to interact with the image processing code.

2015–2016 **Math-Computer Science Research Assistant**, *Reed College*, Portland, OR.

- Worked with professor Adam Groce on Oblivious RAM (ORAM), a cryptographic technique for obfuscating a client's access patterns to a server.
- Implemented ORAM protocols in C++, wrote cryptographic proofs that the protocols were secure, and published a paper.

Education

2016–2017 **Student**, *MIT*, Cambridge, MA.
Participated in classes at MIT including Lattice Cryptography with Vinod Vaikuntanathan, Public Ledgers with Silvio Micali, and Multicore Programming with Nir Shavit.

2012–2016 **Bachelor of Arts in Math-Computer Science**, *Reed College*.

Thesis *Implementing Component-Based Garbled Circuits*

Advisor Professor Adam Groce

Description Explores methods of secure computation, a cryptographic protocol for allowing two people who do not trust each other to work together. I developed a new technique for chaining components of Yao's garbled circuits, and I implemented the technique in C to achieve an order of magnitude speed up over prior work.

Computer Skills

Experienced C, C++, Python, Rust, Java, R, Bash, Linux, Git, Latex

Intermediate Clojure, Coq, SQL, Mathematica, Matlab, Haskell, MongoDB, NoSQL

More Information

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