Silei Ren

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Education

Cornell University PhD Candidate
Ithaca, NY, 2020-2026 (Expected)

- Advisor: Andrew C. Myers

Brown University B.S. Math & Computer Science
Providence, RI, 2015-2019

- GPA: 3.8/4.0   - CS department Senior Prize

Research Projects

An Algebraic Approach to Asymmetric Delegation and Polymorphic Label Inference   ESORICS 2025

- Designed a sementic framework for language-based information flow control (IFC).
- Proposed label inference algorithms that support bounded label polymorphism and proved correctness.
- Implemented the framework as the frontend of the Viaduct Compiler.

Type Confusion Security   In Submission

- Propose a novel semantic security condition that characterizes various modern smart contract exploits.
- Defined language-based mitigation and formally proved its security under a strong threat model.
- Implementing security mechanisms in the SCIF compiler, a compiler for secure-by-construction smart contracts.

Poisoning Attack On Learned Index Structures   SIGMOD 2022

- Performed security analysis & comparison between traditional data structure and machine learned data structures as the co-first author.

Projects & Professional Experience

Viaduct Compiler   Ithaca, NY, 2021.5-2022.8

- Viaduct compiles sequential security-type-annotated programs into cryptographic protocols.
- Design and implementated the frontend, including information flow analysis.

Microsoft SWE Summer Intern   Sunnyvale, CA, 2017.5-2017.8

- Designed and implemented a Proxy web service that translates between OData and GraphQL queries.
- Earned Return Offer.

Teaching Assistance

- CSCI 0330: Introduction to Computer Systems   Fall 2017, Brown University
- CSCI 1420: Machine learning   Fall 2018, Brown University
- CS 2800: Discrete Structures   Spring & Fall 2020, Cornell University
- CS 6830: Cryptography   Spring 2021, Cornell University
- CS 3110: Data Structures and Functional Programming   Spring 2024, Cornell University
- CS 6110: Advanced Programming Languages   Spring 2025, Cornell University
- CS 4120: Introduction to Compilers   Spring 2026, Cornell University