

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 semantic 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.	
Formalizing Confused Deputy Attack	Ongoing Project
- Formalized CDA in open systems like smart contract. - Defined language-based mitigation and proving 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 implemented the frontend information flow analysis and function specialization procedure.	
Microsoft SWE Summer Intern	Sunnyvale, CA, 2017.5-2017.8
- Designed and implemented a Proxy web service that translates between OData and GraphQL protocols.	

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: Programming Languages	Spring 2025, Cornell University