

# Jianxing Qin

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## EDUCATION

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### Duke University

Aug 2023 – Present

*Ph.D. in Computer Science*

- Advisor: Danyang Zhuo

### Shanghai Jiao Tong University

Aug 2019 – Jun 2023

*B.Eng in Computer Science and Technology*

- Advisor: Qinxiang Cao
- Dissertation: VST-IDE: An Interactive Tool for Program Verification (Symbolic Execution)

## PUBLICATIONS

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1. Jianxing Qin, Jingrong Chen, Xinhao Kong, Yongji Wu, Tianjun Yuan, Liang Luo, Zhaodong Wang, Ying Zhang, Tingjun Chen, Alvin R. Lebeck, Danyang Zhuo. *Phantora: Maximizing Code Reuse in Simulation-based Machine Learning System Performance Estimation*. arXiv preprint, 2025.
2. Jianxing Qin, Alexander Du, Danfeng Zhang, Matthew Lentz, Danyang Zhuo. *Can Large Language Models Verify System Software? A Case Study Using FSCQ as a Benchmark*. The ACM SIGOPS 20th Workshop on Hot Topics in Operating Systems (HotOS), 2025.
3. Litao Zhou, Jianxing Qin, Qishi Wang, Andrew W. Appel, Qinxiang Cao. *VST-A: A Foundationally Sound Annotation Verifier*. The 51st ACM SIGPLAN Symposium on Principles of Programming Languages (POPL), 2024.

## SKILLS

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Formal Verification (Proof Assistant / SMT solver) | System Programming (Linux Toolchain / Low-level Programming / Developing large-scale systems) | Programming Languages (Type Systems / Compiler / Functional Programming)

**Programming Skills:** C/C++, Python, Rust, OCaml, Coq, Haskell.

## RESEARCH EXPERIENCES

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### Research Assistant, Duke University

Aug 2023 – Present

*Advisor: Prof. Danyang Zhuo, Department of Computer Science*

**Topic: GPU cluster simulator for performance analysis on machine learning workloads**

- Implement simulator for GPU cluster on deep learning workloads
- Run training workloads as-is without the real GPU cluster
- Avoid reimplementing of the ML framework in the simulator, seamless support most features

### Research Assistant, Shanghai Jiao Tong University

Feb 2021 – Jun 2023

*Advisor: Prof. Qinxiang Cao, John Hopcroft Center for Computer Science*

**Dissertation: Interactive verification of annotated programs**

- Developed separation logic based assertion annotations of program states compatible with C
- Checked annotated C source codes and verified the corresponding user-defined specifications
- Developed a proof assistant like programming environment

**Topic: Verification of annotated programs**

- Implemented foundationally sound annotation verifier based on VST
- Published on POPL 2024

*Advisor: Prof. Danyang Zhuo, Department of Computer Science*

**Topic: Solver-aided development of network functions**

- Leverage the power of SMT solvers in middlebox development
- Push-button verification for modular network function frameworks like Click
- Explored synthesis techniques (syntax-guided, counterexample-guided) for network functions