QI LING

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2nd-year Ph.D. student in Computer Science, Purdue University

RESEARCH INTERESTS

I want to make computer systems more efficient, secure, and reliable. Currently, my project focuses on fine-grained and low-cost microarchitectural isolation techniques, enhancing performance and security for serverless computing. Still, my interest spans many other fields in computer architecture and operating systems.

EDUCATION

- **Purdue University** — **Aug. 2024 – Present**
  Doctoral Degree in CS — Overall GPA: 4.0/4
  Advisors: Prof. Kazem Taram and Prof. Pedro Fonseca
- **University of Michigan** — **Sept. 2022 – May 2024**
  Bachelor's Degree in CS — Overall GPA: 3.92/4
  Advisors: Prof. Baris Kasikci and Prof. Shuwen Deng
- **Shanghai Jiao Tong University** — **Sept. 2020 – Aug. 2024**
  Bachelor's Degree in ECE — Overall GPA: 3.74/4
  Advisor: Prof. Yibo Pi

AWARDS AND HONORS

- **ACM Student Research Competition 2nd Place Award** — **2023**
  Presented a poster and gave a 10min talk at MICRO'23
- **Dean's Honor List** — **2022, 2023**
- **Jackson and Murial Lum Scholarship** — **2022, 2023**
  5 recipients each year
- **SJTU Undergraduate Excellence Scholarship** — **2021**

PEER-REVIEWED WORKS

- **GadgetMeter: Quantitatively and Accurately Gauging the Exploitability of Speculative Gadgets**
  Qi Ling, Yujun Liang, Yi Ren, Baris Kasikci, Shuwen Deng
  Won 2nd Place at MICRO'23 Student Research Competition
  Network and Distributed System Security Symposium (NDSS'25)
- **Towards Fine-Grained, High-Coverage Internet Monitoring at Scale**
  Hongyu Wu, **Qi Ling**, Penghui Mi, Chaoyang Ji, Yinliang Hu, Yibo Pi
  The 7th Asia-Pacific Workshop on Networking (APNet'23)

WORKS IN PROGRESS

- **Cache Partitioning for Performance in Serverless Computing**
  Qi Ling, Ajay R. Rawat, Pedro Fonseca, Kazem Taram
  Under review
- **Compiler and Hardware Support for Zero-Cost Integer Overflow Protection**
  Zheng Zhang, **Qi Ling**, Brendan Ryan Sweeney, Deepak Gupta, Tal Garfinkel, Kazem Taram
  Under review

RESEARCH EXPERIENCE

- **SecArch & RSSys, Purdue University** **Aug. 2024 - Present**
  Advisors: Kazem Taram and Pedro Fonseca
  Microarchitectural isolation for performance and security.
  - Identified a new kind of cache contention in serverless computing.
  - Discovered a new cache partitioning technique, without introducing new hardware.
  - Achieved fine-grained, zero-cost cache partitioning across tens to hundreds of serverless functions.
  - Improved the P50 latency of latency-critical functions by 30% on average.
- **EFESLAB, University of Michigan** **Dec. 2022 - Dec. 2023**
  Advisors: Baris Kasikci and Shuwen Deng
  Detecting and evaluating Spectre-PHT gadgets in programs.
  - Identified the **Timing Condition** of Spectre-PHT gadget.
  - Presented a systematic study and exploration of windowing power.
  - Proposed and implemented a new approach, which describes the timing condition with a DAG graph, models the windowing power with graph algorithms, and quantifies the gadget's exploitability with runtime measurement.
  - Validated our approach and evaluated it against SOTA scanners on 2 micro-benchmarks, 6 userspace programs, and the Linux kernel. Identify 503 gadgets reported by SOTA scanners as unexploitable.
- **Network Measurement and System Lab, SJTU** **Aug. 2021 - Sep. 2022**
  Advisor: Yibo Pi
  Optimizing the accuracy and coverage of large-scale network monitoring.
  - Challenged two root assumptions of conventional network monitoring practice with experiments.
  - Proposed and implemented a greedy end-to-end network monitoring approach.
  - Evaluated the accuracy, coverage and overhead of our approach.

TEACHING EXPERIENCE

- **Purdue University - Computer Security (CS426)** **Spring, Fall 2025**
  Teaching assistant
- **Purdue University - Computer Architecture (CS250)** **Fall 2024**
  Teaching assistant

TECHNICAL SKILLS

- **Linux kernel development**
- **LLVM compiler development**
- **Hardware**: Verilog, Gem5