QI LING

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Department of Computer Science, Purdue University

RESEARCH INTERESTS

I want to make computer systems more efficient, reliable, and secure. Currently, my project focuses on scalable isolation techniques, specifically identifying and addressing bottlenecks in isolation techniques to enhance performance and scalability. 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: NA
  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
- **ACM MICRO Student Travel Grant** **2023**
- **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

- **Dike: Quantitatively and Accurately Gauge 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)

RESEARCH EXPERIENCE

- **SecArch & RSSys, Purdue University** **Aug. 2024 - Present**
  Advisors: Kazem Taram and Pedro Fonseca
  Evaluating scalability bottlenecks for different isolation techniques.
  – Explored scalability issues in virtualization environments, focusing on inter-VM/container scalability.

- Conducted case study on Redis clusters in Kubernetes to observe scalability bottlenecks and performance degradation.

- **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

- **Teaching assistant, Purdue University** **Aug. 2024 - Present**
  CS250 Computer Architecture

TECHNICAL SKILLS

- **Programming Languages**: Assembly, Verilog, C/C++, Rust
- **Software Tools**: Kubernetes, LLVM, Honggfuzz, Syzkaller, Gem5