Kunpeng Wang

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I aim to expand the frontiers of verifiable security, building secure systems and developing more scalable verification methods. My long-term career goal is to become an independent researcher in computer security and formal verification, making innovative and impactful contributions to these fields.

EDUCATION

Shanghai Jiao Tong University Sep 2022 ~ Present

B.Eng. of Computer Science and Technology, Student in ACM Class

- Academic credit score: 90.4/100, GPA 3.876/4.3, Rank: 12/29.
- Selected courses: Program Verification: 99, Programming Practice: 100, Compiler Design: 96, Operating System: 95, Algorithms: 98, Comprehensive Design for Computer System: 95.

RESEARCH

MATCHA Group, MIT May 2025 ~ Dec 2025

Advised by *Prof. Mengjia Yan*

Research Topic: secure (out-of-order) processor design and verification.

Secure Hardware Verification, under submission as co-first author

- Improve verification scalability of security properties on out-of-order processors.
- Investigate architectural insight guided proving and verification oriented secure hardware design.
- Submitted to IEEE S&P 2026 as co-first author.

Network Security and Privacy Protection (NSEC) Lab, SJTU June 2024 ~ June 2026

Advised by *Prof. Guoxing Chen*

Research Topic: verifiable interrupt-based side-channel mitigation for trusted execution environment.

Verifiable Contract for TEE, ongoing as first author

- Establish contract between mutual distrust TEE and OS to mitigate interrupt-based side-channel attacks.
- Allow both TEE and OS to verify the contract and generate proof of execution.

COURSE PROJECTS

Verified TypeInfer, Spring 2024

- Use Coq to verify the correctness of a type inference algorithm implemented by C.
- 2k lines of Coq code.

Mx-Compiler, Summer 2023

- A compiler from Mx language (a variant of C++ language designed for course) to RISCV32IM assembly
- Features: Graphing Coloring, Mem2Reg, Constant Propagation, etc.
- 15.8k lines C++ code.

RISCV32I CPU, Fall 2023

- Features: Tomasulo, Branch Prediction, Instruction Cache, etc.
- Tested on a Xilinx FPGA board.
- 3.3k lines of Verilog code.

RISCV64 Macrokernel, Spring 2024

- Features: KASLR, Virtual Memory, Buddy Allocator, Unix-like Syscall, etc.
- Contain full stack codes from bootloader to user programs.
- Tested on real hardware, VisionFive2.
- 3k lines of Rust code.

TEACHING ASSISTANT EXPERIENCE

Programming Practice, Yong Yu — Summer 2024

- Create CTF problems with the knowledge students have learned (about Programming, Architecture, Cryptography).
- Improve and optimize the major project: Simulator of RISCV32 CPU.
- Guide the lab of Network Proxy.

Data Structure, Alei Liang — Summer 2024

- Deliver detailed aids and lessons.

Data Structure, Huiyu Weng — Spring 2024

- Give lectures on data structures beyond the textbook.
- Guide students to finish the labs.

Programming (C++), Huiyu Weng — Fall 2023

- Create homeworks.
- Set 1 of 3 final exam problems.
- Give lectures on using Git, CMake, Linux, and Algorithms like divide and conquer.

AWARDS

Golden Medal 2022
International Collegiate Programming Contest (ICPC), Hangzhou

Golden Medal 2022
International Collegiate Programming Contest (ICPC), Nanjing

Bronze Medal 2022
International Collegiate Programming Contest (ICPC), Hongkong

Silver Medal 2022
China Collegiate Programming Contest (CCPC), Weihai

Merit Student 2023
Shanghai Jiao Tong University, *one per class only*

Zhiyuan Honorary Scholarship 2022,2023,2024
Zhiyuan College, *top 10% in SJTU*

First Prize Scholarship 2023
Zhiyuan College, *top 3 in class*