# Ganxiang Yang

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(+86) 185-6395-9307 yangganxiang@gmail.com github.com

## Education

**Zhiyuan College, Shanghai Jiao Tong University** **Sep.2020 - Present**

*BEng in Computer Science and Technology, member of **ACM Honor Class** (top 5% students in SJTU)* *Shanghai, China*

- Excellent professional and mathematical courses performance (to list a few):
  Operating System: 95/100, Machine Learning: 93/100, Model Checking: 94/100, Lab Research Practice: A+
  Mathematical Analysis: 92/100, Linear Algebra: 90/100, Mathematical Logic: 91/100, Probability Theory: 92/100

## Research Interests

System security and reliability, trusted execution environment, fuzzing, program analysis.

## Publications

**Palantír: Formally Verified Privileged Enclave as a Lightweight and Efficient Framework Extension**

*Authors: **Ganxiang. Y**, Chenyang. L, Zhen. H, Guoxing. C, Hongfei. F, Yuanyuan. Z, Haojin. Z* *Usenix Security'24*

- Submitted to **Usenix Security 2024** (under review).
- Propose Palantír, a novel Privileged Enclave (PE) framework for enclave platforms.
- Build TAP$^2$, an extended formal model of TEE platform for verifying Palantír security properties.
- Implement Palantír onto Penglai-TVM and conducted three various case studies to show system compatibility.

## Academic Experiences

**Research Intern** **Feb.2023 – Present**

*Northwestern University, U.S.A.* *Mentor: Xinyu Xing*

- Focusing on Web3 Security and bug exploitations on blockchain applications and platforms.
- Designing new methods to improve web API fuzzing efficiency.

**Undergraduate Research Assistant** **Jul.2022 – Present**

*Network Security and Privacy Protection (NSEC) Lab, SJTU* *Mentor: Guoxing Chen*

- Focusing on cross-platform Trusted Execution Environment (TEE) primitive designs.
- Providing an service framework to Penglai-TVM, a RISC-V trusted computing platform.
- Utilizing formal verification to describe TEE platform and verify security properties based on TAP.

## Honors & Awards

**Freshmen Scholarship** **Shanghai Jiao Tong University**

*Awards to students with outstanding performance on admission* *Sep.2020*

**Zhiyuan Honorary Scholarship** **Shanghai Jiao Tong University**

*Top 2% in SJTU* *2020, 2021, 2022*

## Projects

**Isaiah: A C-and-Java-like compiler** **[Github Link]**

*A **compiler** written in Java for compiling a C-and-Java-like Language named Mx**

- Use **ANTLR4** as frontend generator, subset of LLVM as Intermediate Representation (IR), rv32im as assembly.
- Support **λ-function** and **more complex class grammar** than others.
- With **7k+ LoC** and several test cases' performance **close to GCC-O1**.

**YPU: An Speculative Executed CPU on FPGA** **[Github Link]**

*A **rv32i CPU** written in Verilog HDL and working fine on FPGA at 100 MHz.*

- Design a single-issued **Speculative Execution** based on **Tomasulo Algorithm**.
- Support various features: precise interruption, BPU, icache, Load Buffer, prefetching.
- With **3k+ LoC**, low circuit path delay design, and outstanding performance on FPGA.

## Specialized Skills

**Programming Languages**: C, C++, Java, Python, Verilog, RISC-V Assembly, Bash, Boogie, Go, SQL
**Frameworks & Tools**: LLVM, qemu, OpenSBI, Docker, Vivado, LibAFL, AFL++
**Mandarin**: Native Speaker
**TOEFL** (Feb 2023): 107 (R29/L30/S23/W25)