Chengxi Yang (杨承羲)

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Education

Shanghai Jiao Tong University Shanghai, China

Bachelor of Computer Science *Sep. 2022 - Jun. 2026 (expected)*

- A member of ACM Honors Class, an elite CS program in SJTU
- **GPA**: **3.98**/4.3, **Ranking**: **2**/37, 18 A+ courses
- Selected Courses: Mathematical Logic: 100/100, Computer Architecture: 100/100, Program Verification: 99/100, Compiler Design and Implementation: 97/100, Cryptography: 100/100, Computational Complexity: 100/100
- Scholarship: **Fan Xuji Scholarship** (10 winners each year in SJTU), 2024
- **Research Interest:** I'm interested in programming languages, especially formal verification, program analysis and compiler design and implementation.

Research Experience

Shanghai Jiao Tong University Shanghai, China

Undergraduate Researcher, advised by Prof. Qinxiang Cao *Jun. 2024 - present*

- I built **a Hoare Logic framework on monadic programs** and proposed a **two-stage proof approach** to make formal proof reflect natural logical structure. I verified the KMP algorithm using it.
- I leveraged relational Hoare Logic and separation logic to prove a C implementation of KMP refines the algorithm.
- I designed some new features of our **C verification tool**, including **multi-branch** which enables fine-grained controls of branches in symbolic execution. I also implemented a **VS-Code extension** for our tool.

Selected Projects

- **Mx* Compiler**: A Compiler from Mx* language (a C & Java like language) to RISC-V RV32I Assembly implemented in Java, featuring linear scan register allocation, SSA transformation and various optimization.
- **RISC-V CPU**: A Tomasulo-based RISC-V RV32I CPU designed in Verilog RTL, featuring instruction cache and branch predictor. It can be run on FPGA board.
- **Acore**: A toy RISC-V kernel implemented in Rust that can be run on QEMU. It features remote-procedure-call mechanism, virtual memory and preemptive multi-process scheduling.
- **Query2Label Music Tagging**: I leveraged the Query2Label Transformer framework to improve the existing CNN-based music tagging models.

Teaching

- **Teaching assistant for Programming(C++)**. I gave a lecture on introduction to computer systems, designed a new course project and a problem in the final exam.
- **Teaching assistant for Principles and Practice of Computer Algorithms**. I designed a new lab project on formal verification in Coq.

Skills

Natural Languages: Chinese (native), English (fluent, TOEFL 108).

Programming Languages: C/C++, Coq, Java, Rust, Lean4, Python, Verilog, Go.