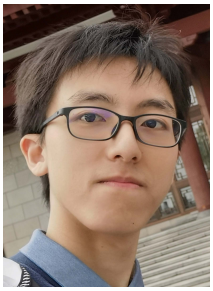

Aoyang Yu

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Website: permui.github.io

Research Interest

I am interested in **programming language theory** and **proof assistants**. I am also exploring **homotopy type theory** recently.

Education

Bachelor of Engineering | ***Computer Science and Technology*** Sep. 2019 – June 2023 (expected)
Zhejiang University, Chu Kochen Honors College Hangzhou, Zhejiang, China

- GPA: 92.83/100 Rank: 3/43

Projects

NbE for STLC | **OCaml** Spring 2022
personal project related to *type theory* and *proof assistants*

- *Normalization by evaluation* (NbE) is an efficient technique for normalizing terms in type theories. It is an essential part of recent proof assistants like Coq, Agda, and the red* family of proof assistants.
- To deepen my understanding of this algorithm, I implemented it for *simply typed lambda calculus* (STLC). See the GitHub repository for more details.

Calocom : A Programming Language and its Compiler | **Rust** Spring 2022
course project of *Compiler Principles*, teamwork

- We designed and implemented an imperative programming language with functional elements. These elements include algebraic data type, pattern matching, lambda expression, and first-class function.
- I was involved in the language design and the development of the compiler frontend.

Motorcycle : A Pipelined RISC-V Processor | ***Verilog*** Spring 2021 - Spring 2022
course project of *Computer System I - III*, individual

- I built a 5-stage pipelined RISC-V processor with Verilog. It operates on the machine level and supports: most RV32I instructions from the official specifications, four machine level CSRs, basic CSR instructions, and exception handling. It has data and instruction caches.
- The processor was tested on a Digilent Nexys A7 FPGA.

MeSQL : A Basic DBMS | ***C++, Flex & Bison*** Spring 2020
course project of *Database System*, individual

- I independently developed a basic DBMS in C++ from scratch. It supports common database operations and comes with an interactive SQL interpreter.
- Behind the scene, there is a buffer manager to accelerate I/O operations and a B+ tree index mechanism to speed up queries. I self-studied basic compiler principles and implemented the interpreter with *Flex* and *Bison*.

Honors and Awards

The 2019 ICPC Asia Nanjing Regional Contest *Gold Medal* Oct. 2019
ICPC stands for International Collegiate Programming Contest ICPC Foundation

Leading Student Scholarship Fall 2020
Merit based scholarship for leading students Chu Kochen Honors College, Zhejiang University

Miscellaneous

Learning Assistant Fall 2019
Helped peers learn C programming Zhejiang University

Learning Assistant Fall 2020
Gave lectures on mathematical analysis and linear algebra to first-year students Zhejiang University

Skills

Programming Language: C++, OCaml, Haskell, Rust, Python
Proof Assistant: Agda, Coq