

ZEBANG HE

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EDUCATION

ShanghaiTech University 2023 - Present
Undergraduate | *Computer Science* Shanghai, China

Shanghai Jiao Tong University - IPADS Lab 2025 - Present
Research Assistant | *MLSys @ Zhichao Hua* Shanghai, China

Research Interests: I am currently focusing on **computer architecture**, **high performance** and **intelligent storage**, with a particular focus on optimizing heterogeneous computing and parallel computing, as well as high-concurrency and distributed file system.

SKILLS

Expertise: HPC | Architecture | OS | Compiler | Full-stack Developing | Product Design

Languages: Python | C/C++ | Javascript/Typescript | OCaml | C# | Golang | LaTeX/Typst

COMPETITIONS

NSCSCC 2025 (Loongson Cup) | SPECIAL PRIZE (RANK 1ST) **Verilog, Vivado, C, ASM**
National Student Computer System Capability Challenge 2025 Jun.

- We are designing a **high-performance** chip supporting the **LoongArch** instruction set on the FPGA of the Artix-7 kit. And **we've defeated Tsinghua University and Fudan University, ranked 1st!**
- We have run the **Linux system** on this chip and ported specific programs, performing targeted **profiling** and **optimization** for the performance of those specific programs.

ASC 25 | 2'ND PRIZE **Slurm, C, Python, ARM-Forge**
Student supercomputing challenge of ASC 2025 Jan.

- We have optimized **HPL** and **HPCG** with special tuning based on the CPU and GPU architectures we use, allowing them to achieve more than 90% of the theoretical results!
- We've transferred **AlphaFold3** from GPU to CPU, and we've done some optimizations.

PROJECTS

JPO - An Order-Based Market Data feed | JUMP TRADING SCHOOL PROJECT **C++**
An efficient implementation of orderbook. Oct 2025

- I implemented an efficient orderbook with high efficiency. Profiled between different hash implementation, high performance data structure and algorithms.
- Supports Augmented BST Tree to trace history, uses Flat Hashmap, and optimized in instruction-level with Intel VTune to be cache friendlier.

GCC-Fortran with Multi-Versioning Support | OSPP PERSONAL PROJECT **C, C++, Fortran**
Function Multi-Versioning `target_clones` support for GFortran compiler. *Jun 2025 - July 2025*

- I implemented the correct registration and parsing of ATTRIBUTE in the frontend, implemented the attribute handling function, and modified the IFUNC function generation mechanism.

Pintos | PERSONAL **C, x86 Assembly**
An operating system for the 80x86 architecture. *Mar 2024 - Jun 2024*

- I implemented the advanced scheduling, system call, user/kernel mode, virtual memory and file system of the operating system.
- Pintos contains basic shell and filesystem, and is able to run programs in user mode.

OATC Language Compiler | PERSONAL **OCaml, LLVM, X86lite**
A simple language compiler for the OATC language. *Aug 2024 - Jan 2025*

- I implemented an X86lite instruction set simulator and assembler. And the OATC language interpreter using OCaml.
- I've also developed the compiler from OATC to LLVMlite IR, and final to X86lite platform.

RISC-V RV32I CPU with pipeline | PERSONAL **RISCV, Logisim**
A full-function RV32I CPU, with 5 stages & hazard solving *Feb 2024 - Jun 2025*

- My CPU supports a classic five-stage pipeline capable of handling structure adventures, data adventures, and control adventures.

QRTech-web | PERSONAL PROJECT **React + Golang + WebRTC; Redis + SQLite**
Real-time Wide-Area-Network Data Broadcasting. *Sep 2023 - Present*

- My project focuses on developing a wide area network data broadcasting system, aimed at sharing datas with short lifecycle within short time.

INTERNSHIPS

UbiQuant | SYSTEM DEV **C++, Python, k8s**
AI Infra - Distributed storage / cache system. Connects to LMCache. *Sep 2025 - Nov 2025*

- I was responsible for developing the dynamic scaling and failover features for distributed storage, and I implemented a task queue based on a sliding window to avoid performance spikes.
- I also wrote correctness tests and a large number of unit tests for the project to ensure that the functions worked properly.

ROLES

GeekPie Association, GeekPie HPC Team | PRESIDENT
*I'm the **president** of GeekPie Association, a comprehensive technology-based science and innovation society. I'm also the **team leader** of the GeekPie HPC team, participated in ASC/SCC.*

SI 100+ / Intro to Computer Science | INSTRUCTOR & MAIN DEVELOPER
*I'm the **main instructor** and person in charge of the course SI 100+ for freshmen in ShanghaiTech.*