Zebang He

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Education

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

Shanghai Jiao Tong University - IPADS Lab *2025*
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.

Internships

SiFlow/Scitix (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.

Skills

Expertise: HPC | Architecture | OS | Compiler | Full-stack Developing | Product Design
Languages: `Python` | `C/C++` | `Javascript/Typescript` | `Rust` | `OCaml` | `C#` | `Golang` | `LaTeX/Typst`

Competitions

RED Hackathon | Software First Prize **ComfyUI, k8s, Python**
Hacker Maration by Red Note *2026. Apr.*

- We've developed a TikTok-like hair style APP **in 48-hours** named **ChicChic**, and won the first prize with many investments.
- I developed ComfyUI workflow to implement facial transition and video generation. I also developed a load-balance router with many optimizations on parallelism on ComfyUI, supporting inference with many cards simultaneously.

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 Augumented 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.

TrackMaker-rs | PERSONAL **Rust**
Audio-based Ethernet Implementation, support ICMP/TCP/UDP/DNS *Feb 2024 - Jun 2025*

- I implemented a ethernet interface based on acoustic link (by AUX wire or by sound). Using WLAN-like protocal to support multiple access.
- Based on physical layer, I implemented other internet layers, including TCP/UDP/ICMP/DNS and other protocals.

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.

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/ISC.*