

# ZEBANG HE

✉ [hezambar@outlook.com](mailto:hezambar@outlook.com) | ☎ +86 155-8000-7649 | Github: [HeZeBang](#)

## EDUCATION

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ShanghaiTech University  
Undergraduate | Computer Science

2023 - Present  
Shanghai, China

Shanghai Jiao Tong University - IPADS Lab  
Research Assistant | MLSys @ Zhichao Hua

2025  
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

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SiFlow/Scitix (UbiQuant) | SYSTEM DEV  
AI Infra - Distributed storage / cache system. Connects to LMCache.

C++, Python, k8s  
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

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

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

## COMPETITIONS

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NSCSCC 2025 (Loongson Cup) | SPECIAL PRIZE (RANK 1ST)  
National Student Computer System Capability Challenge

Verilog, Vivado, C, ASM  
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  
Student supercomputing challenge of ASC

Slurm, C, Python, ARM-Forge  
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

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### 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.

### 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 protocol to support multiple access.
- Based on physical layer, I implemented other internet layers, including TCP/UDP/ICMP/DNS and other protocols.

### 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.

### 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.

## ROLES

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### 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.*