

# ZEBANG HE

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## 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 - Present  
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

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

**Languages:** Python | C/C++ | Javascript/TypeScript | OCaml | C# | Golang | LaTeX/Typoscript

## 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  
*An efficient implementation of orderbook.*

**C++**  
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.

<b>GCC-Fortran with Multi-Versioning Support</b>   OSPP PERSONAL PROJECT <i>Function Multi-Versioning `target_clones` support for GFortran compiler.</i>	C, C++, Fortran	Jun 2025 - July 2025
<ul style="list-style-type: none"><li>I implemented the correct registration and parsing of ATTRIBUTE in the frontend, implemented the attribute handling function, and modified the IFUNC function generation mechanism.</li></ul>		
<b>PintOS</b>   PERSONAL <i>An operating system for the 80x86 architecture.</i>	C, x86 Assembly	Mar 2024 - Jun 2024
<ul style="list-style-type: none"><li>I implemented the advanced scheduling, system call, user/kernel mode, virtual memory and file system of the operating system.</li><li>PintOS contains basic shell and filesystem, and is able to run programs in user mode.</li></ul>		
<b>OATC Language Compiler</b>   PERSONAL <i>A simple language compiler for the OATC language.</i>	OCaml, LLVM, X86lite	Aug 2024 - Jan 2025
<ul style="list-style-type: none"><li>I implemented an X86lite instruction set simulator and assembler. And the OATC language interpreter using OCaml.</li><li>I've also developed the compiler from OATC to LLVMlite IR, and final to X86lite platform.</li></ul>		
<b>RISC-V RV32I CPU with pipeline</b>   PERSONAL <i>A full-function RV32I CPU, with 5 stages &amp; hazard solving</i>	RISCV, Logisim	Feb 2024 - Jun 2025
<ul style="list-style-type: none"><li>My CPU supports a classic five-stage pipeline capable of handling structure adventures, data adventures, and control adventures.</li></ul>		
<b>QRTech-web</b>   PERSONAL PROJECT <i>Real-time Wide-Area-Network Data Broadcasting.</i>	React + Golang + WebRTC; Redis + SQLite	Sep 2023 - Present
<ul style="list-style-type: none"><li>My project focuses on developing a wide area network data broadcasting system, aimed at sharing datas with short lifecycle within short time.</li></ul>		

## **INTERNSHIPS**

**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.

## 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.*