

# SIYUAN ZHU

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## RESEARCH INTEREST

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I am a junior student at Zhejiang University. My research interests include **optimizing compilers** for modern architectures and applications, **runtime systems** and **formal verification**. Currently, I focus on IR design and corresponding static analysis. The final goal is to implement appealing language features and explore more optimization opportunities.

## EDUCATION

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### Zhejiang University

Bachelor of Engineering, Computer Science and Technology

Hangzhou, China

Sep. 2020 – Jun. 2024 (expected)

## EXPERIENCE


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### Teaching Assistant

Zhejiang University

July 2022 – August 2022

Hangzhou, China

- High Performance Computing Practice Course, see 2022 HPC 101 
- CUDA convolution 2D kernel optimization

## PROJECTS

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### SyOC | C++, *Compiler, Optimization*

August 2022

- SysY (a subset of C) optimizing compiler targets at ARMv7-A backend.
- I implement part of middle-end optimization passes and back-end code generation. The backend consists of macro-expansion instruction selection, linear scan register allocation, a stack lowering and limited peephole optimization.

### GPU Kernel Generating | C++, *Python*

May 2022

- Tuning operator kernels for ASC22 DeePMD neural network.
- Use Ansor to generate CUDA kernels or to be packed with TVM runtime, eliminating intermediate GPU memory allocation.

### DPC++ SVM | DPC++, *Optimization*

August 2022

- PAC 2022 final round
- Migrate and optimize ThunderSVM to Intel GPU, refactor the code with Intel oneAPI toolkit. In this task, we mainly focus on GPU SpMM optimization.

## SCHOLARSHIP AND AWARDS

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- Second Prize in the ASC22 student supercomputer challenge 2022
- Excellence Award in Computer System Capability Competition, Compiler Track 2022
- Zhejiang University First Scholarship 2021, 2022