

Guokai Chen

PhD student at EPFL

guokai.chen@epfl.ch

@chenguokai on GitHub

PROFILE

Second year PhD student at EPFL EDIC. Skilled in the design of modern out-of-order RISC-V processor with experience in the XiangShan team.

RESEARCH INTERESTS

Computer Architecture, Security, and Programming Language

EDUCATION

École Polytechnique Fédérale de Lausanne, Lausanne, Switzerland - PhD student, 2024.9 - present

University of Chinese Academy of Sciences/Institute of Computing Technology, CAS, Beijing, China - Master of Computer Technology, 2021.9 - 2024.6

University of California, Berkeley, (Remote) - Visiting student, 2020.8 - 2020.12

University of Chinese Academy of Sciences, Beijing, China - Bachelor of Computer Science and Technology, 2017.9 - 2021.6 Ranked 39/112

SKILLS

The design of modern processors, Linux kernel and Gem 5

Programming languages: C/CPP, Scala, Chisel, Verilog, LaTeX, Assembly, Makefile, Markdown, Python and others

TOEFL: 108 (Reading 29 Listening 30 Speaking 22 Writing 27)

AWARDS

1. 2nd Prize on 4th NSCSCC(Loongson Cup), 2020

- Designed a five-stage pipelined MIPS processor that is capable of running Linux
- 2. Lenovo master student scholarship, 2022

EXPERIENCES

1. Student of YSYX (One chip per student) 2020.8 - 2021.1

2. Teaching Assistant at Introduction to Computer Science 2020.9 - 2021.1

3. Intern at Beijing Institute of Open Source Chips (BOSC) 2022.3 - 2024.6

- **Leader** of the frontend design group of XiangShan open source processor
 - Proposal and implementation of multiple branch predictors
4. Teaching Assistant at Industrial Automation 2025.2 - 2025.6

SELECTED PUBLICATIONS

1. Yinan Xu, ZiHao Yu, Dan Tang, **Guokai Chen** et al, Towards Developing High Performance RISC-V Processors Using Agile Methodology. in 55th IEEE/ACM International Symposium on Microarchitecture(MICRO), 2022.
2. Kaifan Wang, Yinan Xu, Zihao Yu, Dan Tang, **Guokai Chen** et al. XiangShan Open-Source High Performance RISC-V Processor Design and Implementation[J]. Journal of Computer Research and Development, 2023, 60(3): 476-493.
3. Kaifan Wang, Jian Chen, Yinan Xu, Zihao Yu, Zifei Zhang, **Guokai Chen**, et al. XiangShan: An Open-Source Project for High-Performance RISC-V Processors Meeting Industrial-Grade Standards. in IEEE Hot Chips 36 Symposium (HCS), 2024.

SELECTED REPORTS

- Performance evaluation tools for XiangShan Processor, RISC-V Summit China 2022
- Kprobe optimization algorithm for RISC architectures, China Linux Kernel Developer Conference 2022
- The Evolution of XiangShan (Kunminghu) Frontend, RISC-V Summit China 2023
- A Language for Microarchitectural Security Evaluation, YArch'25, colocated with ASPLOS'25

SELECTED PATENTS

- CN115629917B, Data recovery method and device, electronic equipment and readable storage medium, **Guokai Chen** and Huaqiang Wang
- CN116048627B, Instruction buffer method, device, processor, electronic equipment and readable storage medium, **Guokai Chen** and Lingrui Gou
- CN116894209B, Sampling point classification method, device, electronic equipment and readable storage medium, **Guokai Chen**, Lingrui Gou, et al.

OPEN SOURCE PROJECTS

- Open Source Promotion Plan (OSPP) 2020 Port RT-Thread to RISC-V QEMU
 - Outstanding student of the year (**20 out of 151**)
- OSPP 2021 Mentor of Simple-XX community
- OSPP 2022 Optimize Kprobe on RISC-V architecture
 - Reported on China Linux Kernel Developer Conference 2022
 - Outstanding student of the year (**20 out of 350**)
- OSPP 2023 Mentor of Simple-XX community
- OSPP 2024 Implement Full Kdump on openEuler risc-v