ZIANG TIAN

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My Website

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EDUCATION

Wuhan University September 2021-June 2025 (Expected)
Undergraduate student in Computer Science *GPA: 3.94/4* *TOEFL: 111*

- National Scholarship (top 1.5%) in 2022
- National Scholarship (top 1.5%) in 2023

PROJECT EXPERIENCE

Reducing re-encryption incurred writes in AES-CTR memory systems April 2024 - Present
Advisor: Yuezhi Che (Wuhan University), Xiaobo Sharon Hu (University of Notre Dame)

- Identified two prominent performance bottlenecks in existing AES-CTR based memory systems.
- Leading the proposal of a new counter-data re-mapping scheme that allows for dynamic and local re-mapping to reduce re-encryption overheads.
- Implementing the scheme in gem5 simulator to assess overall performance gain over the baseline schemes.
- Expected to be submitted for ISCA 24'.

Locality-centric caching optimization for AES-CTR memory systems March 2024 - August 2024
Advisor: Yuezhi Che (Wuhan University), Xiaobo Sharon Hu (University of Notre Dame)

- Assisted in acquisition of experimental data for graph-based applications in gem5 and with Intel Pintool.
- Submitted for HPCA 24'.

Implementation of the Raft distributed systems August 2024 - September 2024
Go [Code]

- Completed labs (a raft implementation without snapshot support) for MIT 6.5840: Distributed Systems, a graduate level course. Code and passed tests are provided.
- Implemented the Raft paper in Golang, in particular leader election and log replication, with full support for persistence and fault-tolerance.
- Gained experience in developing and debugging distributed systems.

A 5-level Pipelined RISC-V Processor May 2023 - July 2023
Verilog, C [Code]

- Implemented a 5-level pipelined CPU on an Artix-7 FPGA board (Nexys A7) in $\sim$ 3000 lines of Verilog in Vivado.
- Resolved data hazard and control hazard with forwarding and stalling.
- (In Group)Implemented a sudoku game on the CPU (with no OS support).

Implementation of a dynamic memory allocator in xv6 OS April 2024
C, Qemu simulator [Code]

- Researched on the structure of the xv6 operating system.
- Implemented a buddy allocator for the xv6 operating system using a self-devised bit-map tree.

Introduction to memory optimization for AI model training October 2023 - December 2023
Cpp, Python [Slides (In Chinese)]

- Read and presented 13 papers from 2016-2021 on AI model training memory optimization.
- Categorized different works according to their optimization methods.
- Read and researched on the source code of Pytorch concerning data dispatching.

SKILLS

Computer Languages	Python, Cpp, Go, C, Javascript, Verilog, C#
Tools	Gem5 Simulator
Others	Latex