

# ZIANG TIAN

2004.03 ◇ Wuhan, China

My Website

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## EDUCATION

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### Wuhan University

September 2021-June 2025 (Expected)

*Undergraduate student in Computer Science*

- GPA: 3.94/4    Rank: 3/129    Average course score: 93.28
- TOEFL: 111 (Listening: 30 Reading: 29 Speaking: 24 Writing: 28)
- National Scholarship (top 1.5%) in 2022
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## RESEARCH EXPERIENCE

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### Reducing encryption-related memory traffic in AES-CTR memory systems    April 2024 - November 2024

*Collaborator/Advisor:* Yuezhi Che (Wuhan University, Postdoc), Haoran Geng (University of Notre Dame, Ph.D. candidate), Dazhao Cheng (Wuhan University, Professor), Xiaobo Sharon Hu (University of Notre Dame, Professor)

- Conducted a comprehensive analysis of the challenges in existing secure memory systems across various configurations, highlighting re-encryption as a non-trivial bottleneck.
- Led the proposal of OREO, a dynamic security metadata mapping scheme that enables dynamic and local re-mapping to reduce memory traffic.
- Implemented OREO with comparative studies in the ChampSim simulator.
- Under review for ISCA 25'.

### Locality-centric caching optimization for AES-CTR memory systems    March 2024 - August 2024

*Collaborator/Advisor:* Yuezhi Che (Wuhan University, Postdoc), Haoran Geng (University of Notre Dame, Ph.D. candidate), Dazhao Cheng (Wuhan University, Professor), Xiaobo Sharon Hu (University of Notre Dame, Professor)

- Completed supporting experiments to substantiate research motivations with Intel Pintool.
- Implemented comparative studies for benchmarking in Gem5 simulator.
- Entered rebuttal in HPCA 25'. Now under review for ISCA 25'.

### Survey of memory optimization for model training    October 2023 - December 2023

*Advisor:* Dazhao Cheng (Wuhan University, Professor)    [\[Slides \(In Chinese\)\]](#)

- Read and presented 13 papers from 2016-2021 on model training memory optimization.
- Categorized different works according to their optimization methods.

- Read and researched on the source code of Pytorch concerning data dispatching.

## PROJECTS

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### 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 test results 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 Verilog in Vivado.
- Resolved data hazard and control hazard with forwarding and stalling.
- Implemented a sudoku game on the CPU (with no OS support).

### Functionalities and Optimizations in xv6 OS

September 2023 - October 2023

*C*

[\[Code 1\]](#) [\[Code 2\]](#)

- Completed all 10 labs for MIT [6.S081](#): Operating Systems. Code and passed test results are provided.
- Researched on source codes of the xv6 OS, and implemented a series of fundamental operating system functionalities/optimizations, including [copy-on-write](#), [user-level threading](#), a [hash-partitioned block cache](#) for locking contention reduction, [an E1000 network driver](#), etc. Code is available in the branches [here](#).
- Implemented a buddy allocator for the xv6 operating system using a self-devised light-weight bit-map tree. Code is available [here](#).

## TEACHING

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Teaching assistant for Introduction to Quantum Computing (Spring 2024, 115 course-takers)

- Built a course website using Docusaurus, live at <https://nercms-mmap.github.io/WHUQC/>.
- Tutored students with lab assignments on rudimentary quantum circuits simulation.
- Coordinated students of diverse backgrounds to successfully complete collaborative presentations.
- Graded homework and lab reports.

## SKILLS

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### Programming Languages

Python, Cpp, Go, C, Javascript, Verilog

### Tools

Gem5 Simulator, ChampSim Simulator

### Others

Latex