

Zixuan Wang

Ph.D. student

CSE, University of California San Diego

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EDUCATION

- **University of California San Diego** San Diego, CA, US
Ph.D. student in Computer Science and Engineering; GPA: 3.875 Sep. 2018 – Present
- **Zhejiang University** Hangzhou, China
BS in Computer Science; GPA: 3.83; Third year GPA: 3.93 Sep. 2014 – July. 2018

PUBLICATIONS

- **Ayudante: A Deep Reinforcement Learning Approach to Assist Persistent Memory Programming** *USENIX ATC, 2021*
Hanxian Huang, **Zixuan Wang**, Juno Kim, Steven Swanson, Jishen Zhao
- **Characterizing and Modeling Non-Volatile Memory Systems** *IEEE Micro Top Picks, 2021*
Zixuan Wang, Xiao Liu, Jian Yang, Theodore Michailidis, Steven Swanson, Jishen Zhao
- **Characterizing and Modeling Non-Volatile Memory Systems** *MICRO, 2020*
Zixuan Wang, Xiao Liu, Jian Yang, Theodore Michailidis, Steven Swanson, Jishen Zhao
- **Basic Performance Measurements of the Intel Optane DC Persistent Memory Module** *ArXiv*
Joseph Izraelevitz, Jian Yang, Lu Zhang, Juno Kim, Xiao Liu, Amirsaman Memaripour, Yun Joon Soh, **Zixuan Wang**, Yi Xu, Subramanya R. Dulloor, Jishen Zhao, Steven Swanson
- **Reliable and Flexible Large Scale Memory Network** *NVMW, 2019*
Zixuan Wang, Xiao Liu, Jongryool Kim, Hokyoon Lee, Jishen Zhao

EXPERIENCE

- **Software Engineering Intern** GCP, Google
In Confidential VM team, developed KVM testing for AMD SEV features. June. 2021 – Sept. 2021
- **Graduate Research Assistant, STABLE Lab & NVSL Lab** UCSD
Computer architecture and system research. Sep. 2018 – Present
- **Submission Chair** MICRO 2021
Served as submission chair, part of organizing committee, for MICRO 2021 conference. Mar. 2021 – June. 2021
- **Research Internship** SOLAB, SK Hynix
Evaluated GEN-Z memory prototype, developed GPU direct access to GEN-Z memory. Jun. 2019 – Sep. 2019
- **Undergraduate Research Assistant, Computer Architecture Lab** Zhejiang University
Operating system and architecture research. Sep. 2015 – Jun. 2018

TEACHING

- **TA of Computer Hardware System Based Comprehensive Practice** Zhejiang University
Guided students to develop their own SoC to support their OS. Mar. 2018 – Jun. 2018
- **TA of Operating System Course** Zhejiang University
Guided students to develop their own OS. Sep. 2017 – Feb. 2018

PROJECTS

- **NVRAM Security** *In progress*
 - Analyze security issues in new NVRAM products.
 - Reverse engineer a commercial NVRAM product.
 - Analyze the hardware security issues.
- **Communication Optimization for Distributed ML Training** *In progress*
 - Memory centric distributed ML training.
 - Accelerate distributed ML training with emerging cache-coherent interconnection.
 - GPU direct access to memory device over serial bus.
- **NVRAM Characterization** *July. 2020*
 - Part of an MICRO 2020 paper and an IEEE Micro TopPicks paper.
 - Reverse engineer the first NVRAM product, Intel Optane Persistent Memory.
 - Develop performance model for NVRAM.

- MICRO 2020 paper. Code release: github.com/TheNetAdmin/LENS-VANS
- **GPU Direct Access to GEN-Z Memory** *Sep. 2019*
 - *Work done during SK Hynix internship.*
 - Characterize the GEN-Z memory prototype and develop GPU direct access to GEN-Z memory.
 - cuDF library runs 16x faster compared to using indirect access through CPU DRAM.
- **FPGA Accelerated High-Frequency Trading** *Sep. 2018*
 - *Deployed by Nanhua Future.*
 - Use FPGA to accelerate network response and decision making.
 - Increase performance by **99.92%** (Respond time 2ms → 800ns).
- **QEMU micro:bit** *May. 2018*
 - *A micro:bit emulator based on QEMU.*
 - **Best graduation thesis** of computer science department, 2018 Zhejiang University
 - Implemente ARM Cortex-M0, virtual memory, interrupts, exceptions and peripherals.
 - Capable of running unmodified ARM-Mbed OS and micro:bit Bootloader.
 - github.com/TheNetAdmin/qemu-microbit
- **ZJUNIX Operating System** *Apr. 2017*
 - *Self-designed OS running on self-designed SoC.*
 - Buddy and Slub memory management, multi-process, file system, device drivers, etc.
 - github.com/zjunix/
- **ZJUNIX SoC** *Dec. 2016*
 - *Self-designed SOC on FPGA*
 - Self-implemented MIPS32 CPU with DDR3, VGA, PS2, SD controller on FPGA.
 - Capable of running ZJUNIX Operating System.
- **Portable 3D Bioprinter** *Dec. 2016*
 - *Printing tissue directly on wounds; The whole device fits in a 28-inch travel case.*
 - FPGA accelerated edge detector for real-time computing.
 - The outstanding prize of Challenge Cup, Zhejiang Province, China.

PATENTS

- **A Modulized Portable 3D Bioprinter** *Mar. 2017*
 - *Utility model patent, China*
 - Patent Number: 201720246090.1
 - Patent Holder: **Zixuan Wang**, Bin Zhang, Wenzheng Kuang, Huayong Yang

HONORS & AWARDS

- **IEEE Micro TopPicks:** Annually awarded to 12 best papers in computer architecture area, 2021 IEEE
- **Best Graduation Thesis:** Best graduation thesis, 2018 Zhejiang University
- **He-Zhi-Jun Scholarship:** Most outstanding students of computer science department, 2017 Zhejiang University
- **Outstanding Prize:** Challenge Cup, National Undergraduate Curricular Academic Science and Technology Works Competition, 2017 Zhejiang Province China
- **Academic Star:** Top 1% students on academic achievement in computer science department, 2017 Zhejiang University
- **Second Prize:** Diligent Design Contest, 2017 China
- **Third Prize:** Advanced Computer Architecture Undergraduate Innovation Competition, 2016 CCF China

SKILLS

- **Technologies:** KVM, UEFI, QEMU, Linux kernel, TensorFlow, FPGA, Performance profiling
- **Languages:** C/C++, x86/MIPS/ARM Assembly, Python, R, Verilog, Rust, Java, JavaScript

OPEN SOURCE PROJECTS

- **VS Code LinkerScript** *Aug 2018*
 - *The first linker script language extension on VS Code.*
 - GNU linker script highlight extension for VS Code, based on TmLanguage.
 - github.com/TheNetAdmin/vscode-linkerscript (59K Installation)
- **ZJU Thesis** *May 2018*
 - *LaTeX template for Zhejiang University graduation thesis.*
 - LaTeX template, widely used by students in Zhejiang University.
 - github.com/TheNetAdmin/zjuthesis (800 ★ 11K Download)