Xiayang Jin

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Education

University of Michigan, Ann Arbor Aug 2024 — Now
Bachelor's of Science, Computer Science *Ann Arbor, MI*
- Cumulative GPA: 4.0/4.0

Shanghai Jiaotong University Sep 2022 — Now
Bachelor's of Science, Mechanical Engineering *Shanghai, China*

Experiences

Research Intern May 2025 — Present
OrderLab, University of Michigan *Ann Arbor, MI*

- Conduct research at the System–ML boundary on reliability and performance of machine learning systems
- Develop system support for failure modeling, tolerance and recovery strategies of ML workloads that preserve correctness while minimizing overhead
- Evaluate techniques on LLM/RLHF workloads across multi-GPU setups; analyze trade-offs among time-to-recovery, throughput, and data integrity

Research Intern May 2024 — Aug 2024
Shanghai Jiaotong University *Shanghai, China*

- Research in MINLP optimizations and their applications in Computer Networking
- Designed an Machine Learning approach to boost traditional MINLP solvers, and applied it to cutting-edge networking algorithms

Teaching Assistant May 2024 — Aug 2024
Shanghai Jiaotong University *Shanghai, China*

- Assisted in presenting a course about game development and software engineering
- Developed auto grading and feedback programs for student projects
- Conducted weekly lab and office hours for over 50 students

Instructional Aide Expected Jan 2026 — May 2026
University of Michigan *Ann Arbor, MI*

- Will assist in presenting a course about Introduction to Operating Systems

Projects

PhoenixML May 2025 — Present

- Developed a stage-level automatic recovery system for distributed machine learning training jobs with transient CUDA faults without checkpoint/restore
- Designed an runtime interposition layer to transparently trace CUDA alloc/launch calls and maintain a VA to tensor registry
- Implemented CUDA Virtual Memory Management with a proxy context to enable zero-copy remapping across context respawns

CudaProxy Aug 2025 — Present

- Developed a CUDA runtime proxy for machine learning inference to use CUDA Graphs and Persistent Kernels for accelerated performance without brittle fusion
- Implemented Bucketing, Automatic Padding, and Static Memory Pooling to handle dynamic workloads with minimal overhead
- Implemented automatic routing for kernel launches based on workload characteristics

OS Kernel Implementation Jan 2025 — May 2025

- Developed a C++ thread library and virtual memory pager on UNIX-like systems
- Implemented synchronization primitives like mutexes and condition variables using UNIX context management techniques.
- Managing Thread life cycle, Scheduler, Context Switching, CPU Booting, Process creation, Process forking, Page fault handling, and Process destruction
- Implemented optimizations including copy-on-write and page sharing

Dynamic Typed Compiler May 2024 — Aug 2024

- Used Rust to develop a compiler for a simple language supporting dynamic typing and heap allocation on x86-64 architecture
- Implemented frontend checking, middleend Single Static Assignment (SSA) forming, and backend code generation with System V ABI
- Implemented optimizations including register allocation and assertion removal

Hyprtile May 2025 — Present

- Developed a high-performance tiling window management mechanism for Linux using C++ under Wayland protocol, targeting efficient multitasking across multiple projects
- Features include workspace management, windows overview, dynamic window tiling, and multi-monitor support

Deep Learning Approach to MINLP Problems in Wireless Networks May 2024 — Aug 2024

- Designed and implemented an imitation learning approach to accelerate Branch and Bound algorithm for solving Mixed-Integer Nonlinear Programming optimization problems
- Applied the approach to Inteference Graph Estimation in full-duplex millimeter-wave backhaul networks

Skills

- **Programming Languages**: C/C++, Python, CUDA, Rust, HTML, CSS, Java, SQL, Bash, Elm
- **Technologies**: Linux Kernel, CUDA, DeepSpeed, Pytorch, Tensorflow, Git, UNIX, Docker