Hengjia Yu

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EDUCATION

University of California, San Diego Sep 2025 - Apr 2027 (expected)
M.S. in Computer Science (Focus: Systems and AI Infrastructure)

University of Illinois Urbana-Champaign Aug 2021 - May 2025
B.S. in Computer Engineering (with High Honors) GPA: 3.84/4.00

Zhejiang University Sep 2021 - Jun 2025
B.E. in Electronic and Computer Engineering (Outstanding Graduate) GPA: 3.89/4.00

PROJECTS

Tensor-centric library for Graph Neural Network via Segment Reduction UC San Diego
Supervised by: Prof. Jishen Zhao May 2024 - Dec 2024

- Implemented a specialized **segment reduction library** that achieved **2.5x speedup** in Sparse Matrix Multiplication (SpMM) compared to PyG baseline.
- Designed **compute-graph** transformation passes to integrate with **PyTorch's compiler framework**.
- Introduced novel **tensor primitive operations** specifically optimized for irregular graph structures.

CUDA LeNet Kernel Design UIUC
Advisor: Prof. Volodymyr Kindratenko Oct 2024 - Dec 2024

- Implemented and optimized a **LeNet CNN** on **CUDA**, transforming convolution into matrix multiplication.
- Applied CUDA techniques such as **kernel fusion**, **TensorCore**, and **index reuse**, reducing **global memory access** by over **60%** and improving **kernel throughput** by **2.5x** compared to the unfused baseline.
- Designed **adaptive kernel strategies** for different layer configurations, utilizing mixed TensorCore tile sizes (8×32×16 and 16×16×16) to maintain **>90% hardware utilization** across convolutional layers.

Superscalar Out-of-Order Processor UIUC
Advisor: Prof. Nam Sung Kim Oct 2024 - Dec 2024

- Developed a 2-way **Superscalar Out-of-Order** RISC-V processor with **Explicit Register Renaming**, **distributed Reservation Stations**, and **an extensive bypass network**,
- **Ranked #1** among 40 groups. Achieved **IPC over 0.75** on CoreMark (best case 1.15)
- Implemented several performance optimizations including **Age-ordered** issue scheduling, **Split load/store queues**, GShare **branch predictior**.

Operating System Design from Scratch UIUC
Advisor: Prof. Steven S. Lumetta and Prof. Zbigniew T. Kalbarczyk Oct 2023 - Dec 2023

- Developed a **Linux-like operating system** from scratch leading a team of 4. **Ranked #4** among 50 groups.
- Implemented basic OS functionalities like **interrupt handling**, **virtual memory**, **device drivers**, along with advanced features like round-robin **scheduler**, **signals**, **file-system**, and **text-editor**.

WORKING EXPERIENCES

Teaching Assistant UIUC
***ECE391**: Operating Systems (SP24) & **CS225**: Data Structures (SP25)*

- Led weekly lab sessions and office hours, assisting students in debugging **kernel-level code** and evaluating programming assignments and exams.

AWARDS

Provincial Government Scholarship of Zhejiang Province 2022 & 2024
Top 3% students in Zhejiang province, China

Dean's List, Grainger College of Engineering, UIUC 2022 - 2025

SKILLS

- **Programming:** Python, C, C++, CUDA, SystemVerilog, x86, RISC-V, Matlab
- **Frameworks:** PyTorch, NVIDIA Dynamo, TensorRT, HuggingFace, vLLM
- **Tools:** Docker, Kubernetes, Git, Nsight Systems, CMake, LaTeX