Wenhao Chen

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Education

Shanghai Jiao Tong University, Shanghai, China Sept. 2019 – June 2023 (Expected)

B.Eng. in Computer Science and Engineering

- **GPA**: 92.19/100 (or 3.97/4.3), **Rank**: 10/120
- Member of **Zhiyuan Honors Program (Engineering)**
- **Selected A+ courses**: Data Structure (Honor), Discrete Mathematics (Honor), Probability and Statistics (Honor), Algorithms and Complexity, Operating System, Computer Architecture, Artificial Intelligence, Computer Graphics, ...
- **TA Experience**: Programming and Data Structure I (Honor)

Research Interest

I'm broadly interested in the intersection of machine learning, systems, and computer architecture, which includes

- Computation efficient DNN training and inference
- Accelerating DNN on heterogeneous hardware
- Deploy DNN on low-power and edge devices

Experience

Research Intern July 2022 – Present

Microsoft Research Asia ,**System Research Group**, advised by **Dr. Qi Chen**, **Dr. Quanlu Zhang** and **Dr. Hui Xue**
Research Topics: Efficient Reinforcement Learning System

- Improve resource utilization during the Reinforcement Learning training
- Accelerate Reinforcement Learning computation on heterogeneous and large-scale systems
- Automatically schedule resources for different Reinforcement Learning algorithms on different hardware configurations

Research Intern June 2021 – Present

Shanghai Jiao Tong University, **Apex Lab**, supervised by **Prof. Weinan Zhang**
Research Topics: Reinforcement Learning Applications

- Branch Ranking for Efficient Mixed-Integer Programming via Offline Ranking-based Policy Learning (submitted to **ECML PKDD'22**) / arXiv July 2021 – Nov. 2021

  We combined offline Reinforcement Learning and a long-sighted hybrid search scheme to solve Mixed-integer Programming problems efficiently and with better generalization ability.

- Internship at Digital Brain Laboratory Mar. 2022 – June 2022

  Research on efficient and unified modeling systems for Operations Research, as well as support various solving algorithms, including traditional and machine learning-based ones.

Projects

- **Tianshou** (Committer, 5.3k stars) July 2022

  Tianshou is a reinforcement learning platform based on pure PyTorch, providing a fast-speed modularized framework and pythonic API for building the deep reinforcement learning agent with the least number of lines of code.

- **GPU Programming Project** Dec. 2022

  Implemented neural network operators using CUDA Core and Tensor Core programming, and combined these custom operators to complete Resnet18 inference on ImageNet. Besides, we simulated a Volta architecture GPU, including shared memory, register file, CUDA core, and Tensor Core, supporting 10+ SASS instructions.

- **AlphaZero Gomoku** Oct. 2021

  Implemented the entire training procedure of AlphaZero with Pytorch and trained it on a 10 x 10 Gomoku game.

- **RISC-V CPU Simulator** July 2020

  Simulated a 5-stage pipeline CPU supporting 32 RISC-V instructions, correctly handling various hazards and containing branch prediction. Besides, an out-of-order execution version using the Tomasulo algorithm is also implemented.

Honors and Awards

- **Zhiyuan Honor Scholarship** (top 5%), Shanghai Jiao Tong University 2020, 2021, 2022
- **Academic Excellence Scholarship** (top 30%), Shanghai Jiao Tong University 2020, 2021, 2022
- **National Olympiad in Informatics in Provinces (NOIP)**, *1st Prize (477/600)*, China 2018

Programming Skills

- **Programming Languages**: Python, C/C++, CUDA, C#
- **ML Related Skills**: PyTorch (proficient), TensorFlow (able to read)
- **Writing Tools**: Markdown, LaTeX
- **Tools and Environments**: Git, Linux, Docker

Language Skill

- **TOEFL**: 105/120 (Reading 30, Listening 28, Speaking 23, Writing 24)