

Jiamin Li

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Ph.D. Candidate (5th year) ◊ Computer Science ◊ City University of Hong Kong

RESEARCH INTERESTS

I am primarily interested in Systems for Machine Learning with a specific focus on the following topics:

- Distributed training & inference: Accelerating large-scale distributed DNN tasks
- Resource scheduling in GPU clusters: Designing efficient scheduling algorithms for DNN workloads
- Simulation: Building accurate performance simulator of DNN training workloads
- Adaptive & sparse computation: Exploring new computing paradigms to effectively scale DNN models

At present, I am actively engaged in constructing efficient systems tailored for large language models.

EDUCATION

The University of Texas at Austin, Austin, TX, United States Apr. 2023 – Dec. 2023

Visiting Researcher at UTNS Group, Department of Computer Science.

Supervisor: Prof. Aditya Akella

Project: Efficient Serving System for Large Language Models (WIP)

City University of Hong Kong, Kowloon, Hong Kong Sep. 2019 – Jan. 2024 (Expected)

Ph.D. Candidate, Department of Computer Science.

Supervisors: Prof. Cong Wang, Prof. Hong Xu (The Chinese University of Hong Kong)

Dissertation Title: “Efficient Scheduling of Distributed Deep Neural Network Workloads” (WIP)

City University of Hong Kong, Kowloon, Hong Kong Aug. 2015 – Jul. 2019

B.S., Department of Computer Science (First Class Honours).

Advisor: Prof. Shiqi Wang

Dissertation Title: “Mobile Face Anti-spoofing with Deep Learning”

University of Missouri, Columbia, MO, United States Jul. 2017 – Aug. 2017

Big Data Analysis Summer Program, Department of Computer Science.

PUBLICATIONS

Preprints

- [P2] Xin Tan, **Jiamin Li**, Yitao Yang, Jingzong Li, Hong Xu, “Arlo: Serving Transformer-based Language Models with Dynamic Input Lengths”, in submission.
- [P1] **Jiamin Li**, Cheng Luo, Ziyue Yang, Lei Qu, Peng Cheng, Cong Wang, Hong Xu, “Merak: An Analytical Performance Simulator for Large Scale Distributed Training”, under revision.

Conference Proceedings

- [C4] **Jiamin Li**, Qiang Su, Yitao Yang, Yimin Jiang, Cong Wang, Hong Xu, “Adaptive Gating in Mixture-of-Experts based Language Models”, Empirical Methods in Natural Language Processing (**EMNLP**), 2023.
- [C3] **Jiamin Li**, Yimin Jiang, Yibo Zhu, Cong Wang, Hong Xu, “Accelerating Distributed MoE Training and Inference with Lina”, USENIX Annual Technical Conference (**ATC**), 2023. (Acceptance Rate = 18.4%) [Link]
- [C2] **Jiamin Li**, Hong Xu, Yibo Zhu, Zherui Liu, Chuanxiong Guo, Cong Wang, “Lyra: Elastic Cluster Scheduling for Deep Learning”, ACM European Conference on Computer Systems (**EuroSys**), 2023. (Acceptance Rate = 16.1%) [Link] (*Deployed partially at ByteDance*)

- [C1] Kaiwei Mo, Chen Chen, **Jiamin Li**, Hong Xu, Chun Jason Xue, “Two-Dimensional Learning Rate Decay: Towards Accurate Federated Learning with Non-IID Data”, IEEE International Joint Conference on Neural Networks (**IJCNN**), 2021.

Journal Publications

- [J2] Libin Liu, Hong Xu, Zhixiong Niu, Jingzong Li, Wei Zhang, Peng Wang, **Jiamin Li**, Jason Xue Chun, Cong Wang, “ScaleFlux: Efficient Stateful Scaling in NFV”, IEEE Transactions on Parallel and Distributed Systems, 2022 (**TPDS**).
- [J1] Libin Liu, Chengxi Gao, Peng Wang, Hongming Huang, **Jiamin Li**, Hong Xu, Wei Zhang, “Bottleneck-Aware Non-Clairvoyant Coflow Scheduling with Fai”, IEEE Transactions on Cloud Computing, 2021 (**TCC**).

WORK EXPERIENCE

Research Intern, MLSys - AI Lab, ByteDance

May. 2019 – May. 2021

Supervisor: Dr. Yibo Zhu

We build a scheduler for training and inference GPU clusters. The key idea is to exploit cluster-level elasticity by loaning idle inferences servers for training jobs and job-level elasticity by scaling training jobs to better utilize the dynamic resource pool. It is deployed partially at ByteDance.

Part-time Research Assistant, City University of Hong Kong

May. 2018 – May. 2019

Supervisor: Prof. Hong Xu

During the backpropagation of distributed DNN training, some DNN model gradients exhibit negligible updates across multiple iterations. To address this, we propose an adaptive threshold approach that optimizes communication operations by selectively transmitting only the gradients with large updates, effectively reducing data size.

Backend Developer Intern, Jardine Matheson & Co. Limited

May. 2017 – May. 2018

Design and develop web services to facilitate employee recruitment for the Group Human Resources department.

SELECT AWARDS

ATC Student Travel Grant	USENIX ATC	2023
ML and Systems Rising Stars	ML Commons	2023
Research Activity Funds	City University of Hong Kong	2023
EuroSys Student Travel Grant	ACM EuroSys	2023
Full Postgraduate Studentship	City University of Hong Kong	2019 – 2023
Dean’s List (College of Engineering)	City University of Hong Kong	2015 – 2019

TEACHING ASSISTANT

2022 Fall, 2019 Fall	CS2311, Computer Programming
2022 Spring, 2020 Spring	CS4296 & CS5296, Cloud Computing
2021 Fall	CS4394 & CS5294, Information Security and Management
2021 Spring	CS4293 & CS6290, Topics on Computer Security
2020 Fall	CS5222, Computer Networks and Internets

PROFESSIONAL SERVICES

Artifact Evaluation Committee

ACM CoNEXT 2022, MLSys 2023, ACM EuroSys 2023, USENIX OSDI 2023, USENIX ATC 2023, ACM SOSP 2023, ACM SIGCOMM 2023, ACM EuroSys 2024, USENIX FAST 2024

Technical Program Committee Reviewer

IEEE IJCNN 2023
IEEE/ACM Transactions on Networking

TECHNICAL SKILLS

Programming Languages	C++, Python, Bash, Go, \LaTeX
Operating System	Linux/UNIX
Machine Learning Systems	PyTorch, MXNet, DeepSpeed, HuggingFace, NCCL, CUDA