

Qian Jiang

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Education

Ph.D. Candidate in Electrical and Computer Engineering <i>University of Illinois at Urbana-Champaign (UIUC)</i> GPA:4.0/4.0 Advisor: Professor Minh N. Do	2019- Present Illinois, USA
B.Sc. in Electrical Engineering <i>University of Electronic Science and Technology of China (UESTC)</i> GPA:3.9/4.0	2015 - 2019 Chengdu, China

Research Interests

- Machine learning, natural language processing, computer vision, vision-language multi-modal learning, foundation models, efficient machine learning.

Programming Skills

- Pytorch, Python, MATLAB, Bash, Vim, Git.

Work Experience

Microsoft <i>Research Intern, Diffusion-based generative modeling</i>	09/2023 - Now Seattle, USA
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- Working on diffusion-based modeling with extensions into text-controlled video generation.
- Working on pipeline development, extended long-sequence generation, and preparing paper submissions.

Amazon <i>Applied Scientist Intern, Large-scale models for relevance matching</i>	05/2023 - 08/2023 Seattle, USA
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- Conducted empirical and theoretical analysis on applying language models for product relevance matching.
- Proposed approaches for Amazon internal dataset and improved the SOTA baselines over 4% on NDGC ranking metric.
- Proposed and implemented stochastic approach for contrastive learning with noises on public benchmarks (CC3M, ImageNet). Demonstrated improved performance over SOTA.
- Prepared paper submission for ICLR 2024.

Amazon <i>Applied Scientist Intern, Large-scale multi-modal learning for vision and language</i>	05/2022 - 11/2022 Seattle, USA
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- Conducted empirical and theoretical analysis on understanding the impact of the modality alignment between image and text on downstream tasks.
- Propose three instrumental regularizations to improve latent modality structures.
- Conduct extensive and comprehensive experiments on various vision-language models to show that the proposed methods consistently improve over the baselines for different model families (e.g., CLIP and ALBEF) and for different downstream applications (e.g., cross-modality retrieval, VQA, VR and etc).
- Submitted work to CVPR 2023 and got accepted.

IBM Research <i>Research Intern, Optimization of communication libraries for IBM clouds</i>	05/2020 - 08/2020 Yorktown Heights, USA
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- Developed tools to efficiently benchmark and visualize communication performance.
- Optimized parameters for message passing interface on IBM clouds.

Research Experience

University of Illinois at Urbana-Champaign (UIUC)

Aug 2019 - Present

Hardware-aware Neural Architecture Search

Illinois, USA

- Developed differentiable models predicting end-to-end hardware performance of neural network architectures.
- Incorporated hardware feedback into end-to-end Differentiable Neural Architecture Search (DNAS).
- Conducted experiments on CIFAR and ImageNet datasets on multiple hardware platforms (Edge GPUs, Edge TPUs, Mobile CPUs, and customized accelerators) with improved performance.

Multi-source transfer learning

- Formulated multi-source transfer learning as a bi-level optimization problem.
- Learned task weights for each source task during training using implicit differentiation.
- Conducted experiments on multiple tasks including classification and scene understanding.
- Demonstrated improved performance on FashionMNIST, CelebA and Cityscapes datasets.

Teaching Experience

University of Illinois at Urbana-Champaign

2021-2022

Teaching Assistant, Electrical and Computer Engineering Department

Illinois, USA

- ECE310: Digital Signal Processing
- ECE311: Digital Signal Processing Lab

Other Experience

University of California, Los Angeles (UCLA)

2018 Summer

Full scholarship, Cross-disciplinary Scholar in Science and Technology (CSST)

Los Angeles, UCLA

Israel Institute of Technology (Technion)

2017 Summer

Full scholarship, Summer School of Engineering

Haifa, Israel

Publications

Journal papers

1. **Qian Jiang**, Raymond A. Yeh, and Minh N. Do. Multi-source transfer learning by learning to weight source tasks. Under Review for IEEE Transactions on Neural Networks and Learning Systems and Learning systems (TNNLS).

Conference papers

1. **Qian Jiang***, Xiaofan Zhang*, Deming Chen, Minh N. Do, and Raymond A. Yeh. EH-DNAS: End-to-end hardware-aware differentiable neural architecture search. ICML 2023 Workshop on Differentiable Almost Everything. [\[Paper\]](#) [\[Code\]](#)
2. **Qian Jiang**, Changyou Chen, Han Zhao, Liqun Chen, Qing Ping, Son Dinh Tran, Yi Xu, Belinda Zeng, Trishul Chilimbi. Understanding and Constructing Latent Modality Structures in Multi-modal Representation Learning. CVPR 2023. [\[Paper\]](#)
3. **Qian Jiang**, Jingjing Meng, Alireza Bagheri Garakani, Yang Jiao, Yetian Chen, Yikai Ni, Yan Gao, Yi Sun, Changyou Chen. Learning Multi-Modal Representation Alignments from Noisy Data-Pairs. Under Review for ICLR 2024.

Review Services

- Conferences: NeurIPS, ICML, ICLR, ICASSP.
- Journals: Pattern Recognition.

Scholarships and Awards

- Nadine Barrie Smith Memorial Fellowship, 2022.
- C3SR (Illinois- IBM Center of Cognitive Computing Systems Research) Fellowship, 2019-2021.
- National Scholarship, China, 2018.
- Tanglixin Scholarship, China, 2017.

Relevant Coursework

- **Optimization and Statistics:** Random Processes; Introduction to Optimization; Statistical Learning Theory; Computational Inference; Information Theory; Games, Markets, and Mathematical Programming.
- **Machine Learning:** Pattern Recognition; Computer Vision; Deep Generative and Dynamical Models; Mathematical Models of Language.