

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

- Natural Language processing, Computer Vision, Generative Models, Multi-modal Learning, Foundation Vision-Language Models, Efficient Machine Learning.

Programming Skills

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

Work Experience

Microsoft <i>Research Intern, Multimodal Generative Modeling</i>	09/2023 - Now Seattle, USA
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- Working on diffusion-based modeling with extensions into text-controlled video generation.
- Developing efficient text-to-video fine-tuning approaches.
- 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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- Developed approaches using language models for product relevance matching for Amazon internal dataset and improved the internal benchmark over 4% on NDGC.
- Developed stochastic approach for contrastive learning with noises on public benchmarks (CC3M, ImageNet). Demonstrated improved performance over SOTA.
- Two papers submitted to ACL'24.

Amazon <i>Applied Scientist Intern, Large-scale Vision-Language Representation Learning</i>	05/2022 - 11/2022 Seattle, USA
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- Conducted empirical and theoretical analysis on understanding the impact of the modality alignment.
- 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).
- One paper accepted to CVPR'23.

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

Retrieval Augmented Generation

Illinois, USA

- Developed GPTFedRec, a federated recommendation framework leveraging ChatGPT and a novel hybrid Retrieval Augmented Generation (RAG) mechanism.
- Conducted experiments on multiple recommendation tasks with improved performance over SOTA.

Neural Architecture Search

- Developed differentiable models predicting end-to-end hardware performance of neural network architectures.
- 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.
- Conducted experiments on multiple tasks including classification and scene understanding.

Review Services

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

Publications

GenAI, Multi-Modal, Foundation Models

1. Huimin Zeng, Zhenrui Yue, **Qian Jiang**, Dong Wang. Federated Recommendation via Hybrid Retrieval Augmented Generation. Under Review for ACL'24. [\[Paper\]](#)
2. **Qian Jiang**, Jingjing Meng, Alireza Bagheri Garakani, Yang Jiao, Yetian Chen, Yikai Ni, Yan Gao, Yi Sun, Changyou Chen. When Contrastive Learning Meets Bayesian Modeling: Learning Multi-Modal Representation Alignments with Noisy Data-Pairs. Under Review for ACL'24.
3. **Qian Jiang**, Jingjing Meng, Alireza Bagheri Garakani, Yang Jiao, Yetian Chen, Yikai Ni, Yan Gao, Yi Sun, Changyou Chen. When Noises Help: Improve Text-Image Multimodal Contrastive Learning with Stochastic Label Augmentations. Under Review for ACL'24.
4. **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'23. [\[Paper\]](#)

Efficient ML

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'23 Workshop on Differentiable Almost Everything. [\[Paper\]](#) [\[Code\]](#)
2. **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).

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)

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

2018 Summer

Los Angeles, UCLA

Israel Institute of Technology (Technion)

Full scholarship, Summer School of Engineering

2017 Summer

Haifa, Israel

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.