Qian Jiang

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Education

Ph.D. in Electrical and Computer Engineering	**2019- 2024**
University of Illinois at Urbana-Champaign (UIUC) *GPA:4.0/4.0*	*Illinois, USA*
Advisor: Professor Minh N. Do	
B.Sc. in Electrical and Computer Engineering	**2015 - 2019**
University of Electronic Science and Technology of China (UESTC) *GPA:3.9/4.0*	*Chengdu, China*

Research Interests

- Computer Vision, Large Language Models(LLMs), Multi-modal Learning, Generative Modeling, and Efficient Machine Learning.

Work Experience

AWS AI Labs   **2024 - Now**
Applied Scientist, LLM Applications   *Santa Clara, USA*

- Working on LLM-assisted Code Development.
- Working on architect and implement advanced features for code documentation and migration platform, enabling automated code analysis and transformation.
- Expertise with state-of-the-art large language models.

Microsoft   **2023 Fall**
Research Intern, Multimodal Generative Modeling   *Redmond, USA*

- Worked diffusion-based modeling with extensions into text-controlled video generation.
- Developed efficient text-to-video fine-tuning approaches.

Amazon   **2023 Summer**
Applied Scientist Intern, Large-scale Models for Relevance Matching   *Seattle, USA*

- Developed methods for Amazon product relevance matching and improved 4% on ranking metric.
- Developed stochastic approach for contrastive learning on public benchmarks (CC3M, ImageNet) with improved performance over SOTA.
- Two papers submitted.

Amazon   **2022 Summer Fall**
Applied Scientist Intern, Large-scale Vision-Language Representation Learning   *Seattle, USA*

- Conducted empirical and theoretical analysis on modality alignment.
- Propose three instrumental regularizations to improve latent modality structures.
- Conduct extensive and comprehensive experiments on various vision-language models for different downstream applications (e.g., cross-modality retrieval, VQA, VR and etc).
- One paper accepted to CVPR'23.

IBM Research   **2020 Summer**
Research Intern, Optimization of parallelization for IBM clouds   *Yorktown Heights, USA*

- Developed tools to efficiently benchmark and visualize parallel communication performance.
- Optimized parameters for message passing interface on IBM clouds.

Research Experience

University of Illinois at Urbana-Champaign (UIUC)   **2019 - 2024**
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. **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]
2. Huimin Zeng, Zhenrui Yue, **Qian Jiang**, Dong Wang. "Federated Recommendation via Hybrid Retrieval Augmented Generation." IEEE BigData'24. [Paper]
3. **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.
4. **Qian Jiang**, Jingjing Meng, Alireza Bagheri Garakani, Yang Jiao, Yetian Chen, Yikai Ni, Yan Gao, Yi Sun, Changyou Chen. "SLA: Stochastic Label Augmentation for Robust Vision-Language Contrastive Learning." Under Review.

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 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)   **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*

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.

Programming Skills

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

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.