Qian Jiang

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Education

Ph.D. Candidate in Electrical and Computer Engineering **2019- Present**
University of Illinois at Urbana-Champaign (UIUC) *GPA:4.0/4.0* *Illinois, USA*
Advisor: Professor Minh N. Do

B.Sc. in Electrical Engineering **2015 - 2019**
University of Electronic Science and Technology of China (UESTC) *GPA:3.9/4.0* *Chengdu, China*

Research Interests

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

Programming Skills

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

Work Experience

Microsoft **09/2023 - Now**
Research Intern, Diffusion-based generative modeling *Seattle, USA*
- 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 **05/2023 - 08/2023**
Applied Scientist Intern, Large-scale models for relevance matching *Seattle, USA*
- 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 submissions for ACL 2024.

Amazon **05/2022 - 11/2022**
Applied Scientist Intern, Large-scale multi-modal learning for vision and language *Seattle, USA*
- 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 accpeted.

IBM Research **05/2020 - 08/2020**
Research Intern, Optimization of communication libraries for IBM clouds *Yorktown Heights, USA*

- 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. When Contrastive Learning Meets Bayesian Modeling: Learning Multi-Modal Representation Alignments with Noisy Data-Pairs. Under Review for ACL 2024.
4. **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 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.