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 and computer vision, especially transfer learning and AutoML.

Programming Skills

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

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).
- Demonstrated hardware performance improvement of 1.4× on customized accelerators and 1.6× on existing hardware processors.

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.

University of California, Los Angeles (UCLA) **08/2018 - 11/2018**
Semantic segmentation for medical images *Los Angeles, USA*

- Developed tools to efficiently pre-process raw skull MRI images.
- Developed models to segment brain parts, especially hippocampus from raw skull images.

Work Experience

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.

International Business Machine Inc. (IBM) **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.

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).
2. **Qian Jiang***, Xiaofan Zhang*, Deming Chen, Minh N. Do, and Raymond A. Yeh. EH-DNAS: End-to-end hardware-aware differentiable neural architecture search. Under Review for IEEE Transactions on Neural Networks and Learning Systems (TNNLS). [Paper] [Code]

Comference papers

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. Under Review for CVPR 2023.
2. Huimin Zeng, Zhenrui Yue, **Qian Jiang**, Yang Zhang, Lanyu Shang, Ruohan Zong, Dong Wang. Mitigating Demographic Bias of Federated Learning Models via Robust-Fair Domain Smoothing. Under Review for ICML 2023.

Review

- ICASSP, 2022-2023

Scholarships and Awards

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

Relevant Coursework

- CS 543: Computer Vision
- ECE 544: Pattern Recognition
- ECE 543: Statistical learning theory
- ECE 534: Random Processes
- ECE 490: Introduction to optimization