

PEIZHAO LI

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EDUCATION

Brandeis University, Waltham, Massachusetts, United States

08/2019 - Expected 05/2024

Doctor of Philosophy-Ph.D., Computer Science

Advisor: Professor Hongfu Liu

Beihang University, Beijing, China

09/2015 - 06/2019

Bachelor of Science, Electronic and Information Engineering

Advisor: Professor Xiantong Zhen

RESEARCH SUMMARY

Academic Research: **Artificial Intelligence** and **Machine Learning** with particular interests in **Trustworthy and Responsible AI**, **Machine Learning Fairness**, **Data-centric AI**, and relevant learning/data-centric methods to detect and mitigate bias in machine learning and deep learning applications.

Industry Research: **Deep Learning**, **Multimodal Learning (Vision + Language)**, and **Computer Vision** with applications in user feedback & attention modeling, document analysis, object detection and tracking with automotive radar and RGB camera images, automatic code editing, and keypoints detection.

RESEARCH AND INDUSTRY EXPERIENCE

Amazon Alexa AI

09/2023 - 11/2023

Applied Scientist Intern, Manager: Dr. Xiaohu (Derek) Liu

Bellevue, Washington

- Conducted research on language data augmentation with Large Language Models (LLMs).

Google Research

05/2023 - 08/2023

Research Intern, Host: Dr. Junfeng He

Mountain View, California

- Conducted research on user attention and feedback modeling on visual content.
- Built multimodal foundation models for saliency, scanpath, and aesthetics score predictions.
- Achieved leading performance on several saliency and scanpath prediction benchmarks.
- Contributed to the collection of the first-ever dataset on user gaze with rating on images.

Harvard University

01/2023 - 05/2023

Research Fellow, Host: Professor Yiling Chen

Cambridge, Massachusetts

- Conducted research on information elicitation and peer prediction with machine learning.
- Related multitask peer prediction from mechanism design field with multimodal contrastive learning.

Mitsubishi Electric Research Laboratories

05/2022 - 11/2022

Research Intern, Host: Dr. Pu (Perry) Wang

Cambridge, Massachusetts

- Conducted research on object recognition with multi-view radar frequency imaging.
- Proposed a deep learning framework for object segmentation using horizontal and vertical radar images.
- Contributed to an in-door radar dataset collection using internal radar devices.

Mitsubishi Electric Research Laboratories

05/2021 - 08/2021

Research Intern, Host: Dr. Pu (Perry) Wang

Cambridge, Massachusetts (Remote)

- Conducted research on object recognition in autonomous driving using automotive radar.
- Proposed a temporal information-enhanced radar object detection and multi-object tracking framework.
- Authored and prepared a research paper accepted at CVPR 2022.

NEC Laboratories America

Research Intern, Mentor: Dr. Xuchao Zhang

02/2021 - 05/2021

Princeton, New Jersey (Remote)

- Conducted research on automatic and few-shot computer source code editing.
- Proposed a method for learning from few code snippets, and performed well in code refactoring.
- Authored and prepared a research paper accepted at ICLR 2022.

Adobe Research

Research Intern, Primary Mentor: Dr. Jiuxiang Gu

05/2020 - 11/2020

College Park, Maryland (Remote)

- Conducted research on document representation learning, entity recognition, and document classification.
- Proposed a multimodal pre-training framework and performed well on various downstream tasks.
- Authored and successfully submitted a research paper that was accepted at CVPR 2021.

Beihang University

Undergraduate Research Assistant, Advisor: Professor Xiantong Zhen

09/2017 - 03/2019

Beijing, China

- Conducted research on computer vision applications including facial keypoint detection and object tracking.
- Authored and prepared three research papers accepted at WACV 2019 and ICIAP 2019.
- Worked on video object detection and tracking to improve a railway surveillance system.

PUBLICATIONS

Publications in several research fields including **Machine Learning Fairness**, **Multimodal Learning (Vision + Language)**, and **Computer Vision**, etc.

Citations: 403, h-index: 10, i10-index: 10, by Google Scholar, as of 09/16/2023.

Conference Publications

- [C1]. **Peizhao Li**, Ethan Xia, Hongfu Liu. Learning Antidote Data to Individual Unfairness. *International Conference on Machine Learning (ICML)*, 2023.
- [C2]. Anshuman Chhabra, **Peizhao Li**, Prasant Mohapatra, Hongfu Liu. Robust Fair Clustering: A Novel Fairness Attack and Defense Framework. *International Conference on Learning Representations (ICLR)*, 2023.
- [C3]. Zizhang Chen, **Peizhao Li**, Hongfu Liu, Pengyu Hong. Characterizing the Influence of Graph Elements. *International Conference on Learning Representations (ICLR)*, 2023.
- [C4]. **Peizhao Li**, Zhengming Ding, Hongfu Liu. Mining Label Distribution Drift in Unsupervised Domain Adaptation. *Australasian Joint Conference on Artificial Intelligence (AJCAI)*, 2023.
- [C5]. **Peizhao Li**, Hongfu Liu. Achieving Fairness at No Utility Cost via Data Reweighting with Influence. *International Conference on Machine Learning (ICML)*, 2022.
- [C6]. **Peizhao Li**, Xuchao Zhang, Ziyu Yao, Wei Cheng, Haifeng Chen, Hongfu Liu. Code Editing from Few Exemplars by Adaptive Multi-Extent Composition. *International Conference of Learning Representations Deep Learning For Code Workshop (ICLRW)*, 2022.
- [C7]. **Peizhao Li**, Pu Wang, Karl Berntorp, Hongfu Liu. Exploiting Temporal Relations on Radar Perception for Autonomous Driving. *In Proceedings of the IEEE/CVF Conference on Computer Vision and Pattern Recognition (CVPR)*, 2022.

- [C8]. Hanyu Song, **Peizhao Li**, Hongfu Liu. Deep Clustering-based Fair Outlier Detection. *ACM SIGKDD Conference on Knowledge Discovery and Data Mining (KDD)*, 2021.
- [C9]. **Peizhao Li**, Jiuxiang Gu, Jason Kuen, Vlad Morariu, Handong Zhao, Rajiv Jain, Varun Manjunatha, Hongfu Liu. SelfDoc: Self-Supervised Document Representation Learning. *In Proceedings of the IEEE/CVF Conference on Computer Vision and Pattern Recognition (CVPR)*, 2021.
- [C10]. **Peizhao Li**, Yifei Wang, Han Zhao, Pengyu Hong, Hongfu Liu. Dyadic Fairness: Exploring and Mitigating Bias in Graph Connections. *In Proceedings of the 9th International Conference on Learning Representations (ICLR)*, 2021.
- [C11]. **Peizhao Li**, Han Zhao, Hongfu Liu. Deep Fair Clustering for Visual Learning. *In Proceedings of the IEEE/CVF Conference on Computer Vision and Pattern Recognition (CVPR)*, 2020.
- [C12]. **Peizhao Li**, Yanjing Li, Xiaolong Jiang, Xiantong Zhen. Two-Stream Multi-Task Network for Fashion Recognition. *In Proceeding of IEEE International Conference on Image Processing (ICIP)*, 2019.
- [C13]. **Peizhao Li***, Anran Zhang*, Lei Yue, Xiantong Zhen, Xianbin Cao. Multi-Scale Aggregation Network for Direct Face Alignment. *In Proceeding of IEEE Winter Conference on Applications of Computer Vision (WACV)*, 2019. (* equal contribution)
- [C14]. Xiaolong Jiang, **Peizhao Li**, Xiantong Zhen, Xianbin Cao. Model-Free Tracking with Deep Appearance and Motion Features Integration. *In Proceeding of IEEE Winter Conference on Applications of Computer Vision (WACV)*, 2019.

Under Review Papers

- {U1}. Anshuman Chhabra, **Peizhao Li**, Prasant Mohapatra, Hongfu Liu. ‘What Data Benefits My Classifier?’ Enhancing Model Performance and Interpretability through Influence-Based Data Selection.
- [U2]. Tingwei Liu, **Peizhao Li**, Hongfu Liu. Dual Node and Edge Fairness-Aware Graph Partition.
- [U3]. Yuan Zhang, **Peizhao Li**, Feng Pan, Hongfu Liu, Pengyu Hong, Xiuwen Liu, Jinfeng Zhang. Applications of AlphaFold beyond Protein Structure Prediction.

Preprints

- [P1]. Xiaolong Jiang*, **Peizhao Li***, Yanjing Li, Xiantong Zhen, Xianbin Cao. Graph Neural Based End-to-end Data Association Framework for Online Multiple-Object Tracking. *arXiv preprint:1907.05315*, 2019. (* equal contribution)

TECHNICAL SKILLS

Programming Languages	Python, MATLAB, Shell script, SQL, Java, \LaTeX , HTML
Deep Learning Frameworks	PyTorch, JAX, Tensorflow, Keras, T5X, MMDetection, Detectron2
Computational Toolkits	Scikit-Learn, CPLEX Optimizer, Gurobi
Data Processing Frameworks	Apache Spark, Apache Hadoop, SeqIO
Languages	Fluent in English and Mandarin

OPEN-SOURCE CONTRIBUTIONS

FairPy: A Python Library for Machine Learning Fairness 03/2023 - Now

A Python library for promoting fairness in machine learning, which includes a collection of benchmark datasets, fair algorithms, and evaluation metrics for convenient utilization.

Awesome Machine Learning Fairness: A Paper and Resource List 07/2021 - Now

A vast collection of over 250 papers, articles, and resources spanning multiple research fields and practical applications, all dedicated to the topic of machine learning fairness.

TEACHING EXPERIENCE

Computer Vision <i>Teaching Assistant</i> , with Professor Hongfu Liu	01/2023 - 05/2023
Marketing Analytics <i>Teaching Assistant</i> , with Professor Xavi Vidal-Berastain	09/2021 - 12/2021
Discrete Structures <i>Teaching Assistant</i> , with Professor Timothy Hickey	09/2021 - 12/2021
Computer Vision <i>Teaching Assistant</i> , with Professor Hongfu Liu	01/2021 - 05/2021
Advanced Topics in Graph Mining <i>Teaching Assistant</i> , with Professor Chuxu Zhang	09/2020 - 12/2020
Topics in Natural Language Processing <i>Teaching Assistant</i> , with Professor Constantine Lignos	01/2020 - 05/2020
Data Structures and the Fundamentals of Computing <i>Teaching Assistant</i> , with Professor Hongfu Liu	09/2020 - 12/2020

PROFESSIONAL SERVICES

Reviewed over 80 conference/journal manuscripts.

Conference Reviewer

- Conference on Neural Information Processing Systems (NeurIPS), 2022, 2023
- International Joint Conference on Artificial Intelligence (IJCAI), 2023
- European Conference on Computer Vision (ECCV), 2022
- International Conference on Computer Vision (ICCV), 2023
- IEEE International Conference on Data Mining (ICDM), 2022, 2023
- ACM SIGKDD Conference on Knowledge Discovery and Data Mining (KDD), 2022, 2023
- IJCNN at IEEE World Congress on Computational Intelligence (IJCNN), 2022
- Conference on Uncertainty in Artificial Intelligence (UAI), 2022, 2023
- International Conference on Machine Learning (ICML), 2022, 2023
- IEEE/CVF Conference on Computer Vision and Pattern Recognition (CVPR), 2022, 2023
- International Conference on Learning Representations (ICLR), 2022, 2023
- AAAI Conference on Artificial Intelligence (AAAI), 2022, 2023, 2024
- International Conference on Advanced Communications and Computation (INFOCOMP), 2021

Journal Reviewer

- IEEE Transactions on Circuits and Systems for Video Technology
- IEEE Transactions on Multimedia
- IEEE Transactions on Artificial Intelligence
- IEEE Computational Intelligence Magazine
- IEEE Access
- Machine Learning
- Big Data
- Neurocomputing
- Neural Networks
- Journal of Combinatorial Optimization
- Journal of Electronic Imaging

- IET Image Processing
- IET Computer Vision

Others

- External Review Panel, Michtom School of Computer Science, Brandeis University

ACADEMIC TALKS

An Introduction to Fair Machine Learning

- Guest lecture on COSI/ECO-148B: Introduction to Machine Learning, Brandeis University 04/2023
- Guest lecture on BUS/FIN-241A: Machine Learning for Business, Brandeis University 04/2023
- Guest lecture on COSI-159A: Computer Vision, Brandeis University 04/2023
- GSAS Computer Science Alumni Celebration, Brandeis University 03/2023
- MRSEC-Waltham High School Pizza Talk Series, Waltham High School 09/2022
- Brandeis Precollege Academic Immersion Program, Brandeis University 03/2022

Releasing the Tradoff in Algorithmic Fairness

- International Business School Ph.D. Seminar, Brandeis University 03/2022
- Computer Science Seminar, Brandeis University 02/2022

Code Editing from Few Exemplars by Adaptive Multi-Extend Composition

- Data Science and System Security Department, NEC Laboratories America 07/2021

Two-Stream Multi-Task Network for Fashion Recognition

- IEEE International Conference on Image Processing 09/2019

Multi-Scale Aggregation Network for Direct Face Alignment

- IEEE Winter Conference on Applications of Computer Vision 01/2019

MEDIA COVERAGE

- Research Summary: Achieving Fairness at No Utility Cost via Data Reweighing with Influence 07/2023
- The AI Ethics Brief, Montreal AI Ethics Institute

AWARDS

- Meta Research Ph.D. Fellowship Finalist (83/3200+) 2023
- GSAS Career Fellowship, Brandeis University 2023
- Dissertation Research Award, Brandeis University 2022
- COSI Outstanding Research Award, Brandeis University 2022
- Library's Research Excellence Prize, Brandeis University 2022
- Alfred Schonwalter Summer Research Fellowship, Brandeis University 2022
- ICML Complimentary Registration 2022
- CVPR Travel Grant Award 2022
- CVPR Virtual Registration Waiver Award 2022
- Ph.D. Fellowship, Brandeis University 2019 - 2023
- Academic Excellence Fellowship, Beihang University 2017 - 2018
- Competition Excellence Fellowship, Beihang University 2017
- Second Prize in National Undergraduate Electronics Design, Beijing 2017
- Outstanding Volunteer Award, Beihang University 2017