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**, 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 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

Google Research 05/2023 - 08/2023
Research Intern, Host: Dr. Junfeng He *Mountain View, California*

· Conducted research on user attention prediction given visual content.
· Adapted multimodal foundation models to scanpath and saliency predictions with instruction tuning.
· Contributed to the collection of a user gaze dataset during visual question answering tasks.

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 multi-view 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 automonous driving using automotive radar.
· Proposed a temporal information-enhanced radar object detection and multi-object tracking framework.
· Authored and successfully submitted a research paper that was accepted at CVPR 2022.

NEC Laboratories America 02/2021 - 05/2021
Research Intern, Mentor: Dr. Xuchao Zhang *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 successfully submitted a research paper that was accepted at ICLRW 2022.

Adobe Research 05/2020 - 11/2020
Research Intern, Primary Mentor: Dr. Jiuxiang Gu *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 09/2017 - 03/2019
Undergraduate Research Assistant, Advisor: Professor Xiantong Zhen *Beijing, China*

· Conducted research on computer vision applications including facial keypoint detection and object tracking.
· Authored and successfully submitted three research papers that was accepted at WACV 2019 and ICIP 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: 358, h-index: 9, i10-index: 9, by Google Scholar, 07/12/2023.

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**, Hongfu Liu. Achieving Fairness at No Utility Cost via Data Reweighing with Influence. *International Conference on Machine Learning* (ICML), 2022.

[C5]. **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.

[C6]. **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.

[C7]. Hanyu Song, **Peizhao Li**, Hongfu Liu. Deep Clustering-based Fair Outlier Detection. *ACM SIGKDD Conference on Knowledge Discovery and Data Mining* (KDD), 2021.

[C8]. **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.

[C9]. **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.

[C10]. **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.

[C11]. **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.

[C12]. **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)

[C13]. 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]. **Peizhao Li**, Zhengming Ding, Hongfu Liu. Mining Label Distribution Drift in Unsupervised Domain Adaptation. *arXiv preprint: 2006.09565*, 2020.

[P2]. 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)

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 01/2023 - 05/2023
Teaching Assistant, with Professor Hongfu Liu

Marketing Analytics 09/2021 - 12/2021
Teaching Assistant, with Professor Xavi Vidal-Berastain

Discrete Structures 09/2021 - 12/2021
Teaching Assistant, with Professor Timothy Hickey

Computer Vision 01/2021 - 05/2021
Teaching Assistant, with Professor Hongfu Liu

Advanced Topics in Graph Mining 09/2020 - 12/2020
Teaching Assistant, with Professor Chuxu Zhang

Topics in Natural Language Processing 01/2020 - 05/2020
Teaching Assistant, with Professor Constantine Lignos

Data Structures and the Fundamentals of Computing 09/2020 - 12/2020
Teaching Assistant, with Professor Hongfu Liu

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

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

TECHNICAL SKILLS

Programming Languages	Python, MATLAB, Shell script, Java, LaTeX, HTML
Computational Toolkits	Scikit-Learn, CPLEX Optimizer, Gurobi
Deep Learning Frameworks	PyTorch, JAX, Tensorflow, Keras, T5X, MMCV, Detectron2
Languages	Fluent in English and Mandarin

Latest Update: 07/2023