PEIZHAO LI

Name pronounced as 'Pay-Jow Lee'

+1 (781)-392-5571 | peizhaoli@brandeis.edu | peizhaoli.com

1100 112th Ave NE Suite 100, Bellevue, WA, 98004

PROFESSIONAL EXPERIENCE

GE HealthCare   02/2024 - Now
AI Research Scientist, Report to Cao (Danica) Xiao   *Bellevue, Washington*

· Founding member & research scientist with the Foundation AI Team.
· AI research & engineering for healthcare applications.
· Working on large language models (LLMs), retrieval-augmented generation (RAG), foundation models, time-series forecasting, and computer vision for multiple healthcare products.

EDUCATION

Brandeis University, Waltham, Massachusetts, United States   08/2019 - 01/2024
Doctor of Philosophy-Ph.D., Computer Science
Advisor: Professor Hongfu Liu
Thesis: Harmonizing Fairness with Utility in Data and Learning

Beihang University, Beijing, China   09/2015 - 06/2019
Bachelor of Science, Electronic and Information Engineering
Advisor: Professor Xiantong Zhen

RESEARCH SUMMARY

Industrial Research: **Machine Learniing**, **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, automatic code editing, and keypoint detection.

Academic Research: General **Artificial Intelligence** technology 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.

TECHNICAL SKILLS

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

RESEARCH AND INDUSTRY INTERNSHIP EXPERIENCE

Amazon Alexa AI   09/2023 - 11/2023
Applied Scientist Intern, Manager: Dr. Xiaohu (Derek) Liu   *Bellevue, Washington*

· Conducted research on dialogue data generation with Large Language Models (LLMs).
· Proposed single/multi-agent and rephrasing for prompting LLMs to generate synthetic dialogues.
· Validated the three approaches with ablation studies on Dialogue State Tracking tasks.

Google Research 05/2023 - 08/2023
Research Intern, Primary 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 rating predictions.
· Achieved leading performance on multiple saliency, scanpath, and rating prediction benchmarks.
· Contributed to the collection of the first-ever dataset on user gaze with rating on images.
· Internship contributions were acknowledged by the director through a peer bonus.

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 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 a few code snippets and performed well in code refactoring.
· Authored and prepared a research paper 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 prepared three research papers 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: 617, h-index: 11, i10-index: 12, by Google Scholar, as of 06/19/2024.
Google Scholar profile: `https://scholar.google.com/citations?user=h8UyqB4AAAAJ&hl`

Conference Publications

[C1]. Youwei Liang, Junfeng He, Gang Li, **Peizhao Li**, Arseniy Klimovskiy, Nicholas Carolan, Jiao Sun, Jordi Pont-Tuset, Sarah Young, Feng Yang, Junjie Ke, Krishnamurthy Dj Dvijotham, Katie Collins, Yiwen Luo, Yang Li, Kai J Kohlhoff, Deepak Ramachandran, Vidhya Navalpakkam. Rich Human Feedback for Text-to-Image Generation. *In Proceedings of the IEEE/CVF Conference on Computer Vision and Pattern Recognition* (CVPR), 2024. (Oral, Best Paper Award)

[C2]. Anshuman Chhabra, **Peizhao Li**, Prasant Mohapatra, Hongfu Liu. 'What Data Benefits My Classifier?' Enhancing Model Performance and Interpretability through Influence-Based Data Selection. *International Conference on Learning Representations* (ICLR), 2024. (Oral)

[C3]. **Peizhao Li**, Ethan Xia, Hongfu Liu. Learning Antidote Data to Individual Unfairness. *International Conference on Machine Learning* (ICML), 2023.

[C4]. 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.

[C5]. Zizhang Chen, **Peizhao Li**, Hongfu Liu, Pengyu Hong. Characterizing the Influence of Graph Elements. *International Conference on Learning Representations* (ICLR), 2023.

[C6]. **Peizhao Li**, Zhengming Ding, Hongfu Liu. Mining Label Distribution Drift in Unsupervised Domain Adaptation. *Australasian Joint Conference on Artificial Intelligence* (AJCAI), 2023.

[C7]. **Peizhao Li**, Hongfu Liu. Achieving Fairness at No Utility Cost via Data Reweighing with Influence. *International Conference on Machine Learning* (ICML), 2022.

[C8]. **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.

[C9]. **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.

[C10]. Hanyu Song, **Peizhao Li**, Hongfu Liu. Deep Clustering-based Fair Outlier Detection. *ACM SIGKDD Conference on Knowledge Discovery and Data Mining* (KDD), 2021.

[C11]. **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.

[C12]. **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.

[C13]. **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.

[C14]. **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.

[C15]. **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)

[C16]. 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]. Mohammad Mahbubur Rahman, Ryoma Yataka, Sorachi Kato, Pu Wang, **Peizhao Li**, Adriano Cardace, Petros Boufounos. MMVR: Millimeter-wave Multi-View Radar Dataset and Benchmark for Indoor Perception.

[U2]. **Peizhao Li**, Junfeng He, Gang Li, Rachit Bhargava, Shaolei Shen, Nachiappan Valliappan, Youwei Liang, Hongxiang Gu, Venky Ramachandran, Golnaz Farhadi, Yang Li, Kai J Kohlhoff, Vidhya Navalpakkam. ALOHA: from Attention to Likes – a unified mOdel for understanding HumAn responses to diverse visual content.

Preprints

[P1]. Tingwei Liu, **Peizhao Li**, Hongfu Liu. Dual Node and Edge Fairness-Aware Graph Partition.

[P2]. Yuan Zhang, **Peizhao Li**, Feng Pan, Hongfu Liu, Pengyu Hong, Xiuwen Liu, Jinfeng Zhang. Applications of AlphaFold beyond Protein Structure Prediction.

[P3]. 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)

PATENTS

1. Jiuxiang Gu, Vlad Morariu, Varun Manjunatha, Tong Sun, Rajiv Jain, **Peizhao Li**, Jason Kuen, Handong Zhao. Self-supervised Document Representation Learning. U.S. Patent Application No. 17/333,892.

OPEN-SOURCE CONTRIBUTIONS

FairPy: A Python Library for Machine Learning Fairness   03/2023 - 01/2024

Project link: `https://github.com/brandeis-machine-learning/FairPy/tree/dev`

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 - 01/2024

Project link: `https://github.com/brandeis-machine-learning/awesome-ml-fairness`

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 100 conference and journal manuscripts.

Conference Reviewer

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

Harmonizing Fairness with Utility via Data-centric Approaches

· Salesforce AI Research Singapore	10/2023

An Introduction to Fair Machine Learning

· Guest lecture on BUS/FIN-241A: Machine Learning for Business, Brandeis University	12/2023
· 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 Tradeoffs 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

Peizhao Li Ph.D. '24 receives fellowship from the National Institute of Justice the Justice, Brandeis University	02/2024
Uncovering bias in artificial intelligence Brandeis Stories, Brandeis University	12/2023
Research Summary: Achieving Fairness at No Utility Cost via Data Reweighing with Influence The AI Ethics Brief, Montreal AI Ethics Institute	07/2023

AWARDS

CVPR Best Paper Award (2/11,532)	2024
NIJ FY23 Graduate Research Fellowship, $55,500 (declined)	2023
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