Mia (Miao) Zhang (She/Her)

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EDUCATION

New York University – New York, USA *Sep. 2021 – present*
Ph.D. candidate. Computer Science, Tandon school of Engineering (Expected graduation date: May 2026)
Supervisor: Dr. Rumi Chunara
Professional areas: Generalizability and robustness of vision and multi-modal models; agentic AI.

Stanford University – Stanford, CA, USA *Sep. 2018 – Jun. 2020*
M.A., Center for Computer Research in Music and Acoustics (CCRMA)
Supervisor: Dr. Daniel Rubin, Dr. Liangqiong Qu

Beijing University of Posts and Telecommunications – Beijing, China *Sep. 2014 – Jun. 2018*
Supervisor: Dr. Dong Wang, Dr. Lantian Li
B.Eng. Optoelectronic Information Science and Engineering, School of Electronic Engineering

PROFESSIONAL EXPERIENCE

Google - San Francisco, CA
Student Researcher | Supervisor: Dr. Xiang Yin *Aug. 2025 – Mar. 2026*
Developing AI evaluation models for analyzing generative AI products in health and clinical applications.

Amazon - Seattle, WA
Applied scientist intern | Supervisor: Dr. Cheng Cao *May. 2025 – Aug. 2025*
Designing LLM multi-agent debate system that can flexibly adapt to agent competency and debate roles.

Futurewei Technologies – Santa Clara, CA
Research scientist intern | Supervisor: Dr. Masood Mortazavi *May. 2024 – Aug. 2024*
Generative model (DDPM and MAE) based representation learning for image-speech alignment and conditional generation.

Reality Defender – New York City, NY
Research scientist intern | Supervisor: Dr. Gaurav Bharaj *May. 2023 – Aug. 2023*
Spurious correlation modeling for large vision dataset by leveraging LLM, achieving SOTA unsupervised bias mitigation results.

Amazon Web Services, Amazon – Seattle, WA
Software Engineer (full-stack): Built and maintained database migration service for cloud computing. *Sept. 2020 – Sept. 2021*

Engineering Department, Poly (Plantronics) – Santa Cruz, CA *Jun. 2019 – Dec. 2019*
Technology Strategy Intern: Personalized deep learning based speech recognition integration for headphone.

PROJECTS

Causal data augmentation for improving generalizability of clinical LLM *Sept. 2024 - Sept. 2025*
The Visualization and Data Analytics Research Center (VIDA), New York University

- Fine-tuned a BERT base **large language models/LLMs** for patient readmission prediction based on clinical notes.
- **Causal inference** to augment LLM embeddings confounders for domain adaptation and generalization across hospitals.

Vision-speech representation learning for retrieval with latent diffusion models *May. 2024 - Aug. 2024*
IC Lab, Futurewei Technologies

- Proposed joint learning of single-modal reconstruction and cross-modal alignment over Masked Auto Encoder (**MAE**) and Denoising Diffusion Probabilistic Models (**DDPM**) for image and speech.
- Improved image-speech retrieval and image conditioned audio generation task with better semantics alignment.

Fair facial attribute recognition across demographic groups (race/gender/age) *Jan. 2024 - present*

- Proposed to infer sensitive information by leveraging and improving pre-trained **large vision-language models (LLaVA, GPT-4o)**.
- Adaptive re-sampling to mitigate optimization loss across pseudo sensitive groups, achieving fair downstream models.

Robustness of digital data source Google Street View on diabetes/obesity prediction *Mar. 2023 - Jan. 2024*

- **Causal mediation analysis** for "big data" driven machine learning model studying effect of built environment on health outcomes. Proposed a new causal model framework that accounts for the mediator of individual-level activity and leads to 4.17 times higher health improvement than the vanilla model.

Mitigating urban and rural disparity in self-supervised learning for geographic images *June. 2022 - May. 2023*

- Mitigating performance disparities for **semantic segmentation** of geographic images in **contrastive self-supervised learning** across urban and rural areas. De-biasing algorithms applied to multi-level visual representations.

Federated learning for medical images that is robust to data heterogeneity *Nov. 2019 - Nov. 2021*

Laboratory of Quantitative Imaging and Artificial Intelligence (QIAI), Stanford University

- Proposed a **heterogeneity-robust federated learning** algorithm: Split Averaging (SplitAVG), which outperforms SOTA methods when participating clients contain highly heterogeneous data.

Speaker verification: Generalizable speaker features from human short speech. *May. 2017 – July. 2018*

Beijing National Research Center for Information Science and Technology, Tsinghua University

- **Machine speaker recognition** (SRE) via deep learning structure (**Convolutional Time-delayed Neural Network**) to learn speaker vocal traits from the raw text-independent speech signals. Publication at ICASSP conference.

PUBLICATIONS

Research Interests:

- Responsible and robust machine learning, via bias mitigation, fairness, and generalization
- LLM-based agent systems and foundation models for healthcare

Conferences:

***Miao Zhang**, Zee Fryer, Ben Colman, Ali Shahriyari, Gaurav Bharaj.* "Common sense bias modeling for classification tasks." AAAI Conference on Artificial Intelligence (AAAI) 2025.

Dongkyu Cho, **Miao Zhang***, Rumi Chunara. "*Expert-guided Clinical Text Augmentation via Query-Based Model Collaboration." [link]. NeurIPS 2025 Workshop on Socially Responsible and Trustworthy Foundation Models. (* Equal Contribution)

***Miao Zhang**, Rumi Chunara. "*Mitigating urban-rural disparities in contrastive representation learning with satellite imagery". AAAI/ACM Conference on AI, Ethics, and Society (AIES) 2024.

*Junyuan Zhang, Shuang Zeng, **Miao Zhang**, Runxi Wang, Feifei Wang, Yuyin Zhou, Paul Pu Liang, Liangqiong Qu.* "FLHetBench: Benchmarking Device and State Heterogeneity in Federated Learning". Conference on Computer Vision and Pattern Recognition (CVPR) 2024.

***Miao Zhang**, Harvineet Singh, Lazarus Chok, Rumi Chunara.* "Segmenting across places: The need for fair transfer learning with satellite imagery". Fair, Data-efficient, and Trusted Computer Vision (TCV) 2022.

***Miao Zhang**, Xiaofei Kang, Yanqing Wang, Lantian Li, Zhiyuan Tang, Haisheng Dai, Dong Wang.* "Human and Machine Speaker Recognition based on Short Trivial Events". IEEE International Conference on Acoustics, Speech and Signal Processing, (ICASSP), pp. 5009-5013. IEEE, 2018.

Journals:

***Miao Zhang**, Hajra Arshad, Manzar Abbas, Hamzah Jehanzeb, Izza Tahir, Javerya Hassan, Rumi Chunara.* "Quantifying greenspace with satellite images in Karachi, Pakistan using a new data augmentation paradigm". ACM Journal on Computing and Sustainable Societies.

***Miao Zhang**, Salman Rahman, Vishwali Mhasawade, Rumi Chunara.* "Utilizing Big Data Without Domain Knowledge Impacts Public Health Decision Making", Proceedings of National Academy of Sciences (PNAS).

***Miao Zhang**, Liangqiong Qu, Daniel Rubin.* "SplitAVG – A Federated Deep Learning Method to Tackle Data Heterogeneity for Medical Imaging". Journal of the Biomedical and Health Informatics, 2022.

*Liangqiong Qu, Niranjan Balachandar, **Miao Zhang**, Daniel Rubin.* "Handling Data Heterogeneity with Generative Replay in Distributed Deep Learning Models for Medical Imaging". Medical Image Analysis, 2022.

Pre-prints:

***Miao Zhang**, Rumi Chunara. "*Configurable Fairness: Direct Optimization of Parity Metrics via Vision-Language Models". [link]

***Miao Zhang**, Siyuan Xiang, Junsik Kim, Jian Gao, Cheng Cao. "*Dynamic Role Assignment for Multi-Agent Debate*".*

TECHNICAL SKILLS

Programming languages: Python, JavaScript, R, C++, Matlab, Bash
Software & Tools: Pytorch, OpenCV, Tensorflow, NumPy, SpaCy, NLTK, Scikit-learn, VSCode, Docker

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SERVICES & AWARDS

Reviewer for AAAI 2026, WACV2025, ML4H 2024, AISTATS 2023, CVPR 2023
Nature Communications, Journal of Biomedical Health Informatics, ISPRS Journal of Photogrammetry and Remote Sensing, Artificial Intelligence in Medicine, Communications Engineering.

Guest lecture for CS-GY 6053 Foundation of Data Science, New York University
Natural Language Processing Methods in Policy and Services Research, New York University

Invited presentation at Tulane University AI Research Symposium: Demystifying AI in Public Health

Invited presentation at Cohere for AI for a research work in mitigating common sense bias in ML training datasets.

Funding award for university collaboration from Adobe Research.

Future Leader Fellowship, NYU

CRA-WP Grad Cohort for Women Workshop

YOFC Enterprise Scholarship, China, *Top 1%*