

Xinyi Hu

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Education

Boston University, PhD in Computing & Data Science – Boston, MA, USA Sept 2023 – present

- GPA: 4.0/4.0

Tufts University, BS in Applied Math & Psychology (Double Major) – Medford, MA, USA Sept 2019 – June 2023

- GPA: 3.91/4.0, Dean's List

Experience

Researcher, PLAIA Lab, Boston University – Boston, MA, USA Jan 2024 – present

- Architected a MARL framework utilizing Deep Q-Networks (DQN) or Soft Actor-Critic (SAC) to enable decentralized agents to perform autonomous, cooperative exploration in complex hypothesis-testing environments.
- Developed theoretical guarantees and empirical evaluations for scalable multi-player coordination strategies, specifically designing decentralized multi-player bandit algorithms to optimize global utility under generalized resource capacity constraints.

Researcher, Center for Brain Recovery, Boston University – Boston, MA, USA June 2023 – Jan 2025

- Engineered Convolutional Neural Networks (CNNs) and multimodal ML pipelines to integrate structural and functional neuroimaging data, achieving high-accuracy prognostic models for post-stroke aphasia recovery.
- Applied Riemannian Manifold Analysis to high-dimensional fMRI connectivity matrices, utilizing tangent space projection to enhance feature representation and isolate neural biomarkers for language impairment.
- Implemented and operated automated neuroimaging preprocessing pipelines (utilizing fMRIPrep and CONN) to perform motion correction, skull-stripping, and spatial normalization, ensuring high-fidelity data for downstream analysis.

Researcher @ Accenture, Break Through Tech AI – Cambridge, MA, USA June 2023 – Sept 2023

- Developed and deployed Machine Learning models using Python, Scikit-learn, and Pandas to analyze large-scale cosmetics datasets, optimizing resource allocation and in-store product placement for maximum sales impact.

Research Assistant, Emotion Brain & Behavior Lab, Tufts University – Medford, MA Feb 2022 – Dec 2022

- Analyzed fine-grained motor dynamics as behavioral markers of anxiety, employing dimensionality reduction (PCA, t-SNE) and clustering (K-Means).

Research Assistant, NLP Lab, Westlake University – Hangzhou, China Dec 2020 – Nov 2021

- Proposed a data augmentation method to standardize emotion classification in NLP.
- Evaluated variations in multimodal emotion classification techniques across datasets.

Publications

A Mapping on Current Classifying Categories of Emotions Used in Multimodal Models for Emotion Recognition Mar 2024

Ziwei Gong, Muyin Yao, Xinyi Hu, Xiaoning Zhu, Julia Hirschberg

Proceedings of the 18th Linguistic Annotation Workshop (LAW-XVIII), Association for Computational Linguistics

Aphasia Severity Prediction Using a Multi-Modal Machine Learning Approach 2025-06

Xinyi Hu, Maria Varkanitsa, Emerson Kropp, Margrit Betke, Prakash Ishwar, Swathi Kiran

[10.1016/j.neuroimage.2025.121300](https://doi.org/10.1016/j.neuroimage.2025.121300) (NeuroImage)

Meet Me at the Arm: The Cooperative Multi-Armed Bandits Problem with Shareable Arms June 2025

Xinyi Hu, Aldo Pacchiano

[10.48550/arXiv.2506.10127](https://arxiv.org/abs/10.48550/arXiv.2506.10127) (arXiv preprint)

Awards

- Hariri Institute Graduate Student Fellow (2024), Boston University

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