Youxiang Zhu

Website: billzyx.github.io
Email: youxiang.zhu001@umb.edu
Phone: +1 (857)-269-4221

About me

I am a Ph.D. student in Computer Science. I'm broadly interested in deep learning and its applications. My recent research agenda centered on **transfer learning** within the **large language model** (LLM) era, with the aim of developing and customizing **foundation models** for various downstream tasks, particularly those with **limited data**. I explored various topics under this agenda, including long-context language modeling and mechanistic interpretability [1], reasoning with task relating [3], multi-modality (speech [8] and vision [5] language models), targeted training data selection [6], interpretability [7], and privacy concerns [4]. I also dive deep into speech-based dementia detection, a superhuman-level task that requires LLM to reason about dementia-related patterns that human experts may not know. Before Ph.D., my research focused on fine-grained image classification[10][11].

Education

University of Massachusetts Boston — Boston, MA, USA
Ph.D. in Computer Science, Advisor: Xiaohui Liang — Jan. 2021–May. 2026

Nanjing Forestry University — Nanjing, Jiangsu, China
B.E. in Computer Science and Technology, Advisor: Ning Ye — 2016–2020

- Thesis: "Sample-wise Selection for Fine-grained Image Classification" (Best Bachelor Thesis Award)

Work Experience

Fixie AI, Inc (Ultravox.ai) — Boston, MA, USA
Research Intern — Jan. 2025 - Aug. 2025

- Project: Parameter-efficient learning for voice clone under limited data constraint
- Keywords: Speech language models, Speech generation

University of Massachusetts Boston — Boston, MA, USA
Research Assistant — 2021–2024

- Project: Exploiting Voice Assistant Systems for Early Detection of Cognitive Decline (NIH Grant: 1R01AG067416-01)
- Keywords: Speech and language processing, human-computer interaction, AI for healthcare

Eve Communications, Inc — Remote, USA
AI Research Engineer (Intern) — June 2024

- Project: End-to-end speech language model
- Keywords: Speech and language processing, large language models, multi-modal learning

KPMG Digital Ignition Centre — Nanjing, Jiangsu, China
AI Intern — Aug. 2019–Dec.2019

- Project: Table content extraction in uneditable PDF documents
- Keywords: Computer vision, AI for finance

Selected Publications

I have >400 citations according to Google Scholar, and my h-index is 10.

1. **Youxiang Zhu**, Ruochen Li, Danqing Wang, Daniel Haehn, Xiaohui Liang, Focus Directions Make Your Language Models Pay More Attention to Relevant Contexts, Preprint, arXiv:2503.23306 (2025).
2. Ruochen Li, Jun Li, Bailiang Jian, Kun Yuan, **Youxiang Zhu**, ReEvalMed: Rethinking Medical Report Evaluation by Aligning Metrics with Real-World Clinical Judgment, Conference on Empirical Methods in Natural Language Processing (EMNLP), 2025.
3. **Youxiang Zhu**, Nana Lin, Kiran Sandilya Balivada, Daniel Haehn, Xiaohui Liang, Adversarial Text Generation using Large Language Models for Dementia Detection, Conference on Empirical Methods in Natural Language Processing (EMNLP), 2024.
4. **Youxiang Zhu**, Ning Gao, Xiaohui Liang, and Honggang Zhang, Exploiting Privacy Preserving Prompt Techniques for Online Large Language Model Usage, IEEE Global Communications Conference (GLOBECOM), 2024.
5. **Youxiang Zhu**, Nana Lin, Xiaohui Liang, John Batsis, Robert Roth and Brian MacWhinney, Evaluating Picture Description Speech for Dementia Detection using Image-text Alignment, International Workshop on Multimodal Learning (Multimodal KDD), 2023.
6. **Youxiang Zhu**, Xiaohui Liang, John A. Batsis, and Robert M. Roth, Domain-aware Intermediate Pretraining for Dementia Detection with Limited Data, Conference of the International Speech Communication Association (INTERSPEECH), 2022.
7. **Youxiang Zhu**, Bang Tran, Xiaohui Liang, John A. Batsis, and Robert M. Roth. "Towards Interpretability of Speech Pause in Dementia Detection Using Adversarial Learning." In ICASSP 2022-2022 IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP), pp. 6462-6466. IEEE, 2022.
8. **Youxiang Zhu**, Abdelrahman Obyat, Xiaohui Liang, John A. Batsis, and Robert M. Roth. "WavBERT: Exploiting Semantic and Non-Semantic Speech Using Wav2vec and BERT for Dementia Detection." Conference of the International Speech Communication Association (INTERSPEECH), pp. 3790-3794. 2021.
9. **Youxiang Zhu**, Xiaohui Liang, John A. Batsis, and Robert M. Roth. "Exploring deep transfer learning techniques for Alzheimer's dementia detection." Frontiers in computer science (2021): 22.
10. **Youxiang Zhu**, Ruochen Li, Yin Yang, and Ning Ye. "Learning Cascade Attention for Fine-grained Image Classification." Neural Networks (2020).
11. **Youxiang Zhu**, Weiming Sun, Xiangying Cao, Chunyan Wang, Dongyang Wu, Yin Yang, and Ning Ye. "TA-CNN: Two-way Attention Models in Deep Convolutional Neural Network for Plant Recognition." Neurocomputing (2019).

Honors and Awards

- University of Massachusetts Boston, College of Science and Mathematics Dean's Doctoral Research Fellowship (support from Oracle), $13,000 * 2 — Fall 2023 and Spring 2024
- Best (First-class) Bachelor Thesis Award of Nanjing Forestry University and Jiangsu Province — 2020
- Honorable Mention in Mathematical Contest in Modeling — 2018
- First-class Scholarship of Nanjing Forestry University (Top 10%) — 2018 and 2019

Skills

- **Programming:** Python, Java, Tensorflow, PyTorch
- **Research Fields:** Speech and language processing, Deep transfer learning, Large language models, Mechanistic interpretability, Spoken language understanding, Multi-modal learning, In-context learning, Fine-grained image classification

Teaching

- UMB CS697 Special Topics (Speech and Language Processing) Spring 2024
  Co-instructor *with Prof. Xiaohui Liang (The first Speech and Language Processing course at UMB)*

Professional Services

- **Journal Reviewer**
  - IEEE Internet of Things Journal
  - Frontiers in Oncology, section Radiation Oncology
  - IEEE Signal Processing Letters
- **Conference Reviewer**
  - IEEE INFOCOM 2022
  - IEEE ICC 2022
  - INERTSPEECH 2024, 2025

Links

- **Github:** https://github.com/billzyx
- **Google scholar:** https://scholar.google.com/citations?user=priGDB0AAAAJ&hl=en