Youxiang Zhu

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 around **transfer learning** under the **large language model** (LLM) era, with the aim of developing and customizing **foundation models** for various downstream tasks. I explored various topics under this agenda, including reasoning with task relating [1], multi-modality (speech [11] and vision [4] language models), targeted training data selection [7], interpretability [8], and privacy concerns [2]. 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[13][14].

EDUCATION

University of Massachusetts BostonBoston, MA, USAPh.D. in Computer Science, Advisor: Xiaohui LiangJan. 2021–May/Dec. 2025 (Flexible)Nanjing Forestry UniversityNanjing, Jiangsu, ChinaB.E. in Computer Science and Technology, Advisor: Ning Ye2016–2020

B.E. in Computer Science and Technology, Advisor: Ning Ye
Thesis: "Sample-wise Selection for Fine-grained Image Classification" (Best Bachelor Thesis Award)

WORK EXPERIENCE

University of Massachusetts Boston	Boston, MA, USA	
Research Assistant	Sep. 2021–Current	
 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 Nan	jing, Jiangsu, China	
AI Intern	Aug. 2019–Dec.2019	

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

PUBLICATIONS

I have >200 citations according to Google Scholar, and my h-index is 7.

1. 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.

- 2. 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.
- 3. Nana Lin, **Youxiang Zhu**, Xiaohui Liang, John A. Batsis, Caroline Summerour, Analyzing Multimodal Features of Spontaneous Voice Assistant Commands for Mild Cognitive Impairment Detection, Conference of the International Speech Communication Association (INTERSPEECH), 2024.
- 4. 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.
- 5. Eli Kurtz, **Youxiang Zhu**, Tiffany Driesse, Bang Tran, John A Batsis, Robert M Roth, Xiaohui Liang, Early Detection of Cognitive Decline Using Voice Assistant Commands, IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP), 2023.
- 6. Xiaohui Liang, John A Batsis, Jing Yuan, **Youxiang Zhu**, Tiffany M Driesse, Josh Schultz, Voice-Assisted Food Recall Using Voice Assistants, 24th International Conference on Human-Computer Interaction, HCII 2022.
- 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.
- 8. 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.
- Bang Tran, Youxiang Zhu, Xiaohui Liang, James W. Schwoebel, and Lindsay A. Warrenburg. "Speech Tasks Relevant to Sleepiness Determined With Deep Transfer Learning." In ICASSP 2022-2022 IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP), pp. 6937-6941. IEEE, 2022.
- Xiaohui Liang, John A. Batsis, Youxiang Zhu, Tiffany M. Driesse, Robert M. Roth, David Kotz, and Brian MacWhinney. "Evaluating voice-assistant commands for dementia detection." Computer Speech & Language 72 (2022): 101297.
- 11. 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.
- 12. 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.
- 13. Youxiang Zhu, Ruochen Li, Yin Yang, and Ning Ye. "Learning Cascade Attention for Fine-grained Image Classification." Neural Networks (2020).
- 14. 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).
- Chunyan Wang, Yiqing Xu, Xuelin Wang, Li Zhang, Suyun Wei, Qiaolin Ye, Youxiang Zhu, Hengfu Yin, Manoj Nainwal, Luis, Tanon-Reyes, Feng Cheng, Tongming Yin and Ning Ye. "GEsture: an online hand-drawing tool for gene expression pattern search." PeerJ (2018).

HONORS AND AWARDS

•	University of Massachusetts Boston, College of Science and Mathematics Dean's Doctoral (support from Oracle), \$13,000 * 2	Research Fellowship Fall 2023 and Spring 2024
•	Best (First-class) Bachelor Thesis Award of Nanjing Forestry University and Jiangsu Prov	ince 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, Spoken language understanding, Speech-based health diagnosis, 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

LINKS

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