Youxiang Zhu

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About me

I am a Ph.D. student in Computer Science. I'm broadly interested in **deep learning** and its applications, including **speech and language evaluation**, **deep transfer learning**, and **multi-modal learning**. My recent work has focused on dementia detection from speech, specifically: i) Effective transfer learning of semantic and non-semantic information[12][11], ii) Explainable models[8] iii) Overcoming lack of domain-similar data in transfer learning[7], iv) Multi-modal learning with large language models[4]. Before Ph.D., my research focused on fine-grained image classification[13][14].

Education

University of Massachusetts Boston — Boston, MA, USA
Ph.D. in Computer Science, Advisor: Xiaohui Liang — Jan. 2021–Dec. 2024 (Expected)

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

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 — Nanjing, 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 6.

1. **Youxiang Zhu**, Nana Lin, Kiran Sandilya Balivada, Daniel Haehn, Xiaohui Liang, Adversarial Text Generation using Large Language Models for Dementia Detection, (Submitted to EMNLP 2024).

2. **Youxiang Zhu**, Ning Gao, Xiaohui Liang, and Honggang Zhang, Exploiting Privacy Preserving Prompt Techniques for Online Large Language Model Usage, (Submitted to IEEE Global Communications 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.

7. **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.

9. 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.

10. 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).

15. 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 Research Fellowship (support from Oracle), $13,000 — Fall 2023
- 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, 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