Wenbo Zhang

5TH YEAR PHD CANDIDATE · INFORMATICS

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Research Interests

Multilingual and Cross-Lingual NLP, Model Alignment, Code-Switching, AI for Social Impact, Sociotechnical challenges of LLMs, Misinformation Detection, LLM Agents, Data Mining, Speech Processing.

Education

Pennsylvania State University (PSU) *Pennsylvania, USA*
DOCTOR OF PHILOSOPHY IN INFORMATICS (GPA: 4.0/4.0) *Aug. 2021 - Present*
- Advisor: Dr. Amulya Yadav

University of Southern California (USC) *California, USA*
MASTER OF SCIENCE IN ELECTRICAL ENGINEERING *Aug. 2016 - May. 2018*
- Advisor: Dr. Cauligi Raghavendra

University of Electronic Science and Technology of China (UESTC) *Sichuan, China*
BACHELOR OF ENGINEERING IN RENEWABLE ENERGY MATERIALS AND DEVICES *Sept. 2011 – Jul. 2015*

Past Internship and Research Visit

Research Intern *California, USA*
TENCENT AMERICA *May. 2025 - Aug. 2025*
- Built a voice-interactive AI companion for the first-person shooting(FPS) game in Unreal Engine, integrating LLM reasoning.
- Developed behavior trees and Blueprint pipelines to control AI companion actions (e.g., shooting enemies, following players, setting up bombs) and automate ASR/TTS processes.
- Implemented a command-to-action framework that decomposes player speech into atomic instructions (through LLM reasoning), queues them, and dynamically triggers in-game behaviors with voice response.

Data Science Intern *New York, USA*
NEW YORK LIFE INVESTMENTS *May. 2024 - Aug. 2024*
- Financial machine translation through LLMs and agentic workflow.
- Benchmarked the financial translation performance of LLMs on NYLIM test set through multiple dimensionalities.
- Explored innovative agentic workflow to improve the translation quality and increased 1 BLEU score.

Research Intern *Suzhou, China*
COMPREHEND INFORMATION TECHNOLOGY CO., LTD. *Jun. 2017 - Aug. 2017*
- NLP-based data mining on the traffic data (electronic checkpoints data) accessed from Suzhou City Brain.
- Predicted and partitioned whole city into different function regions (education area, central business area etc.).

Publications

UNDER REVIEW

[1] **Wenbo Zhang**, Aditya Majumdar, Amulya Yadav. CHAI for LLMs: Improving Code-Mixed Translation in Large Language Models through Reinforcement Learning with AI Feedback. In Proceedings of the 40th AAAI Conference on Artificial Intelligence (AAAI), 2026. (Currently Under Review)

[2] **Wenbo Zhang**, Saptarshi Roy, Saatvik Pradhan, Vinodkumar Prabhakaran, Ian Kivlichan, Davis Yadav, Hangzhi Guo and Amulya Yadav. A Taxonomy of Rater Disagreement: Surveying Challenges & Opportunities from the Perspective

of Annotating Online Toxicity. In Proceedings of Conference on Human Factors in Computing Systems (CHI), 2026. (Currently Under Review)

[3] Aditya Majumdar, **Wenbo Zhang**, Kashvi Prawal, and Amulya Yadav. The Hardness of Achieving Impact in AI for Social Impact Research: A Ground-Level View of Challenges & Opportunities. In Proceedings of Conference on Human Factors in Computing Systems (CHI), 2026. (Currently Under Review)

Peer Reviewed Publications

[1] Hangzhi Guo, Pranav Narayanan Venkit, Eunchae Jang, Mukund Srinath, **Wenbo Zhang**, Bonam Mingole, Vipul Gupta, Kush R. Varshney, S. Shyam Sundar, Amulya Yadav. Hey GPT, Can You be More Racist? Analysis from Crowdsourced Attempts to Elicit Biased Content from Generative AI. In Proceedings of the 8th AAAI/ACM Conference on AI, Ethics, and Society (AIES), 2025.

[2] Xinyu Wang, **Wenbo Zhang**, Sai Koneru, Hangzhi Guo, Bonam Mingole, S. Shyam Sundar, Sarah Rajtmajer, Amulya Yadav. Have LLMs Reopened the Pandora's Box of AI-Generated Fake News? In Proceedings of the 2025 Annual Conference of the North American Chapter of the Association for Computational Linguistics (NAACL), 2025.

[3] Hangzhi Guo, Xinchang Xiong, **Wenbo Zhang**, Amulya Yadav. ReLax: Efficient and Scalable Recourse Explanation Benchmarking using JAX. In Journal of Open Source Software (JOSS), 2024.

[4] **Wenbo, Zhang**, Hangzhi Guo, Prerna Ranganathan, Jay Patel, Sathyanath Rajasekharan, Nidhi Danayak, Manan Gupta, Amulya Yadav. A Continual Pre-training Approach to Tele-Triaging Pregnant Women in Kenya. In Proceedings of the 37th AAAI Conference on Artificial Intelligence (AAAI), 2023. (**System has been full-time deployed by Jacaranda Health**)

[5] Hangzhi Guo, Xinchang Xiong, **Wenbo Zhang**, Amulya Yadav. ReLax: An Efficient and Scalable Recourse Explanation Benchmarking Library using JAX. In the NeurIPS 2023 Workshop on XAI in Action: Past, Present, and Future Applications, 2023.

[6] **Wenbo Zhang**, Hangzhi Guo, Prerna Ranganathan, Jay Patel, Sathyanath Rajasekharan, Nidhi Danayak, Manan Gupta, Amulya Yadav. TRIM-AI: Harnessing Language Models for Providing Timely Maternal & Neonatal Care in Low-Resource Countries. In the AAAI Workshop on AI for Social Good (AI4SG), 2023.

Archival

[1] Xinyu Wang*, **Wenbo Zhang***, Sarah Rajtmajer. Monolingual and Multilingual Misinformation Detection for Low-Resource Languages: A Comprehensive Survey. arXiv preprint arXiv:2410.18390.

Research Experience

Improve LLMs' translation ability through model alignment *Pennsylvania, USA*
Advisor: Dr. Amulya Yadav *Apr. 2024 - Present*
- This work attempts to answer the question: Can we develop a general-purpose approach to improve the capability of LLMs in dealing with code-mixed tasks? We enhanced the ability of LLMs to understand code-switched languages through machine translation tasks and reinforcement learning from AI feedback (RLAIF).
- A novel framework has been introduced to create preference data and the reward model through the cost-effective strategy. After RLAIF, the aligned LLM exhibits cross-lingual transfer in other language pairs and handles other classification tasks better.

Assist case assessment of online sexual abuse and exploitation among children *Pennsylvania, USA*
Advisor: Dr. Amulya Yadav *Feb. 2024 - Present*
- Children in the Philippines are vulnerable to online sexual abuse and bullying. This research aims to tackle the following research question in partnership with World Hope International-Philippines (WHI-PH): Can we build an AI-driven decision support system which can automate the preliminary triage and case assessments of online sexual abuse and exploitation of children survivors?

Machine learning for phenotypic pattern identification of adolescents with drug usage *Pennsylvania, USA*
Advisor: Dr. Amulya Yadav *Feb. 2023 - Jul. 2023*
- This research focuses on identifying potential students (in high school) who may use alcohol, cigarette or marijuana in the future. We analyze potential patterns which may lead such behaviors through the machine learning perspective.

TRIM-AI: Harnessing language models for providing timely maternal health care *Pennsylvania, USA*
ADVISOR: DR. AMULYA YADAV *Sept. 2021 - Jun. 2022*

- Maternal health situation are servere in Kenya, Africa. This work focuses on developing an NLP framework, using multi-lingual pretraining and continual pretraining, to predict the user's medical situation (emergency level) based on code-mixed SMS messages.
- This framework has been deployed inside the PROMPTS (digital health system developed by Jacaranda Health). According to the feedback from Jacaranda Health, this framework reduces the monthly system management cost by 22.8% and PROMPTS helpdesk's workload by ∼12%.

Industrial Experience

Machine Learning Engineer *Beijing, China*
AI LAB, KINGSOFT CO., LTD. *Jan. 2019 - Jul. 2021*

- Applied recent advanced NLP techniques to develop information extraction modules inside knowledge graph.
- Employed NLP seq2seq models and speech processing techniques to construct the text-to-speech (TTS) system.

DIRECTION 1: KNOWLEDGE GRAPH

Open domain knowledge graph construction *Beijing, China*
PROJECT PARTICIPANT *Jan. 2021 - Jul. 2021*

- Designed modules (name entity recognition and relation extraction) for Chinese knowledge graph construction.
- The knowledge graph has been deployed inside the Kingsoft electronic notebook website.

DIRECTION 2: SPEECH PROCESSING (ESPECIALLY TTS, GENERATIVE AI FOR SPEECH SYNTHESIS)

English multi-speaker text-to-speech (TTS) system for novel website *Beijing, China*
PROJECT PARTICIPANT *Jul. 2020 - Dec. 2020*

- Developed a system which generated speech with someone's tone through few minutes' voice recordings.
- Created a prototype for audiobook reading on English novel translation website to support multiple human voices.

End-to-end framework for Chinese polyphone pronunciation prediction *Beijing, China*
PROJECT LEADER *Apr. 2020 - Jul. 2020*

- Built end-to-end framework for pronunciation prediction of Chinese polyphone with multi-phonemic values.
- Improved the pronunciation correctness of Chinese speech synthesis system.

NLP based Chinese text prosody prediction *Beijing, China*
PROJECT LEADER *Jan. 2020 - Mar. 2020*

- Modeled the prosody (short pronunciation break among Chinese words) prediction as the sequence tagging problem.
- Improved the naturalness and quality of the synthesized speech generated from Chinese speech synthesis system.

End-to-end Chinese text-to-speech (TTS) system *Beijing, China*
PROJECT LEADER *Jan. 2019 - Apr. 2020*

- Implemented whole pipeline of end-to-end Chinese TTS system, including the text processing module (which extracts semantic information from input sentences), acoustic model (which predicts acoustic features based on the semantic information), and the vocoder model (which transforms acoustic features into speech signals).
- Applied on the Kingsoft policy question answer (QA) system.

Awards, Fellowships, & Grants

2023 **AAAI-23 student scholarship**, AAAI Conference on Artificial Intelligence (AAAI)

PSU Student Travel Award, College of Information sciences and technology, Pennsylvania State University

2022 **AI Societal Impact Award**, Center for Artificial Intelligence Foundations and Engineered Systems (CAFÉ) at Pennsylvania State University

2014   **3rd Class of National People's Scholarship (top 15%)**, University of Electronic Science and Technology of China

2013   **3rd Class of National People's Scholarship (top 15%)**, University of Electronic Science and Technology of China

2012   **3rd Class of National People's Scholarship (top 15%)**, University of Electronic Science and Technology of China

Teaching Experience

Spring 2022   **DS 442 Artificial Intelligence**, Teaching Assistant at Pennsylvania State University
Fall 2023   **DS 442 Artificial Intelligence**, Teaching Assistant at Pennsylvania State University
Spring 2024   **DS 442 Artificial Intelligence**, Teaching Assistant at Pennsylvania State University
Fall 2025   **DS 442 Artificial Intelligence**, Teaching Assistant at Pennsylvania State University

Skills

DevOps   Google Cloud Platform, Amazon Web Services, Alibaba cloud, Docker
Back-end   Django
Programming   Python, R, C++, SQL, LaTeX, Shell
Framework   Tensorflow, Pytorch, Transformers, TRL