

Wenbo Zhang

PHD STUDENT · INFORMATICS

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Research Interests

Natural Language Processing, AI for Social Impact, Deep learning, Data Mining, Speech Processing, and Signal Processing.

Education

Pennsylvania State University (PSU)

DOCTOR OF PHILOSOPHY IN INFORMATICS (GPA: 4.0/4.0)

• Advisor: Dr. Amulya Yadav

Pennsylvania, USA

Aug. 2021 - Present

University of Southern California (USC)

MASTER OF SCIENCE IN ELECTRICAL ENGINEERING

• Advisor: Dr. Cauligi Raghavendra

California, USA

Aug. 2016 - May. 2018

University of Electronic Science and Technology of China (UESTC)

BACHELOR OF ENGINEERING IN RENEWABLE ENERGY MATERIALS AND DEVICES

Sichuan, China

Sept. 2011 - Jul. 2015

Publications

PUBLISHED

- [1] **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, 2023. **(System has been full-time deployed by Jacaranda Health)**
- [2] Hangzhi Guo, Xinchang Xiong, **Wenbo Zhang**, Amulya Yadav. Efficient and Scalable Recourse Explanation Benchmark using JAX. XAI in Action: Past, Present, and Future Applications, 2023.

IN PREP

- [1] **Wenbo, Zhang**, Hangzhi Guo, Ian Kivlichan, Vinodkumar Prabhakaran, Davis Yadav and Amulya Yadav. A Taxonomy of Rater Disagreement: Surveying Challenges & Opportunities from the Perspective of Annotating Online Toxicity. arXiv preprint arXiv:2311.04345
- [2] **Wenbo Zhang**, Amulya Yadav. Do large language models understand code-mixed contents well?

Research Experience

Machine learning for phenotypic pattern identification of adolescents with drug usage

ADVISOR: DR. AMULYA YADAV

- 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.

Pennsylvania, USA

Feb. 2023 - Jul. 2023

TRIM-AI: Harnessing language models for providing timely maternal & neonatal care

ADVISOR: DR. AMULYA YADAV

- 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%.

Pennsylvania, USA

Sept. 2021 - Jun. 2022

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

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

Industrial Experience

Machine Learning Engineer

Beijing, China

AI LAB, KINGSOFT CO., LTD.

Jan. 2019 - Jul. 2021

- Applied recent advanced NLP techniques to design 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.

Past Internship and Research Visit

Comprehend Information Technology Co., Ltd.

Suzhou, China

MENTOR: DR. HENGCHANG LIU

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.).

Skills

DevOps	Google Cloud Platform, Alibaba cloud, Docker
Back-end	Django
Programming	Python, R, C, LaTeX, Shell
Framework	Tensorflow, Pytorch