

# Zhen Wang

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## RESEARCH INTERESTS

My research interests lie in areas of machine learning, natural language processing, and data science. I develop principled methods for aligning machine learning models with human needs and proactively assisting humans in solving real-world challenges.

In particular, I'm interested in discovering novel and actionable knowledge from massive data ([KDD](#), [EACL](#)), making black-box models more transparent and interpretable ([ACL](#)), better control of large language models (LLMs), including coherence ([ACL](#)), reasoning ([ACL](#)), efficient adaptation ([ICLR](#)). More recently, I have contributed to building versatile and accountable **LLM agents**, augmenting them with planning ([EMNLP](#)), tool using ([NeurIPS](#)), and prompt optimization ([ICLR](#)).

I'm also interested in the applications of LLMs in accelerating scientific discovery, such as clinical, biomedical, biology research, etc.

## WORK EXPERIENCE

**Postdoctoral Scholar** San Diego, CA, USA  
UC San Diego, Halicioğlu Data Science Institute February, 2023 – present  
Hosted by [Eric Xing](#) and [Zhiting Hu](#)

**Independent Course Instructor** Columbus, OH, USA  
OSU, Dept. of Computer Science & Engineering Autumn 2022  
CSE 5525: *Foundations of Speech & Language Processing (Undergrad & Graduate)*

**Research Intern, MIT-IBM Watson AI Lab** Cambridge, MA, USA  
Hosted by [Rameswar Panda](#) and [Yoon Kim](#) Summer 2022  
Topic: *Multi-task prompt tuning for efficient adaptation of large language models*

**Research Intern, Microsoft Research Redmond** Redmond, WA, USA  
Hosted by [Nebojsa Jojic](#) Summer 2021  
Topic: *Coherence boosting and prompt calibration for GPT-3*

**Research Intern, NEC Labs America** Princeton, NJ, USA  
Hosted by [Bo Zong](#) Summer 2020  
Topic: *Learning word embeddings by commonsense knowledge reasoning*

**Graduate Research Associate** Columbus, OH, USA  
OSU, Dept. of Computer Science & Engineering 2018–2022  
Advisor: [Huan Sun](#)

**Graduate Teaching Assistant** Columbus, OH, USA  
OSU, Dept. of Computer Science & Engineering Autumn 2017  
CSE 2111: *Modeling and Problem Solving with Spreadsheets and Databases*

## EDUCATION

**The Ohio State University (OSU)** Columbus, OH, USA  
PhD, Dept. of Computer Science & Engineering 2022  
Advisor: [Huan Sun](#)  
Thesis: *Knowledge-centric NLP: Acquisition, Representation, Transfer, and Reasoning*

**Université Nice Sophia Antipolis (UNS)** Nice, France

Visiting Student, *Polytech Nice Sophia*  
Individual Study Advisor: Lionel Fillatre and Michel Barlaud

2015

**China University of Petroleum (UPC)**  
B.Eng. in Electronic Information Engineering  
Graduated as 1st-Ranked Student in the Major Overall Ranking

Qingdao, China  
2015

**PUBLICATIONS**  
(\*joint first author)

- [1] Shibo Hao, Yi Gu, Haotian Luo, Tianyang Liu, Xiyan Shao, Xinyuan Wang, Shuhua Xie, Haodi Ma, Adithya Samavedhi, Qiyue Gao, **Zhen Wang**, Zhiting Hu *LLM Reasoners: New Evaluation, Library, and Analysis of Step-by-Step Reasoning with Large Language Models*. Under Review [Code]
- [2] Xinyuan Wang\*, Chenxi Li\*, **Zhen Wang**\*<sup>†</sup>, Fan Bai, Luo Haotian, Jiayou Zhang, Nebojsa Jojic, Eric P. Xing, Zhiting Hu. *PromptAgent: Strategic Planning with Language Models Enables Expert-level Prompt Optimization*. Proceedings of **ICLR 2024** [Paper] (<sup>†</sup> Corresponding author)
- [3] Shibo Hao\*, Yi Gu\*, Haodi Ma, Joshua Jiahua Hong, **Zhen Wang**, Daisy Zhe Wang, Zhiting Hu. *Reasoning with Language Model is Planning with World Model*. Proceedings of **EMNLP 2023** (Main) [Paper]
- [4] Shibo Hao, Tianyang Liu, **Zhen Wang**, Zhiting Hu. *ToolkenGPT: Augmenting Frozen Language Models with Massive Tools via Tool Embeddings*. Proceedings of **NeurIPS 2023** (Oral) [Paper]
- [5] Ana Jojic, **Zhen Wang**, Nebojsa Jojic. *GPT Is Becoming a Turing Machine: Here Are Some Ways to Program It*. Under Review [arXiv]
- [6] Lingbo Mo, Shijie Chen, Zirui Chen, Xiang Deng, Ashley Lewis, Sunit Singh, Samuel Stevens, Chang-You Tai, **Zhen Wang**, Xiang Yue, Tianshu Zhang, Yu Su, Huan Sun. *Roll Up Your Sleeves: Working with a Collaborative and Engaging Task-Oriented Dialogue System*. The 2023 SIGDIAL Meeting on Discourse and Dialogue (SIGDIAL 2023) [arXiv]
- [7] **Zhen Wang**, Rameswar Panda, Leonid Karlinsky, Rogerio Feris, Huan Sun, Yoon Kim. *Multitask Prompt Tuning Enables Parameter-Efficient Transfer Learning*. Proceedings of **ICLR 2023** [Paper]
- [8] Batu Ozturkcler, Nikolay Malkin, **Zhen Wang**, Nebojsa Jojic. *ThinkSum: Probabilistic Reasoning Over Sets Using Large Language Models*. Proceedings of **ACL 2023** (Main) [arXiv]
- [9] Janvijay Singh, Fan Bai, **Zhen Wang**. *Frustratingly Simple Entity Tracking with Effective Use of Multi-Task Learning Models*. Proceedings of **EACL 2023** (Main) [arXiv]
- [10] Lingbo Mo\*, **Zhen Wang**\*, Jie Zhao, Huan Sun. *Knowledge Transfer between Structured and Unstructured Sources for Complex Question Answering* NAACL 2022 Structured and Unstructured Knowledge Integration (SUKI) [Paper]
- [11] **Zhen Wang**, Bo Zong, Wei Cheng, Xuchao Zhang, Yanchi Liu, Wenchao Yu, Jingchao Ni, Haifeng Chen, Huan Sun. *Learning Interpretable Word Representations by Commonsense Knowledge Reasoning*. Under Review
- [12] Nikolay Malkin, **Zhen Wang**, Nebojsa Jojic. *Coherence Boosting: When Your Pre-trained Language Model is Not Paying Enough Attention*. Proceedings of **ACL 2022** (Main) [Paper]
- [13] Shijie Chen, Zirui Chen, Xiang Deng, Ashley Lewis, Lingbo Mo, Samuel Stevens, **Zhen Wang**, Xiang Yue, Tianshu Zhang, Yu Su, Huan Sun. *Bootstrapping a User-Centered Task-Oriented Dialogue System*. 1st Proceedings of Alexa Prize TaskBot (Alexa Prize 2021) [Paper]

- [14] **Zhen Wang**, Bo Zong, Huan Sun. *Modeling Context Pair Interaction for Pairwise Tasks on Graphs* Proceedings of **WSDM 2021** (**Acceptance Rate: 18.6%, Long**) [[Paper](#)]
- [15] **Zhen Wang**, Jennifer Lee, Simon Lin, Huan Sun. *Rationalizing Medical Relation Prediction from Corpus-level Statistics*. Proceedings of **ACL 2020** (Main) [[Paper](#)]
- [16] **Zhen Wang**, Xiang Yue, Soheil Moosavinasab, Yungui Huang, Simon Lin, Huan Sun. *SurfCon: Synonym Discovery on Privacy-Aware Clinical Data* Proceeding of **SIGKDD 2019** (Research Track, Acceptance Rate 14.2%, Oral) [[Paper](#)]
- [17] Xiang Yue, **Zhen Wang**, Jingong Huang, Srinivasan Parthasarathy, Soheil Moosavinasab, Yungui Huang, Simon M. Lin, Wen Zhang, Ping Zhang, Huan Sun. *Graph Embedding on Biomedical Networks: Methods, Applications, and Evaluations*. **Bioinformatics**, Volume 36, Issue 4, 15 February 2020, Pages 1241–1251 (**Impact factor: 5.610**) [[Paper](#)]
- [18] Jayavardhan Reddy Peddamail, Ziyu Yao, **Zhen Wang**, Huan Sun. *A Comprehensive Study of StaQC for Deep Code Summarization*. Proceedings of **SIGKDD 2018** (Deep Learning Day, SPOTLIGHT) [[Paper](#)]
- [19] Weifeng Liu, **Zhen Wang**, Dapeng Tao, Jun Yu. *Hessian Regularized Sparse Coding for Human Action Recognition* Proceedings of **MMM 2015**, Sydney, Australia [[Paper](#)]

## HONORS AND AWARDS

- Top Reviewer Award, NeurIPS 2023 2023
- **Best Paper Award**, SoCal NLP 2023 2023
- Third-Place Honor, Inaugural Alexa Prize TaskBot Challenge 2022
- Graduate Research Award, CSE, OSU 2022
- Graduate Student Research Poster Award (Top 5), CSE, OSU 2021
- SIGIR Student Travel Grant 2021
- **Rising Star in Data Science**, CDAC, University of Chicago 2020
- SIGKDD Student Travel Award 2019
- Excellent Bachelor Degree Thesis Award in Shandong Province, China 2016
- Excellent Graduate Thesis Award of UPC, China 2015
- **Visiting Student Scholarship** in Polytech Nice Sophia, Nice, France 2015
- **National Scholarship**, China 2014
- Soong Ching Ling Foundation (SCLF) Scholarship, China 2013
- National Scholarship for Encouragement, China 2012

## SERVICE

- Area Chair/Senior PC
  - NLPCC 2023
- Program Committee/Reviewer:
  - ACL Rolling Review
    - \* 2021 (Oct., Nov.)
    - \* 2022 (Jan., April, Sep., Oct., Dec.)
    - \* 2023 (Feb., Oct., Dec.)
  - NAACL (2021, 2022 [SUKI](#) Workshop, 2024)
  - EMNLP (2021, 2022, 2023)
  - ACL (2021, 2023)
  - ICML (2023, 2024)

- NeurIPS (2023)
- ICLR (2024)
- KDD (2023, 2024)
- [COLM 2024](#)
- AAAI (2023, 2024)
- NLPCC (2020, 2021, 2022)
- Neural Networks
- External Reviewer: KDD (2019, 2020), ACL 2018, ICDM 2018

## TEACHING EXPERIENCE

- **CSE 5525: Foundations of Speech and Language Processing**
  - † OSU, Department of Computer Science & Engineering
  - Instructor, Autumn 2022 (~30 undergrad and graduate students)
- **Summer School Tutorial: Natural Language Processing in Deep Learning**
  - † OSU, Foundations of Data Science and AI Community of Practice
  - Panelist, June 1 - June 3, 2022 (>180 attendees)
- **CSE 2111: Modeling and Problem Solving with Spreadsheets and Databases**
  - † OSU, Department of Computer Science & Engineering
  - Teaching Assistant, Autumn 2017
- **Panel Discussion: 2001: A Space Odyssey - Science Fiction vs Science Fact**
  - † OSU, Department of Astronomy
  - Panelist, Feb. 2021

## INVITED TALKS

- “Augmenting Language Models with Massive Tools and World Models”, June 2023, North Carolina State University
- “Augmenting Language Models with Massive Tools and World Models”, June 2023, George Mason University
- “Towards Efficient and Robust Practice of Large Language Models”, Autumn 2022, UCSD & MBZUAI & CMU
- “Towards Efficient and Robust Practice of Large Language Models”, Autumn 2022, University of Washington
- “Rationalizing Relation Prediction from Corpus-level Statistics”, ACL 2020, July, Online
- “Modeling Context Pair Interaction for Pairwise Tasks on Graphs”, WSDM 2021, March, Online
- “SurfCon: Synonym Discovery on Privacy-Aware Clinical Data”, KDD 2019, August 6, Anchorage, Alaska, USA

## REFERENCES

Available upon request