Aiwei Liu
Ph.D. Student

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I am a fourth-year Ph.D student. My research interests lie in the fields of natural language processing and deep learning. In particular, I am interested in building more robust and secure natural language generation algorithms and focus on:

- The robustness of converting a database schema related question into a SQL query.
- Text watermarking for Large Language Models.
- Safety alignment of Large Language Models.

EDUCATION

Ph.D., School of Software, Tsinghua University, *Advisor: Associate professor Lijie Wen* 2020 — present

B.Eng., Software Institute, Nanjing University, *GPA: 4.6/5.0, ranking: 5/220* 2016 — 2020

PUBLICATIONS

- **Semantic Enhanced Text-to-SQL Parsing via Iteratively Learning Schema Linking Graph**

  Aiwei Liu, Xuming Hu, Li Lin, Lijie Wen

  In Proceedings of the 28th ACM SIGKDD International Conference on Knowledge Discovery and Data Mining (SIGKDD), 2022

- **Character-level White-Box Adversarial Attacks against Transformers via Attachable Subwords Substitution**

  Aiwei Liu, Honghai Yu, Xuming Hu, Shuang Li, Li Lin, Fukun Ma, Yawen Yang, Lijie Wen

  In Proceedings of the 2022 Conference on Empirical Methods in Natural Language Processing (EMNLP), 2022

- **Exploring the Compositional Generalization in Context Dependent Text-to-SQL Parsing**

  Aiwei Liu, Wei Liu, Xuming Hu, Shuang Li, Fukun Ma, Yawen Yang, Lijie Wen

  In The Findings of Association for Computational Linguistics (Findings of ACL), 2023

- **CHEF: A Pilot Chinese Dataset for Evidence-Based Fact-Checking**

  Xuming Hu, Zhijiang Guo, Guanyu Wu, **Aiwei Liu**, Lijie Wen, Phlip S.Yu

  In The 2022 Conference of the North American Chapter of the Association for Computational Linguistics (NAACL), 2022

- **GAUSSIAN PRIOR REINFORCEMENT LEARNING FOR NESTED NAMED ENTITY RECOGNITION**

  Yawen Yang, Xuming Hu, Fukun Ma, Shuang Li, **Aiwei Liu**, Lijie Wen, Phlip S.Yu

  In 2023 IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP), 2023

- **GDA: Generative Data Augmentation Techniques for Relation Extraction Tasks**

  Xuming Hu*, **Aiwei Liu***, Zeqi Tan, Xin Zhang, Chenwei Zhang, Irwin King, Philip S. Yu

  In The Findings of Association for Computational Linguistics (Findings of ACL), 2023

- **Entity-to-Text based Data Augmentation for various Named Entity Recognition Tasks**

  Xuming Hu, Yong Jiang, **Aiwei Liu**, Zhongqiang Huang, Pengjun Xie, Fei Huang, Lijie Wen, Philip S. Yu

  In The Findings of Association for Computational Linguistics (Findings of ACL), 2023

- **RAPL: A Relation-Aware Prototype Learning Approach for Few-Shot Document-Level Relation Extraction**

  Shiao Meng, Xuming Hu, **Aiwei Liu**, Shu'ang Li, Fukun Ma, Yawen Yang, Lijie Wen

  In Proceedings of the 2022 Conference on Empirical Methods in Natural Language Processing (EMNLP), 2023

- **AMR-based network for aspect-based sentiment analysis**

  Fukun Ma, Xuming Hu, **Aiwei Liu**, Yawen Yang, Philip S. Yu, Lijie Wen

  In Proceedings of Association for Computational Linguistics (ACL), 2023

- **A Multi-level Supervised Contrastive Learning Framework for Low-Resource Natural Language Inference**

  Shu'ang Li, Xuming Hu, Li Lin, **Aiwei Liu**, Lijie Wen, Philip S. Yu

  IEEE/ACM Transactions on Audio, Speech, and Language Processing

- **Reading Broadly to Open Your Mind Improving Open Relation Extraction With Search Documents Under Self-Supervisions**

  Xuming Hu, Zhaochen Hong, Chenwei Zhang, **Aiwei Liu**, Shiao Meng, Lijie Wen, Irwin King, Philip S. Yu

  IEEE Transactions on Knowledge and Data Engineering

- **Enhancing Cross-lingual Natural Language Inference by Soft Prompting with Multilingual Verbalizer**

  Shuang Li, Xuming Hu, **Aiwei Liu**, Yawen Yang, Fukun Ma, Philip S. Yu, Lijie Wen

  In The Findings of Association for Computational Linguistics (Findings of ACL), 2023

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PREPRINTS

- **A Survey of Text Watermarking in the Era of Large Language Models**
  Aiwei Liu*, Leyi Pan*, Yijian Lu, Jingjing Li, Xuming Hu, Lijie Wen, Irwin King, Philip S. Yu

- **An Unforgeable Publicly Verifiable Watermark for Large Language Models**
  Aiwei Liu, Leyi Pan, Xuming Hu, Shu'ang Li, Lijie Wen, Irwin King, Philip S. Yu
  Submitted to International Conference on Learning Representations (ICLR) 2024

- **A Semantic invariant Robust Watermark for Large Language Models**
  Aiwei Liu, Leyi Pan, Xuming Hu, Shiao Meng, Lijie Wen
  Submitted to International Conference on Learning Representations (ICLR) 2024

WORK EXPERIENCE

Apple AIML Group   Mar. 2023 - present
Research Intern, Advisor: Dr. Meng Cao and Dr. Xiang Kong   Online collab with California, United States

Project: Prompt Difficulty Evaluation, Unsupervised safety alignment for LLM

- Keywords: Large Language Model, Safety Alignment

- Accomplishments: 1) Developed a LLM-based automatic attributes identification methods for prompt difficulty evaluation.
  2) Designed a safety alignment method for LLM that does not require manual or GPT-4 annotation of preference data.

Chinese University of Hong Kong   Nov. 2023 - present
Visiting Scholar, Advisor: Prof Irwin King (IEEE Fellow)   Hongkong, China

Project: Watermark for Large Language Models

- Keywords: Large Language Model, Safety Alignment

- Accomplishments: 1) Developed an unforgeable publicly verifiable watermark for Large Language Models 2) Write a comprehensive survey about the text watermarking in the era of LLMs.

SELECTED HONORS AND AWARDS

- Tsinghua Excellent Student Award (SecondClass)
- Outstanding Graduates Nanjing University   2022
- China Electronics Technology Group Scholarship   2020
- National Scholarship   2019
- Hainan Airlines Scholarship   2018
                                                                   2017

COMPETITION EXPERIENCE

- AI Application Innovation Competition of BAAI
  Excellence Award: Atvideo Text-to-Video tool   2021
- Vivo and Nanjing University Hackathon
  First Prize: ChainPaper Blockchain-based Paper Sharing Platform 2019

PROFESSIONAL ACTIVITIES

Program Committee/ Reviewer

- The Annual Meeting of the Association for Computational Linguistics (ACL)
- The Annual Conference on Empirical Methods in Natural Language Processing (EMNLP)
- The Annual Conference of the North American Chapter of the Association for Computational Linguistics (NAACL)
- The Annual Conference of the European Chapter of the Association for Computational Linguistics (EACL)
- The ACM WWW International World Wide Web Conference (WWW)

PERSONAL LIFE

刘瑷玮 is my name in Chinese characters. I was born and grown in Rizhao, China until I went to college in Nanjing, China.Basketball has always been my passion, and I have been a valuable member of my college basketball team, consistently leading as the top scorer in multiple seasons. Additionally, I also have a great interest in cycling and swimming.