Zhiyuan Wang

Institution: University of Electronic Science and Technology of China (UESTC)

Status: Master Degree Candidate Email: yhzywang@gmail.com Google Scholar Profile | Homepage

ISS EDUCATION

University of Electronic Science and Technology of China (UESTC)

Sep 2023 — Jun 2026

Master in Computer Science and Technology

Cumulative GPA: 3.62/4.00

Co-advised by Xiaoshuang Shi and Kaidi Xu (Drexel University)

Chongqing University of Posts and Telecommunications (CQUPT)

Sep 2019 — Jun 2023

Bachelor in Internet of Things Engineering (Hons)

Cumulative GPA: 3.65/4.00 (Rank 1/153)

RESEARCH

1 Uncertainty Quantification:

1. WSE calibrates predictive entropy by assessing semantic relevance at both the word (token) and sentence levels, high-lighting the weights of keywords and highly consistent sentences in uncertainty quantification.

2 Statistical Verification:

- 1. ConU assumes each sampling set contains at least one admissible response and develops the nonconformity score by correlating it with the uncertainty of reliable semantics within the sampling set of each calibration data point, ensuring user-specified coverage of admissible responses in open-ended scenarios for the first time.
- 2. TRON proposes a conformal score for calibrating sampling size, limiting the average probability that sampling sets fail to cover admissible responses. It then develops the nonconformity score based on semantic frequency, rigorously controlling the miscoverage rate by two user-specified risk levels.
- 3. SConU maintains the integrity of the calibration set and introduces the notion of minimum risk level. It also develops two selective conformal p-values to assess exchangeability through significance tests, providing finite-sample guarantees for retained test samples in interdisciplinary contexts.

ISP PUBLICATIONS

Published Papers:

- Zhiyuan Wang, Qingni Wang, Yue Zhang, Tianlong Chen, Xiaofeng Zhu, Xiaoshuang Shi*, Kaidi Xu*. SConU: Selective Conformal Uncertainty in Large Language Models. Annual Meeting of the Association for Computational Linguistics (ACL), Main, 2025
- Qingni Wang, Tiantian Geng, <u>Zhiyuan Wang</u>, Teng Wang, Bo Fu*, Feng Zheng*. Sample then Identify: A General Framework for Risk Control and Assessment in Multimodal Large Language Models. International Conference on Learning Representations (ICLR), Spotlights, 2025.
- 3. Zhiyuan Wang, Jinhao Duan, Chenxi Yuan, Qingyu Chen, Tianlong Chen, Yue Zhang, Ren Wang, Xiaoshuang Shi*, and Kaidi Xu. Word-Sequence Entropy: Towards Uncertainty Estimation in Free-Form Medical Question Answering Applications and Beyond. Engineering Applications of Artificial Intelligence (EAAI), JCR Q1 (IF=7.5), 2025.
- 4. Zhiyuan Wang, Jinhao Duan, Lu Cheng, Yue Zhang, Qingni Wang, Xiaoshuang Shi*, Kaidi Xu, Hengtao Shen, Xiaofeng Zhu. ConU: Conformal Uncertainty in Large Language Models with Correctness Coverage Guarantees. Conference on Empirical Methods in Natural Language Processing (EMNLP), Findings, 2024.

5. Jin Sun, Xiaoshuang Shi*, **Zhiyuan Wang**, Kaidi Xu, Heng Tao Shen, Xiaofeng Zhu. Caterpillar: A Pure-MLP Architecture with Shifted-Pillars-Concatenation. ACM International Conference on Multimedia (**MM**), Poster, 2024.

Preprints:

- 1. **Zhiyuan Wang**, Jinhao Duan, Qingni Wang, Tianlong Chen, Xiaofeng Zhu, Xiaoshuang Shi*, Kaidi Xu*. Uncertainty-Guarding Question Answering of Large Language Models with Provable Risk Guarantees.
- 2. One paper on two-stage risk control comprising (1) abstention-aware sampling size calibration with PAC-style coverage guarantees and (2) conformalized filtering (co-first author), work in progress.
- 3. One paper on uncertainty decomposition in large vision-language models (co-first author), work in progress.

ACADEMIC SERVICES

Program Committee Member of Conferences:

• International Conference on Learning Representations (ICLR)	2025
$ \bullet \ \ {\it Workshop on Large Language Models \ and \ Generative \ AI \ for \ Health \ at \ AAAI \ (GenAI4Health@AAAI) } $	2025
• Survey Track for International Joint Conference on Artificial Intelligence (IJCAL)	2025
• Annual Meeting of the Association for Computational Linguistics (ACL)	2025
• Conference on Empirical Methods in Natural Language Processing (EMNLP)	2025
• ACM International Conference on Multimedia (MM)	2025
• Annual Conference on Neural Information Processing Systems (NeurIPS)	2025

Journal Reviewer:

• Neural Networks (NN)

IS HONORS AND AWARDS

• Academic Youth Award	2025
• Outstanding Graduate Student	2024
Outstanding Student Scholarship	2023, 2024
• Honours Degrees	2023
• Provincial Merit Student	2022
• National Scholarship	2021, 2022
• The First Prize Scholarship	2020, 2021, 2022
• Merit Student	2020, 2021, 2022