

Xujiang Zhao, Ph.D.

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Employment History

- 2022 - Present  **Researcher.** NEC Laboratories America.
- 2021 Summer  **Research Intern.** NEC Laboratories America.
- 2019 Summer  **Research Intern.** Alibaba Damo Academy.

Education

- 2019 – 2022  **Ph.D. University of Texas at Dallas** in Computer Science.
Advisor: Prof. Feng Chen
Thesis title: *Multidimensional Uncertainty Quantification for Deep Neural Networks*.
- 2014 – 2017  **M.Sc. University of Science and Technology of China** in Computer Science.
- 2010 – 2014  **B.S. Chongqing University** in Civil Engineering.

Research Interests

I am generally interested in AI, machine learning, and natural language Processing, with a primary focus on:

- Large Language Models and Agentic AI
- Uncertainty Quantification and Reasoning
- Reinforcement Learning
- Generative AI
- AI Safety & Trustworthy AI
- Graph Learning

Research Publications

†: Denote Corresponding Author; *: Denote equal contribution; *Students* : Denote students I supervise.

Conference Proceedings

NeurIPS(5), ICLR(1), NAACL(4), EMNLP(3), ACL(1), AAAI(2), ICDM(2), CIKM(4), SDM(1), ICASSP(2), IJCAI(1), WWW(1), IEEE BigData(2), PAKDD(1), FUSION(1), MILCOM(1)

1. *Dong Li, Xujiang Zhao*†, Linlin Yu, Yanchi Liu, Wei Cheng, Zhengzhang Chen, Zhong Chen, Feng Chen, Chen Zhao, Haifeng Chen. “*SolverLLM: Leveraging Test-Time Scaling for Optimization Problem via LLM-Guided Search*”. In Advances in neural information processing systems, **NeurIPS**, 2025.
2. Shengkun Tang, Cong Zeng, Yuanzhou Chen, Zhiqiang Shen, Wenchao Yu, **Xujiang Zhao**, Haifeng Chen, Wei Cheng, Zhiqiang Xu. “*Human Texts Are Outliers: Detecting LLM-generated Texts via Out-of-distribution Detection*”. In Advances in neural information processing systems, **NeurIPS**, 2025.
3. *Qiwei Zhao**, *Dong Li**, Yanchi Liu, Wei Cheng, Yiyou Sun, Mika Oishi, Takao Osaki, Katsushi Matsuda, Huaxiu Yao, Chen Zhao, Haifeng Chen, **Xujiang Zhao**†. “*Uncertainty Propagation on LLM Agent*.” In Proceedings of the Association for Computational Linguistics: **ACL** 2025.
4. Jonathan Light, Yue Wu, Yiyou Sun, Wenchao Yu, Yanchi Liu, **Xujiang Zhao**, Ziniu Hu, Haifeng Chen, Wei Cheng. “*Scattered Forest Search: Smarter Code Space Exploration with LLMs*.” In The Thirteenth International Conference on Learning Representations. **ICLR**, 2025.
5. Xinyuan Wang, Yanchi Liu, Wei Cheng, **Xujiang Zhao**, Zhengzhang Chen, Wenchao Yu, Yanjie Fu, Haifeng Chen. “*MixLLM: Dynamic Routing in Mixed Large Language Models*.” In Proceedings of the 2025 Conference of the North American Chapter of the Association for Computational Linguistics. **NAACL**, 2025.
6. Xianjun Yang, Wei Cheng, **Xujiang Zhao**, Wenchao Yu, Linda Petzold, Haifeng Chen. “*Position Really Matters: Towards a Holistic Approach for Prompt Tuning*.” in Findings of the Association for Computational Linguistics. **NAACL**, 2025.

7. Ruomeng Ding, Xujiang Zhao[†], Chen Zhao, Minglai Shao, Zhengzhang Chen, and Haifeng Chen. "Evidence-Based Out-of-Distribution Detection on Multi-Label Graphs." In Proceedings of the 2025 SIAM International Conference on Data Mining, **SDM**, 2025.
8. Chengyuan Deng, Zhengzhang Chen, **Xujiang Zhao**, Haoyu Wang, Junxiang Wang, Jie Gao, Haifeng Chen. "Correlation-aware Online Change Point Detection." In Proceedings of the 34nd ACM International Conference on Information and Knowledge Management, **CIKM**, 2025.
9. Chen Ling, Xujiang Zhao[†], Xuchao Zhang, Wei Cheng, Yanchi Liu, Yiyou Sun, Mika Oishi, Takao Osaki, Katsushi Matsuda, Jie Ji, Guangji Bai, Liang Zhao, Haifeng Chen. "Uncertainty Quantification for In-Context Learning of Large Language Models." In Proceedings of the 2024 Conference of the North American Chapter of the Association for Computational Linguistics, **NAACL**, 2024.
10. Nan Zhang, Yanchi Liu, **Xujiang Zhao**, Wei Cheng, Runxue Bao, Rui Zhang, Prasenjit Mitra, Haifeng Chen. "Pruning as a Domain-Specific LLM Extractor," in Findings of the Association for Computational Linguistics, **NAACL**, 2024.
11. Yijia Xiao, Yiqiao Jin, Yushi Bai, Yue Wu, Xianjun Yang, Xiao Luo, Wenchao Yu, **Xujiang Zhao**, Yanchi Liu, Quanquan Gu, Haifeng Chen, Wei Wang, Wei Cheng. "Large Language Models Can be Good Privacy Protection Learners." in Proceedings of the 2024 Conference on Empirical Methods in Natural Language Processing, **EMNLP**, 2024.
12. Yujie Lin, Chen Zhao, Minglai Shao, Baoluo Meng, **Xujiang Zhao**, and Haifeng Chen. "Towards counterfactual fairness-aware domain generalization in changing environments." **IJCAI**, 2024.
13. Yujie Lin, Chen Zhao, Minglai Shao, **Xujiang Zhao**, and Haifeng Chen. "Adaptation Speed Analysis for Fairness-aware Causal Models." In Proceedings of the 32nd ACM International Conference on Information and Knowledge Management, **CIKM**, 2023.
14. Weili Shi, Xueying Yang, Xujiang Zhao, Haifeng Chen, Zhiqiang Tao, and Sheng Li. "Calibrate Graph Neural Networks under Out-of-Distribution Nodes via Deep Q-learning." In Proceedings of the 32nd ACM International Conference on Information and Knowledge Management, **CIKM**, 2023.
15. Chen Ling, Xuchao Zhang, **Xujiang Zhao**[†], Yanchi Liu, Wei Cheng, Mika Oishi, Takao Osaki, Katsushi Matsuda, Haifeng Chen, Liang Zhao. "Open-Ended Commonsense Reasoning with Unrestricted Answer Candidates," in Findings of 2023 Conference on Empirical Methods in Natural Language Processing.: **EMNLP**, 2023
16. **Xujiang Zhao**, Xuchao Zhang, Chen Zhao, Jin-hee Cho, Lance Kaplan, Dong Hyun Jeong, Audun Jøsang, Haifeng Chen, Feng Chen, "Multi-Label Temporal Evidential Neural Networks for Early Event Detection." In IEEE International Conference on Acoustics, Speech and Signal Processing, **ICASSP**, 2023.
17. **Xujiang Zhao**, Krishnateja Killamsetty, Rishabh Iyer, Feng Chen. "How Out-of-Distribution Data Hurts Semi-Supervised Learning." In 2022 IEEE International Conference on Data Mining, **ICDM**, 2022.
18. Xueying Yang, Jiamian Wang, **Xujiang Zhao**, Zhiqiang Tao. "Calibrate Automated Graph Neural Network via Hyperparameter Uncertainty." In Proceedings of the 31st ACM International Conference on Information and Knowledge Management, **CIKM**, 2022.
19. **Xujiang Zhao**, Xuchao Zhang, Wei Cheng, Wenchao Yu, Yuncong Chen, Haifeng Chen, Feng Chen. "SEED: Sound Event Early Detection via Evidential Uncertainty". In IEEE International Conference on Acoustics, Speech and Signal Processing, **ICASSP**, 2022.
20. Haoliang Wang, Chen Zhao, **Xujiang Zhao**, Feng Chen. "Layer Adaptive Deep Neural Networks for Out-of-distribution Detection". In Pacific-Asia Conference on Knowledge Discovery and Data Mining, **PAKDD**, 2022.
21. Krishnateja Killamsetty, **Xujiang Zhao**, Feng Chen, Rishabh Iyer. "RETRIEVE: Corset Selection for Efficient and Robust Semi-Supervised Learning". In Advances in neural information processing systems, **NeurIPS**, 2021.
22. Liyan Xu, Xuchao Zhang, **Xujiang Zhao**, Haifeng Chen, Feng Chen, Jinho D. Choi. "Boosting Cross-Lingual Transfer via Self-Learning with Uncertainty Estimation". In Proceedings of 2021 Conference on Empirical Methods in Natural Language Processing, **EMNLP**, 2021.
23. Zhuoyi Wang, Chen Zhao, Yuqiao Chen, Hemeng Tao, Yu Lin, **Xujiang Zhao**, Yigong Wang, Latifur Khan. "CLEAR: Contrastive-Prototype Learning with Drift Estimation for Resource Constrained Stream Mining." In Proceeding of TheWebConf 2021, **WWW**, 2021.

24. Yibo Hu, Yuzhe Ou, **Xujiang Zhao**, Feng Chen. "Multidimensional Uncertainty-Aware Evidential Neural Networks." In Proceeding of the Thirty-fifth AAAI Conference on Artificial Intelligence, **AAAI**, 2021.
25. **Xujiang Zhao**, Feng Chen, Shu Hu, Jin-Hee Cho. "Uncertainty Aware Semi-Supervised Learning on Graph Data." In Advances in Neural Information Processing Systems, **NeurIPS**, 2020, (**Spotlight; Acceptance rate: 4%**).
26. Weishi Shi, **Xujiang Zhao**, Qi Yu, Feng Chen. "Multifaceted Uncertainty Estimation for Label-Efficient Deep Learning." In Advances in neural information processing systems, **NeurIPS**, 2020.
27. Adil Alim, **Xujiang Zhao**, Jin-Hee Cho, Feng Chen. "Uncertainty-Aware Opinion Inference Under Adversarial Attacks." In 2019 IEEE International Conference on Big Data, **Big Data**, 2019.
28. **Xujiang Zhao**, Yuzhe. Ou, Lance. Kaplan, Feng. Chen, and Jin-Hee. Cho. "Quantifying Classification Uncertainty using Regularized Evidential Neural Networks." accepted to **AAAI 2019 Fall Symposium Series**, Artificial Intelligence in Government and Public Sector.
29. **Xujiang Zhao**, Shu Hu, Jin-Hee Cho, and Feng Chen. "Uncertainty-based Decision Making using Deep Reinforcement Learning." In 2019 22nd International Conference on Information Fusion, **FUSION**, 2019.
30. **Xujiang Zhao**, Feng Chen, and Jin-Hee Cho. "Deep Learning for Predicting Dynamic Uncertain Opinions in Network Data." In 2018 IEEE International Conference on Big Data, **Big Data** 2018.
31. **Xujiang Zhao**, Feng Chen, and Jin-Hee Cho. "Deep Learning based Scalable Inference of Uncertain Opinions." In 2018 IEEE International Conference on Data Mining, **ICDM** 2018. (Full paper; Acceptance rate: 8.86%)
32. **Xujiang Zhao**, Feng Chen, and Jin-Hee Cho. "Uncertainty-Based Opinion Inference on Network Data Using Graph Convolutional Neural Networks." In IEEE Military Communications Conference , **MILCOM**, 2018.

Journal Article

1. Chen Ling, **Xujiang Zhao**[†], Jiaying Lu, Chengyuan Deng, Can Zheng, Junxiang Wang, Tanmoy Chowdhury, Yun Li, Hejie Cui, Xuchao Zhang, Tianyang Zhao, Amit P., Wei Chen, Haoyu Wang, Yanchi Liu, Zhengzhang Chen, Haifeng Chen, Chris White, Quanquan Gu, Jian Pei, Carl Yang, Liang Zhao., "Domain Specialization as The Key to Make Large Language Models Disruptive: A Comprehensive Survey", **ACM Computing Surveys**, 2025.
2. Ali Riahi Samani, **Xujiang Zhao**, Feng Chen. "Distribution Shift, Generalization and OOD Challenge in Offline Reinforcement Learning: A comprehensive survey." **Artificial Intelligence Review**, 2025.
3. Junji Jiang, Chen Ling, Hongyi Li, Guangji Bai, **Xujiang Zhao**, Liang Zhao. "Quantifying Uncertainty in Graph Neural Network Explanations." **Frontiers in big Data**, 2024.
4. Zhen Guo*, Zelin Wan*, Qisheng Zhang*, **Xujiang Zhao***, Feng Chen, Jin-hee Cho, Qi Zhang, Lance Kaplan, Dong Hyun Jeong, Audun Jøsang. "A Survey on Uncertainty Reasoning and Quantification for Decision Making: Belief Theory Meets Deep Learning." **Information Fusion** (Impact IF: 17.5), 2023.

Under Review

1. Linlin Yu, **Xujiang Zhao**[†], Dong Li, Yanchi Liu, Wei Cheng, Zhengzhang Chen, Chen Zhao, Feng Chen, Haifeng Chen. "Uncertainty-Aware Test-Time Search for Optimization Problem Solving." **ACL** 2026 Under Review.
2. Binchi Zhang, Zhengzhang Chen, **Xujiang Zhao**, Jundong Li, Haifeng Chen. "Mind the Gap in Cultural Alignment: Task-Aware Culture Management for Large Language Models." **ACL** 2026 Under Review.
3. Minghao Guo, Qingcheng Zeng, **Xujiang Zhao**, Yanchi Liu, Wenchao Yu, Mengnan Du, Haifeng Chen, Wei Cheng. "DeepSieve: Information Sieving via LLM-as-a-Knowledge-Router." **ACL** 2026 Under Review.
4. Wangyang Ying, Yanchi Liu, **Xujiang Zhang**, Wei Cheng, Zhengzhang Chen, Wenchao Yu, Yanjie Fu, Haifeng Chen. "Multi-Agent Procedural Graph Extraction with Structural and Logical Refinement." **ACL** 2026 Under Review.
5. Minhua Lin, Zhengzhang Chen, Yanchi Liu, **Xujiang Zhao**, Zongyu Wu, Junxiang Wang, Xiang Zhang, Suhang Wang, Haifeng Chen. "Decoding Time Series with LLMs: A Multi-Agent Framework for Cross-Domain Annotation." **ACL** 2026 Under Review.
6. Xuyuan Liu, Zhengzhang Chen, Xinshuai Dong, Yanchi Liu, **Xujiang Zhao**, Shengyu Chen, Haoyu Wang, Yujun Yan, Haifeng Chen. "Representation Interventions Enable Lifelong Unstructured Knowledge Control." **ACL** 2026 Under Review.

Teaching Experience

- CS7301 ■ *Guest Lecturer* at UT-Dallas: Recent Advances in Computing, 2020 Spring
-Designing lectures on topics in uncertainty-aware machine learning, grading students' written papers, leading discussions, and answering questions.
- CS6364 ■ *Guest Lecturer* at UT-Dallas: Artificial Intelligence, 2020 Fall, 2021 Fall
-Designing lectures on topics in unsupervised learning, deep learning, and reinforcement learning. Preparing all the homework related to the topic of deep learning, designing final exams, guiding students on final projects, and delivering discussion sections.

Mentoring Experience

Thesis Committee

- Chen Ling ■ Ph.D. from *Emory University*, 2024
■ EMNLP 2023, NAACL 2024, ICLR-W 2024, Frontiers in Big Data 2024, ACM Computing Surveys 2025

Interns

- Linlin Yu ■ Ph.D. from *The University of Texas at Dallas*, 2025 Summer
■ NeurIPS 2025, ACL 2026(Submitted)
- Dong Li ■ Ph.D. student from *Baylor University*, 2025 Spring
■ NeurIPS 2025, ACL 2025
- Qiwei Zhao ■ Ph.D. student from *University of North Carolina at Chapel Hill*, 2024 Summer
■ ACL 2025, TMLR (Submitted)
- Ruomeng Ding ■ Master student from *Georgia Institute of Technology*, 2023 Summer
■ AAAI-W 2023, SDM 2025

Invited Talks

- Sep 2025 ■ Uncertainty Quantification and Reasoning for Large Language Models, **Seminar Talk** at Brigham Young University.
- May 2025 ■ Uncertainty Quantification and Reasoning for Large Language Models, **Keynote** at SDM 2025 ARRML Workshop.
- Dec 2024 ■ Uncertainty Quantification in LLMs, **Keynote** at IEEE BigData 2024 RobustMLDS Workshop.
- Dec 2020 ■ Uncertainty Aware Semi-Supervised Learning on Graph Data, **Spotlight Presentation** at NeurIPS 2020.
- Nov 2018 ■ Deep Learning-based Scalable Inference of Uncertain Opinions, **Keynote** at Institute of Information Engineering, Chinese Academy of Sciences (CAS).

Professional Activities

Program Chair

- 2025 ■ 4th KDD Workshop on Uncertainty Reasoning and Quantification in Decision Making.
- 2024 ■ 3rd KDD Workshop on Uncertainty Reasoning and Quantification in Decision Making.
- 2023 ■ 2nd KDD Workshop on Uncertainty Reasoning and Quantification in Decision Making.
■ 1st AAAI Workshop on Uncertainty Reasoning and Quantification in Decision Making.

Professional Activities (continued)

Journal Reviewer

- IEEE Transactions on Knowledge and Data Engineering
- IEEE Transactions on Services Computing
- ACM Transactions on Knowledge Discovery from Data
- Frontiers in Big Data
- Neurocomputing

Program Committee Member / Reviewer

- 2022-2026 ■ International Conference on Learning Representations (ICLR)
- 2022-2025 ■ International Conference on Machine Learning (ICML)
- 2021-2025 ■ Conference on Neural Information Processing Systems (NeurIPS)
- 2022-2025 ■ AAAI Conference on Artificial Intelligence (AAAI)
- 2020-2025 ■ ACM SIGKDD Conference on Knowledge Discovery and Data Mining (KDD)
- 2022-2025 ■ Association for Computational Linguistics (ACL) Rolling Review (ARR)
- 2022 ■ SIAM International Conference on Data Mining (SDM)
- 2022-2023 ■ IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP)
- 2022 ■ ACM International Conference on Web Search and Data Mining (WSDM)

HONORS & Awards

- 2025 ■ The Excellent Invention Award at NEC Corporation.
- 2024 ■ Our ACM Computing Surveys paper on Domain Specialization of LLMs is honorably mentioned by The 2024 Economic Report of the President from the White House.
- 2020 ■ NeurIPS Spotlight Presentation (Top 4%).
- 2018 ■ ICDM 2018 Student Travel Award.
- 2014 ■ Outstanding Graduate Award of Chongqing University.
■ First-class College Scholarship at Chongqing University.
- 2013 ■ National Scholarship.
- 2012 ■ First Prize in The National Drawing Skills and Advanced Technology.

Grants

- Consultant ■ **Amazon Research Awards.** *"Dual-Space Search for Training-Free Agentic Workflow Generation with Runtime Feedback".* Under Review.