Rui Qiao

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CURRENT POSITION

Singapore-MIT Alliance for Research and Technology   Singapore
Postdoctoral Associate; Advisors: Bryan Kian Hsiang Low (NUS), Daniela Rus (MIT)   *Apr 2025 - Present*
- **Research Topic**: Data-efficient Post-training and Test-time Scaling for LLMs.

EDUCATION

National University of Singapore   Singapore
Ph.D. in Computer Science; Advisor: Bryan Kian Hsiang Low   *Jan 2021 - July 2025*
- **Thesis Topic**: Towards Reliable AI under Distribution Shifts: A Data-centric Perspective.
- **GPA**: 5.0/5.0

University of Washington   Seattle, U.S.A.
Visiting Scholar in Dept. of CSE; Advisor: Pang Wei Koh   *Sep 2024 - Dec 2024*
- **Research Topic**: Improving LLM Reasoning with Retrieval Augmented Generation (RAG).

Singapore University of Technology and Design   Singapore
B.Eng (Summa Cum Laude) in Information Systems Technology and Design (ISTD)   *May 2015 – Aug 2018*
- **Focus Tracks**: Artificial Intelligence, Business Analytics
- **GPA**: 4.88/5.0 (Rank: 2)

University of Waterloo   Waterloo, Canada
Exchange Program in David R. Cheriton School of Computer Science   *Sep 2017 – Dec 2017*

EXPERIENCE

Singapore University of Technology and Design   Singapore
Research Assistant; Advisor: Wei Lu   *Oct 2018 - Jan 2021*
- **Research Topic**: Causality and Natural Language Processing.

SUTD-MIT International Design Center   Singapore
Student Research Assistant; Advisor: Jiajia Chen   *May 2016 - Apr 2017*
- **Research Topic**: Genetic Algorithms for FIR Filter Design.

A*STAR, Institute for Infocomm Research   Singapore
Research Intern; Advisor: Tie (Thomas) Luo   *May 2016 - Aug 2016*
- **Research Topic**: Machine Learning for Internet-of-things (IoT) Trust Evaluation.

HONORS

AI Singapore PhD Fellowship	*Jan 2022 - Jan 2025*
NUS Research Scholarship	*Jan 2021 - Dec 2021*
NUS Research Achievement Award	*2023, 2024*
Keppel Award of Excellence (Top 2 Students in the ISTD Pillar at SUTD)	*2018*
SUTD Honours List (Top 10% Students in the ISTD Pillar)	*2016, 2017, 2018*
SM2 Full Scholarship for Undergraduate Study at SUTD	*2014-2018*

PUBLICATIONS (*: EQUAL CONTRIBUTION)

1. Rulin Shao*, **Rui Qiao***, Varsha Kishore, Niklas Muennighoff, Xi Victoria Lin, Daniela Rus, Bryan Kian Hsiang Low, Sewon Min, Wen-tau Yih, Pang Wei Koh, Luke Zettlemoyer. ReasonIR: Training Retrievers for Reasoning Tasks. In *arXiv preprint: arXiv:2504.20595*, 2025.

2. Jingtan Wang, Xiaoqiang Lin, **Rui Qiao**, Pang Wei Koh, Chuan-Sheng Foo, Bryan Kian Hsiang Low. NICE: Non-Differentiable Evaluation Metric-Based Data Selection for Instruction Tuning. In *ICLR 2025 Workshop on Navigating and Addressing Data Problems for Foundation Models*, 2025.

3. **Rui Qiao**, Zhaoxuan Wu, Jingtan Wang, Pang Wei Koh, Bryan Kian Hsiang Low. Group-robust Sample Reweighting for Subpopulation Shifts via Influence Functions. In *Proceedings of the 13th International Conference on Learning Representations (ICLR)*, 2025.

4. Xinyi Xu, Zhaoxuan Wu, **Rui Qiao**, Arun Verma, Yao Shu, Jingtan Wang, Xinyuan Niu, Zhenfeng He, Jiangwei Chen, Zijian Zhou, Gregory Kang Ruey Lau, Hieu Dao, Lucas Agussurja, Rachael Hwee Ling Sim, Xiaoqiang Lin, Wenyang Hu, Zhongxiang Dai, Pang Wei Koh, Bryan Kian Hsiang Low. Data-Centric AI in the Age of Large Language Models. In *Findings of the Association for Computational Linguistics: EMNLP 2024*, 2024.

5. Jingtan Wang*, Xiaoqiang Lin*, **Rui Qiao***, Chuan-Sheng Foo, Bryan Kian Hsiang Low. Helpful or Harmful Data? Fine-tuning-free Shapley Attribution for Explaining Language Model Predictions. In *Proceedings of the 41st International Conference on Machine Learning (ICML)*, 2024.

6. Yingnan Liu, Yingtian Zou, **Rui Qiao**, Fusheng Liu, Mong Li Lee, Wynne Hsu. Cross-Domain Feature Augmentation for Domain Generalization. In *Proceedings of the 33rd International Joint Conference on Artificial Intelligence (IJCAI)*, 2024.

7. **Rui Qiao**, Bryan Kian Hsiang Low. Understanding Domain Generalization: A Noise Robustness Perspective. In *Proceedings of the 12th International Conference on Learning Representations (ICLR)*, 2024.

8. **Rui Qiao**, Xinyi Xu, Bryan Kian Hsiang Low. Collaborative Causal Inference with Fair Incentives. In *Proceedings of the 40th International Conference on Machine Learning (ICML)*, 2023.

9. Guoshun Nan*, **Rui Qiao***, Yao Xiao, Sicong Leng, Jun Liu, Hao Zhang, Wei Lu. Interventional Video Grounding with Dual Contrastive Learning. In *IEEE/CVF Computer Vision and Pattern Recognition Conference (CVPR)*, 2021.

10. Guoshun Nan*, Jiaqi Zeng*, **Rui Qiao***, Wei Lu. Uncovering Main Causalities for Long-tailed Information Extraction. In *Proceedings of the 2021 Conference on Empirical Methods in Natural Language Processing (EMNLP)*, pages 9683–9695, November 7–11, 2021.

11. Jiajia Chen, Chip-Hong Chang, Jiatao Ding, **Rui Qiao**, and Mathias Faust. Tap Delay-and-Accumulate Cost Aware Coefficient Synthesis Algorithm for the Design of Area-Power Efficient FIR Filters. In *IEEE Trans. Circuits Syst. I Reg. Papers*, vol. 65, no. 2, pp. 712-722, Feb. 2018.

ACADEMIC SERVICE

Conference Reviewer

International Conference on Learning Representations (ICLR)	*2024, 2025*
AAAI Conference on Artificial Intelligence (AAAI)	*2024*
Conference on Neural Information Processing Systems (NeurIPS)	*2024, 2025*
International Conference on Machine Learning (ICML)	*2024, 2025*
Transactions on Machine Learning Research (TMLR)	*2025*
International Conference on Artificial Intelligence and Statistics (AISTATS)	*2023*

Teaching

- Graduate TA in Machine Learning (CS3244), 2023 Fall.