

# Ziyu WANG

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## RESEARCH INTEREST

I work on machine learning, with a focus on methods that allow learning systems to reason with uncertainty and adapt to new environments efficiently. This involves designing probabilistic methods tailored to specific applications, such as those related to domain adaptation or causal inference. It also includes research that aims to better understand general-purpose generative models so that they can be used safely and robustly.

I'm also broadly interested in Bayesian statistics, as well as topics such as representation learning, kernel methods, and the computational challenges in generative modelling and inference.

## EDUCATION AND TRAINING

Sep 2023 | Postdoctoral Researcher, Department of Statistics, **University of Oxford**  
- Current | Advisor: [Prof. Chris Holmes](#)

Aug 2018 | Ph.D. in Computer Science and Technology, **Tsinghua University**  
- June 2023 | Advisor: [Prof. Jun Zhu](#) and [Prof. Bo Zhang](#)

Aug 2014 | B.Eng. in Computer Science and Technology, **Tsinghua University**  
- July 2018 | GPA: 93/100 (rank 3/152). Minor: Statistics

## EXPERIENCES

June 2020 | **AWS Shanghai AI Lab**, Applied Scientist Intern  
- Oct 2020 | Worked with [Dr. David Wipf](#) on the use of generative models for unsupervised domain alignment (publication [5]) and uncertainty for graph neural network models.

Sep 2019 | **Microsoft Research Asia**, Research Intern  
- Dec 2019 | Worked with [Dr. David Wipf](#) on variational and Bayes-inspired learning objectives for auto-encoders and the use of deep generative models in outlier detection; see publications [6], [7].

Feb 2018 | **Ant Financial**, R&D Intern  
- Sep 2018 | Worked on topic modeling for a real-world downstream task. Proposed a spectral regularizer for neural topic models which significantly improved downstream task performance as well as interpretability.

## PUBLICATIONS

### Conference Papers

- [1] Fabian Falck\*, [Ziyu Wang\\*](#), Chris Holmes. Is In-Context Learning in Large Language Models Bayesian? A Martingale Perspective. To appear in *International Conference on Machine Learning (ICML)*, 2024.
- [2] [Ziyu Wang\\*](#), Binjie Yuan\*, Jiaxun Lu, Bowen Ding, Yunfeng Shao, Qibin Wu, Jun Zhu. A Constrained Bayesian Approach for Out-of-Distribution Prediction. In *Conference on Uncertainty in Artificial Intelligence (UAI)*, 2023.
- [3] [Ziyu Wang](#), Yuhao Zhou, Jun Zhu. Fast Instrument Learning with Faster Rates. In *Conference on Neural Information Processing Systems (NeurIPS)*, 2022.
- [4] [Ziyu Wang\\*](#), Yuhao Zhou\*, Tongzheng Ren, Jun Zhu. Scalable Quasi-Bayesian Inference for Instrumental Variable Regression. In *Conference on Neural Information Processing Systems (NeurIPS)*, 2021.
- [5] Qipeng Guo, Zhijing Jin, [Ziyu Wang](#), Xipeng Qiu, Weinan Zhang, Jun Zhu, Zheng Zhang, David Wipf. Fork or Fail: Cycle-Consistent Training with Many-to-One Mappings. In *International Conference on Artificial Intelligence and Statistics (AISTATS)*, 2021.
- [6] [Ziyu Wang](#), Bin Dai, David Wipf, Jun Zhu. Further Analysis of Outlier Detection with Deep Generative Models. In *Conference on Neural Information Processing Systems (NeurIPS)*, 2020.
- [7] Bin Dai, [Ziyu Wang](#), David Wipf. The Usual Suspects? Reassessing Blame for VAE Posterior Collapse. In *International Conference on Machine Learning (ICML)*, 2020.
- [8] [Ziyu Wang](#), Shuyu Cheng, Yueru Li, Jun Zhu, Bo Zhang. A Wasserstein Minimum Velocity Approach to Learning Unnormalized Models. In *International Conference on Artificial Intelligence and Statistics (AISTATS)*, 2020.

- [9] Ziyu Wang, Tongzheng Ren, Jun Zhu, Bo Zhang. Function Space Particle Optimization for Bayesian Neural Networks. In *International Conference on Learning Representations (ICLR)*, 2019.

### Preprints and Workshop Abstracts

- [10] Ziyu Wang, Chris Holmes. On Subjective Uncertainty Quantification and Calibration in Natural Language Generation. *arXiv preprint arXiv:2406.05213*.
- [11] Ziyu Wang, Chris Holmes. On Uncertainty Quantification with Near-Bayes Optimal Algorithms. Extended abstract to appear in *Symposium on Advances in Approximate Bayesian Inference (AABI)*, 2024.
- [12] Ziyu Wang, Yucen Luo, Yueru Li, Jun Zhu, Bernhard Schölkopf. Spectral Representation Learning for Conditional Moment Models. *arXiv preprint arXiv:2210.16525*.
- [13] Ziyu Wang, Yuhao Zhou, Ruqi Zhang, Jun Zhu. On Equivalences between Weight and Function-Space Langevin Dynamics. In *NeurIPS Workshop on Understanding Deep Learning Through Empirical Falsification (ICBINB @ NeurIPS)*, 2022.

### AWARDS AND HONORS

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- 2019 Travel Award, ICLR 2019
- 2016 Department Scholarship for Academic Excellence
- 2015 9miao Scholarship for Academic Excellence
- 2014 Outstanding Freshman Award
- 2014 2nd Place, the 2014 ACM-ICPC Asia Guangzhou Regional Contest
- 2013 Gold Medal, National Olympiad in Informatics

### PROFESSIONAL SERVICES

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#### Reviewer / PC Member

- NeurIPS (2019-), ICLR (2020-), ICML (2020-), AAAI (2022-), JMLR (2022-), TMLR (2022-)
- Various workshops at NeurIPS and ICML.

### SKILLS

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- Python (NumPy, JAX, Tensorflow),  $\LaTeX$ , R, C/C++, Java, Haskell, OCaml, HTML/CSS
- Language: English, Chinese