

# Ziping Xu

Postdoctoral Research Fellow  
Department of Statistics, Harvard University

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Harvard University  
☎ (734)-276-8463  
✉ [zipingxu@fas.harvard.edu](mailto:zipingxu@fas.harvard.edu)  
📄 <https://zipingxu.github.io>

## Current Position

2023–Now **Postdoctoral Research Fellow, Harvard University**, Cambridge, MA.

Statistical Reinforcement Learning Lab

Mentor: Prof. Susan A. Murphy

**Projects:** 1) design and implement Reinforcement Learning (RL) intervention package for mobile health clinical trials; 2) RL theory in multitask and non-stationary settings.

## Education

2018–2023 **Ph.D. in Statistics, University of Michigan**, Ann Arbor, MI.

Advisor: Prof. Ambuj Tewari

Thesis: On the Benefits of Multitask Learning: A Perspective Based on Task Diversity

2014–2018 **B.S. in Data Science, Peking University**, Beijing, China.

Advisor: Prof. Song Xi Chen

Thesis: Meteorological Change and Impacts on Air Pollution: Results from North China

## Research Interest

My primary research interests lie in sequential decision-making in health applications, with a focus on mobile health through digital interventions. I work on **theories and methodologies** in sequential decision-making algorithms, such as Reinforcement Learning (RL), to improve their understanding and applicability in health problems. I am also actively involved in implementing RL in **real mobile health products and clinical trials**.

## Publications and Preprints

(\* denotes equal contribution)

- 2024 **Ziping Xu**, Iris Yan, and Susan Murphy. An adaptation of RLSVI with explicit action sampling probabilities. In *RLC 2024 Deployable RL Workshop*, 2024.
- 2024 **Ziping Xu**, Zifan Xu, Runxuan Jiang, Peter Stone, and Ambuj Tewari. Sample efficient myopic exploration through multitask Reinforcement Learning with diverse tasks. In *Proceedings of the International Conference on Learning Representations (ICLR)*, 2024.
- 2024 **Ziping Xu**, Kelly Zhang, and Susan Murphy. The fallacy of minimizing local regret in the sequential task setting. *arXiv*, 2024.
- 2024 Kevin Tan\* and **Ziping Xu**\*. A natural extension to online algorithms for hybrid RL with limited coverage. *Reinforcement Learning Journal*, volume 1, 2024.
- 2024 Yongyi Guo\*, **Ziping Xu**\*, and Susan Murphy. Online learning in bandits with predicted context. In *Proceedings of the 27th International Conference on Artificial Intelligence and Statistics (AISTATS)*, 2024.

- 2024 Quanfu Fan, Yilai Li, Yuguang Yao, John Cohn, Sijia Liu, **Ziping Xu**, Seychelle Vos, and Michael Cianfrocco. CryoRL: Reinforcement Learning enables efficient cryo-EM data collection. In *Proceedings of the IEEE/CVF Winter Conference on Applications of Computer Vision (WACV)*, pages 7892–7902, 2024.
- 2023 **Ziping Xu**, Quanfu Fan, Yilai Li, Emma Rose Lee, John Maxwell Cohn, Ambuj Tewari, Seychelle M Vos, and Michael Cianfrocco. Coupling semi-supervised learning with reinforcement learning for better decision making—an application to cryo-EM data collection. In *NeurIPS 2023 AI for Science Workshop*, 2023.
- 2022 **Ziping Xu** and Ambuj Tewari. On the statistical benefits of curriculum learning. In *Proceedings of the 39th International Conference on Machine Learning (ICML)*. PMLR, 2022.
- 2022 **Ziping Xu**, Eunjae Shim, Ambuj Tewari, and Paul Zimmerman. Adaptive sampling for discovery. In *Advances in Neural Information Processing Systems (NeurIPS)*, volume 35, 2022.
- 2022 Hao Sun, **Ziping Xu**, Taiyi Wang, Meng Fang, and Bolei Zhou. Supervised q-learning for continuous control. In *Deep Reinforcement Learning Workshop NeurIPS 2022*, 2022.
- 2022 Hao Sun, **Ziping Xu**, Zhenghao Peng, Meng Fang, Bo Dai, and Bolei Zhou. Mopa: a minimalist off-policy approach to safe-RL. In *Deep Reinforcement Learning Workshop NeurIPS 2022*, 2022.
- 2022 Eunjae Shim, Joshua A Kammeraad, **Ziping Xu**, Ambuj Tewari, Tim Cernak, and Paul M Zimmerman. Predicting reaction conditions from limited data through active transfer learning. *Chemical Science*. Royal Society of Chemistry, 2022.
- 2022 Aditya Modi, **Ziping Xu**, Mohamad KS Faradonbeh, and Ambuj Tewari. Big control actions help multitask learning of unstable linear systems. In *ICML 2022 Complex feedback in online learning Workshop*, 2022.
- 2022 Yilai Li, Quanfu Fan, **Ziping Xu**, Emma Rose Lee, John Cohn, Veronique Demers, Ja Young Lee, Lucy Yip, Michael A. Cianfrocco, and Seychelle M. Vos. Optimized path planning surpasses human efficiency in cryo-EM imaging. *eLife*. Cold Spring Harbor Laboratory, 2022.
- 2021 **Ziping Xu** and Ambuj Tewari. Representation learning beyond linear prediction functions. In *Advances in Neural Information Processing Systems (NeurIPS)*, volume 34, 2021.
- 2021 **Ziping Xu**, Amirhossein Meisami, and Ambuj Tewari. Decision making problems with funnel structure: A multi-task learning approach with application to email marketing campaigns. In *In Proceedings of the 25th International Conference on Artificial Intelligence and Statistics (AISTATS)*, pages 127–135. PMLR, 2021.
- 2021 Yangyi Lu\*, **Ziping Xu\***, and Ambuj Tewari. Bandit algorithms for precision medicine. *arXiv preprint arXiv:2108.04782*, 2021.
- 2020 **Ziping Xu** and Ambuj Tewari. Reinforcement learning in factored MDPs: Oracle-efficient algorithms and tighter regret bounds for the non-episodic setting. In *Advances in Neural Information Processing Systems (NeurIPS)*, volume 33, 2020.
- 2020 **Ziping Xu**, Song Xi Chen, and Xiaoqing Wu. Meteorological change and impacts on air pollution: Results from north China. *Journal of Geophysical Research: Atmospheres*, volume 125, page e2020JD032423. Wiley Online Library, 2020.
- 2020 Tarun Gogineni, **Ziping Xu**, Exequiel Punzalan, Runxuan Jiang, Joshua Kammeraad, Ambuj Tewari, and Paul Zimmerman. Torsionnet: A Reinforcement Learning approach to sequential conformer search. In *Advances in Neural Information Processing Systems (NeurIPS)*, 2020.
- 2019 **Ziping Xu** and Ambuj Tewari. Worst-case regret bound for perturbation based exploration. In *Advances in Neural Information Processing Systems (NeurIPS)*, 2019.
- 2018 Wenling Liu, **Ziping Xu**, and Tianan Yang. Health effects of air pollution in china. *International journal of environmental research and public health*, volume 15, page 1471. MDPI, 2018.

- 2017 Shuyi Zhang, Bin Guo, Anlan Dong, Jing He, **Ziping Xu**, and Song Xi Chen. Cautionary tales on air-quality improvement in Beijing. *Proceedings of the Royal Society A: Mathematical, Physical and Engineering Sciences*, volume 473, page 20170457. The Royal Society Publishing, 2017.

## Fellowships & Awards

- 2023 **Departmental Outstanding Dissertation Award** (Awarded for outstanding dissertation writing)  
2022 **Rackham Predoctoral Fellowship** (Awarded to outstanding doctoral students)  
2020 **Outstanding Graduate Student Instructor Awards** (Awarded to outstanding instructors)  
2016 **Lee Wai Wing Scholarship** (Awarded to outstanding first year students)

## Teaching Experiences

Teaching Fellow

- Winter 2024 **STATS 234, Sequential Decision Making** Harvard University  
Graduate Student Instructor  
Winter 2020 **STATS 503, Statistical Learning II** University of Michigan  
Fall 2019 **STATS 415, Introduction to Data Mining** University of Michigan  
Winter 2019 **STATS 250, Introduction to Statistics and Data Analysis** University of Michigan  
Fall 2018 **STATS 425, Introduction to Probability** University of Michigan

## Mentoring Experience

2024-Now **Lutong Zou**

Topic: Reward Design through Causal DAG

2023-2024 **Iris Yan**

Topic: Approximate Sampling Probability for Online Decision Making

2022 **Zhiyu Yuan** (Next Step: CMU, MS in Computer Engineer)

Topic: Curriculum Learning for Reinforcement Learning

2022 **Ruanxuan Jiang** (Next Step: Software Engineer Citadel)

Topic: Theory of Multitask Reinforcement Learning

2020–2021 **Anh Tuan (Alan) Tran** (Next Step: University of Toronto, MS in Computer Science)

Topic: Sample Efficient Reinforcement Learning

## Professional Experience

- 2023 – now Postdoctoral Research Fellow at **Department of Statistics, Harvard University**  
Advisor: Dr. Susan A. Murphy, Professor, Department of Statistics and Computer Science  
Summer 2022 Research Intern at **MIT-IBM Watson AI Lab**  
Advisor: Dr. Quanfu Fan  
Summer 2020 Research Intern at **Adobe Inc.**  
Advisor: Dr. Amirhossein Meisami

## Professional Activities

Organizing Committee

2021 Representative Michigan Student Symposium for Interdisciplinary Statistical Sciences

Journal Paper Reviewer

2023 Statistical Science

- 2023 Proceedings of the National Academy of Sciences of the United States of America (PNAS)
- 2022 Journal of the American Statistical Association (JASA)

Conference Paper Reviewer

- 2020 International Conference on Autonomous Agents and Multiagent Systems (AAMAS)
- 2021, 2022 International Conference on Artificial Intelligence and Statistics (AISTATS)
- 2021 International Conference on Algorithmic Learning Theory (ALT)
- 2023 International Conference on Learning Representations (ICLR)
- 2022-2024 International Conference on Machine Learning (ICML)
- 2021-2024 Conference on Neural Information Processing Systems (NeurIPS)