

Xu, Jianyu

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xu-jy.github.io/

Machine Learning Dept,
Carnegie Mellon University
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ACADEMIC APPOINTMENTS

- 2024.9-current **Postdoctoral Research Associate** in Machine Learning (MLD), Carnegie Mellon University
Advisor: Prof. Aarti Singh and Prof. Bryan Wilder
- 2024.7-2024.9 **Visiting Scholar** in Operations Management (ISOM), HKUST Business School, Hong Kong
Host: Prof. Xuan Wang

EDUCATION

- 2019.9-2024.8 **Ph.D. in Computer Science, University of California Santa Barbara**
Advisor: Prof. Yu-Xiang Wang
Thesis title: Dynamic pricing as an online decision-making problem
Committee: Profs. Erik Eyster, Daniel Lokshtanov, Ambuj Singh, Yu-Xiang Wang
- 2015.8-2019.7 **B.S. in Measurement and Control, Tsinghua University, China**
Advisor: Prof. Guoqi Li
With honor of *Excellent Undergraduate Student*

RESEARCH INTERESTS

I am broadly interested in **online learning** and decision-making under uncertainty:

Theoretic foundations:

- Generative online learning with provable guarantees.
- Online optimization with non-convex structures.
- Dynamic pricing algorithms for complex markets.

Applications:

- AI-driven decision support for high-stakes healthcare applications.
- AI-assisted mathematical reasoning and automated theorem proving.

SELECTED PUBLICATIONS [[Google Scholar](#)]

(* for equal contributions.)

Preprints & Working Papers:

- Xu, Jianyu, Vidhi Jain, Bryan Wilder, Aarti Singh, " Online Decision Making with Generative Action Sets." *arxiv preprint*, arXiv 2509.25777. (Preliminary version in *NeurIPS 2025 MLxOR Workshop*).
- Xu, Jianyu, Xuan Wang, Yu-Xiang Wang, Jiashuo Jiang, " Joint Pricing and Resource Allocation: An Optimal Online-Learning Approach." *arxiv preprint*, arXiv 2501.18049. (Preliminary version in *NeurIPS 2025 MLxOR Workshop*)
- Xu, Jianyu, Hanwen Zhang, Liang Ling, Lei Deng, Yuan Xie, and Guoqi Li. "NP-hardness of tensor network contraction ordering." *arxiv preprint*, arXiv 2310.06140.

Conference Papers:

- Xu, Jianyu, Yining Wang, Xi Chen, and Yu-Xiang Wang, " Dynamic Pricing with Adversarially-Censored Demands." in *WINE* 2025. (*Full version forwarding to OR*)
- Xu, Jianyu, and Yu-Xiang Wang. " Pricing with contextual elasticity and heteroscedastic valuation." in *ICML* 2024 (*Spotlight Presentation, Top 3%*).
- Xu, Jianyu, Dan Qiao, and Yu-Xiang Wang, "Doubly Fair Dynamic Pricing." in *AISTATS* 2023.
- Xu, Jianyu, and Yu-Xiang Wang, "Towards Agnostic Feature-based Dynamic Pricing: Linear Policies vs Linear Valuation with Unknown Noise." in *AISTATS* 2022. (*Plenary Oral Presentation, Top 3%*).
- Xu, Jianyu, and Yu-Xiang Wang, "Logarithmic Regret in Feature-based Dynamic Pricing." in *NeurIPS* 2021. (*Spotlight Presentation, Top 3%*).
- Chen, Wenhui, Ming Yin, Max Ku, Pan Lu, Yixin Wan, Xueguang Ma, **Jianyu Xu**, Xinyi Wang, and Tony Xia. "TheoremQA: A Theorem-driven Question Answering Dataset." in *EMNLP* 2023.

Journal Papers:

- Dheeraj Baby*, **Jianyu Xu***, and Yu-Xiang Wang, "Non-stationary Contextual Pricing with Safety Constraints." in *Transactions on Machine Learning Research*, 2023.
- Liang, Ling, **Jianyu Xu**, Lei Deng, Mingyu Yan, Xing Hu, Zheng Zhang, Guoqi Li, and Yuan Xie. "Fast Search of the Optimal Contraction Sequence in Tensor Networks." *IEEE Journal of Selected Topics in Signal Processing* 15, no. 3 (2021): 574-586. (*Cover Paper*)
- Xu, Jianyu, Ling Liang, Lei Deng, Changyun Wen, Yuan Xie, and Guoqi Li. "Towards a polynomial algorithm for optimal contraction sequence of tensor networks from trees." *Physical Review E* 100, no. 4 (2019): 043309.
- Xu, Jianyu, Guoqi Li, Changyun Wen, Kun Wu, and Lei Deng. "Towards a unified framework of matrix derivatives." *IEEE Access* 6 (2018): 47922-47934.

AWARDS AND HONORS

2022 & 23 & 25	NeurIPS Top Reviewer Awards (Top 8%)
2018	Nomination for <i>Special Scholarship</i> of Tsinghua University
2016 & 17 & 18	Comprehensive Scholarship, Tsinghua University
2013 & 14	Silver Medals, 29 th & 30 th Chinese Mathematical Olympiad (CMO)
2014	Provincial Champion (1 st /20,000+), Chinese Mathematical Contest (CMC)

PRESENTATIONS

Conference and Simposium:

- *Contextual Bandits with Online Arm Generation*, Midwest ML Symposium 2025, Chicago
- *Pricing with Adversarial Inventories*, INFORMS 2024, Seattle
- *Online Dynamic Pricing with Inventory-Censored Demands*, ITA 2024, San Diego
- *Dynamic Pricing with Procedural and Substantive Fairness*, INFORMS 2023, Phoenix
- *Linear Contextual Dynamic Pricing*, INFORMS 2022, Indianapolis
- *Towards Agnostic Feature-based Dynamic Pricing: Linear Policies vs Linear Valuation with Unknown*

Noise, plenary oral presentation on AISTATS 2022, Virtual

- *Logarithmic Regret in Feature-Based Dynamic Pricing*, spotlight presentation on NeurIPS 2021, Virtual

Seminars:

- *Decisions and ML in Maternal Health*. In
 - NSF AI Institute for Societal Decision Making (AI-SDM), Mar 2025
 - CMU MLD reading group, Feb 2025.
- *Dynamic Pricing and Decision-Making*. In
 - Center of Statistics Sciences, Academy of Mathematics, Jan 2024
 - LAMDA Lab, Nanjing University, Mar 2023
 - Ant Finance Group, Jul 2021

Tutorials:

- *Maternal Health Chatbot*. Jul 2025
- *LLM for In-Context Exploration & Exploitation*. Feb 2025
- *Introduction to Zeroth-order Optimization*. Feb 2024.
- *Benign Overfitting*. Feb 2023.
- *Introduction to Minimax Risk Theory*. Mar 2022.
- *Dynamic Pricing in Different Valuation Models*. Mar 2021.
- *Dynamic Pricing in High-Dimensions*. Nov 2020.

INTERNSHIP

2022.6-2022.9	Applied Scientist Intern at Amazon Pricing Sciences & Research, Seattle Supervisor: Dr. Pau Pereira Developed multi-armed bandit algorithms for Amazon Retail pricing systems to escalate long-term free cash flow. Built up real-world demand simulator and train it on million-scale (daily sales records) data.
2021.7-2021.10	Research Intern at AntGroup Strategic Pricing & Promotion, Beijing & Hangzhou Supervisor: Lihong Gu Develop algorithms to attract new/sleeping/lost customers with personalized-value coupons.

TEACHING ASSISTANTSHIP

2024 Spring	CS 40, <i>Foundations of Computer Science</i> , Dept. CS, UCSB
2020 Spring	CS 165A, <i>Artificial Intelligence</i> , Dept. CS, UCSB
2020 Winter	CS 165A, <i>Artificial Intelligence</i> , Dept. CS, UCSB
2019 Fall	CS 8, <i>Introduction to Computer Science</i> , Dept. CS, UCSB

STUDENT MENTORSHIP

2025-current	Smriti Jha, Master student in ECE at CMU
2024-current	Vidhi Jain, Master student in Machine Learning at CMU
2023-2024	Jiayue Chen, Undergraduate student in FinMath at UCSB (now M.S. in CS at UChicago)

ACADEMIC SERVICES

2024-	Area Chair, <i>ICML</i>
2022	Session Chair, <i>NeurIPS</i>
2022-	Journal Reviewer, <i>Management Science</i> , <i>JASA</i> , <i>JMLR</i> , <i>MathOR</i>
2021-	Conference Reviewer, <i>NeurIPS</i> , <i>AISTATS</i> , <i>ICML</i> , <i>ICLR</i>

ACADEMIC REFERENCES

Aarti Singh (Postdoc advisor)

Professor

Machine Learning Department

Carnegie Mellon University

aarti@andrew.cmu.edu

Yu-Xiang Wang (PhD advisor)

Associate Professor

Halıcıoğlu Data Science Institute & CSE

University of California San Diego

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Bryan Wilder (Postdoc advisor)

Assistant Professor

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Xi Chen (Research collaborator)

Professor

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Yining Wang (Research collaborator)

Associate Professor

Operations Management Area

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