Xu, Jianyu

xu_jy15@ucsb.edu
(+1)805-886-7689
xu-jy.github.io/
Department of Computer Science
University of California, Santa Barbara
CA, 93106

EDUCATION

2019.9-current **PhD student** in **Computer Science, University of California at Santa Barbara**
Advisor: Prof. Yu-Xiang Wang
Thesis title: Dynamic pricing as an online decision-making problem
Committee: Erik Eyster, Daniel Lokshtanov, Ambuj Singh

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

Currently I am working on ***Dynamic Pricing*** problems. My interest lies broadly in

- Data-driven decision making, and
- Statistical machine learning with provable guarantees.

In the past few years, I have also been working in the following fields:

- Graph Theory
- Computational Complexity
- Tensor Calculus

PUBLICATIONS [Google Scholar]

(* for equal contributions.)

Working Papers and Preprints:

- **Xu, Jianyu**, Dan Qiao, Yining Wang, Xi Chen, and Yu-Xiang Wang, "Data-driven dynamic pricing with procedural and substantive fairness." (*to be submitted to Operations Research*)
- **Xu, Jianyu**, and Yu-Xiang Wang. "Contextual pricing with heteroscedastic elasticities. " (*in submission*).
- **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:

- Chen, W., Yin, M., Ku, M., Wan, E., Ma, X., **Xu, J.**, Xia, T., Wang, X. and Lu, P., "TheoremQA: A Theorem-driven Question Answering dataset." in *EMNLP 2023*.
- **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%)***

Journal Papers:

- Dheeraj Baby*, **Jianyu Xu***, and Yu-Xiang Wang, "Non-stationary Contextual Pricing with Safety Constraints." Accepted by *Transactions on Machine Learning Research*, 2022.
- 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.

RESEARCH EXPERIENCE

2019.11 – current **Data-Driven Contextual Pricing**

Advised by Prof. Yu-Xiang Wang, Dept. Computer Science, UCSB

- Develop algorithms for online dynamic pricing under different assumptions.
- Prove regret upper & lower bounds for these algorithms.

2017.2 – 2019.8 ***NP*-Hardness of Tensor Network Contraction Ordering**

Advised by Prof. Guoqi Li, Department of Precision Instrument, Tsinghua University
and Prof. Yuan Xie, Scalable Energy-Efficient Architecture Lab, UCSB (2018.7-2018.9)

- Given the existing problem setting to be NP-hard, propose an easier version of the problem setting.
- Prove the easiness: by pointing out a case which is polynomial in the new version, but NP-hard in the old.
- Prove the hardness: even the easier version is also NP-hard.

PRESENTATIONS

Conference talks:

- *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

Tutorials:

- Comparing the hardness of bandits versus pricing. In LAMDA lab, Nanjing University, Mar 2023.
- Benign Overfitting. In S2ML lab, UCSB, Feb 2023.
- Minimax Risk Theory. In UCSB, Mar 2022.
- Dynamic Pricing. In Ant Finance Group, July 2022.
- Dynamic Pricing in Different Valuation Models. In S2ML lab, UCSB, Mar 2021.
- Dynamic Pricing in High-Dimensions. In S2ML lab, UCSB, Nov 2020.

INTERNSHIP

2022.06 – 2022.09 **Applied Scientist Intern at Amazon, Seattle**

*In **Retail Pricing** Science & Research Team,*
Supervised by Dr. Pau Pereira

- Develop multi-armed bandit algorithms for Amazon retail pricing systems to escalate long-term revenue.

- Build up real-world demand simulator and train it on million-scale (daily sales records) data.

2021.07 – 2021.10 **Research Intern at AntGroup, Beijing & Hangzhou**

*In **Strategic Pricing & Promotion** Team,*
Supervised by Dr.Wenpeng Zhang

- Develop algorithms on attracting new/sleeping/lost customers with personalized-value coupons.
- Study "contextual bandits with knapsacks" for budget-constraint coupon pricing.

AWARDS AND HONORS

2022 NeurIPS 2022 Reviewer Award (Top 8%)
2018 Departmental Nomination for *Special Scholarship* of Tsinghua University
2014 Silver Medal, 30th Chinese Mathematical Olympiad (CMO)
2014 First Prize and **Provincial Champion** (1st /20,000+), Chinese High School Mathematical Contest
2013 Silver Medal, 29th Chinese Mathematical Olympiad (CMO)
2013 First Prize, Chinese High School Mathematical Contest

ACADEMIC SERVICES

2022 Session Chair, Oral Presentation 1 & 2, NeurIPS
2022- Journal Reviewer, Management Science
2021- Conference Reviewer, NeurIPS/AISTATS/ICML/ICLR

TEACHING ASSISTANTSHIP

2020 Spring CS 165A, *Artificial Intelligence,* Dept. CS, UCSB
2020 Winter CS 165A, *Artificial Intelligence,* Dept. CS, UCSB
2019 Fall CS 8, *Introduction to Computer Science,* Dept. CS, UCSB

ACADEMIC REFERENCES

Yu-Xiang Wang
Associate Professor
Department of Computer Science
University of California, Santa Barbara
yuxiangw@cs.ucsb.edu

Xi Chen
Professor
Department of Technology, Operations, and Statistics
NYU Stern School of Business
xc13@stern.nyu.edu

Yining Wang
Associate Professor
Operations Management Area
Naveen Jindal School of Management
University of Texas at Dallas
Yining.wang@utdallas.edu