

# Xu, Jianyu

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University of California, Santa Barbara  
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## EDUCATION

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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

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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](#)]

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(\* 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**

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### **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**

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### 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**

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### **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**

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

## **ACADEMIC SERVICES**

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

## **TEACHING ASSISTANTSHIP**

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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

## **ACADEMIC REFERENCES**

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### **Yu-Xiang Wang**

Associate Professor

Department of Computer Science

University of California, Santa Barbara

[yuxiangw@cs.ucsb.edu](mailto:yuxiangw@cs.ucsb.edu)

### **Xi Chen**

Professor

Department of Department of Technology, Operations

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### **Yining Wang**

Associate Professor

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