# Xu, Jianyu

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## EDUCATION

2019.9-current **PhD student** in **Computer Science, University of California at Santa Barbara**
**Advisor**: Prof. Yu-Xiang Wang, and Prof. Zheng Zhang
GPA: **3.94**/4.0

2015.8-2019.7 **B.S.** in **Measurement and Control Technology and Instrument**, **Tsinghua University, China**
**Advisor**: Prof. Guoqi Li
GPA: **3.74**/4.0 Rank: 4/59

## RESEARCH INTERESTS

Currently I am working on *Dynamic Pricing* problems. My interest lies on a broad field of **theoretical and algorithmic** problems, including:

- Statistical Machine Learning, Bandits, Online Learning
- Graph Theory, Computational Complexity, and Combinatorics
- Tensor Network and Calculus

## AWARDS AND HONORS

2019.06 Excellent Undergraduate Student Award, Tsinghua University (ranked Top 5%)

2018.09 Recommendation, by Department of PI, for **Special Scholarship** of Tsinghua University
**Only One** undergraduate student in each department can be recommended

2018.01 Member, 11th Group of *Tsinghua Spark Program*
**Top 50**/3300+ promising undergraduate students in scientific research

2016 & 2017 (Twice) Comprehensive Excellence Award, Tsinghua University (ranked Top 5%)

2013 & 2014 (Twice) **Silver Medal** of 29th and 30th Chinese Mathematical Olympiad (CMO)

2013 & 2014 (Twice) **First Prize** of National Senior High School Mathematical Contest
**Provincial Champion (1st )** out of 20,000+ preliminary and 1500+ qualified participants**.**

## PUBLICATIONS AND WORKING PAPERS

My Google Scholar: https://scholar.google.com/citations?user=3ubVhAMAAAAJ&hl=en&oi=ao

- **Jianyu Xu**, Dan Qiao, and Yu-Xiang Wang, "Doubly Fair Dynamic Pricing." arXiv preprint arXiv: 2209.11837.
- Dheeraj Baby*, **Jianyu Xu***, and Yu-Xiang Wang, "Non-stationary Contextual Pricing with Safety Constraints." under submission. (* for equal contribution)
- **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, <3%)***
- **Xu, Jianyu**, and Yu-Xiang Wang, "Logarithmic Regret in Feature-based Dynamic Pricing." in *NeurIPS 2021*. ***(Spotlight Presentation, <3%)***

- 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**, Hanwen Zhang, Lei Deng, and Guoqi Li. "*NP*-hardness of tensor network contraction ordering." (*working 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.

## INTERNSHIP

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

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

- Conduct research on applying multi-armed bandit algorithms for Amazon retail pricing.
- Develop methods to generate simulated real-world demand-to-price data for algorithm comparisons.

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

*Supervised by Dr.Wenpeng Zhang*

- Help developing algorithms on attracting new/sleeping/lost customers with personalized-value coupons.
- Conduct research on “Contextual Bandits with Knapsacks” for budget-constraint coupon pricing.

## RESEARCH EXPERIENCE

### 2019.11 – current **Decision Making and Dynamic 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.

### 2018.1 – 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.

### 2017.2– 2018.2 **Computation on Matrix Function Derivatives**

*Advised by Prof. Guoqi Li, Department of Precision Instrument, Tsinghua University*

- Conclude 2 main approaches of calculating matrix-to-scalar function derivatives in chain rule.
- Proved their equivalence under certain conditions.

## TEACHING ASSISTANTSHIP

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| 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 |

## PROFESSIONAL SKILLS

Programming languages: Python, MATLAB
Spoken languages: Chinese, English
Engineering software: AutoCAD, Solidworks, LabView, etc.