

Renyuan Xu

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POSITION **University of Oxford** *September 2019 -*
Hooke Research Fellow, Mathematical Institute, Oxford

EDUCATION **University of California, Berkeley** *August 2014 - August 2019*
Ph.D., Industrial Engineering and Operations Research Department
Thesis Title: Stochastic Games: Nash Equilibrium, Pareto Optimality, Price of Anarchy, and Learning
Advisor: Xin Guo
University of Science and Technology of China *August 2010 - June 2014*
B.S. Mathematics
University of Sydney *August 2012 - December 2012*
Exchange Student, Mathematics Department

RESEARCH INTERESTS

- Stochastic Modeling, Control Theory and Stochastic Games
- Reinforcement Learning and Data-driven Decision Making
- Deep Learning Theory
- Mathematical Finance, Market Microstructure and High Frequency Trading

HONORS

- Outstanding Graduate Instructor, UC Berkeley March, 2019
- Finalist, Applied Probability Society Best Paper Competition
INFORMS 2018 November, 2018
- Second Place, Citadel Data Competition, Berkeley September, 2018
- Berkeley IEOR Summer Research Grant 2018
- Berkeley IEOR First Year Fellowship 2014-2015
- National Scholarship in China (2% of the department) 2013-2014
- UCLA Summer School Fellowship 2013
- National Scholarship in China (2% of the department) 2012-2013

RESEARCH

- B. Hambly, R. Xu, and H. Yang. “The Policy Gradient method for the Noisy Linear Quadratic Regulator over a Finite Horizon,” Preprint, 2020.
- A. Ananova, R. Cont, and R. Xu, “Excursion Risk,” Submitted, 2020.
- R. Cont, A. Kotlicki, and R. Xu. “COVID-19 Contagion in England: Heterogeneous Dynamics and Targeted Mitigation Policies,” Revision, *Royal Society Open Science*, 2020.
- R. Cont, X. Guo, R. Xu. “Pareto Optima for a Class of Singular Control Games,” Submitted, 2020.

- H. Gu, X. Guo, X. Wei, and R. Xu “Dynamic Programming Principles for Learning Mean-Field Controls”, Submitted, 2020.
- H. Gu, X. Guo, X. Wei, and R. Xu “Q-Learning Algorithm for Mean-Field Controls, with Convergence and Complexity Analysis”, Submitted, 2020.
 - Short version accepted by ICML 2020 Workshop on Theory of Reinforcement Learning.
- X. Guo, R. Xu, T. Zariphopoulou “Entropy Regularization for Mean Field Games with Learning”, Submitted, 2020.
- X. Guo, R. Xu. “Stochastic Games for Fuel Followers Problem: N vs MFG,” *SIAM Journal of Control and Optimization*, 2019.
- X. Guo, A. Hu, R. Xu and J. Zhang. “Learning Mean Field Games,” *NeurIPS*, 2019.
- Z. Zhou, R. Xu and J. Blanchet. “Learning in Generalized Linear Contextual Bandits with Stochastic Delays,” *NeurIPS*, 2019.
- X. Guo, W. Tang, and R. Xu. “A Class of Stochastic Games and Moving Free Boundary Problems,” Revision, *SIAM Journal of Control and Optimization*, 2019.
- X. Guo, A. Hu, R. Xu and J. Zhang. “Consistency and Computation of Regularized MLEs for Multivariate Hawkes Processes,” Working Paper, 2019.
 - Short version accepted by NeurIPS 2018 Workshop on Causality.
- X. Guo, CA Lehalle, and R. Xu. “Transaction Cost Data Analytics for Corporate Bonds,” Revision, *Quantitative Finance*, 2020.

INDUSTRY	<i>Quantitative Researcher Intern</i>	June 2017 - August 2017
EXPERIENCE	Quantitative Brokers, New York, NY <ul style="list-style-type: none"> • Apply statistical learning techniques to build an ensemble model for the prediction of the probability of order fulfillments. Techniques include Random Forest, Gradient Boosting and Recurrent Neural Network. • Model integrated in cash treasury market production system. 	
REVIEWERS	<ul style="list-style-type: none"> • Journals: SIAM Journal on Control and Optimization, Annals of Applied Probability, Operations Research, Mathematics of Operations Research, Management Science, Quantitative Finance, Applied Mathematics and Optimization, Applied Mathematical Finance, Market Microstructure and Liquidity, Journal of Economic Dynamics and Control. • Conferences: NeurIPS , International Conference on Machine Learning 	
ORGANIZERS	<ul style="list-style-type: none"> • Panelist Committee for ICML 2020 Workshop on Theory of Reinforcement Learning. • Organizer of Oxford Mathematical and Computational Finance Seminar; Organizer of Oxford Data Science Seminar. 	

INVITED TALKS

- Berlin Research Seminar on Stochastic Analysis and Stochastic Finance. (November 2020)
- Virtual Workshop on New Challenges in the Interplay between Finance and Insurance. (October 2020)
- 2020 SIAM-CAIMS 2nd Joint Annual Meeting. (July 2020)
- Computer Science Department, University College London, UK. (June 2020)
- Data Science Lab, MIT, Boston, US. (June 2020)
- Math Department, UCLA, Los Angeles, US. (June 2020)
- JP Morgan. (Feb 2020)
- Computer Science Department, University College London. (Jan 2020)
- NeurIPS 2019, Vancouver, Canada. (December 2019)
- Joint Risk & Stochastics and Financial Mathematics Seminar, Department of Mathematics, London School of Economics and Political Sciences, UK. (December 5, 2019)
- 12th Oxford-Berlin Young Researchers Meeting in Stochastic Analysis, Oxford, UK. (December 4, 2019)
- Probability and Financial Mathematics Seminar, School of Mathematics, University of Leeds, UK. (November 21, 2019)
- Finance and Stochastics Seminar, Department of Mathematics, Imperial College London, UK. (November 20, 2019)
- Warwick Stochastic Finance Seminar, Department of Statistics, Warwick University, UK. (November 8, 2019)
- Bielefeld Stochastic Afternoon, Center for Mathematical Economics, Bielefeld University, Germany. (October 30, 2019)
- INFORMS Annual Meeting, Seattle, WA, US. (October 20-23, 2019)
- 9th Western Conference in Mathematical Finance, University of Southern California, Los Angeles, CA, US. (November 2018)
- Inform's Annual Meeting, Phoenix, AZ, US. (November 2018)
 - Selected as one of the four finalists to present in the Applied Probability Society Best Student Paper Competition
- Mathematical Finance Seminars, University of Southern California, Los Angeles, CA, US. (September 2018)
- Probability and Computational Finance Seminars, Carnegie Mellon University, Pittsburgh, PA, US. (August 2018)

- Berkeley-Stanford Workshop on Mathematical and Computational Finance, Stanford, CA, US. (July 2018)
- Berkeley-Columbia Meeting in Engineering and Statistics, Columbia University, New York, NY. (April 2018)
- Probability Seminar, University of Science and Technology of China, Hefei, China. (December 2017)
- INFORMS Annual Meeting, Houston, TX, US. (October 2017)
- Fourth Annual Young Researchers Workshop on Data-driven and Decision Making, Cornell University, Ithaca, NY, US. (October 2017)

TEACHING EXPERIENCE

- Tutor at University of Oxford: provide bi-weekly tutorial sessions.
 - Stochastic Control, Hilary Term 2020
 - Machine Learning, Hilary Term 2020
 - Market Microstructure and Algorithmic Trading, Hilary Term 2020
 - Statistics and Financial Data Analysis, Michaelmas Term 2019
- Graduate Student Instructor at UC Berkeley: provide weekly discussion sessions, office hours, and homework solutions.
 - Capstone project mentor for IEOR master students, Spring 2018.
 - IEOR 222: Financial Engineering System (Graduate), Fall 2016/Spring 2018.
 - IEOR 241: Risk Modeling, Simulation, and Data Analysis (Graduate), Fall 2017.
 - IEOR 263B: Applied Stochastic Processes II (Graduate), Spring 2017.
 - IEOR 161: Operations Research II, Spring 2016.
 - E120: Introduction to Financial Economics, Fall 2015.
 - UGBA 103: Introduction to Finance, Summer 2015.

TECHNOLOGY SKILLS

- Programming:
 - Expert level at development in R, Python, Pandas, PostgreSQL.
 - Proficient at MATLAB, C, C++, Scala, Q/KDB+.
 - Experience with Spark.
- Optimization: CPLEX, AMPL.