Jiacheng Zhang

Industrial Engineering & Operations Research Department, Berkeley, CA 94520
jiachengz@berkeley.edu
Phone: +1 (609) 647-7594

EMPLOYMENT

Postdoctoral Researcher, Industrial Engineering & Operations Research Department　　2021-present
　UC Berkeley, under the supervision of Professor Xin Guo

EDUCATION

PhD, Operations Research and Financial Engineering　　2016 - 2021
　Princeton University, under the supervision of Professor Mykhaylo Shkolnikov and Professor Daniel Lacker
Bachelor, Pure and Applied Mathematics　　2012 - 2016
　Tsinghua University

RESEARCH INTEREST

My research focus lies in the theory of probability and stochastic optimization. I have worked on stochastic partial differential equations, especially Mckean-Vlasov type equation, partial differential equations, mathematical finance like stochastic portfolio theory and stochastic volatility modeling in the past few years. Now my research interests focus on two-level mean field games including principal agent games and the connection between machine learning and mean field game.

HONORS & REWARDS

School of Engineering and Applied Science Award for Excellence at Princeton University　　2021
　This award is given to SEAS advanced graduate students who have performed at the highest level as scholars and researchers
Member of Tsinghua Xuetang Training Program for excellence in academy　　2012 - 2016
National Scholarship　　2012 - 2013

RESEARCH ARTICLES

"Dynamics of observables in rank-based models and performance of functionally generated portfolios" (2018)
　Joint work with Sergio A. Almada Monter and Mykhaylo Shkolnikov. *Annals of Applied Probability* **29, 2849-2883.**
"Inverting the Markovian projection, with an application to local stochastic volatility models" (2019)
　Joint work with Daniel Lacker and Mykhaylo Shkolnikov. *Annals of Probability*. **48, 2189-2211**.
"Superposition and mimicking theorem for conditional McKean-Vlasov equations" (2020)
　Joint work with Daniel Lacker and Mykhaylo Shkolnikov. *To appear in Journal of the European Mathematical Society.*
Preprint available at *https://arxiv.org/abs/2004.0009*
"Stationary solutions and local equations for interacting diffusions on regular trees" (2023)
　Joint work with Daniel Lacker.　*Electronic Journal of Probability* **28, 1-37**
"Agency problem and mean field system of agents with moral hazard, synergistic effects and accidents"(2022)
　Joint work with Thibaut Mastrolia. *Submitted to Journal of Optimization Theory and Applications.* Preprint available at
https://arxiv.org/abs/2207.11087
"Optimization frameworks and sensitivity analysis of Stackelberg mean-field game" (2022)
　Joint work with Xin Guo and Anran Hu. *Submitted to Mathematics of Operations Research.* Preprint available at
https://arxiv.org/pdf/2210.04110.pdf
"On time-consistent equilibrium stopping under aggregation of diverse discount rates"(2023)
　Joint work with Shuoqing Deng and Xiang Yu. *Submitted to Finance and Stochastic.* Preprint available at
https://arxiv.org/abs/2302.07470
"Deep Learning for Population-Dependent Controls in Mean Field Control Problems"(2023)

Joint work with Gökçe Dayanıklı and Mathieu Laurière. Accepted at 2024 AAMAS (International Conference on Autonomous Agents and Multiagent Systems). Preprint available at *https://arxiv.org/abs/2306.04788*

"Sharp interface limit for the Giacomin-Lebowitz model of phase segregation"

Joint work with Sergey Nadtochiy and Mykhaylo Shkolnikov. In preparation.

RESEARCH TALKS & PRESENTATIONS

Dynamics of observables in rank-based models and performance of functionally generated portfolios

11th Oxford Princeton Workshop on Financial Mathematics and Stochastic Analysis, Princeton University, November 2018.

Stationary stochastic local volatility

SIAM Conference on Financial Mathematics & Engineering (FM19), University of Toronto, June 2019.

Inverting the Markovian Projection with an Application to Local Stochastic Volatility Models

Seminar talk in the Department of Applied Mathematics, the Hong Kong Polytechnic University, August 2019,

4_{th} Eastern Conference on Mathematical Finance, October 2019.

Superposition and mimicking theorem for conditional McKean-Vlasov equations

Columbia-Princeton Probability Day 2021], May 2021

SIAM Conference on Financial Mathematics & Engineering (FM21), Virtual Conference, June 2021,

6th Berlin Workshop for Young Researchers on Mathematical Finance, August 2021.

SIAM Annul Meeting (AN22), Virtual Conference, July 2022

Topics in Mckean-Vlasov equations and mimicking theorem

CMU Probability/Math Finance Seminar, January 2021.

Berkeley IEOR Seminar, February 2021.

Sharp interface limit for the Giacomin-Lebowitz model of phase segregation

Princeton Graduate Student Seminar, October 2020.

Columbia Stochastic Partial Differential Equations Seminar(virtual), November 2020,

Applied math and Probability seminar at Stanford University, January 2021.

Locally interacting diffusions and continuous Gibbs measures on trees

Northeast Probability Seminar, November 2020.

Seminar at Center for Math Financial and Actuarial Science at University of California, Santa Barbara, April 2022.

Optimal transport and Mean field games Seminar at University of South Carolina, May 2022.

Sensitivity and Robustness of Stackelberg Mean-Field Games

Mean field game workshop at CRM, Montreal, May 2022.

Machine learning and mean field games at IMSI, Chicago, May 2022.

Topics on Stackelberg Mean-Field Games

Quantitative Finance Seminar NUS(Suzhou) Research Institute, August 2022.

Financial Mathematicsl Seminar, Princeton University, September 2022.

Applied probability seminar, Columbia University, September 2022.

Brownbag seminar, Boston University, September 2022.

TEACHING EXPERIENCE

Princeton University (Assistant in Instruction)   2016 - 2021

Probability and Stochastic Systems (ORF 309), Stochastic Calculus (ORF 527), Probability theory (ORF526)

UC Berkeley (Teaching Assistant)   2021 - 2023

Fintech2021, Financial Engineering Systems II (Fall 2021), Applied Stochastic Process II (Spring 2022, Spring 2023)

PROFESSIONAL ACTIVITIES

Referee for the SIAM Journal on Financial Mathematics, Latin American Journal of Probability and Mathematical Statistics, the book of 'Machine learning in Financial Marker: A guide contemporary practices', Digital Finance, Applied Mathematics and Optimization, Annals of Applied Probability