

## Yufei Zhang

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### CONTACT INFORMATION

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**Website:** <https://yufei-zhang.github.io>

### RESEARCH INTERESTS

Stochastic Control and Games, Mathematical and Computational Finance, Theory and Applications of Machine Learning, particularly Deep Learning and Reinforcement Learning.

### ACADEMIC APPOINTMENTS

**Imperial College London**, United Kingdom  
Department of Mathematics

Associate Professor in Mathematical Finance and Machine Learning    Sep. 2023-present  
Co-director of the MSc in Mathematics and Finance

**London School of Economics**, United Kingdom

Assistant Professor at Department of Statistics    Sep. 2021-Aug. 2023

### EDUCATION

**University of Oxford**, United Kingdom

D.Phil., Mathematics    Oct. 2017-June 2021

**The Chinese University of Hong Kong**, Hong Kong

M.Phil., Mathematics    Aug. 2015-July 2017

M.Sc., Mathematics    Aug. 2013-June 2015

B.B.A., Insurance, Financial and Actuarial Analysis    Aug. 2008-June 2013

### JOURNAL PUBLICATIONS

- [1] Deven Sethi, David Šiška, and Yufei Zhang, *Entropy annealing for policy mirror descent in continuous time and space*, SIAM Journal on Control and Optimization, forthcoming. [Preprint version.]
- [2] Bekzhan Kerimkulov, James-Michael Leahy, David Šiška, Łukasz Szpruch, and Yufei Zhang, *A Fisher-Rao gradient flow for entropy-regularised Markov decision processes in Polish spaces*, Foundations of Computational Mathematics, Online first. [Preprint version.]
- [3] Xin Guo, Xinyu Li, and Yufei Zhang, *An  $\alpha$ -potential game framework for  $N$ -player games*, SIAM Journal on Control and Optimization, 63 (2025), pp. 2964-3005.
- [4] Eyal Neuman and Yufei Zhang, *Statistical learning with sublinear regret of propagator models*, The Annals of Applied Probability, forthcoming. [Preprint version.]
- [5] Xin Guo and Yufei Zhang, *Towards an analytical framework for dynamic potential games*, SIAM Journal on Control and Optimization, 63 (2025), pp. 1213-1242.
- [6] Christoph Reisinger, Wolfgang Stockinger, and Yufei Zhang, *A fast iterative PDE-based algorithm for feedback controls of nonsmooth mean-field control problems*, SIAM Journal on Scientific Computing, 46 (2024), pp. A2737-A2773.

- [7] Lukasz Szpruch, Tanut Treetanthiploet, and Yufei Zhang, *Exploration-exploitation trade-off for continuous-time episodic reinforcement learning with linear-convex models*, The Annals of Applied Probability, forthcoming. [Preprint version.]
- [8] Michael Giegrich, Christoph Reisinger, and Yufei Zhang, *Convergence of policy gradient methods for finite-horizon exploratory linear-quadratic control problems*, SIAM Journal on Control and Optimization, 62 (2024), pp. 1060-1092.
- [9] Lukasz Szpruch, Tanut Treetanthiploet, and Yufei Zhang, *Optimal scheduling of entropy regulariser for continuous-time linear-quadratic reinforcement learning*, SIAM Journal on Control and Optimization, 62 (2024), pp. 135-166.
- [10] Christoph Reisinger, Wolfgang Stockinger, and Yufei Zhang, *Linear convergence of a policy gradient method for some finite horizon continuous time control problems*, SIAM Journal on Control and Optimization, 61 (2023), pp. 3526-3558.
- [11] Christoph Reisinger, Wolfgang Stockinger, and Yufei Zhang, *A posteriori error estimates for fully coupled McKean-Vlasov forward-backward SDEs*, IMA Journal of Numerical Analysis, 44 (2024), pp. 2323-2369.
- [12] Xin Guo, Anran Hu and Yufei Zhang, *Reinforcement learning for linear-convex models with jumps via stability analysis of feedback controls*, SIAM Journal on Control and Optimization, 61 (2023), pp. 755-787.
- [13] Matteo Basei, Xin Guo, Anran Hu and Yufei Zhang, *Logarithmic regret for episodic continuous-time linear-quadratic reinforcement learning over a finite-time horizon*, Journal of Machine Learning Research, 23 (2022), pp. 1–34.
- [14] Christoph Reisinger and Yufei Zhang, *Regularity and stability of feedback relaxed controls*, SIAM Journal on Control and Optimization, 59 (2021), pp. 3118–3151.
- [15] Kazufumi Ito, Christoph Reisinger, and Yufei Zhang, *A neural network based policy iteration algorithm with global  $H^2$ -superlinear convergence for stochastic games on domains*, Foundations of Computational Mathematics, 21 (2021), pp. 331–374.
- [16] Christoph Reisinger and Yufei Zhang, *A penalty scheme and policy iteration for nonlocal HJB variational inequalities with monotone drivers*, Computers and Mathematics with Applications, 93 (2021), pp. 199-213.
- [17] Roxana Dumitrescu, Christoph Reisinger, and Yufei Zhang, *Approximation schemes for mixed optimal stopping and control problems with nonlinear expectations and jumps*, Applied Mathematics & Optimization, 83 (2021), pp. 1387-1429.
- [18] Christoph Reisinger and Yufei Zhang, *Rectified deep neural networks overcome the curse of dimensionality for nonsmooth value functions in zero-sum games of nonlinear stiff systems*, Analysis and Applications, 18 (2020), pp. 951-999.
- [19] Christoph Reisinger and Yufei Zhang, *Error estimates of penalty schemes for quasi-variational inequalities arising from impulse control problems*, SIAM Journal on Control and Optimization, 58 (2020), pp. 243–276.
- [20] Christoph Reisinger and Yufei Zhang, *A penalty scheme for monotone systems with interconnected obstacles: convergence and error estimates*, SIAM Journal of Numerical Analysis, 57 (2019), pp. 1625–1648.
- [1] Xinshi Chen, Yufei Zhang, Christoph Reisinger, and Le Song, *Understanding deep architectures with reasoning layer*, Advances in Neural Information Processing Systems (NeurIPS 2020), 33 (2020), pp. 1240–1252.

## PREPRINTS

- [1] Xin Guo, Xinyu Li, and Yufei Zhang, *Distributed games with jumps: An  $\alpha$ -potential game approach*, [arXiv: 2508.0192](#), 2025.
- [2] Philipp Plank, Yufei Zhang, *Policy optimization for continuous-time linear-quadratic graphon mean field games*, [arXiv: 2506.05894](#), 2025.
- [3] Matthieu Meunier, Christoph Reisinger, and Yufei Zhang, *Efficient learning for entropy-regularized Markov Decision Processes via Multilevel Monte Carlo*, [arXiv: 2503.21224](#), 2025.
- [4] Yanwei Jia, Du Ouyang, and Yufei Zhang, *Accuracy of discretely sampled stochastic policies in continuous-time reinforcement learning*, Revision at SIAM Journal on Control and Optimization, [arXiv:2503.09981](#), 2025.
- [5] Xin Guo, Anran Hu, Jiacheng Zhang, Yufei Zhang, *Continuous-time mean field games: a primal-dual characterization*, [arXiv:2503.01042](#), 2025.
- [6] Lukasz Szpruch, Marc Sabaté Viales, Tanut Treetanthiploet, Yufei Zhang, *Pricing and hedging of decentralised lending contracts*, Submitted, [arXiv:2409.04233](#), 2024.
- [7] Christoph Knochenhauer, Alexander Merkel, and Yufei Zhang, *Continuous-time dynamic decision making with costly information*, Revision at Mathematics of Operations Research, [arXiv:2408.09693](#), 2024.
- [8] Tanut Treetanthiploet, Łukasz Szpruch, and Yufei Zhang,  *$\epsilon$ -policy gradient for online pricing*, Revision at Applied Mathematics and Optimization, [arXiv:2405.03624](#), 2024.
- [9] Bekzhan Kerimkulov, David Šiška, Łukasz Szpruch, and Yufei Zhang, *Mirror descent for stochastic control problems with measure-valued controls*, Revision at Stochastic Processes and Their Applications, [arXiv:2401.01198](#), 2024.
- [10] Eyal Neuman, Wolfgang Stockinger, and Yufei Zhang, *An offline learning approach to propagator models*, Revision at Mathematical Finance, [arXiv:2309.02994](#), 2023.
- [11] Christoph Reisinger, Wolfgang Stockinger, and Yufei Zhang, *Optimal regularity of extended mean field controls and their piecewise constant approximation*, preprint, [arXiv:2009.08175v2](#), 2020.

## AWARDS

- The Mathematical Institute DPhil Thesis Prize 2021, *University of Oxford*.
- G-Research PhD Prize in Maths and Data Science, *G-Research*, 2020.
- Academic Support Grant, *The Queen's College, University of Oxford*, 2017.
- Departmental Studentship, *Mathematical Institute, University of Oxford*, 2017–2021.

## GRANTS

- Principal Investigator, “Reinforcement Learning for Insurance Pricing” in partnership with The Alan Turing Institute, £95,000, November 1, 2022 to April 28, 2023.
- Corresponding Proposer, Isaac Newton Institute Satellite Programme “Bridging Stochastic Control And Reinforcement Learning”, £119,840, November 3-28, 2025.

## PH.D SUPERVISION

- Philipp Plank (2024-now, Imperial College London).

## CONFERENCES ORGANISATION

- Senior Program Committee, 6th ACM International Conference on AI in Finance (ICAIF 2025), Singapore (Nov. 15-18 2025).
- Corresponding Organiser, Isaac Newton Institute Satellite Program “Bridging Stochastic Control and Reinforcement Learning”, Cambridge (Nov. 3-28, 2025)
- Organizing Committee, BIRS workshop “Advances in Stochastic Control and Reinforcement Learning: Theory and Application”, Banff, Canada (April 27-May 2, 2025)

- Scientific Committee, “London–Oxford–Warwick Mathematical Finance Workshop”, Oxford (Jan. 9-10, 2025).
  - Organizing Committee, 8th-London-Paris Bachelier Workshop, Paris (September 2024).
  - Organizing Committee, ETH–Hong Kong–Imperial Mathematical Finance Workshop, London (June 2024).
  - Organizing Committee, 7th-London-Paris Bachelier Workshop, London (September 2023).
- ADMINISTRATIVE DUTIES
- Member of the Research Committee of the Department of Mathematics, Imperial College (2024-2025).
  - Organiser of the Finance and Stochastics seminar at Imperial College (2023-2025).
- REVIEWER
- Journals (in alphabetical order)
    - in **mathematical finance**: Applied Mathematical Finance, Finance and Stochastics, Journal of Computational Finance, Market Microstructure and Liquidity, Mathematical Finance, SIAM Journal on Financial Mathematics, and others.
    - in **machine learning**: Journal of Machine Learning Research, Journal of Machine Learning, and others.
    - in **control and optimization**: Applied Mathematics and Optimization, Automatica, IEEE Transactions on Automatic Control, Operations Research, SIAM Journal on Control and Optimization, and others.
    - in **probability and statistics**: Annals of Applied Probability, Annals of Statistics, Stochastic Processes and Their Applications, and others.
    - in **computational mathematics**: Advances in Computational Mathematics, SIAM Journal on Scientific Computing, and others.
    - in **other areas of applied mathematics**: Discrete and Continuous Dynamical Systems Series B, Journal of Mathematical Analysis and Applications, and others.
  - Conferences
    - in **machine learning**: Advances in Neural Information Processing Systems (NeurIPS 2021), Conference on Mathematical and Scientific Machine Learning (MSML 2020).
- INVITED TALKS
- *CRISM 2.0 Conference*, University of Warwick, May 21-23, 2025.
  - *2nd ETH-HKG-ICL Mathematical Finance Workshop*, Hong Kong, April 22-25, 2025.
  - *ISOR Colloquium*, University of Vienna, Vienna, Austria, Mar. 31, 2025.
  - *Statistics Seminar Series*, Collegio Carlo Alberto, Torino, Italy, Feb. 12-14, 2025.
  - *Modeling, Learning and Understanding: Modern Challenges between Financial Mathematics, Financial Technology and Financial Economics*, Banff, Nov. 10-15, 2024.
  - *12th Bachelier World Congress of the Bachelier Finance Society*, Rio de Janeiro, July 8-12, 2024.
  - *New Trends and Challenges in Stochastic Differential Games*, Banff, June 23-28, 2024.
  - *ETH-Hong Kong-Imperial Mathematical Finance Workshop*, London, June 17-20, 2024.
  - *Probability for Machine Learning seminar*, Oxford, June 12, 2024.
  - *Mathematical Finance seminar*, Bielefeld, June 5, 2024.
  - *Bachelier Seminar*, Paris, April 17, 2024.
  - *Fields-CFI Bootcamp on Machine Learning in Quantitative Finance*, Toronto, April 25-26, 2024.
  - *Recent Advances in Stochastic Control, Machine Learning and Quantitative Finance*, Shanghai, April 15-19, 2024.
  - *IMSI Workshop on Decision Making and Uncertainty*, Chicago, Feb. 2-9, 2024.
  - *CityU-NUS MFG/MFC seminar*, Jan. 30, 2024.
  - *16th International Conference of the ERCIM WG on Computational and Methodological Statistics*, Berlin, Dec. 16-18, 2023.

- 7th London-Paris Bachelier Workshop on Mathematical Finance, London, Sept. 18-19, 2023.
- The Second HKSIA Biennial Meeting, Hong Kong, Aug. 28-Sept. 1, 2023.
- Recent Advances on Quantitative Finance, Hong Kong, Aug. 27-30, 2023
- 10th International Congress on Industrial and Applied Mathematics, Tokyo, Aug. 20-25, 2023.
- 11th Advanced Mathematical Methods for Finance Conference, Bielefeld, June 26-30, 2023.
- Stochastic Analysis and Math Finance Seminar, Berlin, June 22, 2023.
- Berlin Probability Colloquium, Berlin, June 21, 2023.
- North British Probability Seminar, The University of Edinburgh, June 14, 2023.
- Data Science Seminar, The University of Essex, May 11, 2023.
- 2nd Workshop on Machine Learning for PDEs, Imperial College London, Apr. 3-4, 2023.
- Probability Seminar, The University of Bath, Jan. 9, 2023.
- World Online Seminars on Machine Learning in Finance, Virtual, Nov. 22, 2022.
- Machine Learning and Optimal Control, Royal Statistical Society, Virtual, Oct. 19, 2022.
- Finance and Stochastic Seminar, The University of Sydney, Oct. 11, 2022.
- London-Paris Bachelier Workshop on Mathematical Finance, Paris, France, Sept. 15-16, 2022.
- Machine Learning for PDEs, London, UK, Sept. 6-8, 2022.
- The 9th International Colloquium on BSDEs and Mean Field Systems, Annecy, France, June 26–July 1, 2022.
- IMSI Workshop on Machine Learning and Mean-Field Games, Chicago, May 23–27, 2022.
- Maxwell Institute Probability Seminar, Heriot-Watt University and University of Edinburgh, Mar. 24, 2022.
- Finance and Stochastic Seminar, Imperial College London, Mar. 23, 2022.
- Financial/Actuarial Mathematics Seminar, University of Michigan, Virtual, Mar. 16, 2022.
- SIAG/FME virtual seminar, Virtual, Mar. 10, 2022.
- 15th German Probability and Statistics Days, Virtual, Sept. 27-Oct. 1, 2021.
- 2nd Fudan-Warwick Workshop on Financial Mathematics and Stochastic Analysis, University of Warwick, UK, July 30–31, 2019.
- 3rd International Conference on Computational Finance, A Coruña, Spain, July 8–12, 2019.
- International Workshop on PDE-Constrained Optimization, Optimal Controls and Applications, Sanya, China, Dec. 10–14, 2018.
- 10th Oxford-Berlin Young Researchers Meeting on Applied Stochastic Analysis, Oxford, United Kingdom, Nov. 29–Dec. 1, 2018.
- 14th Viennese Conference on Optimal Control and Dynamic Games, Vienna, Austria, July 3–6, 2018.

#### TEACHING EXPERIENCE

- Lecturer at Imperial College London:
  - Simulation Methods for Finance Spring 2024, 2025
  - Advances in Machine Learning Spring 2025
  - Interest Rate Models Spring 2025
- Lecturer at London School of Economics:
  - Stochastic Process Fall 2021, 2022
  - Stochastic Simulation Spring 2023
  - Computational Methods in Finance and Insurance Spring 2022, 2023
- Tutor at University of Oxford:
  - Analysis II Spring 2021
  - Fixed Income Spring 2021
  - Financial Derivatives Fall 2020
  - Introduction to Probability Fall 2020

- Advanced Numerical Methods
- Numerical Methods

Spring 2020  
Fall 2019

PROFESSIONAL  
MEMBERSHIPS

- Member, Bachelier Finance Society
- Member, Society for Industrial and Applied Mathematics

*Last updated on August 20, 2025*