Yufei Zhang

CONTACT INFORMATION	**Office:** COL B.100D, Columbia House **Mail:** Department of Statistics, London School of Economics, Houghton Street, London, WC2A 2AE **E-mail:** y.zhang389@lse.ac.uk **Website:** https://yufei-zhang.github.io

CONTACT INFORMATION

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RESEARCH INTERESTS

My research focuses on developing effective computational frameworks combining stochastic analysis, statistics and modern machine learning techniques to solve large scale continuous time stochastic control problems and differential games in mathematical finance.

EMPLOYMENT

Assistant Professor, London School of Economics   Sep. 2021-present
     Department of Statistics

EDUCATION

University of Oxford, United Kingdom

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

- Adviser: Professor Christoph Reisinger

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

- Minor in Mathematics

REFEREED JOURNAL PUBLICATIONS

[1] Christoph Reisinger and Yufei Zhang, *Regularity and stability of feedback relaxed controls*, SIAM Journal on Control and Optimization, forthcoming, 2021. [Preprint version.]

[2] 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. [Journal version.] [Preprint version.]

[3] 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. [Preprint version.]

[4] 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, Published online, May 2020. [Journal version.] [Preprint version.]

[5] 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. [Journal version.] [Preprint version.]

[6] 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. [Journal version.] [Preprint version.]

[7] Roxana Dumitrescu, Christoph Reisinger, and Yufei Zhang, *Approximation schemes for mixed optimal stopping and control problems with nonlinear expectations and jumps*, Applied Mathematics & Optimization, Published online, July 2019. [Journal version.]

REFEREED CONFERENCE PUBLICATIONS	[1] Xinshi Chen, Yufei Zhang, Christoph Reisinger, and Le Song, *Understanding Deep Architectures with Reasoning Layer*, Advances in Neural Information Processing Systems (NeurIPS), 2020. [Preprint version.]

PREPRINTS AND WORKING PAPERS

[1] Christoph Reisinger, Wolfgang Stockinger, and Yufei Zhang, *A fast iterative PDE-based algorithm for feedback controls of nonsmooth mean-field control problems*, preprint, arXiv:2108.06740, 2021.

[2] Matteo Basei, Xin Guo, Anran Hu and Yufei Zhang, *Logarithmic regret for episodic continuous-time linear-quadratic reinforcement learning over a finite-time horizon*, preprint, arXiv:2006.15316v3, 2021.

[3] Xin Guo, Anran Hu and Yufei Zhang, *Reinforcement learning for linear-convex models with jumps via stability analysis of feedback controls*, preprint, arXiv:2104.09311, 2021.

[4] Christoph Reisinger, Wolfgang Stockinger, and Yufei Zhang, *Path regularity of coupled McKean-Vlasov FBSDEs*, preprint, arXiv:2011.06664, 2020.

[5] Christoph Reisinger, Wolfgang Stockinger, and Yufei Zhang, *Optimal regularity of extended mean field controls and their piecewise constant approximation*, preprint, arXiv:2009.08175v2, 2020.

[6] Christoph Reisinger, Wolfgang Stockinger, and Yufei Zhang, *A posteriori error estimates for fully coupled McKean-Vlasov forward-backward SDEs*, preprint, arXiv:2007.07731, 2020.

AWARDS

- G-Research PhD Prize in Maths and Data Science, *G-Research*, 2020.
- Academic Support Grands, *The Queen's College, University of Oxford*, 2017.
- Departmental Studentship, *Mathematical Institute, University of Oxford*, 2017–2021.
- Postgraduate Studentship, *The Chinese University of Hong Kong*, 2015–2017.
- Honours at Entrance, *The Chinese University of Hong Kong*, 2008–2013.

INVITED TALKS

[1] *2nd Fudan-Warwick Workshop on Financial Mathematics and Stochastic Analysis*, University of Warwick, United Kingdom, July 30–31, 2019.

[2] *3rd International Conference on Computational Finance*, A Coruña, Spain, July 8–12, 2019.

[3] *International Workshop on PDE-Constrained Optimization, Optimal Controls and Applications*, Sanya, China, Dec. 10–14, 2018.

[4] *10th Oxford-Berlin Young Researchers Meeting on Applied Stochastic Analysis*, Oxford, United Kingdom, Nov. 29–Dec. 1, 2018.

[5] *14th Viennese Conference on Optimal Control and Dynamic Games*, Vienna, Austria, July 3–6, 2018.

OTHER TALKS

[1] *8th Workshop on High-Dimensional Approximation*, ETH Zurich, Switzerland, Sept. 9–13, 2019.

[2] *12th European Summer School in Financial Mathematics*, Padova, Italy, Sept. 2–6, 2019.

[3] *SIAM Financial Mathematics and Engineering (FM19)*, Toronto, Ontario, Canada, June 4–7, 2019.

[4] *Scientific Computation using Machine-Learning Algorithms*, Nottingham, United Kingdom, Apr. 25–26, 2019.

[5] *Oxford–ETH Workshop in Mathematical & Computational Finance*, Oxford, United Kingdom, Mar. 14–15, 2019.

[6] *Robust Techniques in Quantitative Finance*, Oxford, United Kingdom, Sept. 3–7, 2018.

[7] *11th European Summer School in Financial Mathematics*, Paris, France, Aug. 27–31, 2018.

[8] *The Fourth Young Researchers Meeting on BSDEs, Nonlinear Expectations and Mathematical Finance*, Shanghai, China, Apr. 23–27, 2018.

PROFESSIONAL SERVICE

Referee Service
- *Automatica*
- *Advances in Computational Mathematics*
- *Applied Mathematical Finance*
- *Applied Mathematics and Optimization*
- *Finance and Stochastics*
- *Journal of Computational Finance*
- *Journal of Mathematical Analysis and Applications*
- *SIAM Journal on Control and Optimization*
- *SIAM Journal on Financial Mathematics*

Committee Service
- Treasurer, University of Oxford SIAM Student Chapter, 2018-20.

TEACHING EXPERIENCE

University of Oxford, United Kingdom
- Tutor

− Financial Derivatives	2020-21

- Teaching Assistant

− Calibration	2018-19
− Continuous Optimization	2018-19
− Numerical Methods: Finite Differences	2017-19
− Numerical Methods: Monte Carlo	2017-18

The Chinese University of Hong Kong, Hong Kong
- Teaching Assistant

− Mathematical Analysis I	2015-17
− Numerical Methods for Differential Equations (MATH3240)	2015-16
− Mathematical Analysis II	2015-17

PROFESSIONAL MEMBERSHIPS

Institute of Mathematics and its Applications, Associate Member, 2017–present

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