

## Yufei Zhang

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### CONTACT INFORMATION

**Office:** COL B.100D, Columbia House  
**Mail:** Department of Statistics, London School of Economics, Houghton Street, London, WC2A 2AE  
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**Website:** <https://yufei-zhang.github.io>

### 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.

### 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, 59 (2021), pp. 3118–3151. [[Journal version.](#)] [[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] Lukasz Szpruch, Tanut Treetanthiploet, and Yufei Zhang, *Exploration-exploitation trade-off for continuous-time episodic reinforcement learning with linear-convex models*, preprint, [arXiv:2112.10264](#), 2021.
- [2] 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.
- [3] 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.
- [4] 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.
- [5] Christoph Reisinger, Wolfgang Stockinger, and Yufei Zhang, *Path regularity of coupled McKean-Vlasov FBSDEs*, preprint, [arXiv:2011.06664](#), 2020.
- [6] Christoph Reisinger, Wolfgang Stockinger, and Yufei Zhang, *Optimal regularity of extended mean field controls and their piecewise constant approximation*, preprint, [arXiv:2009.08175v2](#), 2020.
- [7] 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] *15th German Probability and Statistics Days*, Virtual, Sept. 27-Oct. 1, 2021.
- [2] *8th Workshop on High-Dimensional Approximation*, ETH Zurich, Switzerland, Sept. 9–13, 2019.
- [3] *12th European Summer School in Financial Mathematics*, Padova, Italy, Sept. 2–6, 2019.
- [4] *SIAM Financial Mathematics and Engineering (FM19)*, Toronto, Ontario, Canada, June 4–7, 2019.

- [5] *Scientific Computation using Machine-Learning Algorithms*, Nottingham, United Kingdom, Apr. 25–26, 2019.
- [6] *Oxford–ETH Workshop in Mathematical & Computational Finance*, Oxford, United Kingdom, Mar. 14–15, 2019.
- [7] *Robust Techniques in Quantitative Finance*, Oxford, United Kingdom, Sept. 3–7, 2018.
- [8] *11th European Summer School in Financial Mathematics*, Paris, France, Aug. 27–31, 2018.
- [9] *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
- Society for Industrial and Applied Mathematics, Member

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