

## 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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### RESEARCH INTERESTS

My research interests lie at the intersection of stochastic control and games, foundation of machine learning, and mathematical finance.

### EMPLOYMENT

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

### 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] Matteo Basci, 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, forthcoming, [arXiv:2006.15316v3](https://arxiv.org/abs/2006.15316v3), 2021.
- [2] 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.](#)]
- [3] 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. [[Journal version.](#)] [[Preprint version.](#)]
- [4] 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.](#)]
- [5] 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.](#)]
- [6] 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.](#)]
- [7] 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.](#)]

	[8] Roxana Dumitrescu, Christoph Reisinger, and Yufei Zhang, <i>Approximation schemes for mixed optimal stopping and control problems with nonlinear expectations and jumps</i> , Applied Mathematics & Optimization, Published online, July 2019. [Journal version.]
REFEREED CONFERENCE PUBLICATIONS	[1] Xinshi Chen, Yufei Zhang, Christoph Reisinger, and Le Song, <i>Understanding deep architectures with reasoning layer</i> , Advances in Neural Information Processing Systems (NeurIPS 2020), 33 (2020), pp. 1240–1252. [Journal version.] [Preprint version.]
PREPRINTS AND WORKING PAPERS	<p>[1] Christoph Reisinger, Wolfgang Stockinger, and Yufei Zhang, <i>Linear convergence of a policy gradient method for finite horizon continuous time stochastic control problems</i>, Submitted, <a href="#">arXiv:2203.11758</a>, 2022.</p> <p>[2] Lukasz Szpruch, Tanut Treetanthiploet, and Yufei Zhang, <i>Exploration-exploitation trade-off for continuous-time episodic reinforcement learning with linear-convex models</i>, Submitted, <a href="#">arXiv:2112.10264</a>, 2021.</p> <p>[3] Christoph Reisinger, Wolfgang Stockinger, and Yufei Zhang, <i>A fast iterative PDE-based algorithm for feedback controls of nonsmooth mean-field control problems</i>, Submitted, <a href="#">arXiv:2108.06740</a>, 2021.</p> <p>[4] Xin Guo, Anran Hu and Yufei Zhang, <i>Reinforcement learning for linear-convex models with jumps via stability analysis of feedback controls</i>, Revised for SIAM Journal on Control and Optimization, <a href="#">arXiv:2104.09311</a>, 2021.</p> <p>[5] Christoph Reisinger, Wolfgang Stockinger, and Yufei Zhang, <i>Path regularity of coupled McKean-Vlasov FBSDEs</i>, preprint, <a href="#">arXiv:2011.06664</a>, 2020.</p> <p>[6] Christoph Reisinger, Wolfgang Stockinger, and Yufei Zhang, <i>Optimal regularity of extended mean field controls and their piecewise constant approximation</i>, Submitted, <a href="#">arXiv:2009.08175v2</a>, 2020.</p> <p>[7] Christoph Reisinger, Wolfgang Stockinger, and Yufei Zhang, <i>A posteriori error estimates for fully coupled McKean-Vlasov forward-backward SDEs</i>, Submitted, <a href="#">arXiv:2007.07731</a>, 2020.</p>
AWARDS	<ul style="list-style-type: none"> <li>• G-Research PhD Prize in Maths and Data Science, <i>G-Research</i>, 2020.</li> <li>• Academic Support Grands, <i>The Queen's College, University of Oxford</i>, 2017.</li> <li>• Departmental Studentship, <i>Mathematical Institute, University of Oxford</i>, 2017–2021.</li> <li>• Postgraduate Studentship, <i>The Chinese University of Hong Kong</i>, 2015–2017.</li> <li>• Honours at Entrance, <i>The Chinese University of Hong Kong</i>, 2008–2013.</li> </ul>
INVITED TALKS	<p>[1] <i>The 9th International Colloquium on BSDEs and Mean Field Systems</i>, Annecy, France, June 26–July 1, 2022.</p> <p>[2] <i>Machine Learning and Mean-Field Games Workshop</i>, The Institute for Mathematical and Statistical Innovation, Chicago, May 23–27, 2022.</p> <p>[3] <i>2nd Fudan-Warwick Workshop on Financial Mathematics and Stochastic Analysis</i>, University of Warwick, United Kingdom, July 30–31, 2019.</p> <p>[4] <i>3rd International Conference on Computational Finance</i>, A Coruña, Spain, July 8–12, 2019.</p> <p>[5] <i>International Workshop on PDE-Constrained Optimization, Optimal Controls and Applications</i>, Sanya, China, Dec. 10–14, 2018.</p> <p>[6] <i>10th Oxford-Berlin Young Researchers Meeting on Applied Stochastic Analysis</i>, Oxford, United Kingdom, Nov. 29–Dec. 1, 2018.</p>

	[7] <i>14th Viennese Conference on Optimal Control and Dynamic Games</i> , Vienna, Austria, July 3–6, 2018.
OTHER TALKS	<p>[1] <i>Maxwell Institute Probability Seminar</i>, Heriot-Watt University and University of Edinburgh, Virtual, Mar. 24, 2022.</p> <p>[2] <i>Finance and Stochastic Seminar</i>, Imperial College London, Mar. 23, 2022.</p> <p>[3] <i>Financial/Actuarial Mathematics Seminar</i>, University of Michigan, Virtual, Mar. 16, 2022.</p> <p>[4] <i>SIAG/FME virtual seminar</i>, Virtual, Mar. 10, 2022.</p> <p>[5] <i>15th German Probability and Statistics Days</i>, Virtual, Sept. 27–Oct. 1, 2021.</p> <p>[6] <i>8th Workshop on High-Dimensional Approximation</i>, ETH Zurich, Switzerland, Sept. 9–13, 2019.</p> <p>[7] <i>12th European Summer School in Financial Mathematics</i>, Padova, Italy, Sept. 2–6, 2019.</p> <p>[8] <i>SIAM Financial Mathematics and Engineering (FM19)</i>, Toronto, Ontario, Canada, June 4–7, 2019.</p> <p>[9] <i>Scientific Computation using Machine-Learning Algorithms</i>, Nottingham, United Kingdom, Apr. 25–26, 2019.</p> <p>[10] <i>Oxford–ETH Workshop in Mathematical &amp; Computational Finance</i>, Oxford, United Kingdom, Mar. 14–15, 2019.</p> <p>[11] <i>Robust Techniques in Quantitative Finance</i>, Oxford, United Kingdom, Sept. 3–7, 2018.</p> <p>[12] <i>11th European Summer School in Financial Mathematics</i>, Paris, France, Aug. 27–31, 2018.</p> <p>[13] <i>The Fourth Young Researchers Meeting on BSDEs, Nonlinear Expectations and Mathematical Finance</i>, Shanghai, China, Apr. 23–27, 2018.</p>
PROFESSIONAL SERVICE	<p><b>Referee Service</b></p> <ul style="list-style-type: none"> <li>• <i>Automatica</i></li> <li>• <i>Advances in Computational Mathematics</i></li> <li>• <i>Applied Mathematical Finance</i></li> <li>• <i>Applied Mathematics and Optimization</i></li> <li>• <i>Finance and Stochastics</i></li> <li>• <i>Journal of Computational Finance</i></li> <li>• <i>Journal of Mathematical Analysis and Applications</i></li> <li>• <i>Journal of Optimization Theory and Applications</i></li> <li>• <i>Market Microstructure and Liquidity</i></li> <li>• <i>SIAM Journal on Control and Optimization</i></li> <li>• <i>SIAM Journal on Financial Mathematics</i></li> </ul> <p><b>Committee Service</b></p> <ul style="list-style-type: none"> <li>• Treasurer, University of Oxford SIAM Student Chapter, 2018–20.</li> <li>• Mathematrix, University of Oxford, 2020–21.</li> </ul>
TEACHING EXPERIENCE	<p><b>London School of Economics</b>, United Kingdom</p> <ul style="list-style-type: none"> <li>• Lecturer <ul style="list-style-type: none"> <li>– Stochastic Process</li> <li>– Computational Methods in Finance and Insurance</li> </ul> </li> </ul> <p><b>University of Oxford</b>, United Kingdom</p>

Fall 2021  
Spring 2022

- Tutor
  - Analysis II Spring 2021
  - Fixed Income Spring 2021
  - Financial Derivatives Fall 2020
  - Introduction to Probability Fall 2020
  - Advanced Numerical Methods Spring 2020
  - Numerical Methods Fall 2019
- Teaching Assistant
  - Analysis I Fall 2020
  - Calibration Spring 2019
  - Continuous Optimization Spring 2019
  - Numerical Methods: Finite Differences Fall 2018, Spring 2018, Spring 2019
  - Numerical Methods: Monte Carlo Spring 2018

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

- Teaching Assistant
  - Mathematical Analysis II Spring 2016, Spring 2017
  - Numerical Methods for Differential Equations Spring 2016
  - Mathematical Analysis I Fall 2015, Fall 2016

**PROFESSIONAL  
MEMBERSHIPS**

- Institute of Mathematics and its Applications, Associate Member
- Society for Industrial and Applied Mathematics, Member