HUINING YANG

◇ ORFE Department, Sherrerd Hall, Charlton Street, Princeton, NJ 08544
◇ Email: hy5564@princeton.edu

ABOUT ME

I am a Postdoctoral Research Associate in the Operations Research & Financial Engineering (ORFE) Department at Princeton University, supervised by *Prof. Ronnie Sircar*.

My research interests lie broadly in the span of *Mathematical Finance* and *Machine Learning*, with a special focus on *Reinforcement Learning, Stochastic Control, and Game Theory*.

EMPLOYMENT

Princeton University *2022 – present*
Postdoctoral Research Associate,
Operations Research & Financial Engineering (ORFE) Department.

- Supervisor: Prof. Ronnie Sircar.
- Part of the Princeton-First Republic Bank collaboration.

EDUCATION

University of Oxford *2018 – 2022*
DPhil (PhD) in Mathematics,
EPSRC Centre for Doctoral Training (CDT) in Industrially Focused Mathematical Modelling (InFoMM),
Mathematical Institute.

- Supervisor: Prof. Ben Hambly.
- Thesis Title: Policy Gradient Methods for Linear Quadratic Problems.

University of Manchester *2016 – 2018*
BSc in Mathematics with Financial Mathematics (2+2 dual degree),
School of Mathematics.

- First Class Honours. Grade: 92.63 (major: 95.35).
- Final Year Project: Solving Convection-diffusion Problems. Supervisor: Prof. David Silvester.

Shandong University *2014 – 2016*
BSc in Mathematics (2+2 dual degree),
School of Mathematics and System Science.

HONOURS AND AWARDS

EPSRC CDT InFoMM Studentship *2018 – 2022*

- Fully-funded PhD studentship, University of Oxford.

International Excellence Awards *2016 – 2017*

- Top 15 international students in School of Mathematics, University of Manchester.

INDUSTRIAL PROJECTS

First Republic Bank (FRB), US *Sep. 2022 -*

The Princeton-FRB Collaboration: Research and Lifelong Learning Program

- Construct models to measure and predict the profitability of some loan programs.

Whizz Education, UK *Jul. 2019 - Sep. 2019*

Short project 'Traversing the Curriculum: Optimal Pathways for Learning', supervised by Dr. Ebrahim Patel.

- Use network models and Max-plus algebra to help the Whizz online tutor identify an optimal personalised learning pathway for each student.

BP, UK *Apr. 2019 - Jul. 2019*

Short project 'Bargaining under Uncertainty', supervised by and Prof. Álvaro Cartea, Prof. Sam Howison.

- Propose a framework for deriving the optimal strategies for a buyer and a seller in a negotiation using Bayesian learning, non-linear regression, and Gaussian processes.

Prudential, UK *Apr. 2019*

ESGI 145 Study Group project (Cambridge) 'Conditional Quantile Estimation Using High-dimensional Time Series Data'.

- Apply LASSO to predict conditional quantiles of time series.

PROFESSIONAL ACTIVITIES

Reviewer

- Journals: *SIAM Journal on Control and Optimization (SICON)*, *Mathematical Finance*
- Conferences: *American Control Conference* (ACC), *IEEE Conference on Decision and Control.*

Organizer

- Program Committee Member, 2022 ACM International Conference on AI in Finance (ICAIF), Nov. 2022, New York.
- Session Chair, INFORMS 2022 Annual Meeting, Oct. 2022, Indiana, USA.
  - Session title: Recent Advances in Reinforcement Learning in Finance.
- Organising Committee Member and Session Chair, InFoMM CDT Annual Meeting 2022, Jun. 2022, Oxford.

SELECTED TALKS

- **Invited talk**, SIAM Conference on Financial Mathematics and Engineering (FM23), Jun. 2023, Philadelphi.
- 12th Oxford-Princeton Workshop on Mathematical Finance and Stochastic Analysis, Oct. 2022, Oxford.
- Industrial Maths in the 21st Century, Jun. 2022, Oxford.
- Contributed talk, UKIE National Student Chapter Conference, Jun. 2022, Edinburgh.

- Contributed talk, London-Oxford-Warwick Financial Mathematics Workshop, Apr. 2022, Warwick.
- **Invited talk**, UC Berkeley, Jan. 2022, virtual.
- Junior Applied Maths Seminar (JAMS), Jan. 2022, Oxford.
- **Invited talk**, Financial/Actuarial Mathematics Seminar, University of Michigan, Jan. 2022, virtual.
- **Invited talk**, 15th International Conference on Computational and Financial Econometrics (CFE 2021), Dec. 2021, London.
- Contributed talk, Workshop on Women in AI and Finance, 2nd ACM International Conference on AI in Finance (ICAIF), Nov. 2021, virtual.
- **Invited talk**, The Institute for Operations Research and the Management Sciences (INFORMS) Annual Meeting, Oct. 2021, virtual.
- Mathematical and Computational Finance Internal Seminar, Mar. 2021, Oxford.

TEACHING EXPERIENCE

Teaching Assistant at University of Oxford

- B8.3 Mathematical Models of Financial Derivatives, 2020.
- B8.1 Probability, Measure and Martingales, 2019.

SKILLS

IT Skills	MATLAB, Python, LaTex, git, Linux, Mathematica.
Languages	Chinese (native), English (fluent).

LIST OF PUBLICATIONS

Publications and Preprints

[P3] B. Hambly, R. Xu, and **H. Yang**. *Recent Advances in Reinforcement Learning in Finance.* To appear, **Mathematical Finance**, 2023.

[P2] B. Hambly, R. Xu, and **H. Yang**. *Policy Gradient Methods Find the Nash Equilibrium in N-player General-sum Linear-quadratic Games.* Accepted, **Journal of Machine Learning Research (JMLR)**, 2023.

[P1] B. Hambly, R. Xu, and **H. Yang**. *Policy Gradient Methods for the Noisy Linear Quadratic Regulator over a Finite Horizon.* **SIAM Journal on Control and Optimization**, 59 (5), pp. 3359–3391, 2021.