Curriculum Vitae — Ivan Guo

School of Mathematical Sciences, Monash University
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1 Employment and Education

Current	**Associate Professor**, Monash University, 2024–present **Senior Lecturer**, 2020–2024; **Lecturer**, 2017–2020 **Director** of the Monash Centre for Quantitative Finance and Investment Strategies (CQFIS), 2024–present; **Deputy Director**, 2017–2023 **Director** of the Monash Master of Financial Mathematics program, 2020–2025
Postdoctoral	**Research Fellow**, Monash University, 2016–2017 **Associate Research Fellow**, University of Wollongong, 2014–2016 **Research Associate**, University of Sydney, 2012–2013
Industry	**National Australia Bank**, Market Risk Quantitative Support, 2006–2012
Postgraduate	**Ph.D. in Mathematics**, University of Sydney, 2014 Thesis: *Competitive multi-player stochastic games with applications to multi-person financial contracts*
Undergraduate	**Bachelor of Science (Adv. Mathematics)**, University of Sydney, 2008 Honours Class I with **University Medal** Thesis: *Analytical pricing of American puts*

2 Research

Areas of Interest	Financial mathematics, optimal transport, stochastic control, model calibration, robust finance, stochastic games
Refereed Journal Articles	Guo, I., Nilsson, S., & Wiesel, J. (2026). Dynamic characterization of barycentric optimal transport problems and their martingale relaxation. *Electronic Communications in Probability*, 31, 1–9. Das, K., Guo, I., & Loeper, G. (2026). On Stochastic PDEs for the pricing of derivatives in a multi-dimensional diffusion framework. *Stochastic Processes and their Applications*, 104886. Guo, I., & Jin, S. (2026). Macroscopic market making games. *Mathematical Finance*, 36(2), 352–373. Guo, I., Jin, S., & Nam, K. (2026). Macroscopic Market Making. *Finance and Stochastics*, to appear. Guo, I., Langrené, N., & Wu, J. (2025). Simultaneous upper and lower bounds of American-style option prices with hedging via neural networks. *Quantitative Finance*, 25(4), 509–525. Ma, G., Zhu, S. P., & Guo, I. (2022). Valuation of general contingent claims with short selling bans: an equal-risk pricing approach. *International Journal of Theoretical and Applied Finance*, 25(04n05), 2250022. Guo, I., Loeper, G., Obłój, J., & Wang, S. (2022). Joint modeling and calibration of SPX and VIX by optimal transport. *SIAM Journal on Financial Mathematics*, 13(1), 1–31. Guo, I., Loeper, G., & Wang, S. (2022). Calibration of local-stochastic volatility models by optimal transport. *Mathematical Finance*, 32(1), 46–77. Guo, I., Langrené, N., Loeper, G., & Ning, W. (2022). Portfolio optimization with a prescribed terminal wealth distribution. *Quantitative Finance*, 22(2), 333–347. Guo, I., Langrené, N., Loeper, G., & Ning, W. (2022). Robust utility maximization under model uncertainty via a penalization approach. *Mathematics and Financial Economics*, 16(1), 51–88.

Guo, I., & Loeper, G. (2021). Path dependent optimal transport and model calibration on exotic derivatives. *Annals of Applied Probability*, 31(3), 1232–1263.

Guo, I., Koolen, J. H., Markowsky, G., & Park, J. (2020). On the nonexistence of pseudo-generalized quadrangles. *European Journal of Combinatorics*, 89, 103128.

Siu, C. C., Guo, I., Zhu, S. P., & Elliott, R. J. (2019). Optimal execution with regime-switching market resilience. *Journal of Economic Dynamics and Control*, 101, 17–40.

Guo, I., & Loeper, G. (2018). Pricing bounds for volatility derivatives via duality and least squares Monte Carlo. *Journal of Optimization Theory and Applications*, 179(2), 598–617.

Zeng, XC, Guo, I., & Zhu, SP. (2017). Pricing European options on regime-switching assets: a comparative study of Monte Carlo and finite-difference approaches. *The ANZIAM Journal*, 59(2), 183–199.

Guo, I., & Zhu S-P,. (2017). Equal Risk Pricing under Convex Trading Constraints. *Journal of Economic Dynamics and Control*, 76, 136–151.

Guo, I., & Rutkowski, M. (2017). Arbitrage-free pricing of multi-person game claims in discrete time. *Finance and Stochastics*, 21(1), 111–155.

Guo, I., & Rutkowski, M. (2016). Discrete time stochastic multi-player competitive games with affine payoffs. *Stochastic Processes and their Applications*, 126(1), 1–32.

Buryak, A., & Guo, I. (2014). Effective and simple VWAP options pricing model. *International Journal of Theoretical and Applied Finance*, 17(06), 1450036.

Guo, I. W., & Rutkowski, M. (2012). A zero-sum competitive multi-player game. *Demonstratio Mathematica*, 45(2), 415–433.

Buryak, A., & Guo, I. (2012). New analytic approach to address put-call parity violation due to discrete dividends. *Applied Mathematical Finance*, 19(1), 37–58.

Book Chapters

Guo, I., Loeper, G., & Wang, S. (2019). Local volatility calibration by optimal transport. In *2017 MATRIX Annals* (pp. 51–64). Springer, Cham.

Guo, I., & Rutkowski, M. (2014). Discrete-time multi-player stopping and quitting games with redistribution of payoffs. In: *Arbitrage, Credit and Informational Risks, C. Hillairet, M. Jeanblanc and Y. Jiao, eds.*, World Scientific, Singapore, 171–206.

Preprints

Guo, I., & Obłój, J. (2025). Robust Pricing and Hedging of American Options in Continuous Time. arXiv preprint arXiv:2510.05463.

Aksamit, A., Das, K., Guo, I., Nam, K., & Zhou, Z. (2025). Switching to a Green and sustainable finance setting: a mean field game approach. arXiv preprint arXiv:2503.06967.

Aksamit, A., Guo, I., Liu, S., & Zhou, Z. (2023). Superhedging duality for multi-action options under model uncertainty with information delay. arXiv preprint arXiv:2111.14502v2.

Guo, I., Langrené, N., Loeper, G., & Ning, W. (2021). Deep semi-martingale optimal transport. *arXiv preprint* arXiv:2103.03628.

Guo, I. (2020). On Dynkin Games with Unordered Payoff Processes. *arXiv preprint* arXiv:2008.06882.

Industry Papers

Guo, I., Loeper, G., Obłój, J., & Wang, S. (2022). Optimal Transport for Model Calibration *Risk*.

Guo, I., & Loeper, G. (2020). Efficient Use of Options for Tail Risk Hedging. *Monash CQFIS working paper*.

Guo, I., & Loeper, G. (2019). The volatility risk premium: an empirical study on the S&P 500 index. *Monash CQFIS working paper*.

Research Grants

Australian Research Council (ARC) Discovery Projects

DP220103106, 2022–2025
Can green investors drive the transition to a low emissions economy?, Guo, I., Zhou, Z., Aksamit, A., Nam, K. and Rutkowski, M.

DP170101227, 2017–2020
The role of liquidity in financial markets, Zhu, S., Elliott, R. and Guo, I.

Australian Renewable Energy Agency 2022–2024
Integrating energy storage into the NEM: Bidding, clearing, settlement, dispatch and ancillary markets, Roger, G., Rieger, J., Guo, I., Goeree, J., Karaduman, O. and Pandey, S.

RiskLab Projects — Mathematical Sciences (Hamza) 2020–2022
Zhu, Z., Klebaner, F., Guo, I., Hamza, K., Lee, G., Dong, W. and Langrené, N.

Sydney Mathematical Research Institute (SMRI) 2022
Domestic Visitor Program

CQFIS partnership with BNP Paribas 2017–2022

Government of India: Scheme for Promotion of Academic and Research Collaboration, 2019–2021
Development of efficient computational techniques for convection-diffusion-reaction type problems in econophysics, Mishra, C., Mishra, M., Loeper, G. and Guo, I.

Conference and Event Organisation

Monash QGroup Colloquium, annually, 2023–present

Mathematics Industry Study Group (MISG), 2024

Spring camp in financial mathematics, Jervis Bay, 2023

Financial Mathematics Special Session
63rd Annual Meeting of AustMS, Monash University, 2019

Research Talks

Superhedging Duality with Liquid Multi-action Options
Quantitative Methods in Finance, 2025

Partially Ordered Peacocks (PCOCs)
69th Annual Meeting of the Australian Mathematical Society, 2025
CIRM Workshop — Advances in Mathematics of Randomness for Handling Risks in Finance and Insurance, 2025

Robust hedging of American options in continuous time
MATRIX Workshop — Mathematics of Risk, 2025
BNP Paribas Futures of Quantitative Finance Seminar, 2025
LPSM Seminar — Mathématiques financières et actuarielles, probabilités numériques, 2025
12th General AMaMeF Conference, Verona, 2024
Quantitative Methods in Finance Conference, Sydney, 2024
BIRS Workshop — Stochastic Mass Transports, Banff/Online, 2022
NUS-USyd-NUSRI workshop, 2021

Model Calibration via Optimal Transport
Sydney Financial Mathematics Workshop, 2025

Path-dependent/Semimartingale optimal transport with applications
Vienna Seminar in Mathematical Finance and Probability, 2025
Seminars in Insurance and Economics, University of Copenhagen, 2025
Stochastic Analysis & Mathematical Finance Seminars, University of Oxford, 2024
Stochastics and Finance Seminar, University of Sydney, 2020

From Hahn-Banach to Monge-Kantorovich
Monash University School of Mathematics All-School Seminar, 2024

An Efficient Frontier of Wealth Distributions with Connections to Utility Maximisation
67$^{\text{th}}$ Annual Meeting of AustMS, University of Queensland, 2023
Spring camp in financial mathematics, Jervis Bay, 2023
Minisymposium on Optimal Transport and Applications in Mathematical Finance, SIAM Conference on Financial Mathematics and Engineering, Philadelphia, 2023

Machine Learning Algorithms in Finance
Lecture series, MATRIX: Mathematics of Risk, 2022

Stochastic Optimal Transport in Financial Mathematics
Sydney Mathematical Research Institute (SMRI) Seminar, 2022

Designing Allweather Overlays
BNP Paribas QIS Forum — Quant meets Tech, 2019

Convex duality in robust hedging and optimal stopping problems
63rd Annual Meeting of AustMS, Monash University, 2019

Path dependent optimal transport and model calibration on exotic derivatives
7th Asian Quantitative Finance Conference, Hanoi, 2019

The volatility risk premium: an empirical study on equity indices
Monash-QGroup Colloquium, Melbourne, 2019
Victorian Funds Management Corporation Seminar, 2019

Calibrating volatility to exotic derivatives: a variational approach
Quantitative Methods in Finance Conference, Sydney, 2018

Machine learning in stochastic optimal transport and volatility calibration
6th NUS-USPC Workshop on Machine Learning and FinTech, NUS, 2018
Mixed PDE / least squares Monte Carlo methods for option pricing
Arbitrage-free pricing of multi-person game options
Statistics and Probability Seminars, Monash University, 2017

Least-squares Monte Carlo and duality methods for VIX forwards
Mini Conference on Numerical Methods, University of Melbourne 2016

Equal risk pricing under convex trading constraints and the short selling ban
Quantitative Methods in Finance Conference, Sydney, 2015
University of Wollongong Financial Mathematics Seminar, 2015
University of Sydney Financial Mathematics Seminar, 2015

Multi-player Dynkin games and multi-person game options
University of Sydney Financial Mathematics Seminar, 2013
Bachelier Finance Society Congress, Sydney, 2012
55th Annual Meeting of AustMS, University of Wollongong, 2011
54th Annual Meeting of AustMS, University of Queensland, 2010

An Asymptotic Expansion Method for Pricing Exotics
The Pedersen Method for Calibrating Libor Market Model
NAB Market Risk Quantitative Support Group Seminars, 2007, 2010

3 Teaching and Supervision

University Teaching	**AMSI Summer School**: Machine Learning in Financial Mathematics, 2022; Statistical Machine Learning, 2018
	Monash University: MTH3251/ETC3510/ETC5351 Financial Mathematics / Modelling in Finance and Insurance, 2018–present; MTH5230 Markov Chains and Random Walks, 2021–present; MTH5540 Statistical Learning in Finance, 2016–2017; MTH5510 The Mathematics of Finance: From Derivatives to Risk, 2016
	University of Sydney: AMH4 Advanced Option Pricing, 2015; MATH2070/2970 Optimization and Financial Mathematics, 2012; MATH2061 Linear Mathematics and Vector Calculus, Summer School, 2012–2014
	SPARC Indo-Australian online lecture series, IIT Ropar Introduction to Stochastic Calculus and Financial Mathematics, 2021
Research Supervision	**Monash University**
	Postdoctoral Research Associate: Kaustav Das, 2022–2025 Research Assistant: Shiyi Wang, 2022; Kaustav Das, 2021 PhD: Patrick Schmidt, 2026–present; Siwei Feng, 2026–present; Chi Chan, 2025–present; Shidan Liu, 2020–2025; Shijia Jin, 2019–2025; Jiaohao Wu, 2020–2024; Wei Ning, 2017–2021; Shiyi Wang, 2017–2021 Honours: Vladimir Mihko, 2022; Aidan Butler, 2021; Shidan Liu, 2019–2020; Antony Kennett, 2018; Bryan Ladowsky, 2017; Shiyi Wang, 2016–2017 Masters: Shuhan Cui, 2025; Bowen Yang, 2024; Xiao Sa, 2019; Jiaohao Wu, 2018 Visiting Research Intern: Taha Khn-nous (ENSTA Paris), 2026; Sithea Nou (Ecole Polytechnique), 2019; Dinh-Toan Nguyen (Ecole Polytechnique), 2018; Erwan Kergall (ENSTA ParisTech), 2017
	University of Wollongong
	PhD: Xiangchen Zeng, 2014–2017; Honours: Ashlee Davis, 2015

4 Other Awards and Scholarships

Mathematical Competitions	**International Mathematical Olympiad**: Gold Medal, 2004; Bronze Medal 2003 Numerous medals, prizes and perfect scores in various mathematical competitions.
Postgraduate	Australian Postgraduate Award, 2009–2012 University of Sydney Vice-Chancellor's Research Scholarship, 2009 Helen Beh Citizenship Award, 2013
Undergraduate	K E Bullen Memorial Prize for Applied Mathematics, 2008 Norbert Quirk Prize for Best Honours Essay, 2008 The University of Sydney Scholarship with Merit, 2005–2008 K E Bullen Scholarship, 2007 George Allen Scholarship, 2007 Barker Scholarship, 2005
Enrichment	BH Neumann Award, Australian Mathematics Trust, 2018

5 Services and Other Activities

Services

International Mathematical Olympiad
Problem Selection Committee (PSC) and Coordinator, 2023–2026
Chair of PSC and Chief Coordinator, 2025

Australian Mathematical Olympiad Committee (AMOC), 2008–present,
Deputy leader of the Australian IMO team, 2009–2013; Leader in 2011;
School of Excellence, IMO Selection School, IMO Team Mentor Program

AMOC Senior Problems Committee, 2007–present; Chair: 2020–present

AMSI Summer School Standing Committee, 2018–present

Simon Marais Mathematics Competition, 2018–present
Organising Committee, 2018–2021; Problems Committee, 2022–present
An international undergraduate mathematics competition

Asia Pacific Mathematics Newsletter Problem Corner, 2013–2017

Australian Mathematical Society Gazette Puzzle Corner, 2010–2015

Journal Referee: The Annals of Applied Probability, Finance and Stochastics, Stochastic Processes and Applications, SIAM Journal on Financial Mathematics, Quantitative Finance, International Journal of Theoretical and Applied Finance, The MATRIX Annals, The ANZIAM Journal.

Climate Change Science Hub, Node Lead, 2025–present.

Monash University: Faculty Postgraduate Coursework Committee (PGCC); School Education Committee, Research Committee, Fellowship Committee.

General Interest Talks

A tale of tiles
Monash University Open Day, 2024

Dualities in financial mathematics
AustMS Early-Career Workshop, Online, 2021

Brouwer's fixed-point theorem
LunchMaths, Monash University, 2017

Multi-person redistribution games
From the hexagons of Pascal to the cubics of Cayley-Bacharach
University of Sydney Postgraduate Seminars, 2010, 2013

Farey fractions
University of New South Wales Postgraduate Seminar, 2009

Lengths, areas and projections
A collection of hat puzzles
Tiling problems
The divine ratio
Hats, buckets and Pascal's triangle
Crazy triangle properties
Sydney University Mathematics Society (SUMS) talks, 2009–2014

Outreach

Monash University Science Postgraduate Events, 2022–2024
Monash University Science Alumni Webinar Chair, 2021
Monash University Open Day, 2017, 2019, 2024
AMSI Summer School Careers Afternoon, 2018
Monash University Science Industry Night, 2017
AMOC Primary School Workshop, 2013–2015
Mathematics Club Workshop, Trinity Grammar School, Sydney, 2015
International Pi Day, Australian Museum, Sydney, 2014
University of Wollongong Maths Explorer Day, 2010–2013
SUMS Puzzle Hunt, Puzzle writer and Coordinator 2009–2013