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Qikun Xiang
RESEARCH FELLOW

Research Interests

- Numerical algorithms for optimal transport and related problems
- Distributionally robust optimization
- Operations research
- Mathematical finance

Employment

07.2023 – Present

School of Physical and Mathematical Sciences, Nanyang Technological University, Singapore

Research Fellow (since 02.2024)

Research Associate (07.2023 – 02.2024)

Supervisor: Ariel Neufeld
Project title: Numerical methods in operations research and financial mathematics

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Education

07.2019 – 12.2023

Nanyang Technological University, Singapore
PhD in Mathematics

Supervisor: Ariel Neufeld
Thesis title: Numerical methods for model-free pricing in finance, optimal transport, and cyber risk management
GPA: 5.00/5.00

09.2017 – 07.2019

Swiss Federal Institute of Technology in Zurich (ETH Zurich), Switzerland
Master of Science in Statistics with distinction

Applied area: Finance and Insurance
GPA: 5.90/6.00

08.2013 – 05.2017

Nanyang Technological University, Singapore
B.Eng. in Computer Science with First Class Honours

Specialization area: Intelligent Systems
GPA: 4.84/5.00

Honours and Awards	06.2024	**Singapore Mathematical Society Medal in Mathematical Sciences Academic Year 2023–2024** Awarded for the best PhD thesis in Mathematical Sciences from the School of Physical & Mathematical Sciences and the National Institute of Education
	04.2023	**Student Travel Award for the SIAM Conference on Optimization (OP23)**
	07.2022	**Finalist for the Best Student Paper, European Conference on Stochastic Optimization–Computational Management Science Conference (ECSO–CMS)** Paper title: Numerical method for approximately optimal solutions of two-stage distributionally robust optimization with marginal constraints
	03.2022	**Student Travel Award for the SIAM Conference on Uncertainty Quantification (UQ22)**
	05.2021	**Student Travel Award for the SIAM Conference on Financial Mathematics and Engineering (FM21)**
	06.2017	**Information Technology Management Association Gold Medal Cum Book Prize** Awarded by the School of Computer Science and Engineering, Nanyang Technological University for exceptional performance in the Final Year Project
	08.2016 08.2015 08.2014	**Dean's List** Awarded by the School of Computer Science and Engineering, Nanyang Technological University to the top 5% of the cohort

Journal Publications	2024	Shunan Sheng, Qikun Xiang, Ido Nevat, and Ariel Neufeld, "Binary spatial random field reconstruction from non-Gaussian inhomogeneous time-series observations", *Journal of the Franklin Institute*, vol. 361, no. 2, pp. 612–636, 2024, doi: 10.1016/j.jfranklin.2023.12.016.
	2023	Qikun Xiang, Ariel Neufeld, Gareth W. Peters, Ido Nevat, and Anwitaman Datta, "A Bonus-Malus framework for cyber risk insurance and optimal cybersecurity provisioning", *European Actuarial Journal*, 2023, doi: 10.1007/s13385-023-00366-0.
		Ariel Neufeld, Antonis Papapantoleon, and Qikun Xiang, "Model-free bounds for multi-asset options using option-implied information and their exact computation", *Management Science*, vol. 69, no. 4, pp. 2051–2068, 2023, doi: 10.1287/mnsc.2022.4456.
	2020	Qikun Xiang, Ido Nevat, and Gareth W. Peters, "Bayesian spatial field reconstruction with unknown distortions in sensor networks", *IEEE Transactions on Signal Processing*, vol. 68, pp. 4336–4351, 2020, doi: 10.1109/TSP.2020.3011023.

Preprints

2023	Ariel Neufeld and Qikun Xiang, "Feasible approximation of matching equilibria for large-scale matching for teams problems", Preprint, arXiv:2308.03550, 2023.
2022	Ariel Neufeld and Qikun Xiang, "Numerical method for approximately optimal solutions of two-stage distributionally robust optimization with marginal constraints", Preprint, arXiv:2205.05315, 2022.
	Ariel Neufeld and Qikun Xiang, "Numerical method for feasible and approximately optimal solutions of multi-marginal optimal transport beyond discrete measures", Preprint, arXiv:2203.01633, 2022.

Conference Publications

| 2017 | Qikun Xiang, Jie Zhang, Ido Nevat, and Pengfei Zhang, "A trust-based mixture of Gaussian processes model for reliable regression in participatory sensing", *26th International Joint Conference on Artificial Intelligence (IJCAI)*, 2017. |
| | Qikun Xiang, Jie Zhang, Ido Nevat, and Pengfei Zhang, "A trust-based mixture of Gaussian processes model for robust participatory sensing" (extended abstract), *16th International Conference on Autonomous Agents and Multiagent Systems (AAMAS)*, 2017. |

Talks at International Conferences

07.2023	**Paper Presentation** 7th International Conference on Mathematics in Finance, Berg-en-Dal Rest Camp, Kruger National Park, South Africa
06.2023	**Paper Presentation** SIAM Conference on Optimization (OP23), Seattle, Washington, United States
09.2022	**Paper Presentation (virtual)** SIAM Conference on Mathematics of Data Science (MDS22)
07.2022	**Paper Presentation** European Conference on Stochastic Optimization – Computational Management Science Conference (ECSO-CMS), Venice, Italy Finalist for the Best Student Paper to: Numerical method for approximately optimal solutions of two-stage distributionally robust optimization with marginal constraints
06.2022	**Paper Presentation (virtual)** 11th World Congress of the Bachelier Finance Society
04.2022	**Paper Presentation** SIAM Conference on Uncertainty Quantification (UQ22), Atlanta, Georgia, United States
07.2021	**Paper Presentation (virtual)** 24th International Congress on Insurance: Mathematics and Economics (IME)
06.2021	**Paper Presentation (virtual)** SIAM Conference on Financial Mathematics and Engineering (FM21)

01.2021	**Poster Presentation (virtual)**	
	XXII Workshop on Quantitative Finance	
08.2020	**Pre-recorded Presentation**	
	Bernoulli-IMS One World Symposium 2020	
08.2017	**Paper Presentation**	
	26th International Joint Conference on Artificial Intelligence (IJCAI), Melbourne, Australia	

Research Supervision

2022 – Present — **Co-supervisor of Zeyi Chen (Undergraduate Research Student)**

- Collaborated on a research project about numerical methods for optimal transport and Wasserstein barycenter.
- Provided guidance in the initial project direction, the mathematical background, and the theoretical development in the project.
- Assisted in the writing of the manuscript.

2020 – 2022 — **Co-supervisor of Shunan Sheng (Undergraduate Research Student)**

- Collaborated on a research project about numerical methods for spatial random field reconstruction.
- Provided guidance in the initial project direction and the mathematical development.
- Assisted in the writing and review of the manuscript.
- Produced the journal publication: Shunan Sheng, Qikun Xiang, Ido Nevat, and Ariel Neufeld, "Binary spatial random field reconstruction from non-Gaussian inhomogeneous time-series observations", *Journal of the Franklin Institute*, vol. 361, no. 2, pp. 612–636, 2024, doi: 10.1016/j.jfranklin.2023.12.016.

Teaching Experience

2020 – 2022 — **Teaching Assistant at School of Physical and Mathematical Sciences, Nanyang Technological University, Singapore**

- Taught the exercise classes of the undergraduate Discrete Mathematics course for three semesters.
- Taught the exercise classes of the undergraduate Real Analysis I course for one semester.

Languages

Chinese Mandarin	Native language
English	Fluent (TOEFL iBT 115)

Programming Languages

MATLAB, Java, C++