

Qikun Xiang

RESEARCH FELLOW

Research Interests

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

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 – 06.2017 **Nanyang Technological University, Singapore**
B.Eng. in Computer Science with First Class Honours

Specialization area: Intelligent Systems
GPA: 4.84/5.00

Journal Publications

- 2026 Ariel Neufeld and Qikun Xiang, "Numerical method for feasible and approximately optimal solutions of multi-marginal optimal transport beyond discrete measures", *Foundations of Computational Mathematics* (to appear).
- Zeyi Chen, Ariel Neufeld, and Qikun Xiang, "Provably convergent stochastic fixed-point algorithm for free-support Wasserstein barycenter of continuous non-parametric measures", *Mathematical Programming* (to appear).
- 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.
- 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*, vol.14, no. 2, pp. 581–621, 2024, doi: 10.1007/s13385-023-00366-0.
- 2023 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.
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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.
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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.

Honours and Awards

07.2024	First-Place Winner for the Best Student Paper Prize, European Conference on Stochastic Optimization and Computational Management Science (ECISO-CMS 2024) Paper title: Feasible approximation of matching equilibria for large-scale matching for teams problems
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, Nanyang Technological University
04.2023	Student Travel Award for the SIAM Conference on Optimization (OP23)
07.2022	Finalist for the Best Student Paper Prize, European Conference on Stochastic Optimization and Computational Management Science (ECISO-CMS 2022) 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

Talks at International Conferences

07.2025	INFORMS International Meeting, Singapore
05.2025	Shanghai Jiao Tong University Forum on AI for Math, Shanghai, China
07.2024	European Conference on Stochastic Optimization and Computational Management Science (ECISO-CMS 2024), Stockholm, Sweden <ul style="list-style-type: none"> First-Place Winner for the Best Student Paper Prize to "Feasible approximation of matching equilibria for large-scale matching for teams problems"
07.2024	33 rd European Conference on Operational Research (EURO 2024), Copenhagen, Denmark
07.2023	7 th International Conference on Mathematics in Finance, Berg-en-Dal Rest Camp, Kruger National Park, South Africa
06.2023	SIAM Conference on Optimization (OP23), Seattle, Washington, United States
09.2022	(virtual) SIAM Conference on Mathematics of Data Science (MDS22)

07.2022	European Conference on Stochastic Optimization and Computational Management Science (ECSSO-CMS 2022), Venice, Italy <ul style="list-style-type: none"> Finalist for the Best Student Paper Prize to "Numerical method for approximately optimal solutions of two-stage distributionally robust optimization with marginal constraints"
06.2022	(virtual) 11 th World Congress of the Bachelier Finance Society
04.2022	SIAM Conference on Uncertainty Quantification (UQ22), Atlanta, Georgia, United States
07.2021	(virtual) 24 th International Congress on Insurance: Mathematics and Economics (IME)
06.2021	(virtual) SIAM Conference on Financial Mathematics and Engineering (FM21)
01.2021	(virtual) XXII Workshop on Quantitative Finance
08.2020	(virtual) Bernoulli-IMS One World Symposium 2020
08.2017	26 th International Joint Conference on Artificial Intelligence (IJCAI), Melbourne, Australia

Research Supervision

2022 – 2024	Co-supervisor of Zeyi Chen (Undergraduate Research Student) <ul style="list-style-type: none"> 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. Produced the journal publication: Zeyi Chen, Ariel Neufeld, and Qikun Xiang, "Provably convergent stochastic fixed-point algorithm for free-support Wasserstein barycenter of continuous non-parametric measures", <i>Mathematical Programming</i> (to appear).
2020 – 2022	Co-supervisor of Shunan Sheng (Undergraduate Research Student) <ul style="list-style-type: none"> 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", <i>Journal of the Franklin Institute</i>, vol. 361, no. 2, pp. 612–636, 2024, doi: 10.1016/j.jfranklin.2023.12.016.

Teaching

2020 – 2022	Teaching Assistant at School of Physical and Mathematical Sciences, Nanyang Technological University, Singapore <ul style="list-style-type: none"> 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.
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Languages

Chinese Mandarin Native language

English Fluent (TOEFL iBT 115)

Programming Languages

MATLAB, Python, Java, C++