

# 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

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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

07.2024	<b>First-Place Winner for the Best Student Paper Prize, European Conference on Stochastic Optimization and Computational Management Science (ECSO-CMS 2024)</b> Paper title: Feasible approximation of matching equilibria for large-scale matching for teams problems
06.2024	<b>Singapore Mathematical Society Medal in Mathematical Sciences Academic Year 2023–2024</b> 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	<b>Student Travel Award for the SIAM Conference on Optimization (OP23)</b>
07.2022	<b>Finalist for the Best Student Paper Prize, European Conference on Stochastic Optimization and Computational Management Science (ECSO-CMS 2022)</b> Paper title: Numerical method for approximately optimal solutions of two-stage distributionally robust optimization with marginal constraints
03.2022	<b>Student Travel Award for the SIAM Conference on Uncertainty Quantification (UQ22)</b>
05.2021	<b>Student Travel Award for the SIAM Conference on Financial Mathematics and Engineering (FM21)</b>
06.2017	<b>Information Technology Management Association Gold Medal Cum Book Prize</b> 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	<b>Dean's List</b> Awarded by the School of Computer Science and Engineering, Nanyang Technological University to the top 5% of the cohort

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## Journal Publications

2024	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.  Qikun Xiang, Ariel Neufeld, Gareth W. Peters, Ido Nevat, and Anwitaman Datta, "A Bonus-Malus framework for cyber risk insurance and optimal cybersecurity provisioning", <i>European Actuarial Journal</i> , 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", <i>Management Science</i> , 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", <i>IEEE Transactions on Signal Processing</i> , vol. 68, pp. 4336–4351, 2020, doi: 10.1109/TSP.2020.3011023.

<b>Preprints</b>	2023	Ariel Neufeld and Qikun Xiang, "Feasible approximation of matching equilibria for large-scale matching for teams problems", Preprint, arXiv:2308.03550, 2023.
	2022	<p>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.</p> <p>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.</p>
<b>Conference Publications</b>	2017	Qikun Xiang, Jie Zhang, Ido Nevat, and Pengfei Zhang, "A trust-based mixture of Gaussian processes model for reliable regression in participatory sensing", <i>26th International Joint Conference on Artificial Intelligence (IJCAI)</i> , 2017.
		Qikun Xiang, Jie Zhang, Ido Nevat, and Pengfei Zhang, "A trust-based mixture of Gaussian processes model for robust participatory sensing" (extended abstract), <i>16th International Conference on Autonomous Agents and Multiagent Systems (AAMAS)</i> , 2017.
<b>Talks at International Conferences</b>	07.2024	<p><b>Paper Presentation</b> European Conference on Stochastic Optimization and Computational Management Science (ECSCO-CMS 2024), Stockholm, Sweden</p> <ul style="list-style-type: none"> <li>o First-Place Winner for the Best Student Paper Prize to "Feasible approximation of matching equilibria for large-scale matching for teams problems"</li> </ul>
	07.2024	<p><b>Paper Presentation</b> 33<sup>rd</sup> European Conference on Operational Research (EURO 2024), Copenhagen, Denmark</p>
	07.2023	<p><b>Paper Presentation</b> 7<sup>th</sup> International Conference on Mathematics in Finance, Berg-en-Dal Rest Camp, Kruger National Park, South Africa</p>
	06.2023	<p><b>Paper Presentation</b> SIAM Conference on Optimization (OP23), Seattle, Washington, United States</p>
	09.2022	<p><b>Paper Presentation (virtual)</b> SIAM Conference on Mathematics of Data Science (MDS22)</p>
	07.2022	<p><b>Paper Presentation</b> European Conference on Stochastic Optimization and Computational Management Science (ECSCO-CMS 2022), Venice, Italy</p> <ul style="list-style-type: none"> <li>o Finalist for the Best Student Paper Prize to "Numerical method for approximately optimal solutions of two-stage distributionally robust optimization with marginal constraints"</li> </ul>
	06.2022	<p><b>Paper Presentation (virtual)</b> 11<sup>th</sup> World Congress of the Bachelier Finance Society</p>

04.2022	<b>Paper Presentation</b> SIAM Conference on Uncertainty Quantification (UQ22), Atlanta, Georgia, United States
07.2021	<b>Paper Presentation (virtual)</b> 24 <sup>th</sup> International Congress on Insurance: Mathematics and Economics (IME)
06.2021	<b>Paper Presentation (virtual)</b> SIAM Conference on Financial Mathematics and Engineering (FM21)
01.2021	<b>Poster Presentation (virtual)</b> XXII Workshop on Quantitative Finance
08.2020	<b>Pre-recorded Presentation</b> Bernoulli-IMS One World Symposium 2020
08.2017	<b>Paper Presentation</b> 26 <sup>th</sup> International Joint Conference on Artificial Intelligence (IJCAI), Melbourne, Australia

## Research Supervision

2022 – Present	<b>Co-supervisor of Zeyi Chen (Undergraduate Research Student)</b> <ul style="list-style-type: none"> <li>Collaborated on a research project about numerical methods for optimal transport and Wasserstein barycenter.</li> <li>Provided guidance in the initial project direction, the mathematical background, and the theoretical development in the project.</li> <li>Assisted in the writing of the manuscript.</li> </ul>
2020 – 2022	<b>Co-supervisor of Shunan Sheng (Undergraduate Research Student)</b> <ul style="list-style-type: none"> <li>Collaborated on a research project about numerical methods for spatial random field reconstruction.</li> <li>Provided guidance in the initial project direction and the mathematical development.</li> <li>Assisted in the writing and review of the manuscript.</li> <li>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.</li> </ul>

## Teaching Experience

2020 – 2022	<b>Teaching Assistant at School of Physical and Mathematical Sciences, Nanyang Technological University, Singapore</b> <ul style="list-style-type: none"> <li>Taught the exercise classes of the undergraduate Discrete Mathematics course for three semesters.</li> <li>Taught the exercise classes of the undergraduate Real Analysis I course for one semester.</li> </ul>
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## Languages

Chinese Mandarin Native language

English Fluent (TOEFL iBT 115)

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## Programming Languages

MATLAB, Java, C++