Xingyu Wang

Contact Information

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Research Interests

- Rare Event Analysis, Large Deviations, Metastability, Heavy Tails
- Machine Learning
- Stochastic Simulation
- Hawkes Processes

Employment

University of Amsterdam, Amsterdam School of Economics — Amsterdam, NL

- Postdoc Researcher, Quantitative Economics — 2024 - Present
  Hosts: Roger J.A. Laeven, Bert Zwart

Education

Northwestern University, McCormick School of Engineering — Evanston, IL, US

- Ph.D. in Industrial Engineering and Management Sciences — 2018 - 2024
  Advisor: Chang-Han Rhee
- M.S. in Analytics — 2016 - 2017

Peking University — Beijing, China

- B.S. in Psychology and Applied Mathematics — 2011 - 2016

Submitted and Working Papers

($\alpha - \beta$: alphabetical authorship)

Strongly Efficient Rare-Event Simulation for Regularly Varying Lévy Processes with Infinite Activities [preprint]
Xingyu Wang, Chang-Han Rhee
Major Revision at *Mathematics of Operations Research*; `arXiv:2309.13820`

Large Deviations and Metastability Analysis for Heavy-Tailed Dynamical Systems [preprint]
Xingyu Wang, Chang-Han Rhee
Major Revision at *Annals of Applied Probability*; `arXiv:2307.03479`
George Nicholson Student Paper Competition, Second Place, 2023

Tail Asymptotics of Cluster Sizes in Multivariate Heavy-Tailed Hawkes Processes [preprint]
($\alpha - \beta$) Jose Blanchet, Roger J. A. Laeven, Xingyu Wang, Bert Zwart
Submitted to *Annals of Applied Probability*; `arXiv:2503.01004`

Sample Path Large Deviations for Multivariate Heavy-Tailed Hawkes Processes and Related Lévy Processes [preprint]
($\alpha - \beta$) Jose Blanchet, Roger J. A. Laeven, Xingyu Wang, Bert Zwart
Submitted to *Bernoulli*; `arXiv:2503.01004`

Conference Papers

Multi-agent Multi-armed Bandit with Fully Heavy-tailed Dynamics [preprint]
Xingyu Wang, Mengfan Xu;
To appear at *Winter Simulation Conference (WSC), 2025*

Importance Sampling Strategy for Heavy-Tailed Systems with Catastrophe Principle [pdf]

Xingyu Wang, Chang-Han Rhee
Proceedings of Winter Simulation Conference (WSC), 2023

Eliminating Sharp Minima from SGD with Truncated Heavy-Tailed Noises [pdf]

Xingyu Wang, Sewoong Oh, Chang-Han Rhee
Proceedings of International Conference on Learning Representations (ICLR), 2022
***Nemhauser Prize for Best Student Paper**, 2022*

Keyword-Based Topic Modeling and Keyword Selection [pdf]

Xingyu Wang, Lida Zhang, Diego Klabjan
Proceedings of IEEE Big Data, 2021

Efficient Rare-Event Simulation for Multiple Jump Events in Regularly Varying Lévy Processes with Infinite Activities [pdf]

Xingyu Wang, Chang-Han Rhee
Proceedings of Winter Simulation Conference (WSC), 2020

Competitive Multi-Agent Inverse Reinforcement Learning with Sub-Optimal Demonstrations [pdf]

Xingyu Wang, Diego Klabjan
Proceedings of International Conference on Machine Learning (ICML), 2018

Honors and Awards

- **Nemhauser Best Dissertation Prize**, Northwestern University 2025
- **George Nicholson Student Paper Competition, Second Place**, INFORMS 2023
- **Terminal Year Fellowship**, Northwestern University 2023
- **Nemhauser Prize for Best Student Paper**, Department of Industrial Engineering and Management Sciences, Northwestern University 2022
- **Benjamin A. Sachs Graduate Fellowship**, Northwestern University 2022
- **Arthur P. Hurter Award for Academic Excellence among First Year Graduate Students**, Department of Industrial Engineering and Management Sciences, Northwestern University 2019
- **Lee Wai Wang Scholarship**, Department of Psychology, Peking University 2015
- **National Scholarship for Undergraduates**, Department of Psychology, Peking University 2013

Invited Presentations

Large Deviations for Multivariate Heavy-Tailed Hawkes Processes

- INFORMS Annual Meeting, Atlanta, GA Scheduled for Oct, 2025
- Seminar at School of Mathematics and Statistics, Beijing Institute of Technology Apr, 2025
- Stochastic Seminars at Korteweg-de Vries Institute for Mathematics, Amsterdam, NL Feb, 2025

Sharp Characterization and Control of Global Dynamics of SGDs with Heavy Tails

- University of Copenhagen, Statistics Seminar Sep, 2025
- Monte Carlo Methods 2025, Chicago, IL July, 2025
- Applied Probability Society Conference 2025, Atlanta, GA July, 2025
- Bayes Comp 2025, Singapore Jun, 2025

- Data-Driven Queueing Challenges Conference, Eindhoven, NL — Nov, 2024
- INI Satellite Programme on Heavy Tails in Machine Learning, London, UK — Apr, 2024
- Cornell University, ORIE, Ithaca, NY — Feb, 2024
- University of Pittsburgh, Industrial Engineering, Pittsburgh, PA — Jan, 2024
- SNAPP Seminar, Lightning Talk Session, Virtual [video] — Dec, 2023

Importance Sampling Strategy for Heavy-Tailed Systems with Catastrophe Principle

- Winter Simulation Conference (Advanced Tutorial), San Antonio, TX — Dec, 2023

Large Deviation and Metastability Analysis for Heavy-Tailed Dynamical Systems

- Neurips 2023, Heavy Tails in ML Workshop (Poster), New Orleans, LA — Dec, 2023
- INFORMS Annual Meeting, Phoenix, AZ — Oct, 2023
- Cornell ORIE Young Researchers Workshop, Ithaca, NY — Oct, 2023

Eliminating Sharp Minima from SGD with Truncated Heavy-Tailed Noises

- INFORMS Annual Meeting, Phoenix, AZ — Oct, 2023
- Applied Probability Society Conference 2023, Nancy, France — Jun, 2023
- INFORMS Annual Meeting, Indianapolis, IN — Oct, 2022
- International Conference on Learning Representations (2022), Virtual — Apr, 2022
- DeepMath (2021), Virtual — Nov, 2021

Efficient Rare-Event Simulation for Multiple Jump Events in Regularly Varying Lévy Processes with Infinite Activities

- Winter Simulation Conference, Virtual — Dec, 2020
- INFORMS Annual Meeting, Virtual — Nov, 2020

TEACHING EXPERIENCE

Theses Supervisor

- UvA, Master's Theses, Actuarial Science and Mathematical Finance — 2025
- UvA, Bachelor's Theses, Actuarial Science — 2025

Instructor

- IEMS Bootcamp (Probability) for PhD Students — 2022 Fall, 2023 Fall

Teaching Assistant

- UvA Introduction to Data Science — 2025
- UvA Non-Life Insurance: Statistical Techniques and Data Analytics — 2024, 2025
- NU IEMS 317 Discrete Event Systems Simulation — 2022 Winter; 2021 Winter
- NU IEMS 315 Stochastic Models — 2021 Spring, Fall; 2020 Spring, Fall

Course Grader

- NU OPNS 450 Decision Models & Prescriptive Analytics — 2022 Winter
- NU IEMS 435 Stochastic Simulation — 2020 Winter

Services

- Referee: *Operations Research, Management Science, INFORMS Journal on Computing, SIAM Journal on Optimization, Communications Physics, ICML (2025), Winter Simulation Conference (2023, 2025)*
- Volunteer: *NU MORE-REACH panel (2024)*
- Webmaster: *Stochastic Networks, Applied Probability, and Performance (SNAPP) seminar (2023 - 2024)*
- Mentor: *1st-year mentorship program at NU INFORMS Student Chapter (2020, 2021)*

Industrial Experience

Graduate Student Analytics Consultant, Chicago Park District — Chicago, IL
Oct 2016 - May 2017

Data Analyst Intern, 17zuoye (aka Homework Together) — Beijing, China
Aug - Dec 2015