Ziran Liu

zliu@stern.nyu.edu +1 (646) 961-8656 sites.google.com/view/ziranliu

Education

New York University, Leonard N. Stern School of Business
Ph.D. in Operations Research 2016 – 2023
GPA: 3.91/4.0 — Focus: Probability and Its Applications

New York University, Courant Institute of Mathematical Sciences
M.S. in Mathematics 2014 – 2016
GPA: 3.93/4.0 — Focus: Probability and Differential Geometry

Nankai University, Chern Institute of Mathematics
M.S. in Mathematics 2011 – 2014
GPA: 4.0/4.0 — Focus: Differential Geometry, Global Analysis on Manifolds

Nankai University, School of Mathematical Sciences
B.S. in Mathematics 2007 – 2011
GPA: 3.85/4.0 — Shiing-Shen Chern Honor Class

Research Interests

Probability theory, stochastic processes, differential geometry, with applications to operations research, artificial intelligence, and machine learning.

Academic and Professional Experience

Fudan University, Research Institute of Intelligent Complex Systems
Postdoc Researcher Current
- Conducting research on complex systems and stochastic processes, with applications to optimization and intelligent systems. - Collaborating with interdisciplinary teams on mathematical models for system analysis.

SIMIS (Shanghai Institute for Mathematics and Interdisciplinary Sciences)
Postdoc Researcher Current
- Leading research initiatives on mathematical modeling, queueing theory, and stochastic analysis. - Developing solutions to large-scale optimization problems for interdisciplinary projects.

UC Berkeley, Department of Statistics
Lecturer (position terminated due to visa issues) 2024
- Delivered undergraduate courses on probability theory, including topics such as stochastic processes, Markov chains, central limit theorem, and Poisson processes. - Developed teaching materials to strengthen conceptual understanding of random variables and probability applications.

Cardinal Operations
Visiting Scholar 2024
- Conducted research on stochastic processes, reflected Brownian motion, and queueing theory applications. - Collaborated with data science and engineering teams to implement optimization

strategies for operational systems.

New York University, Stern School of Business
Instructor, Operations Management 2019
- Designed and taught undergraduate courses on operations research, focusing on optimization, scheduling, and queueing theory applied to business problems. - Applied real-world case studies to demonstrate theoretical models' relevance to business operations.

New York University, Courant Institute of Mathematical Sciences
Recitation Leader, Mathematics for Economics 2016
- Led problem-solving sessions for students in a course covering combinatorics, probability, and optimization. - Provided practical examples to enhance understanding of mathematical applications in economics.

New York University, Courant Institute of Mathematical Sciences
Teaching Assistant, Analysis III 2015
- Developed lecture notes, graded assignments, and created problem sets for a real analysis course. - Supported students in mastering complex mathematical concepts through targeted tutoring and office hours.

Publications and Preprints

Approaching Prescribed Gaussian Curvature by Discrete Conformality
Submitted, Preprint, 2025

Studies on Reflected Brownian Motion and Its Applications to Geometric Invariants
Ph.D. Thesis, New York University, 2022.

Reflected Brownian Motion with Drift in a Wedge
Peter Lakner, Ziran Liu, Josh Reed, *Queueing Systems: Theory and Applications*, 2023.
Link to article

A Note on Hausdorff Multifractal Spectrum of Log-correlated Gaussian Multiplicative Chaos
Preprint, 2020.

Assortment Optimization: A Near Linear Algorithm for a Type of Choice Modelling Problem
Preprint, 2020.

Gaussian Processes and the Kolmogorov-Wiener Problem
M.S. Thesis, New York University, 2016.

A Lichnerowicz Vanishing Theorem on Non-compact Spin Manifolds with a Type of Lie Group Action
M.S. Thesis (in Chinese), Nankai University, 2014.

A Lichnerowicz Vanishing Theorem for Proper Cocompact Actions
arXiv, 2013. View on arXiv

Recent Conferences and Invited Talks

INFORMS 2024 Annual Meeting, Seattle, WA, USA
- Invited Session: Interacting Particle Systems and Stochastic Networks
- October 23, 2024 — Time: 1:45 PM - 3:00 PM

The 13th National Conference in Probability and Statistics, Xiamen, China
- Invited Session I: Probability II, Advanced Probabilistic Models and Experiment Designs
- November 9, 2024 — Time: 5:20 PM - 6:20 PM

Projects

Sticky Brownian Motion and the Submartingale Problem 2024
- Developed a novel model for sticky Brownian motion constrained to a geometric wedge, extending existing work in stochastic processes. - Addressed a theoretical question raised during the author's Ph.D. defense.

Heavy Traffic Analysis of the Coupled Queue Processor System 2024
- Investigated heavy traffic behavior in a coupled queue system, deriving limiting theorems based on stochastic process theory. - Built on collaborative research with Lakner and Reed to formalize key findings.

Skills

Languages: English (Native/Bilingual), Chinese (Native/Bilingual)
Programming: MATLAB, C++, Python
Certifications: USA Weightlifting (USAW) Certified Coach (Level 1/2)

Awards and Honors

Ernest Kurnow Fellowship, NYU Stern School of Business 2021 – 2022
NYU Stern Doctoral Fellowship, New York University 2016 – 2020
Outstanding Student Prize, Nankai University 2009 – 2010

References

Joshua Reed
Associate Professor and Deputy Chair of Technology, Operations, and Statistics, Leonard N. Stern School of Business,
New York University.
jreed@stern.nyu.edu — Phone: +1 212-998-0584

Paul Bourgade
Professor of Mathematics, Courant Institute of Mathematical Sciences,
New York University.
bourgade@cims.nyu.edu — Phone: +1 212-998-3090

Wenqiang Xiao
Professor of Technology, Operations, and Statistics, Leonard N. Stern School of Business,
New York University.
wx2@stern.nyu.edu — Phone: +1 212-998-0945