

# Zijian Liu

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Zijian Liu

## Education

- Sept. 2022 **Department of Technology, Operations, and Statistics at Stern School of Business, New York University, NY**  
– May 2026 (Expected) Ph.D. Candidate in Operations Management, advisor: Zhengyuan Zhou
- Sept. 2019 **Courant Institute of Mathematical Sciences, New York University, NY**  
– May 2021 M.S. in Computer Science
- Sept. 2015 **School of Computer Science, Wuhan University, Wuhan, China**  
– June 2019 B.Eng. in Software Engineering

## Research Interests

Mathematical Optimization, Theoretical Machine Learning

## Publications & Manuscripts

(\* indicates equal contribution, † indicates alphabetical order)

- ALT 2026 **Online Convex Optimization with Heavy Tails: Old Algorithms, New Regrets, and Applications** [[Link](#)]  
(To appear) Zijian Liu
- ICML 2025 **Improved Last-Iterate Convergence of Shuffling Gradient Methods for Nonsmooth Convex Optimization** [[Link](#)]  
Zijian Liu, Zhengyuan Zhou
- ICLR 2025 **Nonconvex Stochastic Optimization under Heavy-Tailed Noises: Optimal Convergence without Gradient Clipping** [[Link](#)]  
Zijian Liu, Zhengyuan Zhou
- ICML 2024 **On the Last-Iterate Convergence of Shuffling Gradient Methods** [[Link](#)]  
(Oral) Zijian Liu, Zhengyuan Zhou
- ICML 2024 **On the Convergence of Projected Bures-Wasserstein Gradient Descent under Euclidean Strong Convexity** [[Link](#)]  
Junyi Fan\*, Yuxuan Han\*, Zijian Liu, Jian-Feng Cai, Yang Wang, Zhengyuan Zhou
- ICLR 2024 **Revisiting the Last-Iterate Convergence of Stochastic Gradient Methods** [[Link](#)]  
Zijian Liu, Zhengyuan Zhou
- COLT 2023 **Breaking the Lower Bound with (Little) Structure: Acceleration in Non-Convex Stochastic Optimization with Heavy-Tailed Noise** [[Link](#)]  
Zijian Liu, Jiawei Zhang, Zhengyuan Zhou
- ICML 2023 **High Probability Convergence of Stochastic Gradient Methods** [[Link](#)]  
Zijian Liu\*, Ta Duy Nguyen\*, Thien Hang Nguyen\*, Alina Ene, Huy L. Nguyen
- ICLR 2023 **On the Convergence of AdaGrad(Norm) on  $\mathbb{R}^d$ : Beyond Convexity, Non-Asymptotic Rate and Acceleration** [[Link](#)]  
Zijian Liu\*, Ta Duy Nguyen\*, Alina Ene, Huy L. Nguyen

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| ICML 2022                             | <b>Adaptive Accelerated (Extra-)Gradient Methods with Variance Reduction</b> [ <a href="#">Link</a> ]<br>Zijian Liu*, Ta Duy Nguyen*, Alina Ene, Huy L. Nguyen   |
| ICML 2022                             | <b>Distributionally Robust Q-Learning</b> [ <a href="#">Link</a> ]<br>Zijian Liu, Qinxun Bai, Jose Blanchet, Perry Dong, Wei Xu, Zhengqing Zhou, Zhengyuan Zhou  |
| Operations Research<br>Major Revision | <b>Product Return as a Sequence of Search Processes: Optimality and Search Duration</b><br>[ <a href="#">Available upon request</a> ]<br>Xiaoyu Fan <sup>†</sup> , Srikanth Jagabathula <sup>†</sup> , Zijian Liu <sup>†</sup> , Eitan Muller <sup>†</sup> |
| In Submission                         | <b>Clipped Gradient Methods for Nonsmooth Convex Optimization under Heavy-Tailed Noise: A Refined Analysis</b> [ <a href="#">Link</a> ]<br>Zijian Liu  |
| Manuscript                            | <b>Near-Optimal Non-Convex Stochastic Optimization under Generalized Smoothness</b><br>[ <a href="#">Link</a> ]<br>Zijian Liu, Srikanth Jagabathula, Zhengyuan Zhou  |
| Manuscript                            | <b>Stochastic Nonsmooth Convex Optimization with Heavy-Tailed Noises: High-Probability Bound, In-Expectation Rate and Initial Distance Adaptation</b> [ <a href="#">Link</a> ]<br>Zijian Liu, Zhengyuan Zhou   |
| Manuscript                            | <b>META-STORM: Generalized Fully-Adaptive Variance Reduced SGD for Unbounded Functions</b> [ <a href="#">Link</a> ]<br>Zijian Liu*, Ta Duy Nguyen*, Thien Hang Nguyen*, Alina Ene, Huy L. Nguyen   |

## Invited Talks

- Jul. 2024 *The 25th International Symposium on Mathematical Programming*  
 Jul. 2024 *The 41st International Conference on Machine Learning*

## Services

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| Journal<br>Reviewer    | <i>IEEE Journal on Selected Areas in Information Theory (JSAIT)</i><br><i>IEEE Transactions on Automatic Control (TAC)</i><br><i>IEEE Transactions on Control Systems Technology (TCST)</i><br><i>Journal of Machine Learning Research (JMLR)</i><br><i>Management Science</i><br><i>Mathematical Finance</i><br><i>SIAM Journal on Optimization (SIOPT)</i><br><i>Statistica Sinica</i> |
| Conference<br>Reviewer | <i>ICML 2022, 2024, 2025</i><br><i>NeurIPS 2024, 2025</i><br><i>ICLR 2025, 2026</i><br><i>ALT 2025, 2026</i>   |
| Organizer              | <i>MOILS seminar (internal seminar series at NYU Stern) Spring 2023</i>  |

## Teaching Experience

(**U** denotes undergraduate-level courses, **G** denotes graduate-level courses)

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|-------------|---|---------------------|
| Summer 2025 | <b>Operations Management (U)</b> , Instructor<br>Class Size: 15<br>○ Design and teach two 3-hour lectures per week independently<br>○ Grade assignments and exams and hold office hours | New York University |
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| Fall 2024   | <b>Operations Management (U)</b> , Teaching Fellow<br>Instructor: Prof. Divya Singhvi<br><ul style="list-style-type: none"><li>○ Grade assignments and exams and hold office hours</li></ul>  | New York University |
| Summer 2024 | <b>Stochastic Modeling &amp; Simulation (U)</b> , Teaching Fellow<br>Instructor: Prof. Joshua Reed<br><ul style="list-style-type: none"><li>○ Grade assignments and exams and hold office hours</li></ul>   | New York University |
| Fall 2020   | <b>Bayesian Machine Learning (G)</b> , Section Leader<br>Instructor: Prof. Andrew Gordon Wilson<br><ul style="list-style-type: none"><li>○ Teach supplementary materials and advanced topics in recitation sessions</li><li>○ Grade assignments and exams and hold office hours</li></ul> | New York University |