

Li, Yicheng

Zijiang Young Scholar (Top Young Talent),
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Academic Appointments

Jul. 2026 – Present  **Zijiang Young Scholar (Top Young Talent).**
School of Statistics, East China Normal University, Shanghai, China.

Education and Research Experience

2022 – Jun. 2026  **Ph.D. in Statistics.**
Department of Statistics and Data Science, Tsinghua University, Beijing, China.
Advisor: Associate Professor Qian Lin.
Outstanding Graduate.

Fall 2025  **Visiting Student**, Department of Statistics and Data Science, The Wharton School,
University of Pennsylvania, Philadelphia, USA.
Host: Professor Tony Cai.

2018 – 2022  **B.Sc. in Pure and Applied Mathematics.**
Department of Mathematical Sciences, Tsinghua University, Beijing, China.
Minor in Data Science and Technology.
Outstanding Graduate (top 3/111).

Research Interest

deep learning theory, differential privacy, feature learning, kernel methods

Research Publications

Journal Articles

- 1 *Optimal Rates of Kernel Ridge Regression under Source Condition in Large Dimensions*
Haobo Zhang, **Yicheng Li**, Weihao Lu, and Qian Lin
Journal of Machine Learning Research, vol. 26, no. 219, pp. 1–63, 2025
 URL: <http://jmlr.org/papers/v26/23-1679.html>
- 2 *On the Eigenvalue Decay Rates of a Class of Neural-Network Related Kernel Functions Defined on General Domains*
Yicheng Li, Zixiong Yu, Guhan Chen, and Qian Lin
Journal of Machine Learning Research, vol. 25, no. 82, pp. 1–47, 2024
 URL: <http://jmlr.org/papers/v25/23-0866.html>
- 3 *Kernel Interpolation Generalizes Poorly*
Yicheng Li, Haobo Zhang, and Qian Lin
Biometrika, vol. 111, no. 2, pp. 715–722, 2024
 DOI: [10.1093/biomet/asad048](https://doi.org/10.1093/biomet/asad048)
- 4 *On the Optimality of Misspecified Spectral Algorithms*
Haobo Zhang, **Yicheng Li** (Co-first author), and Qian Lin
Journal of Machine Learning Research, vol. 25, no. 188, pp. 1–50, 2024
 URL: <https://www.jmlr.org/papers/v25/23-0383.html>

Conference Proceedings

- 1 *Functional Virtual Adversarial Training for Semi-Supervised Time Series Classification*
Qingyi Pan and **Yicheng Li** (Corresponding author)
39th Conference on Neural Information Processing Systems (NeurIPS 2025), Sep. 2025.
 URL: <https://openreview.net/forum?id=hYjlAA6wXT>
- 2 *On the Impacts of the Random Initialization in the Neural Tangent Kernel Theory*
Guhan Chen, **Yicheng Li**, and Qian Lin
38th Conference on Neural Information Processing Systems (NeurIPS 2024), Sep. 2024.
 DOI: 10.52202/079017-1132
- 3 *Improving Adaptivity via Over-Parameterization in Sequence Models*
Yicheng Li and Qian Lin
38th Conference on Neural Information Processing Systems (NeurIPS 2024), Sep. 2024.
 DOI: 10.52202/079017-1662
- 4 *On the Saturation Effects of Spectral Algorithms in Large Dimensions*
Weihao Lu, Haobo Zhang, **Yicheng Li**, and Qian Lin
38th Conference on Neural Information Processing Systems (NeurIPS 2024), Sep. 2024.
 DOI: 10.52202/079017-0225
- 5 *On the Asymptotic Learning Curves of Kernel Ridge Regression under Power-Law Decay*
Yicheng Li, Haobo Zhang, and Qian Lin
37th Conference on Neural Information Processing Systems (NeurIPS 2023), 2023.
 URL: <https://openreview.net/forum?id=E4P5kVSKlT>
- 6 *On the Saturation Effect of Kernel Ridge Regression*
Yicheng Li, Haobo Zhang, and Qian Lin
11th International Conference on Learning Representations (ICLR 2023), Feb. 2023.
 URL: https://openreview.net/forum?id=tFvr-kYWs_Y
- 7 *On the Optimality of Misspecified Kernel Ridge Regression*
Haobo Zhang, **Yicheng Li**, Weihao Lu, and Qian Lin
40th International Conference on Machine Learning (ICML 2023), 2023.
 URL: <https://openreview.net/forum?id=Kg2a13GXBR>

Preprints and Ongoing Works

- 1 *Minimax and Adaptive Covariance Matrix Estimation under Differential Privacy*
T. Tony Cai and **Yicheng Li** (alphabetical order)
Mar. 2026. arXiv: 2603.19703 (cs, math, stat)  DOI: 10.48550/arXiv.2603.19703.
- 2 *Alignment-Sensitive Minimax Rates for Spectral Algorithms with Learned Kernels*
Dongming Huang, Zhifan Li, **Yicheng Li**, and Qian Lin
May 2026. arXiv: 2509.20294 (cs.LG)  DOI: 10.48550/arXiv.2509.20294.
- 3 *Large Dimensional Kernel Ridge Regression: Extending to Product Kernels*
Yang Zhou, **Yicheng Li**, Yuqian Cheng, and Qian Lin
May 2026. arXiv: 2605.14524 (stat.ML)  DOI: 10.48550/arXiv.2605.14524.
- 4 *Differentially Private Functional Linear regression: Optimal Algorithms and Theoretical Guarantees*
Yicheng Li and T. Tony Cai
Sep. 2025. Submitted.
- 5 *Diagonal Over-Parameterization in Reproducing Kernel Hilbert Spaces as an Adaptive Feature Model: Generalization and Adaptivity*
Yicheng Li and Qian Lin
Jan. 2025. arXiv: 2501.08679 (cs)  DOI: 10.48550/arXiv.2501.08679.

- 6 *Several Supporting Evidences for the Adaptive Feature Program*
Yicheng Li and Qian Lin
 Nov. 2025. arXiv: 2511.09425 (cs)  DOI: 10.48550/arXiv.2511.09425.
- 7 *Generalization Error Curves for Analytic Spectral Algorithms under Power-Law Decay*
Yicheng Li, Weiye Gan, Zuoqiang Shi, and Qian Lin
 Jan. 2024. arXiv: 2401.01599 (cs, math, stat)  DOI: 10.48550/arXiv.2401.01599.
- 8 *Towards a Statistical Understanding of Neural Networks: Beyond the Neural Tangent Kernel Theories*
 Haobo Zhang, Jianfa Lai, **Yicheng Li**, Qian Lin, and Jun S. Liu
 Dec. 2024. arXiv: 2412.18756 (cs)  DOI: 10.48550/arXiv.2412.18756.
- 9 *Optimal Rate of Kernel Regression in Large Dimensions*
 Weihao Lu, Haobo Zhang, **Yicheng Li**, Manyun Xu, and Qian Lin
 Sep. 2023. arXiv: 2309.04268 (cs, math, stat)  DOI: 10.48550/arXiv.2309.04268.

Seminar & Conference Presentations

- 2025  Invited Talk, *Diagonal Over-parameterization in Reproducing Kernel Hilbert Spaces as an Adaptive Feature Model: Generalization and Adaptivity*, 2025 ICSA China Conference.
- 2024  Contributed Talk, *Generalization error curves for analytic spectral algorithms under power-law decay*, 8th Academic Symposium of the High-Dimensional Data Statistics Section of the Chinese Society of Statistical Research, Nanjing, April 2024.
-  Contributed Poster, *Generalization error curves for analytic spectral algorithms under power-law decay*, Conference “Statistics in the Age of AI”, May 2024, George Washington University, Washington DC, USA.
- 2023  Speaker, Workshop on Machine Learning, August 2023, Hangzhou, China.
-  Poster Presentation, *On the saturation effect of kernel ridge regression*, International Conference on Learning Representations, May 2023. Kigali, Rwanda.

Reviewing Service

I regularly and actively serve as a reviewer for conferences including **NeurIPS**, **ICML**, **ICLR**, **AISTATS**, **AAAI**.

Teaching Experience

- 2024  Main Speaker, Seminar for Student Research Training on Kernel Methods, Tsinghua University.
- 2023  Excellent Teaching Assistant Scholarship (Tsinghua University) for:
 Multivariate Statistical Analysis (Lecturer: Wanlu Deng),
 Elementary Probability Theory (Lecturer: Wanlu Deng).

Awards and Scholarships

Ph.D. Stage (2022–2026)

- 2026  Outstanding Doctoral Dissertation, Tsinghua University.
-  Outstanding Graduate of the Class of 2026, Tsinghua University.
-  Zhong Jiaqing Outstanding Paper Award, the 27th Beijing–Tianjin–Hebei Young Researchers Symposium on Probability and Statistics, Probability and Statistics Branch of the Chinese Mathematical Society, for *Minimax and Adaptive Covariance Matrix Estimation under Differential Privacy*.

Awards and Scholarships (continued)

- 2025
 - National Scholarship.
 - Award for Excellent Poster Presentation at the Ninth Peking-Tsinghua Joint Statistics Symposium.
- 2024
 - Huiyan Scholarship (First Prize Scholarship).
- 2023
 - Excellent Teaching Assistant Scholarship.
 - Award for Excellent Poster Presentation at the Seventh Peking-Tsinghua Joint Statistics Symposium.
 - Kunhua Scholarship (First Prize Scholarship).

Undergraduate Stage (2018–2022)

- 2022
 - Outstanding Graduate, Tsinghua University.
- 2021
 - Tangjunyuan Scholarship (First Prize Scholarship).
- 2020
 - Hengda Scholarship (First Prize Scholarship).
- 2019
 - First Prize in the Eleventh National Undergraduate Mathematics Contest.
 - National Scholarship.

Miscellaneous

- Contributor of TeXify IDEA, an open-sourced IntelliJ IDEA plugin for LaTeX support.
- President, Tsinghua Student Reading Club, 2022–2023.