YAQI DUAN

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ACADEMIC POSITIONS

New York University, Stern School of Business — New York, NY
Assistant Professor in the Department of Technology, Operations, and Statistics — 2023 –

Massachusetts Institute of Technology — Cambridge, MA
Postdoc, hosted by Martin J. Wainwright — 2022 – 2023

EDUCATION

Princeton University — Princeton, NJ
Ph.D. in Operations Research and Financial Engineering — 2017 – 2022

Peking University — Beijing, China
B.S. in Mathematics — 2013 – 2017

PUBLICATIONS AND PREPRINTS

(*α-β*: authors listed alphabetically; *,†: equal contribution;
◊: current/past doctoral student or postdoc under my supervision)

Working Papers and Preprints

1. Stability through curvature: A framework for fast convergence in reinforcement learning.
Duan, Y., Wainwright, M. J.
Minor Revision (first round), *Operations Research*, 2026+.

2. Ask, clarify, optimize: Human-LLM agent collaboration for smarter inventory control.
Duan, Y., Hu, Y., Jiang, J. (*α-β*)
arXiv:2601.00121, 2025.

3. On the optimization dynamics of RLVR: Gradient gap and step size thresholds.
Suk, J.◊ (Postdoc), **Duan, Y.**
arXiv:2510.08539, 2025.

4. Don't waste mistakes: Leveraging negative RL-groups via confidence reweighting.
Feng, Y. (Ph.D. student), Jain, P., Hartshorn, A., Kempe, J.*, **Duan, Y.***
arXiv:2510.08696, 2025.

5. Localized exploration in contextual dynamic pricing achieves dimension-free regret.
Chai, J. (Ph.D. student), **Duan, Y.**, Fan, J., Wang, K. (*α-β*)
arXiv:2412.19252, 2024.

6. Policy evaluation from a single path: Multi-step methods, mixing and mis-specification.
Duan, Y., Wainwright, M. J.
arXiv:2211.03899.

Refereed Journal Publications

7. Optimal policy evaluation using kernel-based temporal difference methods.
   Duan, Y., Wang, M., Wainwright, M. J.
   Annals of Statistics (AoS), 52(5): 1927-1952, 2024.

8. Adaptive and robust multi-task learning.
   Duan, Y., Wang, K. (*α-β*)
   Annals of Statistics (AoS), 51(5): 2015-2039, 2023.

9. Learning good state and action representations for Markov decision process via tensor decomposition.
   Ni, C., **Duan, Y.**, Dahleh, M., Wang, M., Zhang, A.
   Journal of Machine Learning Research (JMLR), 24(115): 1-53, 2023.

10. Adaptive low-nonnegative-rank approximation for state aggregation of Markov chains.
    Duan, Y., Wang, M., Wen, Z., Yuan, Y.
    SIAM Journal on Matrix Analysis and Applications (SIMAX), 41(1): 244-278, 2020.

Refereed Conference Proceedings

11. PILAF: Optimal human preference sampling for reward modeling.
    Feng, Y. (Ph.D. student), Kwiatkowski, A. [†], Zheng, K.[†], Kempe, J.[*], **Duan, Y.**[*]
    International Conference on Machine Learning (ICML) 2025.

12. Taming "data-hungry" reinforcement learning? Stability in continuous state-action spaces.
    Duan, Y., Wainwright, M. J.
    Conference on Neural Information Processing Systems (NeurIPS) 2024.

13. A finite-sample analysis of multi-step temporal difference estimates.
    Duan, Y., Wainwright, M. J.
    Annual Learning for Dynamics & Control Conference (L4DC) 2023.

14. Near-optimal offline reinforcement learning with linear representation: Leveraging variance information with pessimism.
    Yin, M., **Duan, Y.**, Wang, M., Wang, Y.
    International Conference on Learning Representations (ICLR) 2022.

15. Learning good state and action representations via tractable tensor decomposition.
    Ni, C., Zhang, A., **Duan, Y.**, Wang, M.
    IEEE International Symposium on Information Theory (ISIT) 2021.

16. Risk bounds and Rademacher complexity in batch reinforcement learning.
    Duan, Y., Jin, C., Li, Z. (*α-β*)
    International Conference on Machine Learning (ICML) 2021.

17. Bootstrapping statistical inference for off-policy evaluation.
    Hao, B., Ji, X., **Duan, Y.**, Lu, H., Szepesvári, C., Wang, M.
    International Conference on Machine Learning (ICML) 2021.

18. Sparse feature selection makes reinforcement learning more sample efficient.
    Hao, B., **Duan, Y.**, Lattimore, T., Szepesvári, C., Wang, M.
    International Conference on Machine Learning (ICML) 2021.

19. Minimax-optimal off-policy evaluation with linear function approximation.
    Duan, Y., Wang, M.
    International Conference on Machine Learning (ICML) 2020.

20. State aggregation learning from Markov transition data.
    Duan, Y., Ke, Z., Wang, M.
    Conference on Neural Information Processing Systems (NeurIPS) 2019.

21. Learning low-dimensional state embeddings and metastable clusters from time series data.
    Sun, Y., **Duan, Y.**, Gong, H., Wang, M.
    Conference on Neural Information Processing Systems (NeurIPS) 2019.

GRANTS AND FUNDING

- NSF grant DMS-2413812 (Single PI) 2024-2027
- LSE-NYU Research Seed Fund (Co-PI) 2025-2026

SELECTED AWARDS AND HONORS

- IMS Lawrence D. Brown Ph.D. Student Award, *Institute of Mathematical Statistics* 2023
- EECS Rising Star, *Massachusetts Institute of Technology* 2021
- Gordon Y. S. Wu Fellowship in Engineering, *Princeton University* 2017 – 2021

GROUP MEMBER

- Joseph Suk, *Postdoc* 2025 –

INVITED TALKS

- The 2025 INFORMS Annual Meeting Oct. 2025
- The 2025 Joint Statistical Meetings Aug. 2025
- The 2025 INFORMS Applied Probability Conference Jun. 2025
- Statistical Learning and Optimization Workshop, Columbia University Apr. 2025
- CILVR Seminar, New York University Feb. 2025
- RL Theory Seminar (virtual) Dec. 2024
- Department of Statistics, Rutgers University Oct. 2024
- S. S. Wilks Memorial Seminar in Statistics, Princeton University Sept. 2024
- Math & Data (MaD) Seminar, New York University Feb. 2024
- The 2023 INFORMS Annual Meeting Oct. 2023
- The 2023 Joint Statistical Meetings Aug. 2023

PROFESSIONAL SERVICES

Journal review. Annals of Statistics (AoS), Journal of the Royal Statistical Society: Series B (JRSSB), Journal of the American Statistical Association (JASA), Annals of Applied Statistics (AoAS), Management Science (MS), Operations Research (OR), Journal of Machine Learning Research (JMLR), etc.

TEACHING EXPERIENCES

New York University

STAT-UB 103 - *Statistics for Business Control, Regression & Forecasting Models*:
Spring 2024 (1 section), Spring 2025 (2 sections), Fall 2025 (3 sections)
STAT-UB 003 - *Regression and Forecasting Models*: Spring 2024