TIANYU WANG

Columbia University
Mudd 315, 500 W 120th Street
New York, NY 10027, United States

Email: tw2837@columbia.edu
Homepage: https://wangtianyu61.github.io
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EDUCATION

Columbia University   New York, United States
Ph.D. in Operations Research   Aug. 2021 - May 2026 (Expected)
M.S. in Operations Research   Aug. 2021 - Jun. 2022
Overall GPA: 4.17/4.0, Advisors: Garud Iyengar, Henry Lam

Tsinghua University   Beijing, China
B.E. in Information Systems   Aug. 2017 - Jun. 2021
B.S. in Pure and Applied Mathematics   Aug. 2018 - Jun. 2021
Overall GPA: 3.87/4.0, Ranking: 1/28

National University of Singapore   Singapore
Exchange Student   Jul. 2019 - Dec. 2019

RESEARCH INTERESTS

- Methodology: (Contextual / Robust) Stochastic Optimization, Machine Learning Theory, Theoretical Statistics, Uncertainty Quantification.
- Applications: Trustworthy Machine Learning, Reliable Supply Chain Operations, Pharmacy Manufacturing, Portfolio Optimization.

PUBLICATIONS AND PREPRINTS

- Garud Iyengar, Henry Lam, **Tianyu Wang**[*]. Is Cross-Validation the Gold Standard to Estimate Out-of-sample Model Performance? ***NeurIPS 2024***.
- Garud Iyengar, Henry Lam, **Tianyu Wang**[*]. Optimizer's Information Criterion: Dissecting and Correcting Bias in Data-Driven Optimization. *Under review at **Management Science**.*
- **Tianyu Wang**, Ningyuan Chen, Chun Wang. Contextual Optimization under Covariate Shift: A Robust Approach via Intersecting Wasserstein Ambiguity Balls. *To be submitted to Operations Research.*
- Jiashuo Liu, Jiayun Wu, **Tianyu Wang**, Hao Zou, Peng Cui. Geometry-Calibrated DRO: Combating Over-Pessimism with Free Energy Implications. ***ICML 2024***.
    - Preliminary version appeared in *NeurIPS 2023 Workshop on Distribution Shifts.*
- Garud Iyengar, Henry Lam, **Tianyu Wang**[*]. Hedging Complexity in Generalization via a Parametric Distributionally Robust Optimization Framework. *Under revision at* **Management Science**.
    - Preliminary version appeared in ***AISTATS 2023*** (**Notable Paper, 32/1689 = 1.9% of submissions**).
- Jiashuo Liu[+], **Tianyu Wang**[+], Peng Cui, Hongseok Namkoong. Rethinking Distribution Shifts: Empirical Analysis and Inductive Modeling for Tabular Data. *Under review at **Management Science**.*
    - Short version appeared in ***NeurIPS 2023***, *Datasets and Benchmarks Track.*; *INFORMS Workshop on Data Science, 2024* (with a student scholarship);
    - **Highlighted as NeurIPS 2023 Favorite Papers by Two Sigma (9/3500+)**
- Chi Seng Pun, **Tianyu Wang**, Zhenzhen Yan[*]. Data-Driven Distributionally Robust CVaR Portfolio Optimization Under Regime-Switching Ambiguity Set. ***Manufacturing & Service Operations Management***, 25(5):1779-1795.
- **Tianyu Wang**, Chenye Wu, Wei Qi. On Data-Driven Multi-Product Pricing. ***IEEE Control Systems Letters***, 5(5): 1687-1692, 2020. doi: 10.1109/LCSYS.2020.3043591.

[*]: Authors are listed in alphabetical order. [+]: Authors are equally contributed.

Industry Experience

Amazon   Bellevue, United States
Research Scientist Intern   May 2023 - Aug. 2023
Uncertainty Attribution in IPC Simulation (Return offer extended)

Open-Source Projects

[WhyShift](): A Tabular Benchmark with Specific Distribution Shift Patterns   Apr. 2023 - Present
- Implemented 28 standard methods over 6 real-world tabular distribution shift datasets.
- Implemented algorithms for shift pattern decomposition and risk region identification, enabling analysis of performance degradation under distribution shifts.

[DRO](): A Package for Distributionally Robust Optimization in Machine Learning   Nov. 2023 - Present
- Built 12 DRO algorithms for classification and regression loss based on the CVXPY solver and Pytorch framework.

Selected Honors and Awards

- NeurIPS 2024 Travel Award   2024
- INFORMS Data Science Student Scholarship   2024
- Columbia IEOR Department Fellowship   2021
- Outstanding Undergraduate in Tsinghua **(2% in Tsinghua)**   2021
- Distinguished Undergraduate Thesis Award **(6 in Tsinghua SEM)**   2021
- Chen Daisun Scholarship **(3 in Tsinghua SEM)**   2021
- Meritorious Winner in MCM/ICM Mathematical Contest in Modelling   2021
- National Scholarship **(0.2% in China)**   2020
- Fellowship of the 13th "Spark" Innovative Talent Cultivation Program **(40 in Tsinghua)**   2019
- First Prize in Chinese College Student Mathematics Competition   2018
- First Prize in National High School Mathematics League   2016

Invited Talks and Presentations

- On the Need for a Language Describing Distribution Shifts: Illustrations on Tabular Datasets.
  INFORMS Data Science Workshop (Oct. 2024), Citadel PhD Summit (Apr. 2024).
- Optimizer's Information Criterion: Dissecting and Correcting Bias in Data-Driven Optimization
  ISMP (Jul. 2024), CSAMSE (Jul. 2024), INFORMS Annual Meeting (Oct. 2023).
- Hedging against Complexity: Distributionally Robust Optimization with Parametric Approximation
  INFORMS 2024 (Oct. 2024), MOPTA 2024 (Aug. 2024), AISTATS 2023 (Apr. 2023).
- Distributionally Robust Prescriptive Analytics with Wasserstein Distance
  INFORMS Annual Meeting (Oct. 2021, Remote).
- On Data-Driven Multi-Product Pricing
  American Control Conference (May 2021, Remote).

Professional Service

- Peer Reviewer:
  - Journal: Annals of Applied Probability, Operations Research;
  - Conference: AISTATS, NeurIPS, ICML, ICLR.
- Session Chair: ISMP 2024, INFORMS 2024.
- Organizer: NYC Joint PhD Colloquium in Operations 2024.

Additional Information

- Programming: Python (PyTorch), C/C++, R, Java, SQL, MATLAB
- Languages: English (Fluent, TOEFL: 104, GRE: 331), Mandarin (Native)