

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

Ph.D. in Operations Research

M.S. in Operations Research

Overall GPA: 4.17/4.0, Advisors: Garud Iyengar, Henry Lam

New York, United States

Aug. 2021 - May 2026 (Expected)

Aug. 2021 - Jun. 2022

Tsinghua University

B.E. in Information Systems

B.S. in Pure and Applied Mathematics

Overall GPA: 3.87/4.0, Ranking: 1/28

Beijing, China

Aug. 2017 - Jun. 2021

Aug. 2018 - Jun. 2021

National University of Singapore

Exchange Student

Singapore

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

First Author:

- 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 revision 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*.
- 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.

Others:

- 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*.

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

INDUSTRY EXPERIENCE

Amazon

Research Scientist Intern

Uncertainty Attribution in IPC Simulation (Return offer extended)

Bellevue, United States

May 2023 - Aug. 2023

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)