

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

Advisors: Garud Iyengar, Henry Lam

New York, United States

Aug. 2021 - Present

Aug. 2021 - Jun. 2022

Tsinghua University

B.E. in Information Systems

B.S. in Pure and Applied Mathematics

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, Stochastic Process, Uncertainty Quantification.
- Applications: Trustworthy Machine Learning, Supply Chain Management, Pharmaceutical Manufacturing, Portfolio Optimization.

PUBLICATIONS AND PREPRINTS

Preprints:

- **Tianyu Wang**, Luhao Zhang, Rachel Cummings. Integrating Feature Correlation in Differential Privacy with Applications in DP-ERM. *Submitted*. 2025.
- **Tianyu Wang**, Naz Pinar Taskiran, Garud Iyengar. Optimizing Pharmaceutical Control with Multi-Task Contextual Bandits: Addressing Batch Heterogeneity for Improved Manufacturing Efficiency. *Submitted*. 2025.
- **Tianyu Wang**, Ningyuan Chen, Chun Wang. Contextual Optimization under Covariate Shift: A Robust Approach via Intersecting Wasserstein Ambiguity Balls. *Submitted*. 2025.

Journals (with Revision):

- Garud Iyengar, Henry Lam, **Tianyu Wang***. Optimizer's Information Criterion: Dissecting and Correcting Bias in Data-Driven Optimization. *Under revision at **Management Science***.
- Garud Iyengar, Henry Lam, **Tianyu Wang***. Hedging Complexity in Generalization via a Parametric Distributionally Robust Optimization Framework. *Under revision at **Management Science***. Short version appeared in AISTATS 2023.
- Jiashuo Liu⁺, **Tianyu Wang***, Peng Cui, Hongseok Namkoong. Rethinking Distribution Shifts: Empirical Analysis and Inductive Modeling for Tabular Data. *Under revision at **Management Science***. Short version appeared in NeurIPS 2023, Datasets and Benchmarks Track; INFORMS Workshop on Data Science, 2024 (with a student scholarship).
- 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, 2023.

Refereed Conference Publications:

- Garud Iyengar, Henry Lam, **Tianyu Wang***. Is Cross-Validation the Gold Standard to Estimate Out-of-sample Model Performance? *NeurIPS 2024*.

- 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.
- Jiashuo Liu⁺, **Tianyu Wang**⁺, Peng Cui, Hongseok Namkoong. On the Need for a Language Describing Distribution Shifts: Illustrations on Tabular Datasets. *NeurIPS 2023, Datasets and Benchmarks Track*. Highlighted as NeurIPS 2023 Favorite Papers by Two Sigma (9/3500+).
- Garud Iyengar, Henry Lam, **Tianyu Wang**^{*}. Hedging against Complexity: Distributionally Robust Optimization with Parametric Approximation. *AISTATS 2023*. Notable Paper, 32/1689 = 1.9% of submissions.

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

SELECTED HONORS AND AWARDS

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| • Rising star, Georgia Tech ISyE-Stanford MS&E-Umich IOE Joint Workshop | 2025 |
| • 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)*, *Columbia Foundations of Data Science Workshop (Apr. 2024)*, *Citadel PhD Summit (Apr. 2024)*.
- Optimizer’s Information Criterion: Dissecting and Correcting Bias in Data-Driven Optimization *CMU YinzOR (Aug. 2024)*, *ISMP (Jul. 2024)*, *CSAMSE (Jul. 2024)*, *Princeton Workshop on Optimization, Learning and Control (June 2024, Poster)*, *NYC Joint PhD Colloquium (May 2024)*, *NYC Operations Day (May 2024, Poster)*, *IEOR Lunch and Learn (Apr. 2024)*, *INFORMS Annual Meeting (Oct. 2023)*.
- Hedging against Complexity: Distributionally Robust Optimization with Parametric Approximation *INFORMS 2024 (Oct. 2024)*, *MOPTA 2024 (Aug. 2024)*, *NYC Joint PhD Colloquium (May 2023)*, *AISTATS 2023 (Apr. 2023)*, *NYC Operations Day (May 2023, Poster)*, *Columbia Statistical ML Symposium (Apr. 2023, Poster)*.
- 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

- Reviewer:
 - Journal: Annals of Applied Probability, Management Science, Operations Research.
 - Conference: AISTATS, ICLR, ICML, NeurIPS.
- Session Chair: ISMP 2024, INFORMS 2024, INFORMS 2025.
- Organizer: NYC Joint PhD Colloquium in Operations 2024, IEOR PhD Student Seminar 2025.
- Department Service: Foundation Member of IEOR PhD Council (from August 2023)

INDUSTRY EXPERIENCE

Amazon

Research Scientist Intern

Uncertainty Attribution in IPC Simulation

Bellevue, United States

May 2023 - Aug. 2023

OPEN-SOURCE PACKAGES

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.

TEACHING EXPERIENCE

At Columbia University:

Teaching Assistant, IEOR 4650: Business Analytics

Spring 2024

- TA evaluation: 4.67/5.00 (Enrollment: 49)

Teaching Assistant, IEOR 4004: Optimization Models and Methods (*MS Core Course*)

Spring 2023

- TA evaluation: 4.34/5.00 (Enrollment: 110)

Teaching Assistant, IEOR 4650: Business Analytics

Spring 2022

- TA evaluation: 4.75/5.00 (Enrollment: 29)

At Tsinghua University:

Tutor, Basic Courses

Fall 2018 - Spring 2021

- Provide academic and problem-solving guidance in courses such as *Calculus*, *Linear Algebra*, *Probability and Statistics* and *Computer Programming* for junior students.

Tutor evaluation: 4.99/5.00 (Service hours: over 300)

ADDITIONAL INFORMATION

- Languages: English (Fluent, TOEFL: 104, GRE: 331), Mandarin (Native)
- Computer Skills:
 - Data/Statistic Packages: R, SPSS, Stata
 - Languages: C/C++, Java, Python, SQL, MATLAB, LaTeX