

# TIANYU WANG

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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: Stochastic Optimization, Learning Theory, Statistical Inference.
- Applications: Trustworthy Machine Learning, Supply Chain Management, Continuous Manufacturing.

## PUBLICATIONS AND PREPRINTS

### Preprints:

- Henry Lam, **Tianyu Wang\***. Achieving First-order Statistical Improvements in Data-Driven Optimization. *Under Preparation*. 2025.
- Jiashuo Liu<sup>+</sup>, **Tianyu Wang\***<sup>+</sup>, Henry Lam, Hongseok Namkoong, Jose Blanchet. DRO: A Python Library for Distributionally Robust Optimization in Machine Learning. *To be Submitted*. 2025.
- **Tianyu Wang**, Ningyuan Chen, Chun Wang. Contextual Optimization under Covariate Shift: A Robust Approach via Intersecting Wasserstein Ambiguity Balls. *To be Submitted*. 2025.

### Journals Publications and under Revision:

- **Tianyu Wang**, Naz Pinar Taskiran, Garud Iyengar. Optimizing Pharmaceutical Control with Multi-Task Contextual Bandits: Addressing Batch Heterogeneity for Improved Manufacturing Efficiency. **Finalist in MSOM Data-Driven Research Challenge 2025 (Winner TBD)**.
- Garud Iyengar, Henry Lam, **Tianyu Wang\***. Optimizer's Information Criterion: Dissecting and Correcting Bias in Data-Driven Optimization. *Under revision at **Management Science***. **Finalist in Dupačová-Prékopa Best Student Paper Prize in Stochastic Programming 2025 (Winner TBD)**.
- 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<sup>+</sup>, **Tianyu Wang\***<sup>+</sup>, 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<sup>+</sup>, **Tianyu Wang**<sup>+</sup>, 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**<sup>\*</sup>. 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 (listed alphabetically).

## SELECTED HONORS AND AWARDS

- AISTATS 2025 Best Reviewer Award 2025
- Rising star, Georgia Tech ISyE-Stanford MS&E-Umich IOE Joint Workshop 2025
- NeurIPS 2024 Travel Award 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
- National Scholarship (0.2% in China) 2020

## 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 Annual Meeting 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)*.

## PROFESSIONAL SERVICE

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

## 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)

## INDUSTRY EXPERIENCE

**Amazon**

Bellevue, United States

*Research Scientist Intern*

May 2023 - Aug. 2023

Uncertainty Attribution in IPC Simulation

## 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.

## 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