TIANYU WANG

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EDUCATION

Columbia University New York, United States
Ph.D. in Operations Research Aug. 2021 - Present
M.S. in Operations Research Aug. 2021 - Jun. 2022
Advisors: Garud Iyengar, Henry Lam

Tsinghua University Beijing, China
B.E. in Information Management and Information Systems Aug. 2017 - Jun. 2021
B.S. in Pure and Applied Mathematics Aug. 2018 - Jun. 2021

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

RESEARCH INTERESTS

- Data-Driven Decision-Making (Methodology): optimization with performance guarantees, contextual stochastic optimization, robust models against distribution shifts.
- Trustworthy Machine Learning (Application): robustness, explainability and evaluations in operations.

PUBLICATIONS AND PREPRINTS

- Garud Iyengar, Henry Lam, **Tianyu Wang**[*]. Is Cross-Validation the Gold Standard to Evaluate 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. On the Need for a Language Describing Distribution Shifts: Illustrations on Tabular Datasets. *Under review at Operations Research.*
  - 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.

Selected Honors and Awards

- 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.
  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
  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

- 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.

Industry Experience

Amazon   Bellevue, United States
Research Scientist Intern   May 2023 - Aug. 2023
Uncertainty Attribution in IPC Simulation

Teaching Experience

At **Columbia University**:

Teaching Assistant, IEOR 4650: Business Analytics   Spring 2022
- 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