Matías Romero

PhD Candidate at Columbia Business School (DRO division) mer2262@columbia.edu

Research Interests

My research interests center on algorithmic decision-making under uncertainty, combining application-specific design with theoretical performance guarantees to improve the operations of digital marketplaces such as on-demand delivery platforms.

Education

- **Columbia University** *September 2022 - May 2027 (Expected)*
  PhD in Decision, Risk and Operations division (DRO). New York, US
- **Universidad de Chile** *August 2020 - March 2022*
  Master's Degree in Operations Management. Santiago, Chile
- **Universidad de Chile** *March 2015 - July 2020*
  Bachelor's Degree in Mathematical Engineering. Santiago, Chile

Publications

- "*Potential-Based Greedy Matching for Dynamic Delivery Pooling*,", with Hongyao Ma and Will Ma.
  Accepted in Web and Internet Economics (WINE), 2025.
  Finalist, INFORMS TSL Data-Driven Research Challenge.
  Journal version under review (avilable at https://arxiv.org/pdf/2502.16862).
- "*Tight Asymptotics of Extreme Order Statistics*", with José Correa and Frederik Mallmann-Trenn.
  Accepted in Advances in Neural Information Processing Systems (NeurIPS), 2025.
  Journal version under preparation.
- "*A Linear and Scalable Cutting-Plane Algorithm for Electricity Pricing*", with Felipe Verástegui and Matías Villagra.
  Accepted in IEEE Power & Energy Society General Meeting (PESGM), 2025.
  Journal version under preparation.
- "*On the Asymptotic Behavior of the Expectation of the Maximum of IID Random Variables*", with José Correa.
  Operations Research Letters, 49:785-786, 2021.

Work in Progress

- "*Courier Ranking and Pricing*", with Hongyao Ma and Will Ma.

Work Experience

- **Center for Mathematical Modeling** *April 2020 - September 2020*
  Research Assistant Santiago, Chile (Remote)
  - Trained and validated machine-learning models (XGBoost, Random Forest) in Python to predict infection and fatality rates, identifying key health and policy drivers through feature importance and dimensionality reduction (PCA, t-SNE).
- **Telefónica Chile S.A.** *January 2020 - March 2020*
  Research Scientist Intern Santiago, Chile
  - Designed and implemented a Markov-based model to estimate the entropy and predictability of customer mobility from anonymized network data, improving computation speed by two orders of magnitude.
- **Information and Decision Systems Group, IDS, Universidad de Chile** *December 2017 - December 2018*
  Research Assistant Santiago, Chile
  - Developed statistical inference algorithms for estimating light intensity in astronomical imaging using maximum-likelihood and least-squares estimation.

Honors and Awards

- Finalist, INFORMS TSL Data-Driven Research Challenge. 2025
- Paul and Sandra Montrone Fellowship, Columbia University 2022,2025
- Doctoral Fellowship, Columbia University 2022-2027
- Outstanding Student Award, Universidad de Chile 2015,2019,2020

  Yearly recognition awarded to students within the top 10% GPA of the cohort.

Teaching Experience

- **Columbia Business School**
  - TA for Supply Chain Management (MBA Elective). Fall 2025
  - TA for Supply Chain Analytics (MS&E Elective). Fall 2025
  - TA for Operations Management (MBA Core). Summer 2025
  - TA for Operations Management (EMBA Core). Spring 2024, 2025
  - TA for Foundations of Stochastic Modeling (PhD Core). Spring 2024
  - TA for Technology Breakthroughs (MBA Elective). Spring 2024
- **Universidad de Chile**
  - Lecturer for Modeling and Optimization (BS Core). Spring 2022
  - TA for Algorithmic Game Theory (MS Elective) Spring 2022
  - TA for Stochastic Models in Engineering Systems (MS and PhD Core) Fall 2021
  - TA for Decision Making Under Uncertainty (BS Core) Fall, Spring 2021
  - TA for Probability and Statistics (BS Core) Fall 2021
  - TA for Probability for Mathematicians (BS Core) Spring 2020
  - TA for Markov Processes (BS Core) Fall 2019
  - TA for Multivariate Calculus (BS Core) Fall 2018,2019
- **Universidad de O'Higgins**
  - TA for Game Theory (BS Elective) Spring 2021

Professional Services

- Co-organizer of the NYC Operations Day PhD Colloquium 2025
- Brown Bag (DRO Internal Seminar) Series Co-Organizer 2024-2025
- DRO PhD Student Representative 2024-2025
- **Conference and workshop reviewing**
  - ACM Conference on Equity and Access in Algorithms, Mechanisms, and Optimization (EAAMO) 2024-2025

Selected Talks

- "*Courier Ranking and Pricing*"
  - INFORMS Annual Meeting, Atlanta GA October 2025
- "*Potential-Based Greedy Matching for Dynamic Delivery Pooling*"
  - Workshop in Management Science, Santa Cruz, Chile January 2026
  - WINE 2025 December 2025
  - INFORMS Annual Meeting, Atlanta GA October 2025
  - RMP Annual Conference, New York July 2025
  - Marketplace Innovation Workshop, (Online) May 2025
  - INFORMS Annual Meeting, Seattle, WA October 2024
- "*On the Asymptotic Behavior of the Expectation of the Maximum of IID Random Variables*"
  - Workshop in Management Science, Puerto Varas, Chile January 2023

Skills

Programming and Tools: Python, Gurobi, SQL, Julia, MATLAB, Excel, AMPL, R, LaTeX, Git.
Languages: Spanish (Native), English.