

Matías Romero

PhD Candidate at Columbia Business School (DRO division)

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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 (available 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 review.
- "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

- "Sequential Offering in On-Demand Platforms: On the Optimality of Greedy Ranking", with Hongyao Ma and Will Ma.
Analyzed optimal ranking and dynamic pricing policies for assigning time-sensitive jobs to independent workers one at a time, proving that a simple greedy dispatch sequence maximizes platform welfare under standard stochastic acceptance behavior.
- "Sequential Price Discovery in On-Demand Delivery", with Hongyao Ma and Will Ma.
Designed a sequential pricing framework that treats targeted wage increases as active informational probes, leveraging worker rejections to dynamically update beliefs about unobservable market conditions.

WORK EXPERIENCE

- **Uber Technologies, Inc.** *May 2026 - August 2026*
PhD Scientist Intern New York, NY
 - Courier Pricing Team. Supervisor: Qitang Wang.
 - Developed evaluation guidelines for acceptance rate prediction model, designing metrics to assess causal validity and calibration to improve reliability and reduce overspending.
- **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 Operations Management (EMBA Core). Spring 2024, 2025, 2026
 - 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 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 2024-2026
- DRO PhD Student Representative 2024-2025
- **Conference and workshop reviewing**
 - ACM Conference on Equity and Access in Algorithms, Mechanisms, and Optimization (EAAMO) 2024-2026

SELECTED PRESENTATIONS

- *"Sequential Offering in On-Demand Platforms: On the Optimality of Greedy Ranking"*
 - INFORMS Annual Meeting, Atlanta, GA October 2025
 - RMP Annual Conference, Ann Arbor, MI July 2026
- *"Potential-Based Greedy Matching for Dynamic Delivery Pooling"*
 - Workshop in Management Science, Santa Cruz, Chile January 2026
 - WINE 2025, New Jersey NJ December 2025
 - INFORMS Annual Meeting, Atlanta GA October 2025
 - RMP Annual Conference, New York NY July 2025
 - Marketplace Innovation Workshop, (Online) May 2025
 - INFORMS Annual Meeting, Seattle, WA October 2024
 - RMP Annual Conference, Los Angeles, CA July 2024
- *"Tight Asymptotics of Extreme Order Statistics"*
 - NeurIPS, San Diego, CA December 2025
- *"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, $\text{\LaTeX}$, Git.

Languages: Spanish (Native), English.