Antonio Alcántara Mata

CONTACT INFORMATION

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RESEARCH INTERESTS

Primary research interests: *Data-driven Optimization, Decision-making under uncertainty.*
Secondary research interests: *Machine Learning, Probabilistic Forecasting.*

EDUCATION

Universidad Carlos III de Madrid, Madrid, Spain:

Ph.D. Candidate, Mathematical Engineering, Expected graduation date: July 2025

- Thesis: "Machine Learning and Optimization for Decision-making under Uncertainty"
- Advisor: Carlos Ruiz Mora

KTH Royal University of Technology, Stockholm, Sweden:

Visiting Ph.D. student hosted by Jan Kronqvist, August-October, 2024

Imperial College London, London, UK:

Visiting Ph.D. student hosted by Calvin Tsay, September-November, 2023

Universidad de Granada, Granada, Spain: M.S., Applied Statistics, July, 2021

Universidad Carlos III de Madrid, Madrid, Spain: B.S., Statistics and Business, July, 2020

PUBLICATIONS

I have authored six research papers published in reputable journals, highly ranked in both the Journal Citation Report (JCR) and SCImago Journal Rank (SJR).

- Alcántara, A., & Ruiz, C. (2024). Optimal day-ahead offering strategy for large producers based on market price response learning. *European Journal of Operational Research.* JCR/SJR Q1
- Alcántara, A., & Ruiz, C. (2023). A neural network-based distributional constraint learning methodology for mixed-integer stochastic optimization. *Expert Systems with Applications.* JCR/SJR Q1
- Alcántara, A., & Ruiz, C. (2023). On data-driven chance constraint learning for mixed-integer optimization problems. *Applied Mathematical Modelling.* JCR/SJR Q1
- Alcántara, A., Galván, I. M., & Aler, R. (2023). Deep neural networks for the quantile estimation of regional renewable energy production. *Applied Intelligence.* JCR/SJR Q2
- Alcántara, A., Galván, I. M., & Aler, R. (2023). Pareto optimal prediction intervals with hypernetworks. *Applied Soft Computing.* JCR/SJR Q1
- Alcántara, A., Galván, I. M., & Aler, R. (2022). Direct estimation of prediction intervals for solar and wind regional energy forecasting with deep neural networks. *Engineering Applications of Artificial Intelligence.* JCR/SJR Q1

WORKING PAPERS

- Alcántara, A., Ruiz, C., & Tsay, C. (2024). A Quantile Neural Network Framework for Two-stage Stochastic Optimization. *Under review, Computers & Operations Research.* JCR/SJR Q1

HONORS AND AWARDS

FPU Fellowship, Spanish Ministry of Science and Universities **2021-2025**
- I was awarded one of the fifteen highly competitive fellowships available nationally in my field of expertise.

	Teaching Excellence Acknowledgement, Universidad Carlos III de Madrid	**2022-2024**
	Competitive Mobility Grant, Universidad Carlos III de Madrid	**2023**
	Extraordinary End of Studies Award, Universidad Carlos III de Madrid	**2020**
	Social Council Excellence Award, Universidad Carlos III de Madrid	**2019**
	Santander Progreso Scholarship, Santander Bank	**2019**
	Excellence Award, Comunidad de Madrid	**2018**

Conference Presentations
(*Denotes presentation by co-author)

33rd European Conference on Operational Research, Copenhagen (Denmark)	**July 2024**
*2024 INFORMS Optimization Society Conference, Houston (USA)**	**March 2024**
*40th National Congress of Statistics and Operations Research, Elche (Spain)**	**Nov. 2023**
20th Intl. Conference on Constraint Programming, A.I., and O.R., Nice (France)	**June 2023**

Invited Seminars

Linköping University, Department of Mathematics, Linköping (Sweden)	**Oct. 2024**
KTH Royal University of Tech., Department of Mathematics, Stockholm (Sweden)	**Sep. 2024**
Imperial College London, Department of Computing, London (UK)	**Sep. 2023**

Technical Contributions

CCL-Tool (2023) `[GitHub]`
- A comprehensive framework for chance-constrained learning, covering the training of probabilistic models and their integration within mixed-integer optimization problems.

POPI-HN (2022) `[GitHub]`
- A Pytorch framework for training hypernetwork-based models, capable of generating a complete set of solutions for the coverage-width trade-off (Pareto front) in prediction intervals.

Research Projects & Experience

Researcher **Sep. 2024 - present**
- Contributing to the project *"Algorithms for Stochastic Optimization Using Data-driven and Learning Analysis"*. Funded by the Spanish State Research Agency (PID2023-151013NB-I00).

Researcher **Dec. 2021 - Sep. 2024**
- Contributed to the project *"Optimization under Uncertainty and Stochastic Control: Applications to Stochastic Markets in the Big Data Paradigm"*. Funded by the Spanish State Research Agency (PID2020-116694GB-I00).

Research Assistant **Jan. 2021 – Nov. 2021**
- Hired as a full-time research assistant for the project *"Probabilistic forecasting and meta-heuristic optimization of solar/wind resources in the Iberian Peninsula"*. Funded by the Spanish State Research Agency (PID2019-107455RB-C22).

Teaching Experience

Universidad Carlos III de Madrid, Madrid, Spain

Instructor **January, 2022 - present**

Taught **six courses** for the B.S. programs in Data Science, Aerospace Engineering, and Industrial Engineering. Responsible for delivering lectures, designing exams, preparing case studies, and grading. Average teaching survey score: 4.75/5

- *Statistics*, Spring term, 2024. Teaching Surveys: 4.52/5 & 4.75/5
- *Intro. to Statistical Modeling*, Spring term, 2023-2024. Teaching Surveys: 4.92/5 & 5.00/5
- *Statistics*, Spring & Fall Term, 2022. Teaching Surveys: 4.38/5 & 4.92/5

Languages

Spanish: Native Speaker
English: Working Proficiency

References

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Assistant Prof. of Optimization
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