

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 published 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*.
- Alcántara, A., & Ruiz, C. (2023). A neural network-based distributional constraint learning methodology for mixed-integer stochastic optimization. *Expert Systems with Applications*.
- Alcántara, A., & Ruiz, C. (2023). On data-driven chance constraint learning for mixed-integer optimization problems. *Applied Mathematical Modelling*.
- Alcántara, A., Galván, I. M., & Aler, R. (2023). Deep neural networks for the quantile estimation of regional renewable energy production. *Applied Intelligence*.
- Alcántara, A., Galván, I. M., & Aler, R. (2023). Pareto optimal prediction intervals with hyper-networks. *Applied Soft Computing*.
- 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*.

WORKING PAPERS

- Alcántara, A., Diaz-Cachinero, P., Sánchez-González, A., & Ruiz, C. (2024). Leveraging Neural Networks to Optimize Heliostat Field Aiming Strategies in Concentrating Solar Power Tower Plants. *Under review*.

- Alcántara, A., Ruiz, C., & Tsay, C. (2024). A Quantile Neural Network Framework for Two-stage Stochastic Optimization. *Under review*.

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
TEACHING EXPERIENCE	Universidad Carlos III de Madrid , Madrid, Spain	
	<i>Instructor</i>	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	
	• <i>Statistics</i> , Spring term, 2024. Teaching Surveys: 4.52/5 & 4.75/5	
	• <i>Intro. to Statistical Modeling</i> , Spring term, 2023-2024. Teaching Surveys: 4.92/5 & 5.00/5	
	• <i>Statistics</i> , Spring & Fall Term, 2022. Teaching Surveys: 4.38/5 & 4.92/5	
CONFERENCE PRESENTATIONS (*DENOTES PRESENTATION BY CO-AUTHOR)	<i>33rd European Conference on Operational Research, Copenhagen (Denmark)</i>	July 2024
	<i>2024 INFORMS Optimization Society Conference, Houston (USA)*</i>	March 2024
	<i>40th National Congress of Statistics and Operations Research, Elche (Spain)*</i>	Nov. 2023
	<i>20th Intl. Conference on Constraint Programming, A.I., and O.R., Nice (France)</i>	June 2023
INVITED SEMINARS	<i>Linköping University, Department of Mathematics, Linköping (Sweden)</i>	Oct. 2024
	<i>KTH Royal University of Tech., Department of Mathematics, Stockholm (Sweden)</i>	Sep. 2024
	<i>Imperial College London, Department of Computing, London (UK)</i>	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 “ <i>Algorithms for Stochastic Optimization Using Data-driven and Learning Analysis</i> ”. Funded by the Spanish State Research Agency (PID2023-151013NB-I00).	
	Researcher	Dec. 2021 - Sep. 2024
	- Contributed to the project “ <i>Optimization under Uncertainty and Stochastic Control: Applications to Stochastic Markets in the Big Data Paradigm</i> ”. 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 “ <i>Probabilistic forecasting and meta-heuristic optimization of solar/wind resources in the Iberian Peninsula</i> ”. Funded by the Spanish State Research Agency (PID2019-107455RB-C22).	

LANGUAGES

Spanish: Native Speaker
English: Working Proficiency

REFERENCES

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Associate Professor of Statistics & OR
Department of Statistics
Universidad Carlos III de Madrid
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Calvin Tsay

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Inés M. Galván

Full Professor of Computer Science
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Jan Kronqvist

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