

Juan Martinez-Piazuelo

Barcelona, Spain

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Ph.D. in Automatic Control with expertise in optimization, machine learning, control systems, and game theory. Experienced in research and industry collaboration, seeking to apply my technical skills to solve real-world challenges.

Studies

- Ph.D. degree (*cum laude*) in Automatic Control, Robotics and Vision (2024), Universitat Politècnica de Catalunya, Spain. Speciality: Game Theory, Distributed Optimization and Model Predictive Control.
- Master degree in Electronic and Computer Engineering (2019), Universidad de los Andes, Colombia. Speciality: Automatic Control and Reinforcement Learning.
- Bachelor degree (*cum laude*) in Electronic and Computer Engineering (2017), Universidad de los Andes, Colombia. Speciality: Automatic Control and Machine Learning.

Key Technical Skills

- **Machine Learning:** Proficient in formulating, implementing, and validating machine learning algorithms using Python and TensorFlow. Experienced in working with convolutional neural networks for image recognition and deep reinforcement learning methods for control. Read more in this paper.
- **Control Systems:** Extensive experience designing and implementing automatic controllers for complex systems. Developed control methods to optimize production and maintenance processes in microalgae cultivation systems in collaboration with VAXA Technologies Ltd. Read more in this paper.
- **Optimization Algorithms:** Proficient in formulating and solving optimization problems for distributed systems. Expert in designing and analyzing game-theoretical methods for Nash-like equilibrium seeking in non-cooperative multi-agent systems. For more details, see the Selected Publications.
- **Programming:** Proficient in Python, TensorFlow, CasADi, MATLAB, Git, and Docker, used in research projects for developing simulation environments and validating complex mathematical models.

Professional Work

- **2024 – Present:** Postdoctoral Researcher, Automatic Control Department (ESAI), Universitat Politècnica de Catalunya, Barcelona, Spain.
- **2021 – 2024:** Predoctoral Researcher, Automatic Control Department (ESAI), Universitat Politècnica de Catalunya, Barcelona, Spain.
- **2020 – 2021:** Instructor Professor, Electrical and Electronics Engineering Department, Universidad de los Andes, Bogotá, Colombia.
- **2017 – 2019:** Research and Teaching Assistant, Electrical and Electronics Engineering Department, Universidad de los Andes, Bogotá, Colombia.

Grants & Awards

1. Recipient of the 2023 CSIC IMOVE Grant for an academic research stay at Politecnico di Bari, Italy.
2. Recipient of the 2020 FPI-UPC Predoctoral Grant funded by Banco Santander and Universitat Politècnica de Catalunya, Spain.
3. Award of academic excellence: highest GPA at Department of Electrical and Electronics Engineering, Universidad de los Andes, Colombia, 2016.

Languages:

- Spanish (native), English (fluent, TOEFL 104/120)

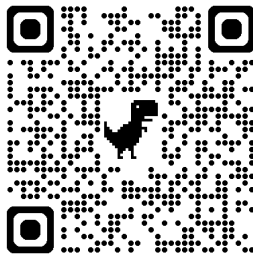
Participation in Research Projects

- Member of the Project Supervision and fault-tolerant control of smart infrastructures based on advanced learning and optimization L-BEST (MCIN/ AEI /10.13039/ 501100011033, 2020-2024).
- Contributed to the Project DDDAS anomaly detection and response for attack-resilient multi-agent systems (SOARD/AFOSR USA, 2019-2021).

Selected Publications

- J. Martinez-Piazuelo, C. Ocampo-Martinez and N. Quijano, Distributed Nash equilibrium seeking in strongly contractive aggregative population games, in IEEE Transactions on Automatic Control, vol. 69, no. 7, pp. 4427-4442, 2024
- N. Mignoni, J. Martinez-Piazuelo, R. Carli, C. Ocampo-Martinez, N. Quijano and M. Dotoli, A game-theoretical control framework for transactive energy trading in energy communities, in Proceedings of the 22nd IEEE European Control Conference (ECC), 2024, pp. 786-791
- J. Martinez-Piazuelo, W. Ananduta, C. Ocampo-Martinez, S. Grammatico and N. Quijano, Population games with replicator dynamics under event-triggered payoff provider and a demand response application, in IEEE Control Systems Letters, vol. 7, pp. 3417-3422, 2023
- A. Sanchez-Amores, J. Martinez-Piazuelo, J. M. Maestre, C. Ocampo-Martinez, E. F. Camacho and N. Quijano, Coalitional model predictive control of parabolic-trough solar collector fields with population-dynamics assistance, in Applied Energy, vol. 334, pp. 120740, 2023
- J. Martinez-Piazuelo, C. Ocampo-Martinez, N. Quijano and A. Ingimundarson, Microalgae production and maintenance optimization via mixed-integer model predictive control, in Proceedings of the 22nd IFAC World Congress, vol. 56, no. 2, pp. 11100-11105, ISSN 2405-8963, 2023
- J. Martinez-Piazuelo, N. Quijano, and C. Ocampo-Martinez, Nash equilibrium seeking in full-potential population games under capacity and migration constraints, in Automatica, vol. 141, pp.110285, 2022
- J. Martinez-Piazuelo, N. Quijano and C. Ocampo-Martinez, A payoff dynamics model for generalized Nash equilibrium seeking in population games, in Automatica, vol. 140, pp. 110227, 2022
- J. Martinez-Piazuelo, G. Diaz-Garcia, N. Quijano and L. F. Giraldo, Discrete-time distributed population dynamics for optimization and control, in IEEE Transactions on Systems, Man, and Cybernetics: Systems, vol. 52, no. 11, pp. 7112-7122, 2022
- J. Martinez-Piazuelo, N. Quijano and C. Ocampo-Martinez, Decentralized charging coordination of electric vehicles under feeder capacity constraints, in IEEE Transactions on Control of Network Systems, vol. 9, no. 4, pp. 1600-1610, Dec. 2022
- J. Martinez-Piazuelo, D. E. Ochoa, N. Quijano and L. F. Giraldo, A multi-critic reinforcement learning method: an application to multi-tank water systems, in IEEE Access, vol. 8, pp. 173227-173238, 2020

Additional Publications and Projects:



<https://martinez-piazuelo.github.io/>

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