

Nicolás Cuadrado

PH.D. CANDIDATE · MACHINE LEARNING

Mohamed Bin Zayed University of Artificial Intelligence, Masdar City, Abu Dhabi

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Education

Mohamed Bin Zayed University of Artificial Intelligence

Abu Dhabi, United Arab Emirates

PH.D. MACHINE LEARNING

August 2023 - present

- **Advisor:** Dr. Martin Takáč
- **Fields:** Reinforcement Learning, Federated Learning, Energy Efficiency, Model Efficiency.

Mohamed Bin Zayed University of Artificial Intelligence

Abu Dhabi, United Arab Emirates

M.SC. MACHINE LEARNING

August 2021 - May 2023

- **Advisor:** Dr. Martin Takáč
- **Fields:** Reinforcement Learning, Federated Learning, Energy Efficiency.
- **Thesis:** Enabling Transactive Microgrids: A Multi-Agent Reinforcement Learning Hierarchical Framework

Universidad Nacional de Colombia

Bogotá D.C., Colombia

B.S. ELECTRONICS ENGINEERING

July 2012 - April 2019

- **Fields:** Embedded systems, Microcontrollers, Energy Efficiency.

Professional Experience

2025 **AI for Good Intern**, Inception Institute of Artificial Intelligence (G42 Company), Abu Dhabi, UAE

- Implement a testbed of adversarial attacks and defenses to genomic generative models.
- Academic research on responsible AI methods for genomic, protein, and medicine generative models.
- Structure a plan for further research on the safety of biology models around jailbreaking.

2022 **Data Analyst Intern**, FortyGuard Tech Limited, Abu Dhabi, UAE

- Design and structure a cloud-based data pipeline for geo-referenced data.
- Reduced the process of parsing, storing, and analysing to less than 1 minute.

2017-2021 **CTO**, Cycle S.A.S., Bogotá D.C., Colombia

- Leader of a diverse team of 5+ engineers, developers, and a Ph.D.
- Involved in strategic decisions regarding technologies and product development.
- I halved the software production time by implementing the Scrum methodology.
- Coding activities: web app development, migration from Matlab to Python of Energy Management Systems, embedded system programming.

2017 **Machine Learning Assistant**, Tessi Lab S.A.S., Grenoble, France

- Research and implementation of classical machine learning methods for document classification.
- Added two modules to the product Tessi Lab Document Reader: random forest and XGBoost classification.

Research Experience

Czech Technical University in Prague - Faculty of Electrical Engineering

Prague, Czechia

ADVISOR: DR. JAKUB MAREČEK

Sep. 2025 - Dec. 2025

- Project: Usage of tractable probabilistic models for investment planning and battery arbitrage.

Publications

I. Gollini, **N. Cuadrado**, M. Takáč, S. Hovárth. 2025. What Scalable Second-Order Information Knows for Pruning at Initialization. **CPAL 2026: Oral**. ArXiv preprint 2502.11450

N. Cuadrado, S. Hovárth, M. Takáč. 2024. Generalising Battery Control in Net-Zero Buildings via Personalised Federated RL. **ICML 2025 Workshop: CO-BUILD**. ArXiv preprint 2412.20946.

- Y. Li, **N. Cuadrado**, S. Hovárth, M. Takáč. 2023. Generalized Policy Learning for Smart Grids: FL TRPO Approach. **ICLR 2024 Workshop: Tackling Climate Change with Machine Learning**. ArXiv preprint 2403.18439.
- N. Cuadrado**, R. Gutiérrez, Y. Zhu, M. Takáč. 2023. MAHTM: A Multi-Agent Framework for Hierarchical Transactive Microgrids. **ICLR 2023 Workshop: Tackling Climate Change with Machine Learning**. ArXiv preprint 2303.08447.
- N. Cuadrado**, R. Gutiérrez, M. Takáč. 2023. FRESCO: Federated Reinforcement Energy System for Cooperative Optimization. **ICLR Tiny Papers track**. ArXiv preprint 2403.18444.

IN REVIEW

- M. Takroui, **N. Cuadrado**, M. Takáč. 2026. WattCouncil: Context-Aware Household Energy Scenario Generation With Governed LLMs.
- N. Cuadrado**, M. Takroui, J. Němeček, M. Takáč, F. Mareček. 2026. Tractable Probabilistic Models for Investment Planning ArXiv preprint 2511.13888.

Patents

- 553002US, USPTO (Pending)**, M. Takáč, M. Takroui, **N. Cuadrado**. Method For Grid Load Balancing And Enhanced Renewable Energy Use In Climate Control Applications. April 2025.
- US-20250272621-A1, USPTO**, M. Takáč, M. Takroui, **N. Cuadrado**. System And Method For A Hierarchical Multi-agent Framework For Transactive Microgrids. August 2025.
- US-20250272723-A1, USPTO**, M. Takáč, R. Gutierrez, **N. Cuadrado**. Federated Reinforcement Learning-based System And Method For Cooperative Energy Optimization. August 2025.

Awards, Fellowships, & Grants

- 2023 **I4C Challenge Winner at COP28**, Youth 4 Sustainability, Masdar
- 2023 **Graduate Research Scholarship Ph.D.**, MBZUAI
- 2023 **Graduate Research Scholarship M.Sc.**, MBZUAI
- 2018 **Winner “World Virtual GovHack”**, Prime Minister’s Office, UAE \$ 150,000
- 2016 **“Pilos por el mundo - primera cohorte” Scholarship**, Ministry of Education, Colombia

Mentoring

- 2023 **Arman Bolatov**, Research Intern, Mohamed Bin Zayed University of Artificial Intelligence *Abu Dhabi, UAE*
- 2023 **Devaganthan S S**, Research Intern, Mohamed Bin Zayed University of Artificial Intelligence *Abu Dhabi, UAE*

Outreach & Professional Development

- 2026 **MBZUAI ML Winter School 2026 - MBZUAI**, Member of Organizing Committee *Abu Dhabi, UAE*
- 2024 **Undergraduate Research Internship Program 2024 - MBZUAI**, Student Coordinator *Abu Dhabi, UAE*
- 2024 **MBZUAI Executive Program (MEP)**, Student Facilitator *Abu Dhabi, UAE*
- 2023 **Youth 4 Sustainability, Masdar**, Future Sustainability Leader - Cohort 2023 *Abu Dhabi, UAE*

PEER REVIEW SERVICE

NEURIPS 2024, ICLR 2025, AISTATS 2025, ICML 2025, NEURIPS 2025, AISTATS 2026, Electric Power Systems Research.