

RICARDO GONZÁLEZ MOYANO

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RESEARCH PROFILE

Ph.D. candidate in Statistics, Optimization and Applied Mathematics, specializing in operations research, machine learning, and causal inference for decision-making under uncertainty. My research focuses on Explainable AI (XAI) to turn predictive models into transparent decision support, providing confidence-aware assessments and actionable counterfactual recommendations. I combine Machine Learning with efficiency-based benchmarks (DEA-type frameworks) to quantify uncertainty, identify key drivers, and explain when and how a unit can improve performance.

Keywords: Causal Inference, Explainable AI (XAI), Counterfactual Explanations, Uncertainty Quantification, Probabilistic Modeling, Machine Learning, Efficiency Analysis, Model Validation, Fairness & Accountability.

PhD candidate (grad 2027) | Available from 15 Jun 2026 (10-12 weeks)

EDUCATION

Miguel Hernández University of Elche (UMH) — Elche, Spain *Dec 2023 - Dec 2027*

Ph.D. in Statistics, Optimization and Applied Mathematics | Thesis: Technical efficiency assessment reinterpreted as an explainable artificial intelligence method. Supervisors: Juan Aparicio Baeza and Jose Luis Zofio Prieto.

- Selected coursework: Machine Learning, Probabilistic Modeling, Causal Inference, Responsible/Interpretable AI.
- Research interests: XAI for decision-making, uncertainty quantification and calibrated probabilities, counterfactual recommendations, fairness & accountability in high-stakes models.
- Funding: Competitive Predoctoral Research Contract (Personal Investigador en Formación, PIF), awarded under the Predoctoral Training Grants linked to Knowledge Generation Projects (2022 call). Grant: PREP2022-000117 (linked to Project PID2022-136383NB-T00).

UMH — Elche, Spain

Sep 2022 – Sep 2023

M.Sc. in Computational Statistics and Data Science for Decision Making | Thesis: Technical efficiency assessment reinterpreted as an explainable artificial intelligence method.

- **Scholarships:** Recipient of two competitive scholarships (2022, UMH; 2022, valgrAI - Valencian Graduate School and Research Network of Artificial Intelligence).

International University of La Rioja — Logroño, Spain

Sep 2021 – Nov 2022

M.Sc. in Business Intelligence | Thesis: Analysis of the music market using Spotify: characteristics of a music hit.

- Spotify Web API data; supervised and unsupervised ML to identify patterns linked to hit outcomes and translate results into decision support for record labels.

University of Alicante — Alicante, Spain

Sep 2016 - Jun 2021

B.Sc. in Economics | Specialization: Economic analysis | Thesis: Analysis and economic dynamics in sub-Saharan countries.

RESEARCH EXPERIENCE

Ph.D. Researcher — Institute ‘Operations Research Center’, UMH | Elche, Spain *Dec 2023 - Present*

- Develop a probabilistic framework for efficiency assessment that reframes technical efficiency as a binary classification problem with calibrated confidence levels.
- Design and evaluate counterfactual recommendation methods that propose feasible “paths to efficiency” for inefficient units under realistic constraints.
- Apply Explainable AI (XAI) (global and local explanations) to identify key drivers of inefficiency, quantify uncertainty, and support transparent decision-making.

- Build reproducible research pipelines in R/Python (documentation, version control, experiment tracking), enabling robust validation and comparison across models.
- Produce research outputs including working papers/manuscripts, research software, and open repositories for reproducibility (when applicable).

Visiting Researcher — Rotterdam School of Management, Erasmus University of Rotterdam | *(4 months) 2025*
Rotterdam, Netherlands

- Collaborated with an interdisciplinary team on probabilistic modeling and interpretable ML for performance analysis.
- Presented progress in internal seminars and incorporated feedback into ongoing research.

PUBLICATIONS

- González-Moyano, R., Aparicio, J., Zofío, J. L. & España, V. J. (2025). PEAXAI: Probabilistic Efficiency Analysis Using Explainable Artificial Intelligence (Version 1.0.0) R package. CRAN. (Published) <https://doi.org/10.32614/CRAN.package.PEAXAI>
- González-Moyano, R., Aparicio, J., Zofío, J. L., & España, V. J. (n.d.). Probability-based technical efficiency analysis through machine learning. Machine Learning with Applications. (Manuscript under review)
- González-Moyano, R., Zofío, J. L., & Aparicio, J. (n.d.). Artificial intelligence methodologies in efficiency and productivity analysis: State of the art. (Chapter under review).

RESEARCH PROJECTS

- Update of Police Risk Assessment Forms in Gender-Based Violence Cases (VioGen)** 2025 - Present
- Objective: To improve the prediction of recidivism and the severity level of the current system using machine learning techniques, and to understand the factors driving the model's decisions.
 - Methods: ML, Logistic Regression, Bayesian models.
 - Commissioned by: Ministry of the Interior of Spain.

- R&D&I Strategy for Security and Emergencies 2026–2029** 2026 - Present
- Objective: To strengthen risk identification, prevention, and decision-making in security and emergency management through research, innovation, and data-driven approaches.
 - Methods: ML and DEA.
 - Commissioned by: Regional Government of Valencia (Department of Emergencies and Interior).

TEACHING & MENTORSHIP

- Graduate Teaching Assistant — Miguel Hernández University** 2023 - Present
- Courses: Linear Models; Efficiency and Productivity (Master); Quality Control Systems; Statistics and Optimization.
 - Delivered lectures and lab sessions using Excel, R, and Python; prepared assignments and grading rubrics.
 - Office hours and student support in statistical modeling, optimization, and data analysis.

- Mentorship — Master's Thesis Supervision** 2025 - Present
- Supervising two Master's theses on Explainable Artificial Intelligence applied to absenteeism and recidivism prediction.
 - Guidance on robust machine learning pipelines, model validation, interpretability methods, and scientific writing.

SKILLS

Technical: R, Python, Git, LaTeX, Quarto, optimization solvers. Methods: Machine Learning, Explainable AI (XAI), causal inference (foundations), probabilistic modeling, model validation, simulation. Languages: English (B2), Spanish (native)