

Juan David Prada Malagón

Bridging research and industry through AI, mathematics, and intelligent systems

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Open to: full-time roles · consulting

Senior Data Scientist and Mathematical-Physicist with 6+ years of commercial experience in applied data science, algorithm engineering, and technical leadership, operating autonomously across end-to-end ML/AI projects for Finance, Cybersecurity, Sports & Entertainment, Smart Cities, Government, and Scientific Research. Hands-on expertise in Machine Learning, Deep Learning, MLOps, predictive modelling, solution architecture, and production deployment, applied to fraud and anomaly detection, adaptive authentication, risk-based decision systems, NLP, and LLM applications. My academic background in Mathematical Physics and Applied Mathematics lets me approach problems from first principles, bridging rigorous scientific thinking with practical software engineering. I am currently expanding into Quantum Computing — Quantum Machine Learning, Quantum Optimization, and Post-Quantum Cryptography — with the goal of bridging Research and Industry through production-ready solutions with real-world impact.

[LinkedIn](#)[GitHub](#)

Experience

Data Scientist

Jan 2025 — Present

Cívica · Barcelona, Spain

- Ticket Fraud Detection (UEFA Champions League final): led end-to-end development of a fraud detection application, from requirements and data analysis to modeling, deployment (Dockerized, Snowflake), and stakeholder communication — identifying suspicious applicants, bots, and anomalous behavior
- Marketing Chatbot: designed and implemented a semantic chatbot on structured/unstructured data for UEFA's marketing team, using NLP and LLM prompting, hosted on Snowflake
- Match Risk Assessment: built a risk-scoring algorithm analyzing security and operational risk before, during, and after football matches, with dashboards for stakeholder communication

Senior Data Scientist

Jan 2021 — Dec 2025

SKG Tecnología · Colombia & Spain

- Head of the Data Science & Applied Mathematics area, leading end-to-end analytics and ML projects for smart city, public sector, transportation, and government auditing use cases
- Speed Prediction Algorithm (Bogotá): traffic speed prediction for a government smart city platform using large-scale sensor data
- Fraud Detection in Government Contracts: anomaly detection algorithm for the Auditoría General de la República (AGR) flagging inconsistencies and suspicious correlations in public contract data
- Traffic Fines Decision Algorithm & Photo Infraction Decider: rule-based and ML decision systems validating sensor-based traffic infringement evidence for the National Police and Secretary of Mobility
- TransMilenio predictive maintenance: time series and deep learning system assessing bus maintenance needs and driver performance for Bogotá's public transport

Algorithms Engineer

Apr 2023 — Dec 2024

DefensePoint · Barcelona, Spain

- Product Manager and Algorithms Engineer for an Adaptive Authentication platform, owning the full lifecycle: requirements, algorithm/risk model design, backend development, database integration, testing, and deployment
- Engineered an API that dynamically determines authentication level per login attempt based on contextual risk, historical telemetry, and behavior patterns (IP, device, geolocation, language, local time)
- Applied data science to cybersecurity risk management, reducing noisy security signals and false positives while evolving traditional MFA into a dynamic, risk-based decision system

Scientific Consultant (Freelance)

Dec 2019 — Dec 2025

Freelance — Independent · Worldwide

- Delivered services spanning applied Data Science & Mathematics, ML/AI products, and research collaborations
- Worked with a broad, multicultural range of clients across industries including Finance, High-Precision Engineering, Manufacturing, Government, and Scientific Research

Strategy Consultant

Mar 2020 — Jul 2020

Consultoría e Inversiones Breakthrough · Bogotá, Colombia

- Analyst of businesses and investments, building mathematical models to support strategy design for competitiveness

Research Fellowship

Sep 2021 — Jun 2022

Université Bourgogne Franche-Comté · Dijon, France

- Led the research project "Multi-Domain Spectral Approach for the Computation of Fourier Transform"
- Developed numerical analysis algorithms in MATLAB to reduce resolution error in partial differential equations, with applications to medical imaging accuracy

Associate Researcher

Jan 2020 — Jan 2021

Universidad de los Andes · Bogotá, Colombia

- Researcher for Project INV-2019-84-1833, Ministerio de Ciencias — Topological Phase Transitions and Non-Commutative Geometry in Quantum Electrodynamics
- Research in Topological Machine Learning and Topological Data Analysis

Undergraduate Teaching Assistant

Sep 2016 — Dec 2019

Universidad de los Andes · Bogotá, Colombia

- Taught Physics I & II, Mathematical Methods for Physicists, Particle Physics, and Differential Equations
- Supported students at the Problem Solving Center

Selected Projects

Marketing Chatbot

Cívica (for UEFA)

Semantic chatbot trained to answer queries from the organization's marketing team using NLP and LLM prompting.

Match Risk Assessment

Cívica (for UEFA)

NLP and LLM-based application generating match incident summaries focused on violence, crowd behavior, police interventions, and external stadium events.

Ticket Fraud Detection

Cívica (for UEFA)

Custom algorithm detecting high-probability risk in ticket re-selling for customers applying for match entry.

Point Adaptive Authentication

DefensePoint

End-to-end adaptive authentication API deciding the appropriate authentication level for each login attempt.

Government Justice Risk Detection

SKG Tecnología

Risk detection tool for the Comptroller's Auditoría General de la República (AGR) based on public contract information, using NLP, Text2Data, and ML.

Public Bus Transport Performance Detection

SKG Tecnología

TransMilenio (Bogotá public transport) performance detection using time series, image analysis, and deep learning to prevent maintenance and monitor driver performance.

Bogotá Traffic Model

SKG Tecnología

Real-time traffic analysis tool for Bogotá's Secretary of Mobility, combining mathematical-physics and mathematical modelling for business intelligence.

Photo Infraction Decider

SKG Tecnología

Decision-support tool for the National Police and Secretary of Mobility easing traffic infraction validation via image processing and ML.

Education

Master in Quantum Computing

Mar 2025 — Present

Universidad Internacional de La Rioja (UNIR)

Quantum Computing, theoretical and experimental — Quantum Algorithms, Quantum Machine Learning, Quantum Optimization, Quantum Programming (Qiskit, IBM Quantum, D-Wave), Quantum Information, Quantum Hardware, and Post-Quantum Cryptography.

Master of Science, Mathematics

Sep 2022 — Sep 2023

Universitat de Barcelona

Advanced studies in Applied Mathematics, Probability Theory, Numerical Analysis, and Scientific Computing, with research in Topological Machine Learning and Topological Data Analysis (TDA).

Specialization, Data Science, Machine Learning, Deep Learning & AI

May 2022 — Dec 2022

Centro de Investigación en Matemáticas Bourbaki

Professional specialization program, Mexico.

Research Fellowship / Master 1, Mathematical Physics (Math4Phys)

Sep 2021 — Jun 2022

Université Bourgogne Franche-Comté

Research fellowship in Mathematical Physics — Numerical Analysis, Spectral Methods, Partial Differential Equations, and High-Performance Scientific Computing, contributing to research published in Physica D.

Bachelor of Science, Physics & Mathematics

2014 — Dec 2019

Universidad de los Andes

Mathematical-Physics, Experimental Physics, and Scientific Computing, combined with Applied Mathematics, Optimization, and Probability Theory.

Research Projects

Multi-Domain Spectral Approach for the Computation of Fourier Transform Sep 2021 — Present

Université Bourgogne Franche-Comté

Efficient computation of the Fourier Transform with a numerical spectral algorithm via deformation techniques, improving accuracy of numerical solutions of partial differential equations, with further applications to medical imaging.

Quantum Field Theory, Anomalies and Topological Phases Jan 2020 — Present

Universidad de los Andes

Research Project INV-2019-84-1833, Ministerio de Ciencias, in the field of Topological Phase Transitions and Non-Commutative Geometry in Quantum Electrodynamics.

Quantum Fields with Dynamical Boundary Conditions Mar 2019 — Dec 2019

Universidad de los Andes

Studied aspects of Quantum Field Theory in flat and curved spacetimes in the context of the Casimir effect with subtle modifications on spacetime, observing that changes on vacuum introduce changes on observables of the physical system.

SPDC Characterization on Liquid Phase Exfoliated 2D Crystals for Piezoelectric Devices Jan 2019 — Aug 2019

Universidad de los Andes

Characterized non-linear behavior of crystals, studying Spontaneous Parametric Down Conversion (SPDC) with the aim of obtaining a piezoelectric response on the material.

Compactificación de la métrica de Schwarzschild y estructuras causales Aug 2018 — Dec 2018

Universidad de los Andes

Multi-disciplinary approach from Mathematics, Philosophy, and Computer Science to understand Schwarzschild metric compactification and its causality implications, complemented by computer simulations on the Einstein-Rosen black hole as an introduction to the Raychaudhuri equation and the Singularity Theorems.

Seminar on Quantum Field Theory and Mathematical Physics: Non-trivial Geometrical Effects on Flat Space-time Aug 2018 — Nov 2018

Universidad de los Andes

Discussion of the quantum vacuum from the point of view of the Poincaré group of symmetries, studying phenomena such as the Casimir effect on a bidimensional cylinder, accelerated expansion space-time, and Rindler space-time using Quantum Field Theory on curved space-time.

Publications

On numerical approaches to nonlinear Schrödinger and Korteweg–de Vries equations for piecewise smooth and slowly decaying initial data

Klein, C., Prada-Malagón, J.D., & Stilov, N.

Elsevier — Physica D — Nonlinear Phenomena · Nov 2023

Time-dependent topological analysis for cardiovascular disease diagnosis using magnetic resonance

Prada-Malagón, J.D.

CRAI Universitat de Barcelona — Dipòsit Digital UB · Sep 2023

Topological Phase Transitions and Non-commutative Geometry

Prada, J.D. & Reyes, A.

Research Project INV-2019-84-1833 — Ministerio de Ciencias · 2020

Quantum Fields with Dynamical Boundary Conditions

Prada Malagón, J.D.

Universidad de los Andes · 2020

SPDC characterization on liquid phase exfoliated 2D crystals for piezoelectric devices

Prada, J.D., Navarrete, C., Navarrete, C., Hernandez, Y., Valencia, A.

Universidad de los Andes · 2019

Compactificación de la métrica de Schwarzschild y estructuras causales

Prada, J.D., Calderón, F., Laguna, M., Bargeño, P.

Universidad de los Andes · 2018

Certifications

Source Systems, Data Ingestion, and Pipelines — DeepLearning.AI · Credential ID: EMPDG2LN7XLG	Mar 2025
Introduction to Data Engineering — DeepLearning.AI · Credential ID: NNZ1H18YDVXJ	Feb 2025
Python Project for Data Engineering — Coursera	Feb 2024
Data Engineering Essentials — Coursera	Jan 2024
Aplicaciones Financieras de Inteligencia Artificial — Colegio de Matemáticas Bourbaki · Credential ID: 557281dd-3b76-7548-ec74-f941c10cefd8	May 2023
Ruta a través de la Ciencia de Datos — Colegio de Matemáticas Bourbaki · Credential ID: f479b5ca-0eec-a8ce-dcdd-530cb3f6bf3f	May 2023
Ruta a través de la Ciencia de Datos — Colegio de Matemáticas Bourbaki · Credential ID: 734554f3-64fd-3c7c-a78a-778fa5a59e3e	May 2023
Machine Learning & AI — Colegio de Matemáticas Bourbaki · Credential ID: 03799107-4be9-d999-b974-22c50c98c1ac	May 2023
Data Science Summer School 2022 — Hertie School — Data Science Lab	Aug 2022
Applied Machine Learning — Columbia Engineering	Jun 2019
Data Science Summer School 2021 — Hertie School — Data Science Lab	Jul 2021

Skills

AI & MACHINE LEARNING

- Artificial Intelligence (AI)
- Machine Learning
- Deep Learning
- Computer Vision
- Natural Language Processing (NLP)
- Large Language Models (LLM)
- Generative AI Studio
- AI Engineering
- Machine Learning Engineering
- Bayesian Methods
- Recommendation Systems

MATHEMATICS & PHYSICS

- Mathematical Modeling
- Data Modeling
- Applied Mathematics
- Theoretical Mathematical Physics
- Optimization
- Scientific Computing
- Forecasting
- Physics
- High-Precision Engineering
- Numerical Analysis
- Topological Data Analysis

QUANTUM COMPUTING

- Quantum Computing
- Quantum Programming
- Quantum Modelling
- Quantum Cybersecurity

CYBERSECURITY & RISK

- Cybersecurity
- Defense
- Multi-factor Authentication
- Adaptive Authentication
- Fraud & Anomaly Detection
- Risk Assessment

DATA & SOFTWARE ENGINEERING

- Data Science
- Data Analytics
- Applied Analytics
- Data Engineering
- Data Ingestion
- Data Governance
- MLOps
- Cloud Computing
- Software Development
- Software Systems Engineering

LANGUAGES & TOOLS

- Python
- R
- SQL
- C/C++
- Matlab
- Docker
- Apache Airflow
- MLFlow
- Git

VISUALIZATION & BI

- Seaborn
- Matplotlib
- Tableau
- Power BI
- Qlik

DELIVERY & RESEARCH

- Research and Development (R&D)
- Research
- Project Planning
- Project Management

Problem Solving

Creative Problem Solving

Storytelling

Tool Box

Coding

10/10

Python (almost all libraries)

SQL (ORM)

R

C/C++

Matlab

Delphi

Machine Learning & Deep Learning

10/10

Classical ML

Segmentation

Supervised Learning

Unsupervised Learning

Optimization

A/B Testing

MLOps

8/10

Apache Airflow

MLFlow

Git

Docker

Visualization

10/10

Seaborn

Matplotlib

Tableau

Power BI

Qlik

Storytelling

10/10

Technical communication

Stakeholder presentations

Strengths

Hard-working

Competitive

Analytic

Consistent

Strategic

Persistent

Proactive

Languages

Spanish · Native

English · Bilingual (IELTS C1)

Catalan · Basic

German · Basic (A2)

French · Basic (A2)