

Mario Alfonso Prado Romero

AI Researcher and Developer



About me

Machine Learning Researcher with a Ph.D. in Artificial Intelligence from the Gran Sasso Science Institute, specializing in explainable AI for graph-structured data. My background bridges academic research and real-world application, with experience designing ML systems for recommendation and anomaly detection. Before my doctoral studies, I was a Lecturer in Database Systems and Information Retrieval at the University of Havana, where I also led research in data mining and AI. I am currently extending my work toward Earth Observation, where interpretable anomaly detection can add real value to the analysis of large-scale satellite data.

Contact

✉ m.a.pradoromero@gmail.com

📍 LAquila (AQ), Italy

in: Mario Alfonso Prado-Romero

RG: Mario Alfonso Prado-Romero

ORCID: 0000-0002-0491-3515

GitHub: MarioTheOne

Languages

🇪🇸 **Spanish** - Native

🇬🇧 **English** - Full professional proficiency

(C1 CEFR – IELTS 7.5)

🇮🇹 **Italian** - Working proficiency

(B1 CEFR – CILS)

🇫🇷 **French** - Elementary proficiency

(A2 CEFR – DELF)

WORK EXPERIENCE

2025-
Present



ML Specialist
Fondazione Gran Sasso Tech

📍 LAquila, Italy

- Leading development of machine learning systems for applied research and real-world deployments.
- Focus areas: recommender systems, anomaly detection, scalable model design, and explainable AI.
- Contributing to the Foundation's expansion into Earth Observation, exploring ML applications for satellite data.

Mar-Apr
2026



Adjunct Lecturer (Contract)
Luiss Business School

📍 Rome, Italy

- Delivered a 14-hour course on AI and Machine Learning for Business Applications.
- Covered topics included recommender systems, anomaly detection, and AI governance, with a focus on business decision-making.

2023-2024



Research Intern
NEC Laboratories Europe

📍 Heidelberg, Germany

- Worked with the Human-Centric AI and Biological AI groups.
- Researched explainable AI techniques for graph neural networks in biomedical applications.

2017-2020



Lecturer
University of Havana

📍 Havana, Cuba

- Lecturer in Information Retrieval and Database Systems.
- Conducted research on ML techniques for information retrieval and anomaly detection in complex networks.
- Developed algorithms for influence detection on Twitter.

Sep-Dec
2018



Guest Researcher
University of LAquila

📍 LAquila, Italy

- Worked at the Department of Engineering and Information Science and Mathematics.
- Researched the application of Data Analysis and Machine Learning to predict topic popularity in massive news datasets.

2013-2017



Researcher
Advanced Technologies Application Center

📍 Havana, Cuba

- Researched machine-learning techniques for anomaly detection in social networks and bank transactions.
- Developed a framework in C++ to detect anomalies in bank transactions.

Oct-Dec
2016



Guest Researcher
Delft University of Technology

📍 Delft, Netherlands

- Worked at the Cyber Security Group.
- Developed an algorithm for discovering potential money laundering in the Bitcoin network using anomaly detection.

EDUCATION

2020-2025



Doctoral Degree
Gran Sasso Science Institute
PhD fellow in Artificial Intelligence – Graduated cum laude

📍 LAquila, Italy

- Developed several novel eXplainable Artificial Intelligence techniques for Graph Neural Networks.
- Created a framework for developing and evaluating new Graph Counterfactual Explanation Methods.

Research Interests

Machine Learning Data Science
eXplainable AI Anomaly Detection
Graph Theory

Soft Skills and Strengths

Creativity Curiosity Flexibility
Self Confidence Ability to Plan and Organize
Autonomy Adaptability Eye for Details
Problem Solving Team Working Leadership
Good Communication Managing Information
Patience

Programming Languages

- **Python:** Advanced
- **SQL:** Intermediate
- **C#:** Intermediate
- **C/C++:** Intermediate
- **Java:** Basic

Information Technology Skills

Data Science

- **Jupyter Notebook:** *Advanced*
- **Pandas:** *Advanced*
- **Anaconda:** *Intermediate*
- **SQL Server:** *Intermediate*

Machine Learning

- **Scikit-Learn:** *Advanced*
- **PyTorch:** *Advanced*
- **Tensorflow:** *Intermediate*

Dev & Collaboration Tools

- **VS Code:** *Advanced*
- **Git & GitHub:** *Advanced*
- **LaTeX & Overleaf:** *Advanced*

Other Interests

- Travels 🌍
- Books 📖
- Movies 🎬
- Photography 📷

References

Prof. Dr. Giovanni Stilo
University of L'Aquila

Dr. Bardh Prenkaj
Technical University of Munich

Prof. Dr. Michele Flammini
Gran Sasso Science Institute

2017-2019



Master Degree
University of Havana
Master Student in Computer Science

📍 Havana, Cuba

- Attended courses included Information Extraction, Business Intelligence and Analytics, and Regression Analysis.
- Thesis focused on anomaly detection algorithms for complex networks, with applications in detecting money laundering in Bitcoin and identifying influencers on Twitter.

2008-2013



Bachelor Degree
University of Havana
Bachelor Student in Computer Science

📍 Havana, Cuba

- Attended courses included Artificial Intelligence, Information Retrieval, Algorithms Design and Analysis, and Graph Theory.
- The thesis project was a Framework for Detecting Telecom Fraud.



PUBLICATIONS

- **On the Minimization of Graph Counterfactual Explanations: Theory and a Local Bounded Search Algorithm.** R. García, M.A. Prado-Romero, F. Gullo, G. Stilo. **Machine Learning**, Vol. 115, Article 224, 2026. <https://doi.org/10.1007/s10994-026-07157-0>
- **Exploring Ensemble Strategies for Graph Counterfactual Explanations.** M.A. Prado-Romero, B. Prenkaj, G. Stilo. In: Explainable Artificial Intelligence. **xAI 2025**. Communications in Computer and Information Science, vol 2579. (2026) Springer, Cham. https://doi.org/10.1007/978-3-032-08330-2_9
- **GRETEL 2.0: Generation and Evaluation of Graph Counterfactual Explanations Evolved.** M.A. Prado-Romero, B. Prenkaj, G. Stilo. In Machine Learning and Knowledge Discovery in Databases. Research Track and Demo Track. **ECML PKDD 2024**. Lecture Notes in Computer Science, vol 14948. (September, 2024) Springer, Cham. https://doi.org/10.1007/978-3-031-70371-3_21
- **Robust Stochastic Graph Generator for Counterfactual Explanations.** M. A. Prado-Romero, B. Prenkaj, G. Stilo. In Proc. of the 38th Conference on Artificial Intelligence. **AAAI 2024** (Mar. 2024), 21518-21526 <https://doi.org/10.1609/aaai.v38i19.30149>
- **A Survey on Graph Counterfactual Explanations: Definitions, Methods, Evaluation, and Research Challenges.** M. A. Prado-Romero, B. Prenkaj, G. Stilo, F. Giannotti. **ACM Comput. Surv.** 56, 7, Article 171 (July 2024), 37 pages. <https://doi.org/10.1145/3618105>
- **Are Generative-Based Graph Counterfactual Explainers Worth It?** M. A. Prado-Romero, B. Prenkaj, G. Stilo. In Joint European Conference on Machine Learning and Knowledge Discovery in Databases (pp. 152-170). Cham: Springer Nature Switzerland. **ECML PKDD 2023**. https://doi.org/10.1007/978-3-031-74633-8_10
- **Revisiting CounterGAN for Counterfactual Explainability of Graphs.** M. A. Prado-Romero, B. Prenkaj, G. Stilo. In **Tiny Papers @ ICLR 2023**. <https://openreview.net/pdf?id=d0m0Rl15q3g>
- **Developing and Evaluating Graph Counterfactual Explanation with GRETEL.** M. A. Prado-Romero, B. Prenkaj, G. Stilo. in: Proc. of the 16th ACM Int. Conf. on Web Search and Data Mining, Association for Computing Machinery, **WSDM 2023**. <https://doi.org/10.1145/3539597.3573026>
- **GRETEL: Graph counterfactual explanation evaluation framework.** M. A. Prado-Romero, G. Stilo. in: Proc. of the 31st ACM Int. Conf. on Inf. and Knowl. Management, Association for Computing Machinery, **CIKM 2022**. <https://doi.org/10.1145/3511808.3557608>
- **Ensemble approaches for Graph Counterfactual Explanations.** M. A. Prado-Romero, B. Prenkaj, G. Stilo, A. Celi, E. Estevanell-Valladares, D. A. Valdés-Pérez. in: Proc. of the 3rd Italian Workshop on Explainable AI | co-located with AIXIA, **XAI.it 2022**, <https://ceur-ws.org/Vol-3277/>
- **A Time-sensitive Model to Predict Topic Popularity in News Providers.** M. A. Prado-Romero, A. Coto-Santiesteban, A. Celi, G. Stilo. in: **Intelligent Data Analysis**, vol. 24, no. S1, pp. 123-140, 2020, IOS Press. <https://dx.doi.org/10.3233/IDA-200012>
- **TSTM: A Model to Predict Topics' Popularity in News Providers.** M. A. Prado-Romero, A. Celi, G. Stilo, A. Coto-Santiesteban. in: Proc. of the 24th Iberoamerican Congress on Pattern Recognition, **CIARP 2019**, Springer, Cham. https://doi.org/10.1007/978-3-030-33904-3_9

Memberships

Association for Computer Machinery (ACM)

(Aug 2022 - Present)

Italian Association for Artificial Intelligence (AIxIA)

(Nov 2022 - Present)

Signature

- **Identifying Twitter Users Influence and Open Mindedness Using Anomaly Detection.** M. A. Prado-Romero, A. F. Oliva, L. G. Hernández. in: Proc. of the 6th Int. Workshop on Artificial Intelligence and Pattern Rec., **IWAIPR 2018**, Springer, Cham. https://doi.org/10.1007/978-3-030-01132-1_19
- **Discovering Bitcoin Mixing Using Anomaly Detection.** M. A. Prado-Romero, C. Doerr, A. Gago-Alonso. in: Proc. of the 22nd Iberoamerican Congress on Pattern Recognition, **CIARP 2017**, Springer, Cham. https://doi.org/10.1007/978-3-319-75193-1_64
- **Community Feature Selection for Anomaly Detection in Attributed Graphs.** M. A. Prado-Romero, A. Gago-Alonso. in: Proc. of the 21st Iberoamerican Congress on Pattern Recognition, **CIARP 2016**, Springer, Cham. https://doi.org/10.1007/978-3-319-52277-7_14
- **Detecting Contextual Collective Anomalies at a Glance.** M. A. Prado-Romero, A. Gago-Alonso. in: Proc. of the 23rd Int. Conf. on Pattern Recognition, **ICPR 2016**, IEEE. <https://doi.org/10.1109/ICPR.2016.7900017>

COMMUNITY SERVICE & REVIEWING

- **Session Chair** – Explainability Track, **IEEE ICDM 2021**
- **Program Committee Member:**
 - **AAAI 2024, CIKM 2024-2026, PAKDD 2024, 2025, HT'22**
- **Journal Reviewer:**
 - **ACM TIST** – Transactions on Intelligent Systems and Technology
 - **IEEE TNNLS** – Transactions on Neural Networks and Learning Systems
- **Conference Reviewer / Co-Reviewer:**
 - **NeurIPS 2025-2026, SDM 2022, 2023, ICDM 2021, 2022, IJCAI-ECAI 2022**

HONORS AND AWARDS

- **PhD in Computer Science, Gran Sasso Science Institute - Graduated cum laude** (2025)
- **Gran Sasso Science Institute Full PhD Scholarship:** One out of seven full PhD scholarships in Computer Science offered by GSSI in 2020.
- **AIxIA Student Grant:** The Italian Association for Artificial Intelligence (AIxIA) offered grants for the participation of students in the 19th International Conference of the Italian Association for Artificial Intelligence (AIxIA 2022). All assigned grants covered conference fees and supported travel and accommodation expenses.