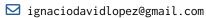
Ignacio David Lopez Miguel

Graduate research assistant at TU Wien



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Professional experience

Geneva, Switzerland

- Development and maintenance of the tool PLCverif to formally verify PLC programs.
- Optimization of model-checking algorithms.

2017 − 2019 **Model Validation Specialist,** Deutsche Bank

Frankfurt am Main, Germany

- Validation of machine-learning models for credit scoring, including analyses such as assumption validation, sensitivity testing, robustness checks, and bias assessment
- Validation of models for credit scoring of enterprises based on textual natural language.
- Participation in Data Science competitions.

2015 — 2017 **Quantitative Consultant,** GMS Management Solutions SL Madrid, Spain, and London, UK

- Development of supervised and unsupervised machine-learning models for banks.
- Design and development of VBA-based prototypes to automate processes.

2015 − 2015 Research Engineer, Ifak e.V

Magdeburg, Germany

- Analysis of empirical data to characterize fluids via acoustic waves.

Education

2022 — present Ph.D. Logic in Computer Science, TU Wien

Vienna, Austria

- Explanation of black-box machine-learning models via rule learning.
- Rule-guided deep reinforcement learning (neuro-symbolic AI).

Tokyo, Japan

- Logic reasoning with answer set programming.
- Ethical AI applied to autonomous driving cars, including reasoning about norms.

2019 – 2021 M.Sc. Artificial Intelligence, Int. Univ. Menendez Pelayo GPA: 9.5/10

Online, Spain

- Including a course on deep learning applied to visual information.

B.Sc. Mathematics, National Univ. of Distance Education GPA: 8.7/10 Online, Spain

- Including courses on algebra, probability, and optimization.

2015 — 2017 M.Sc. Business Consulting, ICADE Business School GPA: 8.4/10 Madrid, Spain

Thesis title: *Machine Learning Applied to Credit Scoring*.

B.Sc. Ind. Electronics & Automation Eng., Univ. Valladolid GPA: 8.7/10 Valladolid, Spain

- Including a course on classical computer vision.

Skills

Languages

2011 - 2015

Spanish (mother tongue), English (fluent), German (intermediate), French (basic).

Technical skills

2016 – present

Python (Pandas, Scikit-learn, TensorFlow,...), Java, C, R, SQL, VBA, Git, Microsoft 365

Soft skills

Teamwork and collaboration, problem-solving, adaptability and flexibility, stress management, proactive approach, fast learning.

Selected Research Publications

- **Lopez-Miguel, I. D.** et al. (2025). OFTEN-DEEPRL: On-the-Fly Teaching of Ethical Norms to Deep Reinforcement Learning Agents. In 28th European Conference on Artificial Intelligence.
- Tappler, M., **Lopez-Miguel, I. D.** et al. (2025). Rule-Guided Reinforcement Learning Policy Evaluation and Improvement. In 34th International Joint Conference on Artificial Intelligence.
- **Lopez-Miguel, I. D.**, Adiego, F. et al. (2025). Formal Verification of PLCs as a Service: A CERN-GSI Safety-Critical Case Study. In 17th NASA Formal Methods Symposium.
- 4 Soldà, D., **Lopez-Miguel, I. D.** et al. (2023). Progression for Monitoring in Temporal ASP. In 26th European Conference on Artificial Intelligence.
- **Lopez-Miguel, I. D.** et al. (2023). Verification of Neural Networks Meets PLC Code: An LHC Cooling Tower Control System at CERN. In 24th Int. Conf. on Engineering Applications of Neural Networks.
- Ádám, Z., **Lopez-Miguel, I. D.** et al. (2023). From Natural Language Requirements to the Verification of PLCs: Integrating FRET into PLCverif. In 15th NASA Formal Methods Symposium.

References

Borja Fernandez Adiego, Automation Engineer at CERN

Juan A. Rodriguez-Aguilar, Research Professor at Artificial Intelligence Research Institute (IIIA-CSIC)
Jean-Charles Tournier, Software Engineer at CERN and Lecturer at EPFL
Martin Tappler, Postdoc at TU Wien