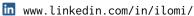
# Ignacio David Lopez Miguel

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http://ignaciolopezmiguel.github.io//







2020 - 2022	Formal Verification Engineer, CERN	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 Fra	ınkfurt am Main, Germany	
	- Validation of machine-learning models for credit scoring, include	ding analyses such as	
	assumption validation, sensitivity testing, robustness checks, and bi	as assessment	
	- Validation of models for credit scoring of enterprises based on na	tural language.	
	- Participation in Data Science competitions.		
2015 – 2017	Quantitative Consultant, Management Solutions  Made	rid, Spain, and London, UK	
	- Development of supervised and unsupervised machine-learning n	nodels 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 wave	S.	
2014 - 2015	LEGO Robotics Teacher, San Jose School	Valladolid, Spain	

#### **Education**

2022 – present	<ul> <li>Ph.D. Logic in Computer Science, TU Wien</li> <li>Explanation of black-box machine-learning models via rule learning.</li> <li>Rule-guided deep reinforcement learning (neuro-symbolic AI).</li> </ul>	Vienna, Austria
2024 – 2024	<ul> <li>Visiting researcher, NII</li> <li>Logic reasoning with answer set programming.</li> <li>Ethical AI applied to autonomous driving cars, including reasoning about</li> </ul>	Tokyo, Japan out norms.
2019 – 2021	<ul> <li>M.Sc. Artificial Intelligence Research, UIMP GPA: 9.5/10</li> <li>Including a course on deep learning applied to computer vision.</li> </ul>	Spain
2016 – present	<b>B.Sc. Mathematics</b> , National Univ. of Distance Education GPA: 8.7/10 - Including courses on algebra, probability, and optimization.	Spain
2015 – 2017	M.Sc. Business Consulting, ICADE Business School GPA: 8.4/10 Thesis title: Machine Learning Applied to Credit Scoring.	Madrid, Spain
2011 – 2015	■ B.Sc. Ind. Electronics and Automation Eng., UVa GPA: 8.7/10 - Including a course on classical computer vision.	Valladolid, Spain

### **Selected Research Publications**

- **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.
- Tappler, M., **Lopez-Miguel, I. D.** et al. (2025). Rule-Guided Reinforcement Learning Policy Evaluation and Improvement (under review). In 34th International Joint Conference on Artificial Intelligence.
- 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.
- Lopez-Miguel, I. D. (2023). Stop at red? Engineering meets ethics. In Int. Conf. on Computer Ethics.

## **Skills**

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

Coding Python, Java, C, R, sql, vba

## 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

Ezio Bartocci, Full Professor at TU Wien