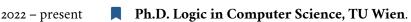
# Ignacio D. Lopez-Miguel, M.Sc.

☑ ignacio.lopez@tuwien.ac.at

http://ignaciolopezmiguel.github.io//

in www.linkedin.com/in/ilomi/

#### **Education**



Applying logic reasoning to machine learning-based systems. It includes reinforcement learning, answer set programming, runtime verification, and ethical AI.

2019 – 2021 M.Sc. Artificial Intelligence Research, Menendez Pelayo Univ. (UIMP). GPA: 9.5/10. Thesis title: Simplification of Numeric Variables for PLC Model Checking.

2016 – present B.Sc. Mathematics, National University of Distance Education (UNED). GPA: 8.7/10.

2015 – 2017 M.Sc. Business Consulting, ICADE Business School. GPA: 8.4/10. Thesis title: *Machine Learning Applied to Credit Scoring*.

B.Sc. Ind. Electronics and Automation Eng., Valladolid University. GPA: 8.7/10.

Thesis title: Guided acoustic wave's phase and group velocity at low frequencies in fluid-filled elastic pipes.

# **Employment History**

#### 2020 – 2022 Formal Verification Engineer, CERN Geneva, Switzerland

- Development and usage of the tool PLCverif to automatically formally verify PLC code.
- Eclipse ecosystem with Java and Xtext.
- Research work to optimize model-checking algorithms for programs containing complex data types.

#### 2017 – 2019 Model Validation Specialist, Deutsche Bank Frankfurt am Main, Germany

- Validation of Machine Learning models to estimate credit score by performing different analyses, such as assumptions validation, sensitivity, robustness, and back-testing.
- Validation of Natural Language Processing model for credit scoring of enterprises.
- Development of Machine Learning challenger models.
- Participation in Data Science competitions.
- 2015 2017 **Quantitative Consultant,** Management Solutions Madrid, Spain, and London, UK
  - Design and development of tools in VBA to automate processes.
  - Analysis of Hadoop-based ecosystem to integrate it in a data lake.

2015 – 2015 Research Engineer, Ifak e.V Magdeburg, Germany

- Experimental research in order to characterize fluids via acoustic waves.

2014 – 2015 LEGO Robotics Teacher, San Jose School Valladolid, Spain

- Teaching students aged from 10 to 14 how to program and build LEGO robots.

## **Research Publications**

- 1 Lopez-Miguel, Ignacio D., Fernandez Adiego, B., Blanco Viñuela, E., Salinas, M., & Betz, C. (2023). Working Together for Safer Systems: A Collaboration Model for Verification of PLC Code. In 19th International Conference on Accelerator and Large Experimental Physics Control Systems (ICALEPCS).
- Soldà, D., **Lopez-Miguel, Ignacio D.**, Bartocci, E., & Eiter, T. (2023). Progression for Monitoring in Temporal ASP. In *26th European Conference on Artificial Intelligence (ECAI)*.
- Lopez-Miguel, Ignacio D., Fernández Adiego, B., Ghawash, F., & Blanco Viñuela, E. (2023). Verification of neural networks meets PLC code: An LHC cooling tower control system at CERN. In 24th International Conference on Engineering Applications of Neural Networks.



- Ádám, Z., **Lopez-Miguel, Ignacio D.**, Mavridou, A., Pressburger, T., Bęś, M., Blanco Viñuela, E., ... Fernández Adiego, B. (2023a). From Natural Language Requirements to the Verification of Programmable Logic Controllers: Integrating FRET into PLCverif. In NASA Formal Methods 15th International Symposium, NFM 2023.
- Ádám, Z., **Lopez-Miguel, Ignacio D.**, Mavridou, A., Pressburger, T., Bęś, M., Blanco Viñuela, E., ... Fernández Adiego, B. (2023b). Automated verification of programmable logic controller programs against structured natural language requirements. ().
- **Lopez-Miguel, Ignacio D.** (2023). Stop at red? Engineering meets ethics. In *International Conference on Computer Ethics, CEPE 2023.*
- Lopez-Miguel, Ignacio D., Fernandez Adiego, B., Tournier, J.-C., Rodriguez-Aguilar, J. A., & Blanco Viñuela, E. (2021). Simplification of Numeric Variables for PLC Model Checking. In 19th ACM-IEEE International Conference on Formal Methods and Models for System Design (MEMOCODE'21).
- Fernandez Adiego, B., **Lopez-Miguel, Ignacio D.**, & Tournier, J.-C. (2021). Applying model checking to highly-configurable safety critical software: the SPS-PPS PLC program. In *ICALEPCS'21*.
- **Lopez-Miguel, Ignacio D.**, Tournier, J.-C., & Fernandez Adiego, B. (2021). PLCverif: status of a formal verification tool for Programmable Logic Controller. In *ICALEPCS'21*.
- Lopez-Miguel, Ignacio D. (2021). Survey on Big Data Preprocessing Techniques. In XOVETIC'21.

#### Skills

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

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

## References

Juan A. Rodriguez-Aguilar, Research Professor at Artificial Intelligence Research Institute (IIIA-CSIC)

Borja Fernandez Adiego, Automation Engineer at CERN

Jean-Charles Tournier, Software Engineer at CERN and Lecturer at EPFL

Ezio Bartocci, Full Professor at TU Wien