



Mariana Oliveira

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EDUCATION

- MAP-i Doctoral Program in Computer Science* Sep. 2016 – Dec. 2021
Faculty of Sciences of the University of Porto, Porto, Portugal.
Thesis: “Predictive Analytics for Spatio-temporal Data”
Advisors: Prof. Luís Torgo and Prof. Vítor Santos Costa
- MSc in Computer Science* Sep. 2013 – Dec. 2015
Specialization in Data Mining and Advanced Data Processing
Faculty of Sciences of the University of Porto, Porto, Portugal.
Thesis: “Propositional and Relational Approaches to Spatio-Temporal Data Analysis”
Advisors: Prof. Luís Torgo and Prof. Vítor Santos Costa
- BSc in Physics with Minor in Informatics* Sep. 2010 – Jul. 2013
Faculty of Sciences of the University of Porto, Porto, Portugal.

RESEARCH EXPERIENCE

- Post-Doctoral Fellow, Dalhousie University, Halifax, NS, Canada* Feb. 2022 – now
– Supervisor: Prof. Luís Torgo
– Developing research on Data Mining and Machine Learning.
- PhD Student Researcher at the Laboratory of Artificial Intelligence and Decision Support (LIAAD – INESC TEC), Porto, Portugal* Sep. 2016 – Dec. 2021
– Advisors: Prof. Luís Torgo and Prof. Vítor Santos Costa
– Conducted an empirical study to provide guidelines for estimating performance of spatio-temporal forecasting strategies;
– Proposed biased resampling strategies that improved the prediction of rare and extreme values in spatio-temporal data using Machine Learning techniques;
– Implemented these solutions in open-source R packages *STEvaluation* and *STResampling*;
– Supported by FCT/MAP-i PhD scholarship PD/BD/128166/2016.
- Visiting Graduate Researcher Student at Dalhousie University, Halifax, NS, Canada* Sep. – Oct. 2019
– Advisor: Prof. Luís Torgo
– Worked on research related to PhD thesis, in collaboration with an expert on marine protected areas.
- Assistant Researcher at LIAAD – INESC TEC, Porto, Portugal* Jan. – Oct. 2016
– Advisor: Prof. Luís Torgo
– Built a platform for integrating and analyzing physical-chemical and biological data on the marine environment;
– Supported by a research stipend under project MarinEye.

Student Researcher at LIAAD – INESC TEC, Porto, Portugal Feb. – Jul. 2014, Dec. 2014 – Nov. 2015

- Advisor: Prof. Luís Torgo
- Developed and tested new ensemble methods for time series forecasting based on diversity generation exploring specific properties of these tasks (Feb.– Jul. 2014);
- Designed propositional and relational approaches to spatio-temporal data analysis, and applied them to wildfire prediction (Dec. 2014– Nov. 2015);
- Supported by research stipends under projects e-Policy and PEST Adicional.

Intern at the School of Computer Science, Carnegie Mellon University, United States Aug. – Sep. 2014

- Host: Prof. J. Ziko Kolter
- Developed a web framework for finding, parsing and managing microstructure image data using web.py in collaboration with the Materials Science and Engineering Department at CMU;
- Supported by the CMU Portugal Undergraduate Internship Program

Junior Researcher at the Institute of Physics for Advanced Materials, Nanotechnology and Photonics (IFIMUP), Porto, Portugal Oct. 2011 – Jul. 2013

- Advisors: Dr. A.M. Pereira, Dr. M.P. Fernandez-García, and Dr. J.M. Teixeira
- Developed a LabView program to control a lock-in amplifier of an AC magnetic susceptometer for measuring and controlling the formation of magnetic nanoparticles in real-time.

PUBLICATIONS

Full Conference Papers

1. Oliveira, M., Moniz, N., Torgo, L., & Costa, V. S. (2019). Biased Resampling Strategies for Imbalanced Spatio-Temporal Forecasting. In *Proceedings of the 2019 IEEE International Conference on Data Science and Advanced Analytics, DSAA* (pp. 100–109). doi: 10.1109/dsaa.2019.00024
2. Oliveira, M., Torgo, L., & Costa, V. S. (2018). Evaluation Procedures for Forecasting with Spatio-Temporal Data. In *Proceedings of the European Conference on Machine Learning and Knowledge Discovery in Databases, ECML PKDD* (pp. 703–718). doi: 10.1007/978-3-030-10925-7_43
3. Cerqueira, V., Torgo, L., Oliveira, M., & Pfahringer, B. (2017). Dynamic and Heterogeneous Ensembles for Time Series Forecasting. In *Proceedings of the IEEE International Conference on Data Science and Advanced Analytics, DSAA* (pp. 242–251). doi: 10.1109/DSAA.2017.26
4. Oliveira, M., Torgo, L., & Costa, V. S. (2016). Predicting Wildfires - Propositional and Relational Spatio-Temporal Pre-processing Approaches. In *Proceedings of the 19th International Conference on Discovery Science* (pp. 183–197). doi: 10.1007/978-3-319-46307-0_12
5. Oliveira, M., & Torgo, L. (2015). Ensembles for Time Series Forecasting. In D. Phung & H. Li (Eds.), *Proceedings of the 6th Asian Conference on Machine Learning, ACML* (Vol. 39, pp. 360–370).

Journal Articles

1. Oliveira, M., Moniz, N., Torgo, L., & Santos Costa, V. (2021). Biased resampling strategies for imbalanced spatio-temporal forecasting. *International Journal of Data Science and Analytics*, 12(3), 205–228. doi: 10.1007/s41060-021-00256-2
2. Oliveira, M., Torgo, L., & Santos Costa, V. (2021). Evaluation Procedures for Forecasting with Spatiotemporal Data. *Mathematics*, 9(6). doi: 10.3390/math9060691
3. Fernández-García, M. P., Teixeira, J. M., Machado, P., Oliveira, M. R. F. F., Maia, J. M., Pereira, C., ... Araujo, J. P. (2015). Automatized and desktop AC-susceptometer for the in situ and real time monitoring of magnetic nanoparticles' synthesis by coprecipitation. *Review of Scientific Instruments*, 86(4), 043904. doi: 10.1063/1.4918723

Other Publications

1. Magalhães, C., Mucha, A., Carvalho, F., Ribeiro, H., Almeida, C., Azevedo, I., ... Silva, E. (2016). Development of an autonomous system for integrated marine monitoring. In *Proceedings of the XIX Iberian Symposium on Marine Biology Studies*. doi: 10.3389/conf.FMARS.2016.05.00006
2. Oliveira, M., & Torgo, L. (2014, 10). *Ensembles for Time Series Forecasting*. Poster presentation at the 17th International Conference on Discovery Science.

TRAINING & DEVELOPMENT

Completed Teaching Courses

- First Year Faculty Teaching Academy (CIRTL Network) Jun. – Jul. 2022
- An Introduction to Evidence-Based Undergraduate STEM Teaching (CIRTL Network MOOC, completed with distinction) Jun. – Aug. 2022

Participation in Advanced Schools and Workshops

- School on Machine Learning and Big Data with Quantum Computing, SMBQ, *Online* Sep. 2020
- Porto Winter School on Network Science, Porto, Portugal Dec. 2018
- EAIA Advanced School on Data Science for Big Data, Porto, Portugal Jul. 2018
- Workshop on Advanced Computing for Earth Sciences, ACES, Porto, Portugal Dec. 2017
- Lisbon Machine Learning Summer School, LxMLS, Portugal (selected for a scholarship) Jul. 2017

OTHER ACTIVITIES

Data Science Competitions & Events

- Jury member at World Data League, 2nd Edition Mar. – Jun. 2022

Journal Reviewing

- Machine Learning 2022, 2023
- IEEE Transactions on Knowledge and Data Engineering 2018, 2023
- Inteligencia Artificial – Iberoameric Journal of Artificial Intelligence 2018