

# Xurxo Rigueira

School of Computer Engineering  
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## EDUCATION

- 2021 – Now      **University of Vigo**  
Ph.D. Student in Computer Science advised by Prof. David Olivieri and Prof. Maria Araujo
- 2023              **Arizona State University**  
Visiting Ph.D. Student advised by Prof. Tianfang Xu
- 2018 – 2020      **University of Vigo**  
Master of Science in Mining Engineering
- 2014 – 2018      **University of Vigo**  
Bachelor of Science in Mining and Energy Engineering
- 2017 – 2018      **California State University, East Bay**  
Exchange Student in Environmental Engineering

## PUBLICATIONS

- 2024              **Enhancing water quality prediction for fluctuating missing data scenarios: A dynamic Bayesian network-based processing system to monitor cyanobacteria proliferation**  
Maria Pazo, Saki Gerassis, Maria Araujo, Margarida Antunes, and Xurxo Rigueira  
Science of the Total Environment 2023, 927, 172340
- Automatic characterization of block-in-matrix rock outcrops through segmentation algorithms and its application to an archaeo-mining case study**  
Andres Cristobal, Xurxo Rigueira, Ignacio Perez-Rey, Xian Estevez-Ventosa, Maria Pazo, Maria Lia Napoli, Brais X. Curras, and Leandro R. Alejano  
Geosciences 2024, 14(2), 29
- 2023              **Computer vision application for improved product traceability in the granite manufacturing industry**  
Javier Martinez, Xurxo Rigueira, Maria Araujo, Eduardo Giraldez, and Antonio Recaman  
Materiales de Construcción 2023, 73 (351)
- Impact of artificial intelligence on assessment methods in primary and secondary education: Systematic literature review**  
Miguel Martinez, Xurxo Rigueira, Ana Larrañaga, Javier Martinez, Iago Ocaranza, and Denis Kreible  
Psicodidactica 2023, 28 (2), 93-103
- Bayesian machine learning and functional data analysis as a two-fold approach for the study of acid mine drainage events**  
Xurxo Rigueira, Maria Pazo, Maria Araujo, Saki Gerassis, and Elvira Bocos  
Water 2023, 15 (8), 1553
- 2022              **Functional data analysis for the detection of outliers and study of the effects of the COVID-19 pandemic on air quality: A case study in Gijón, Spain**  
Xurxo Rigueira, Maria Araujo, Javier Martinez, Paulino Garcia, and Iago Ocaranza  
Mathematics 2022, 10 (14), 2374
- Under review**
- Multivariate functional data analysis v. random forest for anomaly detection in water data**  
Xurxo Rigueira, David Olivieri, Maria Araujo, Angeles Saavedra, and Maria Pazo  
*Under review at Science of The Total Environment*

## In progress

**Anomaly discovery and explainability in water quality with an iterative multiresolution algorithm**

Xurxo Rigueira, David Olivieri, Maria Araujo, and Maria Pazo

**Explainable Streamflow Forecasting in a Snow-Dominated, Mountainous, Karst Watershed with Temporal Attention-Based Models**

Xurxo Rigueira, Seohye Choi, and Tianfang Xu

**”Enhanced forecasting of extreme water events using a hybrid transformer-UNet model”**

Xurxo Rigueira, David Olivieri, Maria Araujo, and Maria Pazo

## CONFERENCES

2023 **Real-time incremental machine learning for anomaly detection and surveillance in water quality**

Xurxo Rigueira, David Olivieri, Maria Araujo, Maria Pazo, and Elena Alonso

Water Innovation and Circularity Conference. Athens, Greece, (2023.6)

2022 **Computer vision application for improved product traceability in the granite manufacturing industry**

Xurxo Rigueira, Javier Martinez, Maria Araujo, Eduardo Giraldez, and Antonio Recaman

5th International Conference on Production Economics and Project Evaluation. Castelo Branco, Portugal. (2022.9)

**Multivariate functional data analysis for outlier detection in environmental data**

Xurxo Rigueira, Javier Martinez, Maria Araujo, Maria Pazo, and Javier Taboada

International Congress on Mathematical Modelling in Engineering and Human Behaviour. Valencia, Spain. (2022.7)

**Directional outlyingness for the detection of functional outliers in water quality data**

Xurxo Rigueira, Javier Martinez, Maria Araujo, and Eduardo Giraldez

International Congress on Water, Waste, and Energy Management. Rome, Italy. (2022.7)

## TEACHING EXPERIENCE

### Teaching Assistant

2024 **Informatics: Computer Science in Engineering (V09G311V01110)**, University of Vigo

*Introductory level course, 120 students (Instructor: Prof. Manuel Pérez Cota)*

### Outreach speaker

2020 – Now **Introduction to Smart Materials**, University of Vigo

*25+ Introductory level seminars, 20 students per seminar on average*

2022 – Now **Introduction to Artificial Intelligence**, University of Vigo

*10+ Introductory level seminars, 25 students per seminar on average*

## HONORS AND AWARDS

2022 **Undergraduate Excellence Award for Admitted Ph.D. Students**, University of Vigo

**Fulton Fellowship**, Arizona State University

2020 **Graduated with honors**, Class of 2020, University of Vigo

2018 **Salutatorian**, Class of 2018, University of Vigo

2017 **International Student Scholarship**, [International Student Exchange Program \(ISEP\)](#)

## RESEARCH GRANTS

- 2024 **Spanish Ministry of Science and Innovation** Improving water quality management: dynamic-based machine learning and deep learning solutions ([PID2024](#))  
Co-author
- 2020 **Spanish Ministry of Science and Innovation** Improving water quality management: functional and machine learning solutions ([PID2020-116013RB-I00](#))  
Co-author

## MENTORING EXPERIENCE

### One-on-one mentoring

- 2024 – Now **Pablo Alonso** (Undergraduate Student at the University of Vigo)  
Co-supervised with Maria Pazo  
*Prediction of malfunction alerts at a machine level for wind power plants with a deep learning approach.*
- 2024 – Now **Javier Dopico** (Undergraduate Student at the University of Vigo)  
Co-supervised with Maria Pazo  
*Imputation of missing values in water data with Bayesian models.*
- 2023 – Now **Antia Vidal** (Undergraduate Student at the University of Vigo)  
Co-supervised with Prof. Maria Araujo  
*Comparison between functional data analysis and machine learning models for the detection of anomalies in air quality data.*

## INDUSTRY EXPERIENCE

- 2020 **Industrial and Production Engineer** ([Soltec Ingenieros](#))  
Completed 50+ energy audits for shopping centers and finished the renewable energy plan for the town of As Pontes, Spain, which received media coverage by [El Periódico de la Energía](#).
- 2019 **Engineering Intern** ([Soltec Ingenieros](#))  
Helped senior engineers to complete 2+ environmental engineering projects.

## PROFESSIONAL SERVICE

### Paper reviewing

- 2022 Mathematical Problems in Engineering

### Volunteering

- 2018 Science Contest Judge for [Mesa USA](#)

## REFERENCES

- Ph.D. advisor **Professor Maria Araujo**, [maraujo@uvigo.es](mailto:maraujo@uvigo.es) +34 630 502 931,  
Department of Natural Resources and Environmental Engineering, University of Vigo
- Ph.D. advisor **Professor David Olivieri**, [olivieri@uvigo.es](mailto:olivieri@uvigo.es) +34 691 947 237,  
Department of Computer Science, University of Vigo
- Collaborator **Dr. Ignacio Perez**, [iperez@uvigo.es](mailto:iperez@uvigo.es) +34 637 490 880,  
Department of Natural Resources and Environmental Engineering, University of Vigo