Xurxo Rigueira

School of Computer Engineering
School of Mining and Energy Engineering
Campus As Lagoas-Marcosende
Vigo, PO 36310, Spain

+1 (909) 955-3913
xurxo.rigueira@uvigo.es
xrigueira.github.io

EDUCATION

2021 – Now **University of Vigo**
Ph.D. Candidate in Computer Science advised by Prof. David Olivieri and Prof. Maria Araujo

2023 – Now **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

2025 **Multivariate functional data analysis and machine learning methods for anomaly detection in water quality sensor data**
Xurxo Rigueira, David Olivieri, Maria Araujo, Angeles Saavedra, and Maria Pazo
Environmental Modelling & Software 2025, 190, 106443.

Introducing AutoML and the noisy-average probabilistic independence of causal influence (PICI) model for the prediction of ornamental stone quality
Maria Pazo, Xurxo Rigueira, Saki Gerassis, Angeles Saavedra, and Margarida Antunes
Engineering Geology 2025, 352, 108088

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 Ocarranza, 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 Ocarranza
Mathematics 2022, 10 (14), 2374

Under review

An Explainable AI Model for Anomaly Detection in Water Quality Data
Xurxo Rigueira, David Olivieri, Maria Araujo, and Maria Pazo
Under review at Water Resources Management

In progress

Explainable streamflow prediction in a snow-dominated, mountainous, karst watershed with temporal attention-based deep learning
Xurxo Rigueira, Seohye Choi, and Tianfang Xu

Modeling of sub-grid scale processes at the ocean-atmosphere boundary later with physics-informed neural networks
Xurxo Rigueira, David Olivieri, Maria Araujo, and Maria Pazo

CONFERENCES

2025 **Harmful cyanobacteria blooms: drivers and impacts**
Maria Pazo, Pablo Alonso, Xurxo Rigueira, Isabel Vadillo and Maria Araujo
13th World Congress of EWRA on Water Resources and Environment. Palermo, Italy, (2025.6)

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 – 2024 **Introduction to Smart Materials**, University of Vigo
25+ Introductory level seminars, 20 students per seminar on average

2022 – 2024 **Introduction to Artificial Intelligence**, University of Vigo
10+ Introductory level seminars, 25 students per seminar on average

HONORS AND AWARDS

2025 **ERASMUS+ Ph.D. Fellowship**, University of Vigo

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 **Pablo Alonso** (Undergraduate Student at the University of Vigo)
Co-supervised with Ph.D. Student Maria Pazo
Prediction of malfunction alerts at a machine level for wind power plants with a deep learning approach.

2024 **Abraham Novas** (Undergraduate Student at the University of Vigo)
Co-supervised with Ph.D. Student Maria Pazo
Analysis of environmental risks associated with areas of potential enrichment in Sn-W using Bayesian techniques and AutoML.

2023 – 2024 **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 of shopping malls 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)
Assisted senior engineers in completing 2+ environmental engineering projects.

PROFESSIONAL SERVICE

Scientific reviewing

2024 Journal of Hazardous Materials

Water Resources Management

2022 Mathematical Problems in Engineering

Volunteering

2018 Science Contest Judge for Mesa USA

RESEARCH TOOLS

Python, R, C++, GPU computing (CUDA), PyTorch, TensorFlow, OpenCV, Git, GitHub.

REFERENCES

Advisor **Professor Maria Araujo**, maraujo@uvigo.es +34 630 502 931,
Department of Natural Resources and Environmental Engineering, University of Vigo

Advisor **Professor David Olivieri**, olivieri@uvigo.es +34 691 947 237,
Department of Computer Science, University of Vigo

Advisor **Assistant Professor Tianfang Xu**, tianfang.xu@asu.edu +1 (480) 965-7666,
School of Sustainable Engineering and The Built Environment, Arizona State University