

Xurxo Rigueira

School of Computer Engineering
School of Mining and Energy Engineering
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EDUCATION

- 2021 – Now **University of Vigo**
Ph.D. Candidate 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 and machine learning methods for anomaly detection in water quality data

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

Under review at Environmental Modelling and Software

Visual Paths: an explainable machine learning model for anomaly detection in water quality

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

Under review at Water Resources Management

Noisy-average probabilistic independence of causal influence (PICI) model for ornamental rock exploitability prediction using AutoML

Maria Pazo, Xurxo Rigueira, Saki Gerassis, Angeles Saavedra, and Margarida Antunes

Under review at Engineering Geology

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 process at the ocean-atmosphere boundary layer with physics-informed neural networks

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 – 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

- 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

- Mentor **Professor Amir AghaKouchak**, amir.a@uci.edu +1 (949) 824-9350,
Department of Civil and Environmental Engineering, University of California, Irvine
- 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