Xurxo Rigueira

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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 – Now	**Arizona State University** Visiting Ph.D. Student advised by of 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 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

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 Journal of Hydrology

In progress

Streamflow forecast with transformers in snow-dominated mountainous karst watersheds
<u>Xurxo Rigueira</u>, Seohye Choi, and Tianfang Xu

Water quality anomaly discovery and explanation with an iterative bootstrapped multiresolution algorithm
<u>Xurxo Rigueira</u>, David Olivieri, Maria Araujo, and Maria Pazo

Hybrid deep learning model for the prediction of anomalies in water data
<u>Xurxo Rigueira</u>, David Olivieri, Maria Araujo, and Maria Pazo

CONFERENCES

2023   **Real-time incremental machine learning for anomaly detection and surveillance in water quality**
<u>Xurxo Rigueira</u>, 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**
<u>Xurxo Rigueira</u>, 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
<u>Xurxo Rigueira</u>, Javier Martinez, Maria Araujo, Maria Pazo, and Javier Taboada
Modelling in Engineering and Human Behaviour. Valencia, Spain. (2022.7)

Directional outlyingness for the detection of functional outliers in water quality data
<u>Xurxo Rigueira</u>, 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, Department of Natural Resources and Environmental Engineering, University of Vigo
Ph.D. advisor	**Professor David Olivieri**, olivieri@uvigo.es, Department of Computer Science, University of Vigo
Research advisor	**Assistant Professor Tianfang Xu**, tianfang.xu@asu.edu, School of Sustainable Engineering and the Built Environment, Arizona State University
Collaborator	**Dr. Ignacio Perez**, iperez@uvigo.es, Department of Natural Resources and Environmental Engineering, University of Vigo
Former Advisor	**Professor Javier Martinez**, javmartinez@uvigo.es, Department of Applied Mathematics II, University of Vigo