Rodrigo Junes

MSc Eng

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Resume

Civil Engineer with a Master's Degree in Applied Fluid Mechanics, with experience in hydrodynamic modelling and predictive environmental modelling, environmental data analysis and interpretation, environmental consultancy, applied work in environmental impact assessment and management, to generate actionable information for some of the largest infrastructure, energy and industrial projects in Uruguay. Looking for a research opportunity with meaningful impact.

Experience

Estudio Ingeniería Ambiental SRL / Environmental Impact Assessment Team Lead (full time)

Uruguay, October 2021 - present

Manage a team of four professionals (engineers and scientists) and coordinate various other consultants (engineers, sociologists, archaeologists, architects, biologists, etc.) in order to produce environmental impact assessment reports to be submitted to the environmental authorities for the purposes of permitting the assessed projects.

Lead the development of environmental impact assessments, directing the team in solving the complex problems that arise during the process, especially pertaining environmental modelling (air quality, noise, water quality, hydrodynamics and probabilistic modelling), data analysis and statistics (exploratory data analysis, processing visualisation and interpretation). Personally solve the higher complexity problems regarding these areas.

Propose, conceptualise and actively lead the in-house development and implementation of an environmental database and web based management tool for planning, executing and storing results from environmental monitoring, as well as automating reports to the environmental authorities, resulting in the creation of Atenea, which is now a fundamental tool within Estudio Ingeniería Ambiental.

Estudio Ingeniería Ambiental SRL / Jr Environmental Consultant (part time)

Uruguay, February 2017 - September 2021

Developed environmental impact assessments in order to obtain permits from the environmental authority and funding from international finance groups for a variety of projects, including infrastructure (roads, ports, and waterways), industry, and the energy sector.

Implemented (and supervised the implementation of) predictive models to quantify potential environmental impacts to air quality, water quality, hydrodynamics, hydrology, and coastal morphodynamics. Implemented the road noise prediction model from Sétra in MATLAB language and combined it with the ISO 9613-2 implementation to create a tool for assessing road noise. Analysed and interpreted widely varied datasets obtained from predictive modelling and field measurements to gain insight into environmental impacts, and designed mitigation measures to achieve environmental compliance.

Evaluated data from industrial processes and the environment, through exploratory data analysis and statistical modelling, to obtain actionable information, and determine trends and behaviours of environmental variables. Environmental monitoring of various projects, taking part in the design and implementation of monitoring plans and fieldwork activities, such as air quality, noise, water and sediment quality.

Estudio Ingeniería Ambiental SRL / Environmental Consultancy Assistant (part time)

Uruguay, March 2013 - January 2017

Collaborated in the development of environmental impact assessments, environmental quality monitoring, and the design of civil engineering projects. Developed a computational implementation of the ISO 9613-2 “Acoustics — Attenuation of sound during propagation outdoors” standard using MATLAB language, a tool that is still in use for environmental impact assessment within Estudio Ingeniería Ambiental.

Landmark projects:

- ANCAP fluvial fuel port: conceptualised and implemented a 2D dispersion model using the oil spill module from TELEMAC-2D, exploring a grid of forcing combinations (discharge, water level and wind vector field), and assigning probabilities to each in order to generate a risk assessment map for the Uruguay river in the case of an oil spill.
- UPM Paso de los Toros pulp mill: applied my knowledge of environmental modelling and data analysis for air quality and noise model implementation, and the supervision of water quality models.
- Ferrocarril Central railway: implemented air quality models for environmental permitting, and completed a cumulative impact assessment for the IADB.
- Katoen Natie container port: managed an interdisciplinary team and developed an environmental assessment for the land reclamation and operation of a 3 million TEU expansion of the existing port.

Institute of Fluid Mechanics and Environmental Engineering, Faculty of Engineering, University of the Republic / Assistant Researcher
Uruguay, November 2018 - April 2020

Carried out research for the development of my Master’s Thesis within the Fluvial and Maritime group (see education section for details on my thesis).

Administrative Committee of the Uruguay River (CARU) / Scholarship Holder
Uruguay, June 2017 - October 2018

Implemented, calibrated and validated a 2-dimensional, high resolution hydrodynamic model for the last 350 km stretch of the Uruguay river in TELEMAC-2D, and transferred the tool to CARU for use in the management of the river. This was done within the framework of a Master’s scholarship awarded by CARU.

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Education

Massachusetts Institute of Technology - MITx / MicroMasters Program in Statistics and Data Science
March 2022 - November 2023

Successfully completed all four courses from the program: Data Analysis: Statistical Modeling and Computation in Applications, Fundamentals of Statistics, Machine Learning with Python-From Linear Models to Deep Learning, Probability - The Science of Uncertainty and Data, gaining valuable and practical knowledge in these areas.

Faculty of Engineering, University of the Republic / Master’s in Science (Applied Fluid Mechanics)
Uruguay, March 2017 - July 2020

The thesis (available here) focused on an analysis of the Uruguay river flow patterns and its spatial and temporal variation, through the implementation of a 2-dimensional hydrodynamic model in TELEMAC-2D. Free surface elevation from gauging stations and velocity data from ADCP measurements was used to calibrate and validate the model. The spatial datasets of velocity and free surface elevation generated by the model (7 years of data with 1 hour sampling step for 90,000 nodes) where analysed, with a focus on the characterization of flow reversal events caused by the synergy between astronomical tidal waves, storm surges and low discharge.

Faculty of Engineering, University of the Republic / Bachelor's in Civil Engineering
Uruguay, March 2010 - February 2017

The thesis focused on the design of a deep water port located on the eastern coast of Uruguay. I implemented a wave propagation model using SWAN in order to characterise the effect of the port structures on the wave parameters, and an internal agitation model using ARTEMIS from the TELEMAC-MASCARET model suite.

Skills

English: very good user (IELTS band 8, CEFR level C1).

Portuguese: very good user.

Spanish: native speaker.

Programming languages: Python and MATLAB for exploratory data analysis, statistics and machine learning.

QGis for spatial data analysis and representation.

Modelling software: TELEMAC-MASCARET, DELFT3D, MOHID, HEC-RAS, CALPUFF, AERMOD, EPANET.

MS Office, LibreOffice, LATEX, Windows and Linux.

Certified quadcopter drone operator and ample experience with RGB drone image processing for photogrametry.

Conferences and courses attended

2022: 39th IAHR World Congress, accepted for oral presentation: "Characterization of Flow Reversals in the Uruguay River and its Relation to Forcings".

2022: XI Congreso Nacional de AIDIS (National Conference of the Inter-American Association of Sanitary Engineering), presented: "Emergency generators and air quality: an exploratory analysis of the problem"

2019: Earth Observation For Sustainable Development seminar - Water Resources Management, attended classes by Dr. G.N. Parodi (Department of Water Resources, University of Twente).

2019: X Congreso Nacional de AIDIS (National Conference of the Inter-American Association of Sanitary Engineering), presented: "Air quality modelling: case study of odour emissions from a future UPM's pulp mill".

2019: VI Simposio sobre Métodos Experimentales en Hidráulica (Symposium on Experimental Methods in Hydraulics), presented: "Sediment transport capacity of the navigation channel of Uruguay river, from field data and hydrodynamic modelling".

2018: XXVIII Congreso Latinoamericano de Hidráulica (Latin-American Conference on Hydraulics), presented: "Determination of the Main Flow Patterns in Uruguay River".

2018: Earth Observation For Sustainable Development seminar - Water Resources Management, attended classes by Dr. G.N. Parodi (Department of Water Resources, University of Twente).