





Mario A. Ponce-Pacheco

Hydrology – Data Science – Software development

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EXPERIENCE

Technische Universiteit Delft

April 2024 – September 2024

Project Manager / Teaching Assistant

I collaborated in the organization of the biggest course of the faculty: [Modelling, Uncertainty and Data for Engineers \(MUDE\)](#); which is taken by ~300 students and around 30 lecturers and Teaching assistants are involved.

Supervisor: [Robert Lanzafame](#) (r.c.lanzafame@tudelft.nl)

Technologies: Python, Django

Jan 2023 – March 2024

Researcher / Backend developer

I developed the backend of [MAKARA](#), an app implementing a socio-hydrological model in Maharashtra, India. Developed a robust API for seamless frontend communication and automated climatic data processing. **Supervisor:** [Saket Pande](#) (s.pande@tudelft.nl)

Technologies: Python, Django REST, Linux

BairesDev

Jun 2021 – Aug 2022

Python Engineer

Responsible for implementing Machine Learning algorithms to improve the performance of a cooking robot.

Technologies: Python, C++, ROS, pytest, Linux

Tata Consultancy Services

Sep 2020 – Jun 2021

Software Engineer

Responsible for giving support in Linux systems to financial projects. I got also training in AWS technologies.

Technologies: Python, AWS, Linux

Soluciones en Ingeniería y Tecnologías del Agua

Nov 2018 – Aug 2020

Hydrology and Hydroinformatics Consultant

Oversaw hydrological modelling, and flood simulations, and devised mitigation solutions for a Protected Natural Area.

Technologies: Python, IoT, R, Raspberry, Arduino, QGIS, HEC-RAS, Linux.

Deltares

May 2018 – Sep 2018

Intern

Managed the processing of raster files and spatial time series, with a focus on down/up-scaling; which now it's part of a commercial toolbox. Conducted runoff simulations for European basins, considering diverse climate change scenarios using Wflow.

Supervisor: [Albrecht Weerts](#) (albrecht.weerts@deltares.nl)

Technologies: Python, Wflow, Linux

Irrigation engineer

Aug 2011 – Apr 2016

Throughout these years, I contributed my skills to various small companies, taking on versatile roles depending on the project: Designing irrigation systems, GIS and soil conservation infrastructure, and conducting hydrological model simulations.

Technologies: GIS, R, python

University of Arizona

Jan 2010 – Mar 2010

Intern

I worked for the university's controlled environment agriculture centre.

Supervisor: [Murat Kacira \(mkacira@cals.arizona.edu\)](mailto:mkacira@cals.arizona.edu)

Technologies used: CRBasic

Independent Project

Jul 2015 – Sep 2015

Web Designer

I worked as a designer of web pages.

Technologies used: HTML5, CSS3, WordPress, Joomla

EDUCATION

Wageningen University & Research

Master's Degree in Climate Studies, 2016-2018

Hydrology and Quantitative Water Management Group

Minor: Dynamic Systems Modelling

Thesis: Feasibility of the application of the Lattice Boltzmann Method to resolve flow in a sharp river bend

Supervisor: [Ton Hoitink \(ton.hoitink@wur.nl\)](mailto:ton.hoitink@wur.nl), *Paul Torfs*

Description: I studied the feasibility of the implementation of the Lattice Boltzmann Method - novel CFD method - in the simulation of natural flows, identifying their advantages and disadvantages; as well as the limitations of implementation in large-scale problems. Special focus on the similarity between the physical and computational models, and their relationship in the stability, accuracy, and efficiency of the simulations.

Universidad Nacional Autónoma de México, IIMAS-UNAM

Postgraduate Degree in Applied Statistics, 2014- 2015

Universidad Autónoma Chapingo, UACH

Bachelor's Degree in Irrigation Engineering, 2006-2010

Thesis: Design of irrigation networks using Differential Evolution algorithms and Artificial Bee Colony

Supervisor: [Irineo López Cruz \(ilopez@correo.chapingo.mx\)](mailto:ilopez@correo.chapingo.mx)

Description: I studied the algorithms of Differential Evolution and Artificial Bee Colony, for which I proved their efficiency in different types of problems in continuous and discrete domains. Later I propose a cost function for the design of a hydraulic distribution network. Finally, I analysed the algorithms' performance in minimising the cost of the proposed objective function.

TRUNCATED EDUCATION

Universidad Autónoma de la Ciudad de México, UACM

Master in Complexity Sciences, 2019→

Part-time student in parallel with my job. (unfinished)

Metropolitan Autonomous University, UAM

Applied Mathematics Specialist 2015-2016

Truncated to 30%. I left it behind to go to the WUR

RELEVANT COURSES

[OPENSENSE Training School](#)

COST Actions, 2023 in Tel Aviv

[Coursera – DeepLearning.AI](#)

Deep Learning Specialization, 2022

[Universidad Nacional Autónoma de México, UNAM](#)

[Diploma in aerobic treatment and wastewater reuse](#), 2021

[Instituto Politécnico Nacional, CIC-IPN](#)

Course: Machine Learning, 2021

[Karlsruhe Institute of Technology](#)

[Spring School in Lattice Boltzmann](#) Methods with OpenLB Software Lab, 2018

PUBLICATIONS

- Ponce Pacheco, M.A., Soham, A., Guntha, R., Aravindakshan, A., Presannakumar, M., Tyagi, A., Nagi, A., Pastore, P., & Pande, S. (In review). Makara: A tool for cotton farmers to evaluate risk to income [Application Note]. Smart Agricultural Technology. Manuscript under review.

LANGUAGES

- **Spanish:** Native
- **English:** Professional, B2

TECHNICAL SKILLS

- **Languages:** Python (advanced), R (advanced), C++ (intermediate), MATLAB (intermediate), Julia (basic)
- **Web design:** HTML/CSS
- **Frameworks:** Django, Django REST, ROS
- **OS:** Linux, Windows
- **Databases:** MySQL, PostgreSQL
- **GIS:** QGIS, ArcGIS, RASTER, SHP, NetCDF
- **Cloud:** AWS
- **Agile:** SCRUM