Mario A. Ponce-Pacheco

Hydrology – Data Science – Software development

mappacheco24@gmail.com Delft, The Netherlands
+31 6 1389 6357 mario-ponce-pacheco marioponce marioponce.github.io

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, Uncertantie 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)

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), 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)
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.

INCOMPLETE 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]. Computers and Electronics in Agriculture. Manuscript under review.

LANGUAGES

	Spoken fluency	Reading fluency	Written fluency	Level
Spanish	—	—	—	Native
English	High	High	High	B2
French	Low	Confident	Low	A2

SKILLS

OS
- Windows
- UNIX: Debian, CentOS MacOS

Text edition
- Latex

Programming languages
- Python — Advanced
- R — Advanced
- MATLAB — Intermediat
- C++ — Intermediate
- C — Intermediate

Databases & datasets
- mySQL, SQLite, PostgreSQL
- RASTER & SHP
- NetCDF
- CML, PWS, SML

Statistics a & Data Science
- Machine Learning
- Bayesian Statistics

Open Hardware
- Raspberry Pi — Advanc
- Arduino — Intermediat
- IoT — Basic

Complexity
- Non-linear dynamic
- Cellular automata
- Agent-based model

Optimization
- Differential Evolution
- Bioinspired Algorithms

CFD
- OpenFoam
- Lattice Boltzmann Metho

Agile methodologies
- SCRUM

Cloud Services
- AWS — Intermediate

WEB
- Django REST
- HTML5/CSS3