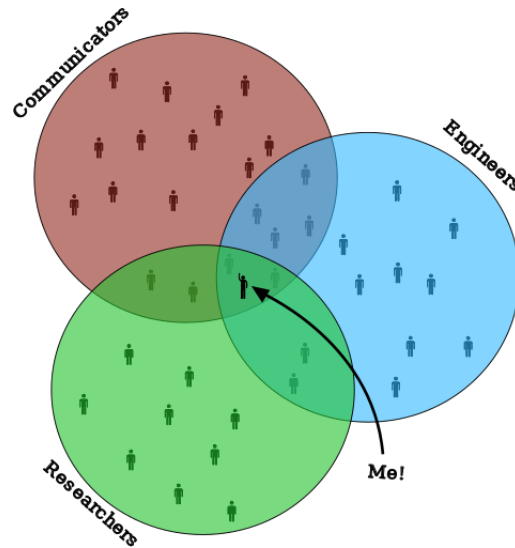


Pablo Rodríguez-Sánchez, PhD

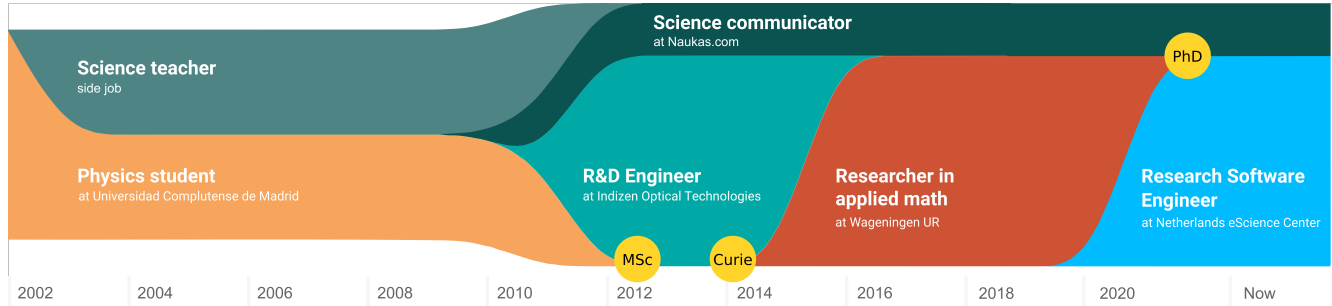
Applied mathematician. Research software engineer. Science communicator

• pabrod.github.io • pabrod@proton.me • (+31) 629 177 277

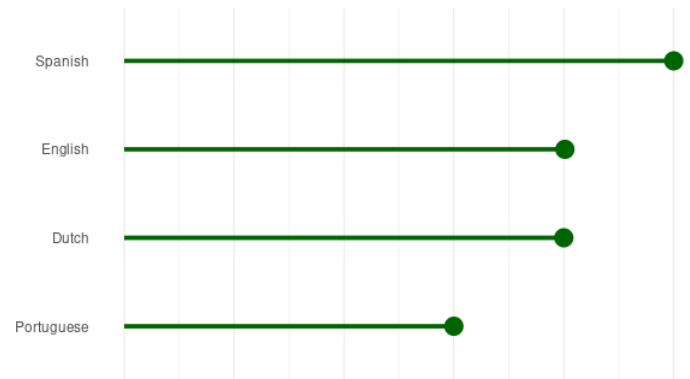
Me in a nutshell



My timeline



Relevant skills



Work experience



Research Software Engineer. Netherlands eScience Center, Amsterdam
October 2019 – Now

Designer and developer of reusable software solutions for diverse research problems such as:

- Automatic feature classification of x-ray tomographies of **agricultural soils** using ML
- Teaching and implementing from scratch an **automatic differentiation** engine
- Implementation of high-performance algorithms for **fluid dynamics** simulation
- Exploration of **quantum computing** algorithms' applications to radioastronomy
- Deeply involved in **teaching** and **science communication**



Marie Curie Early Stage Researcher. Aquatic ecology department, Wageningen UR.
October 2015 – October 2019

PhD student in mathematical modelling, simulation and analysis of **chaotic dynamics in biological systems**; with a focus on the forecast of regime shifts using experimental time series. This project is part of the CRITICS (CRItical Transitions In Complex Systems) Intensive Training Network, coordinated by Imperial College London. The main outcome of this period was my **PhD thesis**: "Cycles and interactions, a mathematician among biologists"



R&D Engineer. Indizen Optical Technologies, Madrid.
July 2012 – September 2015

IOT is an ophthalmic lens design company. My work focused on the numerical simulations, optimization of lens surfaces' shapes, ray tracing, design of clinical trials, **software development and maintenance** and the research of new technologies and methods. I also developed tailored software for internal use, and provided training for employees and partners



Science tutor. Academia Oxford, Guadalajara. 2003–2011

Physics, chemistry and mathematics tutor. Student levels from high school to first university years

Side jobs



Science communicator. Naukas.com. April 2011 – Now

Frequent collaborations in media, theaters and universities in the form of short essays, live talks, interactive applets and even stand-up comedy. The full list can be found in my personal webpage



Activities and Promotion Coordinator. Marie Curie Alumni Association. April 2016 – April 2017



Teaching assistant. Faculty of physics, Complutense University of Madrid. 2007–2009

In charge of Single Variable Calculus, introduction to Electromagnetism and introduction to Thermodynamics

Education

- **PhD in applied mathematics, Wageningen UR.** October 2015 – October 2019
- **MSc in Physics, Universidad Complutense de Madrid.** September 2002 – September 2012

Relevant postgraduate courses

- **From working code to software package,** *Complexity Lab Utrecht.* 2019
- **Mathematics and industry,** *Imperial College.* London. 2018
- **Advanced High Performance Cluster course,** *Wageningen UR.* 2017
- **Modelling environmental resilience,** *École Normale Supérieure.* Paris. 2016
- **Orientation on mathematical modelling in biology,** *Wageningen UR.* 2016

Technical skills

- **R:** two packages accepted in CRAN
- **Python:** professional use since 2014
- **Julia:** professional use since 2022
- **git:** professional use since 2015
- **Matlab :** 10 years of professional use
- **C#:** 3 years of professional use
- **SQL:** 3 years of professional use
- **C++:** intermediate training during my studies



- **Practical introduction to partial differential equations,** *Workshop for PhDs at WUR.* 2018

Selected publications

- Automatic differentiation from scratch, Rodríguez-Sánchez P, 2024.
URL: pabrod.github.io/autodiff-slides/
- Quantum Radio Astronomy: Quantum Linear Solvers for Redundant Baseline Calibration. Broekema C., Rodríguez-Sánchez P, et al. 2023.
DOI: 10.1016/j.ascom.2024.100803
- bytelparsing: a functional parser combinator for mixed ASCII/binary data. Rodríguez-Sánchez P, Hidding J. 2023. DOI: 10.21105/joss.05293
- Evaluating recovery metrics derived from optical time series over tropical forest ecosystems. De Keersmaecker W., Rodríguez-Sánchez P, et al. 2023. DOI: 10.1016/j.rse.2022.112991
- Early warning signals for desynchronization in periodically forced systems. Rodríguez-Sánchez P, van Nes EH, Scheffer M. 2020. ArXiv ID: 2003.11595
- Neutral competition boosts chaos in food webs. Rodríguez-Sánchez P, van Nes EH. DOI: 10.1098/rsos.191532
- Climbing Escher's stairs: a way to approximate stability landscapes in multidimensional systems. Rodríguez-Sánchez P, van Nes EH, Scheffer M. 2020. DOI: 10.1371/journal.pcbi.1007788
- Horizontal and vertical diversity jointly shape food web stability against small and large perturbations. Zhao et al. 2019. Ecology letters. DOI: 10.1111/ele.13282

Personal webpage

For expanded information, please click or type:

pabrod.github.io

or catch this QR code:



Relevant teaching experience

- **Automatic differentiation from scratch,** *Vrije Universiteit Amsterdam.* 2024
- **R packaging,** *Software Carpentry course.* Also author of the course materials.. 2023
- **Introduction to parallel computing with Python,** *Software Carpentry course.* Also co-author of the course materials.. 2020
- **Continuous integration,** *Workshop for PhDs at WUR.* 2019
- **Introduction to Unit Testing with pytest,** *Workshop for PhDs at WUR.* 2018

Latest update January 28, 2025