

VICTORIA PEREIRA

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ACADEMIC AND PROFESSIONAL EXPERIENCE

2019–Current

Postdoctoral
Research Associate

Mathematical Institute, University of Oxford

- Funded by the Royal Society and the EPSRC Impact Acceleration Account Award.
- I use a combination of analytical and numerical methods to study and optimise single and multi-phase fluid dynamics in filtration systems.
- RisingWISE 2021 Cohort. RisingWISE is an enterprise course for selected women early career researchers from the universities of Oxford and Cambridge.
- *Publications:*
 - Pereira, V.E., *et al.*, 2021. Optimising the flow through a concertinaed filtration membrane, *J. Fluid Mech.* **913**, A28.
 - Pereira, V.E., *et al.*, 2021. The role of caking in optimising the performance of a concertinaed ceramic filtration membrane, *Phys. Rev. Fluids*. (In Press).

2021

Faculty Science Ltd.

Data Science Fellow

- Faculty is a technology company who provide artificial intelligence and machine learning services to a wide range of clients.
- Faculty's Fellowship program is a two month intensive training program covering technical and commercial topics in data science and machine learning, including a six week consultancy project.

EDUCATION

2015–2019

PhD in Mathematics

University of Oxford, Mansfield College

- EPSRC Centre of Doctoral Training in Industrially Focused Mathematical Modelling (InFoMM)
- In my PhD, I used a combination of mathematical, computational, and machine learning methods to solve a range of physical and commercial challenges.
- *Thesis title:* Bubble dynamics and regime transitions in two-phase flow.
- In my thesis, I derived and analysed solutions of deterministic partial differential equations to model two-phase liquid–gas pipe flow, and further used Monte Carlo simulations and kinetic theory to develop a master equation governing the evolution of a bubble distribution.
- *Responsibilities:* Tutoring undergraduate and postgraduate mathematics. President of the University of Oxford's Society of Industrial and Applied Mathematics (SIAM) Student Chapter. 2019 SIAM Student Chapter Certificate of Recognition.
- *Publication:*
 - Pereira, V.E. and A.C. Fowler, 2019. Exsolving two-phase flow in oil wells, *Geophys. Astrophys. Fluid Dyn.* **114**(3) 283–305.

2014–2015

MSc in Mathematics

University of Oxford, Worcester College

- Mathematical Modelling and Scientific Computing. Distinction in thesis.
- *Thesis title:* Mathematical Modelling of the Growth and Homeostasis of the Epidermis.

2011–2014

BSc in Mathematics

King's College London, University of London

First class honours.

COMPUTING SKILLS

Proficient
Intermediate

PYTHON (NumPy, SciPy, Pandas, Scikit-Learn, Matplotlib, Seaborn), MATLAB, Mathematica, Linux.
SQL, PYTHON (PyTorch, Keras).

MATHEMATICAL EXPERTISE

Continuous and discrete mathematical modelling of real-world problems, analytical and numerical methods to study differential equations, unsupervised machine learning (clustering and matrix completion, signal processing), supervised machine learning (XGBoost tree-based classification and forecasting models).

COMMERCIAL EXPERIENCE

2021
Data Scientist This consultancy project was undertaken as part of the Faculty Fellowship program (*described above*).

- **Subak** is a non-profit climate impact accelerator. I worked with Subak and one of the member start-ups **NewAutomotive**, a transport research organisation. I developed a data collection and machine learning pipeline to analyse and forecast the uptake of electric vehicles in the UK.

2019–2021
Mathematical Consultant The following consultancy partnerships were undertaken as part of my postdoctoral research (*described above*).

- **Beko Plc** is a domestic appliance producer. I used mathematical modelling and computational fluid dynamics to advise on the efficiency of microparticle removal in washing machine filters. I provided co-supervision of a 1st year PhD project.
- **Smart Separations Ltd.** is a UK-based filtration start-up. I have developed mathematical models to advise on the optimisation of reusable ceramic membranes.

2017–2019
Study Groups with Industry Study groups are intensive week-long meetings between collaborating academics and companies.

- **Fonterra** is a dairy co-operative. We analysed spectral data from cheese samples to advise an objective measure of homogeneity for a given sample. Mathematics in Industry NZ. NZ, Jun 2019
- **Finpass** is a finance technology start-up. We developed an algorithm to predict future sustainable income from historical transactions. European Study Groups with Industry (ESGI) 142. Lithuania, Jul 2018
- **Syngenta** is an agricultural technology company. We developed a mathematical model of droplet distribution to optimise nutrient delivery to crops. ESGI 130. UK, Sep 2017

2016–2016
PhD Researcher These two projects were each eight weeks long and undertaken as part of my PhD program.

- **e-Therapeutics Plc** is a data-driven drug discovery company. I used unsupervised machine learning (clustering, matrix completion) to study and predict protein–chemical interactions.
- **Petrotechnical Data Systems** is a petrotechnical software company. I used partial differential equations to mathematically model the flow of oil, water, and gas through oil wells.

TEACHING AND MENTORSHIP

Mathematical Institute, Oxford

Supervision of a 1st year PhD student,
UK 12th Graduate Modelling Camp: project mentor of the winning team.
Delivering teaching to postgraduate and undergraduate students in the following courses:
Applied Partial Differential Equations Further Mathematical Methods
Nonlinear Systems Perturbation Methods
Continuum Methods in Industry Maths for Energy
Organisation in Research