# Ramón Ros Trujillo

Machine Learning Researcher specializing in scalable, structure-aware ML and dynamical systems modeling

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## Education

**University of Bristol** – Bristol, UK — Jan 2022 – Apr 2026
PhD in Applied Mathematics
The focus of my thesis was structure-preserving model reduction and inference for high-dimensional dynamical systems.

- Developed data-driven algorithms for extracting, identifying, and enforcing invariants and symmetries in time-series data.
- Developed data-driven methods for structure-preserving approximation of the Koopman operator, enabling spectral analysis and estimation of dynamical systems with continuous symmetries.
- Constructed thermodynamically consistent reduced-order models via the Mori–Zwanzig formalism, supporting stochastic coarse-graining of high-dimensional dynamical systems.

**University of Bristol** – Bristol, UK — Sept 2016 – Sept 2021
MEng in Mechanical Engineering

- Awarded Master of Engineering with First Class Honours

## Work Experience

**Quantia**, *Research Scientist*, *Machine Learning* – Madrid, ES — Mar 2026 – present
Contributing to the construction of the IFMIF-DONES fusion research facility in Granada, developing digital twin systems for predictive maintenance and condition monitoring of accelerator and infrastructure systems.

**Airbus Operations LTD**, *Research Engineer*, *Optical Communications (Intern)* – Bristol, UK — July 2019 – July 2020
Designed the mechanical, electronic, and embedded control systems for a closed-loop fast steering mirror used in a 10 Gb/s air-to-air laser communication demonstrator, enabling precise beam alignment with a fiber optic receiver.

**Bristol Robotics Laboratory**, *Engineer*, *Embedded Systems (Intern)* – Bristol, UK — Apr 2018 – Sept 2018
Designed the electronics and STM32 embedded firmware for a skydiving altimeter, implementing a Madgwick filter sensor fusion algorithm for real-time orientation estimation from accelerometer and gyroscope data.

## Selected Publications

**Data-driven symmetry detection for dynamical systems (Under Review)** — Dec 2025
Developed algorithms for symmetry detection in dynamical systems by reconstructing infinitesimal generators from trajectory data (ODEs and PDEs), enabling dimensionality reduction, invariant solution construction, and phase-space analysis.
Ramon Ros, Andrew Lawrie
(Applied and computational harmonic analysis)