

IGNACIO FERNÁNDEZ GRAÑA

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Transversal range of skills in scientific computing, machine learning and quantum science.
I enjoy finding simple solutions to hard problems.



WORK EXPERIENCE

Quantum Algorithms Developer

Pasqal

📅 Nov 2022 - Present 📍 Amsterdam, The Netherlands

Responsibilities:

- Design and implement novel quantum and classical machine learning algorithms, translating research ideas into robust software.
- Actively contribute to both closed and open-source software projects (e.g. [Qadence](#), [Qadence-lib](#), [Perceptrain](#)) following best practices in professional software development.
- Build and train machine learning models using PyTorch and Jax on extensive high-performance computing (including GPU) resources, and deploy them in highly-constrained quantum devices.
- Investigate scientific topics such as physics-informed machine learning, kernel methods, model-based optimization, quantum neural networks and graph machine learning.
- Apply proprietary algorithms to industry-relevant use cases working closely with clients.

Quantum Software Developer (Intern)

Fermioniq

📅 Jul 2022 - Oct 2022 📍 Amsterdam, The Netherlands

- Contribute to the design and development of quantum emulation tools using tensor networks.
- Implement machine learning techniques, specifically message-passing algorithms, to optimize tensor network contraction.
- Collaborate closely with a small scientific team in a fast-paced startup environment.

EDUCATION

MSc Applied Physics - Quantum Computing

TU Delft

📅 Sep 2020 - Present 📍 Delft, The Netherlands

- Quantum Computing and Quantum Devices track, covering a wide range of topics in quantum information science, quantum technologies, machine learning and computational methods.
- Part of the Honours Programme (selective track, <3% of students).

BSc Physics

University of Santiago de Compostela

📅 Sep 2016 - Jul 2020 📍 Santiago de Compostela, Spain

- 4 year bachelor with a broad spectrum within physics, including courses both in experimental and theoretical physics.
- Year abroad within the Erasmus Programme at University of Groningen, The Netherlands.

SKILLS

- **Languages:** Python, familiar with Rust, C++, Julia, Matlab
- **Tools:** Gitlab & Github CI/CD, Linux, SLURM, Docker/Singularity, LaTeX, Agile
- **Libraries:** PyTorch, NumPy, Jax, Pandas, Scikit-learn, MLFlow, familiar with Tensorflow, Keras

KEY PROJECTS

ML- and quantum-assisted discovery of novel organic semiconductors (Pasqal & Panasonic)

- First author in a project aimed at investigating novel computational methods for semiconductor materials discovery.

Multi-physics simulation of electric batteries (Pasqal)

- Led the development of physics-informed machine learning models to simulate battery dynamics as part of a European Innovation Council (EIC)-funded project.

FlowLab (Pasqal)

- Main contributor to an internal library aimed to run, log and benchmark ML experiments in-house. Built with Dask, MLFlow and other scalable computing tools.

Digital-analog quantum simulation of quantum chemistry (MSc thesis, QuTech).

- Conducted research of various simulation techniques for quantum chemistry tasks in a quantum computer.

Deep Learning for Particle Recognition (BSc thesis, University of Groningen).

- Developed a Convolutional Neural Network for particle recognition in particle physics experiments.

PUBLICATIONS

- [Inductive Graph Representation Learning with Quantum Graph Neural Networks](#) (arXiv:2503.24111)
- [Materials Discovery With Quantum-Enhanced Machine Learning Algorithms](#) (arXiv:2503.09517)

CERTIFICATIONS

- Introduction to XAI (Forschungszentrum Jülich)
- European Summer School in Quantum AI (Udine, Italy)
- Deep Learning specialization (Coursera)