IGNACIO FERNÁNDEZ GRAÑA

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% inafergra.github.io

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

Pasgal

Mov 2022 - Present

Responsabilities:

- 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-libs, 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) Fermionia

₩ 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

Q 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).

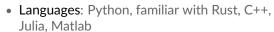
BSc Physics

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



- 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 (Pasgal)

 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

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