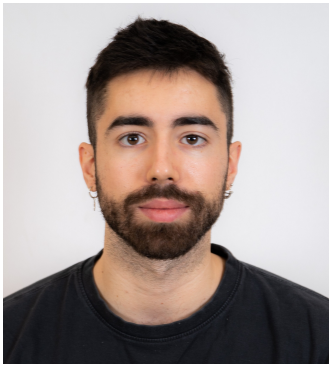
IGNACIO FERNÁNDEZ GRAÑA

@ inafergra@gmail.com +34 674762368 Delft, The Netherlands inafergra



Physicist interested in the interplay between physics, mathematics and computer science, with a focus on Quantum Computing and Machine Learning. Motivated and self-driven learner, able to quickly adapt to different environments.

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 of the faculty. Research project on *Approximating ground states with free-fermionic states on a quantum computer* in the Applied Quantum Algorithms group in Leiden.
- MSc thesis: *Digital-analog quantum simulation of quantum chemistry* in the Quantum Matter and Artificial Intelligence group at TU Delft.

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.
- BSc thesis: *Deep Learning for Particle Recognition* at the KVI center in Groningen, The Netherlands. Studied the use of Convolutional Neural Networks for particle recognition in particle physics experiments.

WORK EXPERIENCE

Research Intern - Machine Learning and Quantum Computing

Fermioniq B.V.

Jul 2022 - Oct 2022 Amsterdam, The Netherlands

Responsabilities:

- Develop computational methods to build a quantum simulator using tensor networks.
- Study of techniques used in machine learning algorithms (message-passing algorithms) to contract tensor networks more efficiently.

Teaching Assistant - Quantum Sensing and Measurement

TU Delft

Sep 2021 - Jan 2022 Delft, The Netherlands

Responsibilities:

- Preparing and grading homework assignments and exams
- Mentoring the students in the preparation of the course material and the final project.

SKILLS

- Languages: Python, Julia, Matlab, basic knowledge of C++
- Tools: Git, Linux, Latex
- Frameworks: Qiskit, Qutip, Cirq, Keras

PROJECTS

Percolation theory-based epidemic simulation (Apr 2021 - Jun 2021)

- Simulation of the spread of an epidemic using percolation theory models.

Sparsity as a regularization technique for Quantum Born Machines (Mar 2021 - Jun 2021)

- Study of the effect of sparsity as a regularization technique for Quantum Machine Learning models with Cirq.

Monte-Carlo simulation of the Ising model (March 2021 - Apr 2021)

- Monte-Carlo simulation of the 2D Ising model via the Metropolis and Wolff algorithms.

Molecular dynamics simulation of Argon atoms (Feb 2021 - Mar 2021)

- Simulation of a molecular system interacting via Lennard-Jones potential.

Quantum Approximate Optimization Algorithm for the Max-Cut problem (Oct 2020 - Jan 2021)

- Implemented QAOA from scratch using Qiskit.

LANGUAGES

- English: Professional working proficiency
- Spanish: Native
- Galician: Native
- Italian: Elementary (learning at the moment)

PERSONAL INTERESTS

- Music: Guitar, keyboards, singing. Took part in several music bands.
- Sports: Handball, boxing, climbing.
- Puzzles: Rubik's cubes.

CERTIFICATIONS

- Deep learning specialization in Coursera (4 online courses)
- Participated in 8 international Erasmus+ Youth Meetings