

Madalena Osório de Barros

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SUMMARY

Performance-oriented MSc candidate in Electrical and Computer Engineering (IST), specializing in Control, AI, and Robotics with a minor in Contemporary Physics. Thesis work accelerates quantum circuit simulation on NVIDIA GPUs and HPC systems using hybrid parallelism (MPI/OpenMP), focusing on benchmarking, profiling, reproducible experiments, and performance/accuracy trade-offs across CPU/GPU backends.

EXPERIENCE

TripGoGo (start-up)

AI & Prompt Engineering Intern

Sept. 2025 – Present
Amsterdam, Netherlands

- Performed QA on itinerary outputs by validating POIs, coordinates, and opening hours against official sources/APIs and documenting recurring failure modes.
- Designed a RAG approach to enrich answers with verified place metadata and reduce hallucinations in recommendations.

KPMG Portugal

Data and Analytics Summer Intern

July 2024
Évora, Portugal

- Contributed to an internal Generative AI project, focusing on UI/UX. Implemented using React + TypeScript.

EDUCATION

Instituto Superior Técnico (IST), University of Lisbon

MSc in Electrical and Computer Engineering

2024 – Present
Lisbon, Portugal

- **Specialisation:** Control, Artificial Intelligence, and Robotics
- **Minor:** Contemporary Physics
- **Thesis:** Accelerating Quantum Circuit Simulation with NVIDIA GPUs (HPC focus on scalable architectures and benchmarking).
- **Expected completion:** May 2026
- **Selected topics:** parallel computing concepts through thesis work; HPC applied to quantum computing simulation.

Chalmers University of Technology

Erasmus Exchange – MSc in Electrical and Computer Engineering

2024 – 2025
Gothenburg, Sweden

- **Focus:** Quantum Mechanics, Astrophysics, Artificial Intelligence & Machine Learning, Mechatronic Systems

Instituto Superior Técnico (IST), University of Lisbon

BSc in Electrical and Computer Engineering

2020 – 2024
Lisbon, Portugal

- **Academic Merit Diploma:** 2022/2023
- **Foundation:** electronics, control, embedded systems, and software fundamentals.

PROJECTS

Accelerating Quantum Circuit Simulation (MSc Thesis) | C/C++, NVIDIA GPU backends, MPI/OpenMP 2024 – Present

- Benchmarking quantum circuit simulators on HPC infrastructure; studying scaling limits, memory bottlenecks, and CPU/GPU performance trade-offs.
- Evaluated simulator accuracy under noise models using quantitative error/fidelity-style metrics to compare outputs across runs.

STUDENT ORGANIZATION & VOLUNTEERING

NEECIST (Student Organization)

Board Member

2020 – 2024
Lisbon, Portugal

- Organized **NEECathon**, a student-led hackathon promoting innovation and collaboration.
- Conducted workshops on Machine Learning, AI development, and IoT.
- Collaborated with design and multimedia teams on outreach and event delivery.

Food Bank Against Hunger (Banco Alimentar Contra a Fome)

Volunteer

2014 – Present
Portugal

- Long-term volunteering support for food collection and distribution initiatives.

Scouts

Member

2009 – 2013
Portugal

- Developed teamwork, leadership, and problem-solving skills through group activities and outdoor programs.

EXTRACURRICULAR TRAINING & COURSES

Robotics Bootcamp (PACT)

Hands-on Arduino programming & hardware prototyping

Dec. 2018
Évora, Portugal

- Built Arduino programming and hardware prototyping skills in a collaborative environment.

Fusão Nuclear – uma visão global e um caso local (IST)

Theoretical program on nuclear fusion

Aug. 2020
Lisbon, Portugal

- Engaged in a comprehensive exploration of nuclear fusion concepts and current research directions.

SKILLS

Programming Languages: Python, C/C++, Java, Assembly, TypeScript

Performance & HPC: CUDA (NVIDIA), MPI, OpenMP, SIMD, Valgrind

Quantum Simulation: CUDA-Q, Qiskit, Qulacs, statevector simulation, tensor networks, noise models

Frontend: React, HTML/CSS, JSON, SQL, UI/UX prototyping (Figma)

LANGUAGES

Portuguese: Native **English:** Advanced (C1, CAE) **Spanish:** Basic