

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)	2020 – 2024
<i>Board Member</i>	Lisbon, Portugal
<ul style="list-style-type: none">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)	2014 – Present
<i>Volunteer</i>	Portugal
<ul style="list-style-type: none">Long-term volunteering support for food collection and distribution initiatives.	
Scouts	2009 – 2013
<i>Member</i>	Portugal
<ul style="list-style-type: none">Developed teamwork, leadership, and problem-solving skills through group activities and outdoor programs.	

EXTRACURRICULAR TRAINING & COURSES

Robotics Bootcamp (PACT)	Dec. 2018
<i>Hands-on Arduino programming & hardware prototyping</i>	Évora, Portugal
<ul style="list-style-type: none">Built Arduino programming and hardware prototyping skills in a collaborative environment.	
Fusão Nuclear – uma visão global e um caso local (IST)	Aug. 2020
<i>Theoretical program on nuclear fusion</i>	Lisbon, Portugal
<ul style="list-style-type: none">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