João Guilherme

Lisbon, Portugal · *joaommg.com*

(+351) 917 657 526 | joaommguilherme@gmail.com | Joao03Guilherme | joaommguilherme

MSc student in Electrical and Computer Engineering with a strong foundation in Engineering Physics. Passionate about the intersection of Control, Robotics, and Artificial Intelligence, leveraging solid Software Engineering skills to build intelligent, efficient systems. Experienced in optical computing research, quantitative analysis, and full-stack development.

Skills

Languages	Python, Java, C/C++, SQL, Bash
Frameworks	Django, NumPy, Pandas, SciPy, CERN-ROOT, scikit-learn, PyTorch
Tools	Git, Linux, Docker, Azure, CI/CD, Pytest
Spoken	Portuguese (Native); English (Full Professional); Spanish (Limited); French (Limited)

Education

Instituto Superior Tecnico — *Lisbon, Portugal*

MSc in Electrical and Computer Engineering - Major in Control, Robotics and AI (GPA 19/20) — *Sep 2025 – Present*

Instituto Superior Tecnico — *Lisbon, Portugal*

BSc in Engineering Physics (**GPA 18/20**) — *Sep 2022 – Jul 2025*

- BSc Thesis (grade **20/20**): Optical implementation of Quantum-Inspired and Classical Classifiers with a Joint Transform Correlator

Experience

Instituto de Telecomunicacoes - Quantum Photonics Laboratory

Research Student — *Apr 2025 – Present*

- Implemented a quantum-inspired optical classifier using a single-lens setup, demonstrating a 10% p.p accuracy improvement over classical linear algorithms on the MNIST dataset.
- Co-authoring the first journal paper on the method (manuscript in preparation, submission target Q1 2026).

CERIS – Civil Engineering Research and Innovation for Sustainability

Research Student — *Feb 2025 – Present*

- Implemented and estimated parameters for Multinomial Logit (MNL) mode choice models within the MITO framework, processing 80.000+ survey trips to calibrate utility functions for 5 transport modes across a synthetic population of 2.87 million agents.
- Collaborated with researchers from TU Munich to develop a high-fidelity synthetic population of 2.87 million individual agents and 1.1 million households, calibrated against census data.

Tecnico Investment Club (Student Club)

Quantitative Analyst — *Sep 2024 – Jul 2025*

- Collaborated in a four-member team to research, back-test, and deploy a quantitative trading strategy.
- Attended workshops from BCG and McKinsey, gaining exposure to consulting and risk management.

Student Hub (Ed-Tech startup)

Software Engineering Intern — *Dec 2022 – Jan 2024*

- Built a REST API (Python Flask + PostgreSQL) and launched the MVP, attracting 3,000+ users in two months.
- Added unit/E2E tests with pytest and set up GitHub Actions CI/CD along with Azure deployment.

Projects

PIC1: Optical and Quantum-Inspired Classification (BSc Thesis)

Python, Optical Physics, Hardware Control — *2025*

- Developed a framework for simulating and testing classical (Nearest-Mean) and quantum-inspired (RBF) optical ML models.
- Implemented hardware control for Spatial Light Modulators (SLM) and cameras to execute physical optical computing experiments.

Self-Balancing Robot

C++, Control Theory, Embedded Systems — *2024*

- Designed and programmed a two-wheeled self-balancing robot utilizing a PID controller for active stability management.
- Tuned control loop parameters to handle external disturbances and maintain equilibrium.

Awards

May 2025	**Merit Diploma**, Awarded for excellent academic performance.	*Instituto Superior Técnico*
Dec 2024	**1st place – Neecathon 24**, Designed a driver-safety system using computer vision and biosensors.	*NEECIST*
Sep 2023	**Gulbenkian Merit Scholarship**, Awarded for excellent academic performance.	*Fundacao Calouste Gulbenkian*

Extracurriculars

Conservatório de Música Jaime Chavinha

Musician — *2014 – Present*

- Completed the 8-year conservatory curriculum with a final GPA of 19/20.
- Performed as a soloist at prestigious venues including Casa da Música (Porto) and on national radio (Antena 2).
- Choralist in Gulbenkian's Participatory Choir; interpreted Mozart's Requiem in the Great Auditorium together with the Gulbenkian Choir and Orchestra before an audience of 1,000+.