Gonçalo Pascoal

Software Developer
Vestas

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About

I hold a Master's degree in Informatics and Computing Engineering conferred by FEUP. My Master's dissertation leveraged deep reinforcement learning to compile quantum algorithms more efficiently for realistic architectures. I was distinguished with several awards for merit during my academic journey. My main areas of interest include algorithms and data structures, low-level / systems programming, distributed systems and performance-critical software. I consider myself to be rigorous, organized, and hard-working. I am also a hobbyist game developer and keenly interested in game design.

Languages

Portuguese Native
English Professional proficiency (C1/C2)
French Elementary proficiency (A1)

Hobbies

Music (Guitar, Mandolin)
Game Development
Drawing

Experience

Feb. 2025 – Present — **Software Developer** — Vestas
C# • Microsoft Azure • ASP.NET • Python • SQL • Git
REST APIs • Scrum
Simulation Development – Tower Structural Design Tool

- Complete architectural redesign of the Tower Structural Design Tool aimed at improving modularity, maintainability and traceability, as well as modernizing the technology stack.
  - Full rewrite of core business logic with greatly improved test coverage and reusability.
  - Implemented a system for auditing structural calculations, allowing engineers to review the inputs, outputs and intermediate results of key procedures.

Feb. 2024 – Feb. 2025 — **Software Developer Trainee** — Vestas
Python • Django • Microsoft Azure • C# • SQL • Angular • Java • Git
REST APIs • Scrum • E2E Testing
Simulation Development – Tower Structural Design Tool

- Full-stack development of new features, improvements, and bug fixes for a complex web application used for structural analysis, modeling, and design of wind turbine towers.
- Contributed to the development and maintenance of CI/CD pipelines featuring build, near-zero downtime cloud deployment, testing, static analysis, and automatic versioning tasks.
- Worked fully in Scrum with two-week sprints.

Education

Faculty of Engineering, University of Porto (FEUP)
Porto, Portugal

Sep. 2021 – Oct. 2023 — **Master's Degree, Informatics and Computing Engineering**
Final Grade: 19.23 / 20
Thesis: *Noise-Adaptive Reinforcement Learning Strategies for Qubit Routing* (graded 20 / 20)

Sep. 2018 – Jul. 2021 — **Bachelor's Degree, Informatics and Computing Engineering**
Final Grade: 19.03 / 20

Awards / Grants / Scholarships

2024 — **Prof. Doutor Raul Vidal / Deloitte Award** — Deloitte
Granted to a FEUP M.EIC or M.ESW graduate that has distinguished themselves for the quality and innovation of their work in Software Engineering, and for their social, solidarity or student support activities

2023 — **STSM Grant** — COST (European Cooperation in Science and Technology)
Granted under COST Action CA191935 – CERCIRAS to visit the SIMULA research laboratory (Oslo, Norway) in the context of my M.Sc. thesis and discuss our methodology with other quantum computing researchers

2022 — **Bondalti / Fundação Amália de Melo Award** — Bondalti
For concluding the Bachelor's in Informatics and Computing Engineering at FEUP with the highest final grade

2021 — **Merit Scholarship** — DGES
For the average grade obtained during the 2019/2020 academic year

2020 — **Merit Scholarship** — DGES
For the average grade obtained during the 2018/2019 academic year

2020 — **Prémio Incentivo / Incentive Award** — University of Porto
For concluding the first year of the Bachelor's in Informatics and Computing Engineering at FEUP with the highest grade

Skills

Programming Languages

- **Most Experience:** Python, C#, Java, SQL, C++
- **Experience:** C, Rust, HTML, CSS, JavaScript, TypeScript, Dart
- **Some Experience:** PHP, Bash, Prolog

Technologies

Git, Linux, Microsoft Azure, Angular, LaTeX, Flutter, PyTorch, Qiskit, Godot Engine

Knowledge Areas

Deep Reinforcement Learning, Algorithms and Data Structures, REST APIs, Full-Stack Development

Other

Problem Solving, Autonomy, Resourcefulness, Time Management, Project Management, Leadership, Technical Writing (English)

Publications

Jul. 2024 — **Deep Reinforcement Learning Strategies for Noise-Adaptive Qubit Routing**
Gonçalo Pascoal, João Paulo Fernandes, Rui Abreu
2024 IEEE International Conference on Quantum Software (IEEE QSW 2024)

Projects

Master's Thesis — **Oct. 2023**
Python • **PyTorch** • **Qiskit** • **Ray RLlib** • **NumPy** • **Pandas** • **LaTeX**
Deep Reinforcement Learning • **Quantum Compiling**

- Leveraged deep RL (PPO) to compile quantum algorithms more efficiently for realistic architectures, helping to mitigate the adverse effects of noise on the outcome of computations.
- Tackled the NP-complete qubit routing problem, which consists of inserting auxiliary operations to ensure that programs adhere to the connectivity constraints between qubits in a specific quantum architecture.

Interactive Satellite Megaconstellation Simulation — **Jan. 2023**
Rust • **Python** • **Godot Engine** • **Modeling and Simulation**

- Analyzed effectiveness of different satellite connection strategies and orbital configurations for maintaining connectivity in the event of failures.

Solver for Capacitated Vehicle Routing Problem — **Jul. 2022**
C++ • **Data Structures** • **Map Matching** • **Search Algorithms** • **Metaheuristics**

- Algorithms for solving large-scale CVRP instances (finding routes for a fleet of vehicles with multiple deliveries and limited carrying capacity). Implemented variants of popular metaheuristics found in the literature for CVRP (ant colony optimization, tabu search).
- Uses real-world OpenStreetMap data from Brazilian cities and performs map matching of GPS coordinates from test instances to graph vertices (using quadtrees or k-d trees).

Unified Search System for Steam Games — **Jan. 2022**
Apache Solr • **Python** • **Pandas** • **Data Processing & Analysis** • **Information Retrieval**

- Aggregates Steam game data from multiple sources (public datasets, APIs, website scraping).

Peer-to-Peer Distributed Backup Service — **Jun. 2021**
Java • **Distributed Systems** • **Threads & Non-Blocking I/O** • **TCP Sockets w/ SSL**

- Implements the Chord distributed hash table protocol. Files are divided into chunks stored across multiple peers.
- Tackled scalability and fault tolerance concerns (thread pools, periodic tasks to manage peer failures).

Extra-Curricular Groups

Oct. 2019 – Oct. 2023 — **Tuna de Engenharia da Universidade do Porto**
Traditional academic group with over 35 years of history, bound by the values of music and friendship. Participating in the organization of events such as our festival (*PortusCalle*) has helped me develop and strengthen a diverse set of skills, such as multimedia, communication, teamwork, leadership, and working under time / resource pressure.