RODRIGO GOMES DE ARAÚJO

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PROFILE

Computer Science graduate specializing in systems programming and computational modeling, currently pursuing graduate studies in distributed systems and performance optimization. Proven ability to build efficient, low-level solutions from custom device drivers to physics simulations, with strong foundations in algorithms and machine learning. Fluent in Portuguese (native) and English.

EDUCATION

Master's in Computer Science *Sep 2025 – Present (Expected 2027)*
Faculdade de Ciências da Universidade do Porto (FCUP)
Focus: Distributed Systems and Performance Optimization

Bachelor's in Computer Science and Engineering *Sep 2022 – Jul 2025*
Faculdade de Engenharia da Universidade do Porto (FEUP)

PROJECTS

Black Hole Light Simulation — Rust — Raylib — Computational Physics *2025*

- Independently developed a real-time 2D simulation of gravitational lensing around a Schwarzschild black hole, combining computational physics with graphics programming.
- Implemented null geodesic integration using 4th-order Runge–Kutta method, ensuring numerical stability and physical accuracy while maintaining 60 FPS rendering performance.
- Validated simulation against theoretical predictions through reference orbit analysis; applied memory optimization techniques to handle complex light path calculations efficiently.

UFC Fight Outcome Predictor — Python — scikit-learn — Streamlit *2025*

- Designed and implemented a supervised machine learning pipeline achieving 80% accuracy in predicting UFC fight outcomes through feature engineering and ensemble modeling techniques.
- Built an interactive web-based dashboard using Streamlit for real-time predictions and data visualization, enabling non-technical users to explore model insights.

Space Invaders with Custom Device Drivers — C — MINIX OS — Systems Programming *2024*

- Engineered a complete 2D game engine in C on MINIX OS, demonstrating low-level hardware interaction and system-level programming expertise.
- Developed custom interrupt-driven device drivers for VGA graphics, timer, keyboard, and mouse, implementing proper synchronization and event handling.
- Achieved smooth gameplay through double-buffered rendering and efficient event-driven I/O architecture.

Large-Scale TSP Solver — C++ — Graph Algorithms — Optimization *2024*

- Implemented and compared multiple algorithms (backtracking, triangular approximation, 2-opt local search) for solving Traveling Salesman Problem instances with over 10,000 nodes.
- Optimized algorithm performance through careful memory management and algorithmic improvements, achieving 40% speedup compared to baseline implementation.

ACHIEVEMENTS & AWARDS

2nd Place – IEEE RetroJam Game Development Competition — IEEE UP Student Branch *2025*

- Collaborated in a team to design, implement, and deliver a complete 2D narrative-driven game within 48-hour deadline, demonstrating rapid prototyping, time management, and teamwork under pressure.

Academic Merit Awards — Escola Secundária Carlos Amarante *2020–2022*

- Recognized for outstanding academic performance in science and technology disciplines throughout high school.

World 4th Place – RoboCup Rescue Superteam — RoboCup Leipzig, Germany *2016*

- Represented Portugal internationally in autonomous robotics competition, developing navigation algorithms and autonomous systems for rescue scenarios.

National 1st Place – Robotics Championship (CoSpace Rescue) — Portugal *2016*

National 4th Place – Canguru Matemático Sem Fronteiras — Portugal *2016*

TECHNICAL SKILLS

Programming Languages: Rust, C/C++, Java, Python, OCaml, SQL
Technologies & Tools: Git, Linux, Docker, MPI, OpenMP, scikit-learn, Streamlit
Areas of Expertise: Systems Programming, Algorithm Design & Optimization, Machine Learning, High-Performance Computing, Computational Physics