

# EDUARDO SILVA

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MSc Software Engineering student currently specializing in high-performance computing, mobile-robotics (ML & Graphics), and low-level systems. Strong background in C/C++, OpenGL, GPU/CPU optimization, parallel computing (OpenMP, CUDA, MPI) and real-time systems.

## EDUCATION

### University of Minho

BSc Software Engineering,

### Technische Universität Wien

MSc Software Engineering & Internet Computing,

- Participated in the F1/Tenth Autonomous Racing Challenge
  - 1st Place - Time Trial | 3rd Place - Head-to-Head
  - Deployed autonomous driving algorithms using ROS2 and simulation tools

**Braga, Portugal**

Sep 2020 – Jul 2024

**Vienna, Austria**

Mar 2024 – Present

## EXPERIENCE

### Full-stack Developer

**Jan 2024 – Feb 2025**

#### SORSI

- Collaborated in a small team to design a full-stack client management platform (MERN, RESTful API, microservices)

## PROJECTS

### GPU-Accelerated Fluid Simulation (C/CUDA/OpenMP)

- Optimized 3D fluid solver using ILP, cache tiling, OpenMP, and CUDA
- Achieving  $8 \times$  speedup, analyzed CPU vs GPU scalability
- Profiling & performance with perf, gprof, nsys, ncui

### MPI Collectives & Parallel Algorithms

- Implemented custom MPI Allgather + merge algorithms
- Designed Bruck / Circulant variants, loser trees, SoA layouts
- Bencharked up to 640 processes on an HPC Cluster

### Graphics Engine / OpenGL Rendering

- Built rendering pipeline using VBOs, Catmull-Rom splines, Bézier patches
- Implemented lighting models, normals, specular mapping
- XML driven & performance oriented engine

### Custom Anti-Cheat System for Esports Tournament

- Organized and hosted a competitive online tournament with 180 participants
- Developed anti-cheat integration using a third-party API to detect and prevent cheating

### Autonomous Racing (F1/Tenth Challenge)

- ROS2 autonomous racing: SLAM, LiDAR, control, algorithms such as (Disparity Extender, Pure-Pursuit)
- Implemented real-time navigation, obstacle avoidance, and path planning
- Deployed on 1/10 scale autonomous vehicle

## SKILLS

**Programming Languages:** C, C++, CUDA, Python

**Graphics:** OpenGL

**Parallelism:** OpenMP, MPI, CUDA, multi-threading

**AI/ML:** PyTorch, TensorFlow

**Robotics:** ROS2, RViz, Foxglove

## LANGUAGES

Portuguese - Native; English - C1 (Advanced); Spanish - Conversational