

GABRIEL CARVALHO

Software Developer | Computer Graphics & Game Development | Belo Horizonte, Brazil
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PROFESSIONAL SUMMARY

Software Developer specializing in Computer Graphics and high-performance systems. Hands-on experience in C++ and Java, with a focus on developing rendering engines and real-time interactive applications. Intermediate proficiency in OpenGL and foundational knowledge of Vulkan, backed by a strong background in linear algebra and hardware architecture. Committed to writing clean, well-structured, and performance-aware code in Linux environments.

TECHNICAL SKILLS

- **Programming Languages:** C++ (Advanced – STL, RAII, Smart Pointers), Java (Advanced), C (Intermediate), Python (Scripting & Tooling).
- **Computer Graphics & APIs:** OpenGL (Intermediate – Rendering Pipeline, GLSL Shaders, VAO/VBO), Vulkan (Basic – Pipeline & Command Buffers), SDL2, ImGui (Debugging Tools).
- **Math & Engineering:** Linear Algebra for CG (Vectors, Matrices, Quaternions), Trigonometry, Game Physics, Algorithms, and Data Structures.
- **Tools & Workflow:** CMake, Git/GitHub, Linux (Ubuntu), RenderDoc (Graphics Debugging), GPU Profiling.
- **Web & Backend:** Node.js, REST APIs, SQL (PostgreSQL, MySQL).

PROFESSIONAL EXPERIENCE

SARAH Network of Rehabilitation Hospitals | *Software Development Intern* | **2023 – 2024**

ENGINEERING PROJECTS

Real-Time Rendering Engine (C++ / OpenGL / SDL2)

- Developed a custom 3D rendering engine featuring perspective camera systems (FPS/Arcball) and full spatial transformations based on linear algebra principles.
- Implemented GLSL shader pipelines for dynamic lighting models (Phong/Blinn-Phong) and real-time vertex processing.
- Integrated the ImGui library to build custom debugging tools for monitoring performance and adjusting scene parameters at runtime.

2D Game Physics & Gameplay Systems (Unity / C#)

- Designed physics-based movement and collision detection systems for 2D games, focusing on frame-rate independent gameplay response.

- Implemented game loop architectures and finite state machines (FSM) to handle complex entity AI behaviors.

Inventory Management System (Full-Stack)

- Architected a scalable full-stack application using React and Node.js for corporate asset tracking.
- Implemented robust MySQL database integrations and RESTful APIs for secure data persistence and access control.

EDUCATION

- **Bachelor's degree in Computer Science | *In Progress***
 - Focus on High-Performance Algorithms, Computer Graphics, and Software Engineering.
 - Relevant Coursework: Linear Algebra, Calculus III, Advanced Data Structures, Theory of Computation.

LANGUAGES

- **Portuguese:** Native.
- **English:** Advanced (Technical fluency for documentation and professional communication).
- **Italian:** Basic.