

Gabriel Carvalho

Software Developer | Computer Graphics, Engine and Game Development

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SUMMARY

Computer Science student (graduating 2027) focused on real-time graphics and engine programming in C++ and OpenGL. Creator of gabrielfrc.dev, an interactive graphics programming course platform with 250+ lessons and WebGL2 visualizations. Looking for internship or junior roles in graphics, engine and game development.

TECHNICAL SKILLS

Languages: C++ (STL, RAII, smart pointers), C, C#, Java, TypeScript, Python, Lua, SQL

Graphics: OpenGL, GLSL (VAO/VBO, rendering pipeline), WebGL2, Vulkan (pipeline and command buffer fundamentals), SDL2, Dear ImGui

Math: Linear algebra for graphics (vectors, matrices, quaternions), trigonometry, game physics, algorithms and data structures

Engines and Tools: Unity (URP), Unreal Engine 5 (Blueprints), Blender, RenderDoc, CMake, Git, GitHub, Linux

Web: Next.js, React, TypeScript, Tailwind, Node.js, REST APIs, MongoDB, PostgreSQL, MySQL, Vercel

PROJECTS

Fractal Engine: Custom Game Engine | In progress

C++ · OpenGL · Lua

- Implemented the asset loading system of a game engine I am building from scratch in C++.
- Integrated Lua scripting so gameplay logic can be written and changed outside the engine code.

gabrielfrc.dev: Interactive Graphics Programming Courses | Live

Next.js 16 (App Router) · React 19 · TypeScript · Tailwind · WebGL2 · Web Audio API · KaTeX · MongoDB · Vercel

- Wrote and developed, alone, a learning platform with 10 tracks and 250+ lessons covering OpenGL, GLSL, Vulkan, modern C++, SDL3, game development, math, algorithms, AI from scratch in C++ and music theory.
- Built a reusable WebGL2 host that manages context setup, resizing and context loss, powering interactive WebGL2 and SVG figures, full-screen guided labs with objectives and quizzes, and procedurally generated exercise rounds.
- Shipped bilingual EN/PT routing with indexable per-language URLs, hreflang, JSON-LD structured data and sitemaps; loaded chapters on demand through code splitting and saved learner progress in the browser.

Real-Time Rendering Engine

C++ · OpenGL · GLSL · SDL2 · Dear ImGui

- Developed a 3D renderer with FPS and arcball cameras and spatial transformations built from linear algebra principles.
- Wrote GLSL shader pipelines for Phong and Blinn-Phong lighting and real-time vertex processing.
- Integrated Dear ImGui to build debugging tools for monitoring performance and adjusting scene parameters at runtime.

EXPERIENCE

IT Intern, SARAH Network of Rehabilitation Hospitals | 2023 to 2024

- Built an internal tool that generated participation certificates for hospital events and emailed them automatically to attendees, used by the IT team.

EDUCATION

Bachelor's in Computer Science | Expected Dec 2027

- Relevant coursework: Linear Algebra, Calculus III, Advanced Data Structures, Theory of Computation.

LANGUAGES

Portuguese: native · **English:** advanced (technical and professional) · **Italian:** basic