# Collin Longoria

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## Technical Skills

**Languages**: C++, C, CUDA, GLSL, HLSL, C#, Python, JavaScript
**Engines & APIs**: Unreal Engine 5, Godot, OpenGL, Vulkan, WebGPU
**Developer Tools**: Git, Perforce, Visual Studio, VS Code, CLion, CMake, Renderdoc
**Libraries**: glslang, FMOD, Assimp, stb, GLM, SDL, GLFW, Dear ImGui

## Relevant Projects

**Blok** | *C++, Vulkan, CUDA, OpenGL, GLSL, ImGui (Academic Project)* Aug. 2025 – Present

- Developed a **dual-backend voxelization and ray-tracing engine** with both Vulkan-compute and CUDA-accelerated OpenGL pipelines, enabling flexible **GPU performance benchmarking** across APIs.
- Optimized a high-precision **mesh voxelizer** converting millions of triangles into **sparse voxel octrees (SVOs)** in under **40 ms per frame** on RTX-class hardware, **supporting real-time global illumination research.**

**Trajan Engine** | *C++, OpenGL, Vulkan, GLFW, ImGui* Dec. 2024 – Present

- **Engineered a modular Vulkan renderer** supporting **data-driven pipelines and dynamic descriptor allocation**, resulting in a more adaptable and extensible graphics framework.
- Implemented a **multithreaded entity-component system (ECS)** with **ImGui-based live editing and diagnostics**, reducing iteration time and **debugging efficiency for engine-level systems.**

**An Omen in the Mirror** | *Unreal Engine 5, C++, Blueprints (Academic Project)* Aug. 2024 – April 2025

- Developed a **modular puzzle framework in C++** allowing designers to **link interactive components without code**, reducing **technical bottlenecks** in level design.
- Collaborated with **technical artists** to design **high-performance custom shader effects** and **reusable Blueprint components**, **improving gameplay** clarity and achieving project goal of **60 frames per second** across all target platforms.

**Elementokens** | *C++, OpenGL (Academic Project)* Aug. 2023 – April 2024

- Led **engine-side development** of **rendering and gameplay logic**, creating **reusable modules** for **turn-based movement, combat, and dynamic map rendering** to streamline feature integration.
- Designed a **data-driven content pipeline** that **enabled designers** to **prototype units, maps, and rulesets without engine changes, accelerating iteration cycles by roughly 50%**.

## Experience

**Assistant Teacher** June 2025 – July 2025
*DigiPen WANIC Program* *Redmond, WA*

- Mentored high school students in programming fundamentals, data structures, and basic game programming in JavaScript.
- Debugged student code in real-time, identifying logic errors and teaching debugging strategies.
- Developed supplemental coding exercises and mini-projects to reinforce classroom material, including interactive projects using P5.js.
- Collaborated with the lead instructor to adapt lesson content based on student feedback and performance.

## Education

**DigiPen Institute of Technology** Redmond, WA
*Bachelor of Science in Computer Science in Real-Time Interactive Simulation, Minor in Math* *Aug. 2022 – May 2026*
*3.6 GPA*