Mitchell Bizzigotti

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Experience

Embedded Systems Engineer, *GelTech Labs* Dec 2025 — Mar 2026

Developed, tested, and debugged embedded C firmware in for ARM microcontrollers. Assisted closely with engineering team on RCA to help solve multiple issues. Rewrote GUI application from C# to C++ to enable more reliable firmware integration, better user experience, and faster development.

Education

M.S. Computer Science, University of California, San Diego 2025 — present
B.S. Computer Science, University of California, San Diego 2023 — 2025

Projects

LLVM: Custom RISC-V Backend, *C++*

Successfully modified LLVM RISC-V backend to generate code for a new experimental branching technique. Learned how to effectively apply LLVM tools and test programs to debug a variaty of compiler issues.

Kai Scripting Language, *C*

Designed an open-source performance-oriented AOT scripting language in C with zero dependencies to target real-time systems. Built a custom bytecode interpreter to support compile-time code execution and enable advanced metaprogramming features. Utilized arena allocation strategy to decrease total compilation speed, resulting in a 2x speed up in parsing.

Pipelined Out-of-Order Processor, *SystemVerilog*

Worked in a team of 2 to design, test, and implement a modern MIPS processor using SystemVerilog in a Linux environment with Verilator. Implemented out-of-order execution with register renaming to increase IPC by up to 50%. Designed a custom non-blocking data cache to increase memory throughput.

Voxel Rendering Engine, *C++*

Developed a dynamic multi-threaded chunk remeshing system to optimize terrain updates without blocking the render thread using the Vulkan graphics API. Implemented level-of-detail voxel streaming to allow more than 100x the draw distances. Integrated greedy meshing algorithm to decrease cost of CPU to GPU data transfer.

Fission: Cross-Platform Game Framework, *C++*

Developed a cross-platform Vulkan game framework over 4+ years, to enable efficient application creation. Maintained a custom "in-house" build pipeline to support compilation across varied platforms (Windows, MacOS, Android) and toolchains (MSVC, Clang, GCC).

YT Music Manager, *Python*

Designed a user database system in Python for efficient music organization/synchronization. Implemented continuous integration workflows on GitHub to automatically build and deploy binaries on each push.

OptiX Path Tracer, *CUDA, C++*
SPH Fluid Simulation, *Javascript, WebGPU*
Cloth Simulation, *Odin*

Skills

Programming	C++, C, Python, x86, ARM, CUDA, MATLAB, bash, HTML, Javascript, CSS
Programming Tools	git, lldb/gdb, Makefiles, CMake, Linux
Graphics Tools	Vulkan, DirectX, OpenGL, WebGPU, Slang, Unreal Engine 5, Blender