Nathan Lapp

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SUMMARY

Gameplay and systems programmer focused on engine architecture, graphics programming, and interactive systems. Experience shipping a Steam title and a licensed VR game for Meta Quest and PlayStation VR, building a custom game engine, and developing low-level graphics debugging tools.

SELECTED PROJECTS

Realm – Custom Game Engine (D)
nathanlapp.xyz/projects/realm.html

- Built a custom game engine in D using SDL2 and OpenGL to explore low-level engine architecture
- Designed and implemented the rendering architecture, plus supporting systems including an Entity Component System, asset loading, and UI

GLTrace – OpenGL Call Tracing & Debugging Tool (Rust)
nathanlapp.xyz/projects/gltrace.html

- Built GLTrace, a Rust library that traces every OpenGL call a program makes, recording call parameters along with CPU and GPU timing
- Implemented dynamic OpenGL function interception by hooking the function-loading path, so tracing runs inside the target application with no external launcher
- Wrote traces to file with additional statistics and metrics for performance analysis and debugging
- Developed GLHooker, a separate function-hooking program in C, alongside it

Spider Canyon – 3D Puzzle Platformer (Steam Released)
nathanlapp.xyz/portfolio/spidercanyon/

- Lead developer on a two-person team; took a game jam prototype (Mini Jam 175) to a complete 3D puzzle-platformer released on Steam
- Designed and implemented custom player movement and traversal systems, including physics-driven mechanics tailored for skill-based navigation and level design
- Built core gameplay systems supporting iterative tuning, level design workflows, and refinement of movement-based challenges

WORK EXPERIENCE

Game Developer Jun 2024 – Present
Invalid Symbol LTD. • Remote

- Architected a modular movement system supporting 20+ abilities for scalable traversal gameplay
- Designed a reusable hierarchical state machine framework used across multiple systems
- Implemented physics-based movement using vector mathematics
- Built a JSON-based localization pipeline for text and audio assets
- Implemented VR hand gesture interaction systems for gameplay mechanics
- Led development of a mixed reality game using passthrough occlusion and relighting on Meta Quest

Game Programmer and Consultant Apr 2021 – Sep 2021
Cream Productions • Brampton, Ontario (Remote)

- Programmer on *Survivorman VR: The Descent*, a licensed VR game for Meta Quest and PlayStation VR; built gameplay systems and minigames in Unity
- Main developer of the Dynamic Digital Humans pipeline, which turns actor performances into game-ready facial animation, including a system that keeps video, audio, and animation in sync when video frames drop
- Profiled with RenderDoc and Snapdragon Profiler and optimized on Meta Quest 2 so the pipeline, including on-device video decoding, did not affect the game's performance

Research Assistant and Programmer Dec 2020 – Apr 2021
Sheridan Institute of Research and Technology • Brampton, Ontario (Remote)

- Contributed to a digital human facial animation pipeline for VR and virtual production, building a Unity-based framework that integrates with its workflows
- Developed tools using image and video processing techniques for experimental pipelines

SKILLS

Core Areas: Engine and gameplay systems; graphics programming and rendering tools; VR/MR interaction systems; systems architecture

Languages: C#, C, C++, Rust, D, Python, GDScript

Engines: Unity, Godot

Graphics & Libraries: OpenGL, SDL2, RenderDoc, Snapdragon Profiler

EDUCATION

B.Sc. Honours, Computer Science – Trent University (2024)
Software Development and Network Engineering – Sheridan College (2021)