

Tristan Cox

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Skills

Programming Languages: JavaScript, C, C++, Rust, Python, SQL, React, Lua

Experience

UI Developer, Zombies for Charity – Remote

Jan 2023 – June 2024

- Delivered custom UI components using Lua and C++ for a Zombie Blood Rush charity event that raised \$7,900
- Collaborated with other developers to integrate their systems into the UI to provide visual feedback to players and visual interest for event viewers
- Tested UI systems for reliability and performance to ensure smooth gameplay and clear visual communication

Projects

Intrusion Detection System Configuration Dashboard

github.com/Team-69-MLIDS/ids_engine

- Led the development of an intrusion detection system, coordinating backend and frontend integration, guiding technology decisions, conducting research, and facilitating team meetings to ensure successful project delivery
- Designed and implemented an SQLite database schema to store and retrieve hyperparameter configurations and classification performance metrics for the intrusion detection system
- Implemented back-end API in Python with Flask to service requests from the configuration front-end
- Assisted front-end team with design and implementation of front-end components with React

Vulkan Rendering Engine

gitlab.com/nice_sprite/bakitech

- Implemented Phong lighting, skybox, object transform hierarchy, and pixel-accurate object selection in Vulkan to support core engine features
- Wrote custom rendering back-end for Dear ImGui to add support for Vulkan descriptor indexing to improve in-engine scene editor and debug overlay
- Optimized performance of 3D object transformation pipeline with SIMD to increase dynamic object count by 8x

Real-Time UI Debugging and Live-Reload Implementation

- Reverse engineered the UI framework used in Call of Duty to create debug overlays, allowing developers to visualize element bounds, positions, animation states, and scene hierarchy, significantly improving debugging efficiency
- Implemented a live-reload feature for UI scripts, eliminating the need for game recompilation and reducing development iteration time from minutes to seconds
- Documented the UI scripting and rendering system in Call of Duty: Black Ops 3, facilitating easier development of custom UIs for the modding community

Audio Spectrum Analyzer

gitlab.com/nice_sprite/maki

- Developed real-time audio spectrum analyzer using WGPU and Rust, using FFT to visualize frequency content in songs
- Implemented multithreading to ensure seamless UI updates alongside audio processing
- Created an intuitive UI for audio player controls, with pause/play, song selection, playback position, and volume slider

Education

University of Texas at Dallas – Bachelor of Science Computer Science

August 2024

Relevant Coursework

- Computer Graphics, Linear Algebra, Operating Systems, Computer Architecture, Database Systems