Jerry Zhu

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Education

Stony Brook University   **August 2022 - May 2026**
Bachelor of Science, Computer Science   *Stony Brook, NY*
- **Cumulative GPA**: 3.54
- **Coursework**: Linear Algebra, Data Structures and Algorithms, Discrete Mathematics, Probability and Statistics
- **Extracurriculars**: Stony Brook Game Developers, Stony Brook Computing Society

Technical Skills

Languages: C++, C, C#, GLSL, Java, Python, JavaScript/TypeScript, Lua
Skills: OpenGL, Linear Algebra, Multithreaded Programming
Developer Tools: Git, GDB, Valgrind, Visual Studio, RenderDoc
Databases: MongoDB (NoSQL)
Game Engines: Unity

Projects

3D Dungeon Crawler - Soul Walker | C#, Unity Game Engine   **April 2023**
- Programmed a configurable actor controller for all entities including the player and 4 enemy types.
- Developed a custom raycast based movement system with sloped surface support.

Custom Language Transpiler - CrankLang | C++   **March 2023 - May 2023**
- Designed a language supporting user-defined types, and multiple modules with a recursive descent parser.
- Compiles programs from a type-checked abstract syntax tree (AST) into C++ code.
- Implemented a constant-folding optimization pass which preprocesses and simplifies the AST before output.

2D Tactical RPG - Legends | C, Custom Game Engine   **June 2022 - September 2023**
- Developed a tiled software renderer optimized with a multithreaded job system improving performance by 200%.
- Implemented an initiative turn-based combat system through a queue with undo-able actions.
- Eliminated runtime memory allocations with a zoned memory allocator backed by a fixed 16MB buffer.
- Designed a backward-compatible save system with delta-compression to reduce file size and memory usage.

2D Action-Platformer - Ascension | C, Custom Game Engine   **February 2022 - March 2022**
- Implemented a 2D platformer physics engine with sloped surfaces and fixed timestep updates.
- Developed a particle system with physical interactions optimized through a spatial partitioning scheme.
- Designed an in-game level editor with support for live level playtesting allowing for iterative level design.
- Implemented gameplay mechanics such as 'attack-bouncing' on spikes and enemies, wall jumping, and dashing.

2D Game Framework | C, OpenGL, SDL2, Emscripten   **July 2021 - October 2021**
- Implemented an OpenGL 3.3 sprite batcher with a custom packed vertex format reducing memory usage by 40% compared to standard 32-bit floating point vertex formats.
- Developed a hot-reloadable resource manager for the real-time update of assets such as shaders and textures.
- Created a dynamic link library (DLL) plugin system to separate the framework from game code.
- Built a font-glyph cache for arbitrary text within a fixed memory footprint utilizing a hashset and texture atlas.

Fullstack Wiki System - Recyclopedia | JavaScript, React.js, MongoDB   **April 2021 - October 2021**
- Collaborated with a team of 4 to develop a web application for the Environment Project.
- Designed data-schema, and deployed MongoDB database for article data and user authentication information.
- Specified and created a REST API to modify article data.
- Implemented a custom WYSIWYG article editor allowing wiki specific elements with a draft/publish system.
- Reduced database requests through the implementation of static site generation with Next.js.

Leadership

Software Development Team Lead   **February 2021 - September 2022**
The Environment Project - Non-Profit Organization   *Queens, NY*
- Led the development of Recyclopedia, a wiki web application with a team of 4.
- Maintained and redesigned the organization's WordPress website which reached 10K visitors.
- Authored the event page for the Flushing Meadows Corona Park clean-up which resulted in 111 participants.
- Organized collaboration through GitHub pull requests, Trello, and pair-programming meetings on Zoom.