Alexander Wilson

Software Engineer — Game Designer
Austin, TX

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Projects

2D Physics Engine - nbphysics (View Project) | *GameMaker Studio 2, GML*
- Worked independently to develop a 2D particle-based iterative impulse-based physics engine within GameMaker based on Ian Millington's book 'Game Physics Engine Development'.
- Utilized a central object that houses registrations between entities, force generators and contact generators, also allowing users to create custom force and contact generators.
- Designed to work with rotated rectangles and circle colliders and handled contact resolution iteratively through interpenetration and seperating velocity calculations.
- Implemented a sleep system for objects for improved performance.

2D Online Multiplayer Game - V-Shift (View Project) | *Unity, C#*
- Worked in a small, collaborative, multidisciplinary environment to create V-Shift, a competitive online multiplayer 2D action platformer game using C# and Unity.
- Designed and implemented the AI systems for singleplayer, abstracting player character controller functions and utilizing behavior trees for overall AI state organization.
- Designed and implemented a finite state machine used for organizing physical character states.
- Worked on other game systems, including the design and implementation of several character combat abilities and their corresponding multiplayer netcode.

2D Math Game - Graphmatical! (View Project) | *GameMaker Studio 2, GML*
- Developed an educational math game where users are tasked with graphing math equations to solve problems and generate terrain.
- Designed and implemented a reusable graphing calculator within the game, utilizing a token system with expression trees to parse and convert user inputs into fully interactable graphs.
- Designed and implemented a level editor using JSON files for the sharing of user-generated content, allowing the opportunity for educators or general users to create levels focused on their own needs.

Technical Skills

Languages: GML(Expert), C# (proficient), Python (proficient), JavaScript (proficient), Lua (prior experience)
Technologies: GameMaker Studio 2 (Expert), Unity (proficient), Git (proficient), Godot (prior experience), MATLAB (prior experience)

Education

The University of Texas at Austin   Expected May 2025
Bachelor of Science in Computational Physics   *Austin, TX*
- **Elements of Computing Certificate**
- **Relevant Programming Coursework:** Elements of Programming (Python), Elements of Software Design (Python), Elements of Graphics (Processing, Java), Elements of Game Development (Godot, GDScript), Elements of Networking (Python), Intro to Computational Physics (MATLAB), Elements of Software Engineering I (Python), 2D Game Development Capstone (Unity, C#)
- **Relevant Math Coursework:** Calculus (I,II,III), Matrices and Matrix Calculations, Probability I, Differential Equations with Linear Algebra
- **Relevant Physics Coursework:** Electronic Techniques