

Timothy Trimble

Contact Information

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Summary

Highly skilled and motivated Gameplay Programmer with a passion for creating immersive gaming experiences. Possessing a strong background in computer science and game development, I am adept at designing, implementing, and optimizing complex gameplay mechanics and AI systems. With a proven track record of delivering successful projects, I am eager to contribute my expertise to a dynamic and innovative gaming studio.

Education

[Master of Science in Entertainment Arts & Engineering](#)

University of Utah, Salt Lake City, Utah August 2021 – May 2023

[Bachelor of Science in Computer Science – Entertainment Arts & Engineering](#)

University of Utah, Salt Lake City, Utah August 2015 – December 2019

Technical Skills

- Programming Languages: C++, C#, C, Python, Swift4
- Game Engines: Unity, Unreal Engine, MonoGame, Godot, OpenFrameworks
- AI Frameworks: Behavior Trees, Finite State Machines, Pathfinding, Goal-Oriented Action Planning (GOAP), NAV Meshes, Procedural Animation, Procedural Level Generation
- Gameplay Mechanics: Player Movement, Combat Systems, Level Design
- Version Control: Git, Perforce
- Project Management Tools: Gitlab, Github, Jira, Bitbucket, Trello
- Debugging and Profiling Tools: Visual Studio, Visual Studio Code, Unreal Engine Profiler
- Software Design Patterns: Observer, Factory, State, Command, Singleton, Flyweight, Prototype, Service Locator, Component, Subclass Sandbox, Type Object

Professional Experience

Simulation Software Programmer

Hill Air Force Base, Hill AFB, Utah *January 2020 – Present*

- Collaborates with customers to implement a simulated model of the F-16 Falcon aircraft.
- Wrote an A* Pathfinding algorithm and optimized heuristic for a large graph.
- Contributes to code reviews and actively participated in team meetings to provide technical insights and improvements.
- Serves as the leader of a scrum team to facilitate effective cross-team workflows.
- Actively maintains a long-term code base with modern and legacy code.
- Ensures product works in a cross-platform environment (Linux/windows/proprietary).
- Created and maintains launcher software for multiple program management.
- Works with a simulation physics engine.
- Rapid prototyping development experience.

Computer Science Teaching Assistant

University of Utah, Utah *January 2019 – December 2019*

- Taught C++ to students for the first time.
- Practiced memory management techniques.
- Communicated technical expertise with others using multiple mediums and styles to ensure adequate portrayal of expertise.
- Prepared and presented lesson plans for Software Practice II Lab, undergraduate.

STEM Teacher Internship

Hill Aerospace Museum, Utah *May 2018– August 2019*

- Taught STEM-oriented classes to K-12 students
- Planned and modified lesson plans based on modern research.

Server

Litza's Pizzas, Utah *March 2016 – January 2020*

- Worked in a fast-paced unpredictable environment.
- Practiced effective multi-tasking.

Electrician's Assistant

D & A Electric, Utah *June 2015 – August 2015*

- Wired household lights and outlets.
- Interpreted and followed blueprints and layouts.

Published Games

Slime Knight - Gameplay Programmer

Unreal Engine 5 *Published: May 2023*

- Implemented a universal behavior tree for all A.I. enemies that supports unique attacks.
- Programmed the system for saving/loading game state and data.
- Created an interface for determining grabbable objects in the levels.
- Managed the Performance issues across the team, particularly helping artists learn.
- Collaborated with the engineering team to debug and determine the cause of frame rate drops.
- Optimized spline mesh code allowing the game to run at 60 fps rather than 30.

Pathos – UI Programmer

Unity *Published: May 2015*

- Implemented the game's UI and Integrated the UI art assets.
- Integrated FMod into the Unity project and created a wrapper class for other developers to interface with FMod.

A.I. In Games

Flow Field AI Pathfinding Plugin - Solo Developer

Unreal Engine 5 *In Progress*

- Creating a flow field pathfinding system for Unreal Engine 5.
- Developing ways for a lot of pathfinding to occur simultaneously.
- Graph pruning using a high-level hierarchical representation and A* portal pathing.

AI Strategy Independent Study - Solo Developer

Unity *December 2022*

- Studied strategy AI in complex (partially observable non-deterministic) environments.
- Analyzed the requirements of environments and their properties to identify how best to describe the environment to the agent so that it may adequately perform its tasks.
- Implemented strategy AI for a capture-the-flag style game.
- Developed tools to describe required environmental information for an A.I. to perform goal reasoning, and goal delegations to decision-makers.
- Practiced describing A.I. goals in GFI (Goals, Feedback, Interpretation) and MDA (Mechanics, Dynamics, Aesthetics) frameworks.
- Reported findings to and collaborated with sponsoring researcher and professor.

AI Engine Framework - Solo Developer

OpenFrameworks April 2022

- Implemented the following A.I. framework systems:
 - Movement Algorithms (Kinematic Motion, Seek Steering Behavior, Wander Steering Behavior, Flocking Behavior)
 - Pathfinding Algorithms (Dijkstra's, A*, Heuristic Design)
 - Decision-Making (Decision Trees, Behavior Trees, Goal Oriented Action Planning)
- Studied and practiced the connection between different A.I. hierarchies.

NPC Interactive Dialogue – AI Programmer

Unity April 2022

- Integrated Tracery, a language-generating framework, into a unity project.
- Designed and implemented a relationship system based on generated conversations.
- Explored applications for creating unique AI-driven NPC experiences.

Gameplay Engineering

The following projects originated from the master's level course at the University of Utah which focused on the engineering aspects of gameplay programming. Each of these projects was completed in a single-week timeframe and required implementing different software patterns.

Kingdom Builder 3D - Solo Developer

Unreal Engine 5 December 2022

- Transformed previous project [see: Castle Builder] from a 2D game to a 3D game.
- Maintained the design pillars of the original game in the new 3D space.
- Executed an observer pattern for type-agnostic communication to the resource system.

Dungeon Walker - Solo Developer

Unreal Engine 5 November 2022

- Implemented a procedurally generated dungeon using the subdivision method.
- Generated a musical puzzle obstacle to make exploration-only gameplay more exciting.
- Procedurally populated different rooms.

Parkour Ranger - Solo Developer

Unreal Engine 5 October 2022

- Implemented a climbing mechanic based on the climbing surface's tangent angle.
- Designed and created a crafting system that modifies player movement mechanics.

Castle Builder - Solo Developer

Unreal Engine 5 October 2022

- Developed UI-heavy gameplay informed by UI/UX frameworks.
- Created a dynamically adjustable UI system for showing available construction parts.
- Used the command pattern to allow players to undo and redo building decisions.

Experimental Gameplay

The following projects were all created as part of the master's level course 'Experimental Gameplay' at the University of Utah. Each project was completed in 1-2 weeks and required exploration and evaluation of an experimental idea based on a given theme.

Scoville Chopper - Solo Developer

Unreal Engine 5 April 2023

- Used Unreal Engine's post-processing objects to blur player vision.
- Incorporated Unreal Engine's mesh slicing as a core mechanic.
- Implemented procedural generation to create gameplay recipes.

Uncertainty Principle - Solo Developer

Unreal Engine 5 April 2023

- Implemented camera visibility logic to alter meshes not visible to the player.
- Practiced user experience design to create an eerie/unsettling gameplay atmosphere.

After Wars - Solo Developer

Unreal Engine 5 April 2023

- Designed a game where a 'suboptimal' strategy could earn more points and win.
- Implemented a 2D game in Unreal Engine
- Programmed a turn-based gameplay system.

Line World Shifter - Solo Developer

Unreal Engine 5 March 2023

- Procedurally generated initial-level layout.
- Programmed gravity manipulation to allow the player to travel in a loop around the map.

Die Attack - Solo Developer

Unreal Engine 5 February 2023

- Implemented enemy AI that has a limited time allocated for movement.
- Used the physics engine to affect gameplay elements.

Like Clockwork - Solo Developer

Unreal Engine 5 *January 2023*

- Implemented rotation matching logic that toggles based on player state.
- Designed levels to engage the core mechanic through a series of 4 puzzles.

School Projects – Misc.

Battle Bard - Solo Developer

Unreal Engine 5 *December 2022*

- Integrated Arduino code connection to the Unity Engine.
- Designed and crafted a wearable drum controller aimed to fit inclusive body types.
- Wired and programmed an Arduino board to interface with the alternative controller.

Bouncer Mage - Solo Developer

Unreal Engine 5 *April 2022*

- Studied and evaluated the design of Hollow Knight's bouncing mechanic.
- Implemented this mechanic in a third-person platformer.
- Designed and blocked out a level to support the core mechanic.
- Procedural animation of the upper torso of the character based on player input.

Kitty Kitty Bang Bang – Gameplay Programmer

MonoGame *August 2021*

- Implemented a metronome system for measuring player success with the beat.
- Built a level creator allowing developers to rapidly create and test level difficulties.
- Designed gameplay based on the entertainment value of a real-world object.
- Designed a quality experience around the feeling and feedback from a computer mouse.

Personal Projects

Quest Board – Programmer/Designer

Godot 4 *Game Jam Submission (GMTK) July 2023*

- Designed, Implemented, and published a game in 48 hours.
- Created functions to determine AI NPC decisions.
- Developed a dynamic UI to support the unpredictable nature of the gameplay order.
- Programmed an event system for developers to provide feedback output to the player.

Custom Game Engine - Solo Developer

SFML *In Progress*

- Creating a custom 2D game engine using SFML as the graphics and windowing core.
- Designed and implemented a component system.
- Created a custom JSON parser to initialize game objects/levels at runtime.
- Worked with CMake to build/organize project hierarchy.
- Implemented a Separating Axis Theorem collision system.
- Practiced Meta Programming and Template code.

Personal Interests

- I enjoy working on personal programming projects and exploring the latest trends in AI and game development.
- My biggest inspiration for game development and current favorite game is Hyper Light Drifter.
- I really enjoy SNES games, and my favorite is The Legend of Zelda: A Link to the Past.
- I seek to foster creativity and collaboration within the gaming community by participating in game jams.
- My love of gaming extends to board, card, and tabletop genres and I am the running Game Master in my group of friends.
- While not gaming, I enjoy playing music including piano, guitar, ukelele, and clarinet.
- I was a devoted Boy Scout for many years and earned my Eagle Scout in 2013.
- I love the outdoors and find joy hiking, camping, swimming, and spending time with my family and our pets.