ZHEHAO XU

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EDUCATION

University of Southern California, Viterbi School of Engineering — Los Angeles, CA
Master of Science, Computer Science — Expecting: May 2025
Bachelor of Science, Computer Science (Games) GPA: 3.89/4.0 — May 2024

SKILLS

Programming Languages / Frameworks: C++, C#, Java, Python, R Language, DirectX, HLSL, DirectX, HTML/CSS, JavaScript
Version Control Software: Perforce, Git
Game Engines / Tools: Unreal Engine 4/5, Unity, UEFN, SDL Library, Maya, VS, Rider

EXPERIENCE

Endless Studios — Remote
Game Systems Engineer Intern — June 2024-August 2024
- **Pipeline Implementation**: Design and build real-time audio visualization pipeline in Unreal Engine 5 using Blueprint programming with sound analysis conducted inside TouchDesigner.
- **Audio Visualization**: Utilize OSC protocol to transfer analyzed music data from TouchDesigner to communicate with Niagara effects and Animation Blueprint, Control Rigs, and IK systems inside of Unreal Engine 5 and create unique audio visualizations.

Sony — Culver City, CA
Summer Technical Associate – Sony Immersive Music Studios — June 2023-August 2023
- **Rapid Prototyping**: Employed UEFN and Unreal Engine 5 to quickly create prototypes within a 10-week period that seamlessly merge music and gaming elements that efficiently translate ideas to interactive experiences.
- **Audio Synchronization**: Designed and implemented a robust system of audio synchronization with gameplay using the Sequencer Tool inside of UEFN, achieving innovative gameplay mechanics.

GAME PROJECTS

Climate GO — Summer 2024
- **Mobile Development**: Programmed and designed a mobile game using Unity, coded in C# to achieve all gameplay logic including mobile specific touch controls, location-based gameplay using MapBox API, persistent saving-loading, and more.
- **Technical Design**: Designed and implemented innovative gameplay to combat fossil fuel usage and climate change. Created pipeline to reflect real-world driving data into environmental effects in game.

Oasis Blitz — Fall 2023 – Spring 2024
- **Collaboration in Large Code Base**: Worked with 20+ people with a code base over 200+ scripts with 100,000+ LOC, organized character behaviors through Hierarchical State Machine; worked with libraries like DOTween, FMOD, and Cinemachine.
- **Optimization**: Enhanced gameplay performance by profiling and improved the particle instantiations with object-pooling, implemented additive scene loading for faster scene transitions in Unity.
- **Design & Implementation**: Created automated target selection system, constructed a cinematics creation pipeline with Cinemachine splines, designed and implemented grapple system, enemy behaviors and more.

DirectX11 Custom Game Engine (Class Project) — Spring 2024
- **C++ Development**: Developed a game engine with rendering, animations, and collision detections with C++ and DirectX11.
- **Graphics Programming**: Used HLSL with D3D11 buffers to implement rendering. Created skinned shader for skeletal animation, normal-map shader, Phong lighting, Half-lambert shader, and bloom with multiple render passes.

Multiplayer FPS (Class Project) — Fall 2023
- **Networking**: Successfully achieved networking with listen servers and dedicated servers on a First-Person Shooter game, including replicated game mechanics such as UI with UMG, chatting, scoring, ammo pickups and more.
- **Unreal Engine Programming**: Programmed in C++ to create fundamental gameplay features while following UE coding conventions and worked with blueprint programming when implementing animations.

Simply Rotate — Spring 2023
- **Gameplay Engineering**: Led a team of 5 people, designed, and programmed a physics-based 2D puzzle game where you can rotate levels to create solutions, constructed using Unity C# with custom shader graphs to create retro shader effects.
- **Level Design**: Practiced level design principles, successfully conveyed complex gameplay ideas with minimal graphics, and encouraged players to think outside the box to create innovative solutions to puzzles.

LANGUAGES AND INTERESTS

- **Languages**: *English* – Fluent; *Chinese (Mandarin)* – Native
- **Interests**: Game Development; Drumming (Mainly Indie Rock); Music Production; Gaming; Skiing