Tsingtao Zhang

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LinkedIn, Portfolio, Github

Skills

Game Engine and Graphics API: Unreal 5, Unity, OpenGL, Direct 3D 11
Programming Language: C/C++, C#, Python, GLSL, HLSL, HTML
Software: PyQt, OpenCV, Blender, Photoshop, Substance Painter, Trello, Github, Perforce
Area of Focus: Pipeline Tool Design, 3D Math, VR development, Procedural Content Generation (PCG), Multiplayer, Android Development, Socket, TCP/IP, Agile Principle

Experience

Role: Graduate Research Assistant   June - Aug 2024
Rochester Institute of Technology
- Enhanced a VR exercise game by switching the render pipeline to URP and optimizing gameplay performance.
- Designed and developed an AI shooter with physics-based aiming and block-avoidance, enabling other researchers to guide users' limb positioning by easily setting the shooting position.
- Parameterized in-game variables which can be tuned during gameplay based on the user's physical measurements and target exercise intensity.
- Solo developed the game while collaborating with 2 other researchers to design the user study. Enriched data items from two to five and extended game time from 5 min to 30 min.
- Configured a wireless environment for seamless data transfer and video streaming of headset imagery using Socket, reducing data collecting time from 5 min to 10 seconds per user test.

Projects

Role: Technical Artist and Gameplay Programmer   Sep 2024 - Now
Duolatera: A VR Multiplayer Puzzle Game, using Unreal 5, C/C++, Python, PyQt, Blender, Perforce, HLSL
- Designed and managed game asset production pipeline and led the team of 5 artists.
- With 3D asset creating skill, established an art bible for artists to reference.
- Using Python and Unreal Editor Utilities Widget, created an automated asset import tools for Unreal Engine, reducing 90% of related manual work.
- Created a texture conversion tool using PyQt and OpenCV, converting albedo textures into RGB Channel Masks.
- Using PyQt, developed an asset renaming tool, autonomously managing all assets avoiding human error.
- Using Python, developed a checking tool that assembles all associated assets (mesh and textures) in Blender.
- Using 3D Math and Unreal IK system, built IK retargeted/predicted avatar animation based on player's movement.
- Implemented PCG contents and spline's auto snapping tool, cutting average layout time from 1 min to 10 seconds.
- Implemented the online multiplayer gaming feature, allowing 2 players to cooperate remotely through Steam.

Role: Mocap Engineer, Multiplayer Programmer
XR Karaoke: A virtual performance, using Unreal, C++, VR/XR, Motion Capture   Feb - April 2025
- Built an XR environment supporting audience watch performance in VR headset via internet.
- Tested motion capture solutions: Rokoko, Mocopi, and RADiCAL. Integrated in Unreal Engine 5.5.
- Extracted mocap data from Unreal Animation Blueprint, replicated from server to more than 10 clients.
- Led and facilitated 10 people from art to programming backgrounds, set up a virtual performance system.

Role: Graphics Programmer   March - May 2024
Ocean Simulator: A real time ray-tracing water shader, using OpenGL, GLSL, C/C++
- Created a real-time interactive ocean renderer using GLSL in OpenGL with ray-tracing, performing above 30 FPS.
- Using linear algebra, ray reflection and refraction, added in a real-time caustics effect 10 times faster than backward ray tracing method, additive blending the underwater illumination.
- Created a clicking-promoted water circle waves on the surface interactively, on top of the default wave patterns.

Education

Rochester Institute of Technology, Rochester, NY.   August 2023 - May 2025
M.S., Game Design and Development
China Agricultural University, Beijing, China.   Sep 2018 – June 2022
B.Eng., Agricultural Structure Environment Engineering

Extracurricular Activities

Bass in China Agricultural University Choir   Sep 2021 - June 2022
Led weekly practice in bass, participated in 4 performances and 1 national competition with gold price.