Ailun Pei

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EDUCATION

Arizona State University, Tempe, AZ — Aug 2020 – May 2025
B.S./M.S. in Computer Science, Accelerated Program, magna cum laude — *GPA 3.7/4.0*
Honors: *Dean's List, Recipient of Academic Merit Scholarship*
Certifications: *Web Development*

EXPERIENCE

Arizona State University, Tempe, AZ — Jan 2023 – May 2025
Graduate & Undergraduate Teaching Assistant (CPI 411 - CPI 111 Graphics for Games)
- Supported instruction in Unity rendering, lighting, and shaders for real-time simulation
- **Guided students in building** 3D scenes**,** Shader Graph effects**, and** gameplay scripting**, enhancing hands-on proficiency in** Unity **workflows**
- Designed tutorials and walkthroughs for C# gameplay systems and basic VFX logic

PROJECTS

Mesh Subdivision & Surface Optimization — Aug 2024 – Nov 2024
- Developed **subdivision** and **edge-swap algorithms** using **Python** and **C** to automate complex 3D **mesh refinement** and enhance surface smoothness
- Visualized **curvature and surface transitions** using **Gaussian smoothing** and **matplotlib**, applying custom **shaders** to render topology evolution
- Applied to geometry refinement use cases in character and terrain modeling workflows

MonoGame 3D Shooter + Shader Integration — Jan 2023 – May 2023
- Built a 3D shooting prototype using MonoGame, integrating custom shaders adapted from NVIDIA's GPU Gems series to create fire, plasma, and aura effects
- Implemented basic enemy spawning, player movement, and hit detection with C#, targeting PC platforms
- Created GPU-based particle systems for performance testing in .NET environments

WebGL Visualization Suite – Skybox & Effects Demos — **Jan** 2023 – May 2023
- Created interactive **WebGL** demos with **Three.js**, including **skybox rendering** and **kaleidoscopic shaders**, demonstrating real-time **shader-based environments**
- Implemented **camera controls**, material blending, and responsive UI for 3D interaction.
- Used **fragment shaders** for real-time environmental effects.

Unity FPS Game with AI Navigation and Shader Effects — **Jan** 2022 – May 2022
- Built a 3D **first-person shooter** in **Unity**, implementing **navmesh-based AI enemies** with patrol and chase logic
- Integrated **shader-based visual effects** (explosions, muzzle flashes) and handled player input, shooting, and animation states with **C# scripts**
- Designed **modular systems** including scene transitions, health logic, and item pickups.

SKILLS

- **Graphics**: Unity, Shader Graph, HLSL, WebGL, OpenGL, MonoGame, Three.js
- **Languages:** C#, C++, Python, JavaScript, GML, GLSL, HTML/CSS
- **Tools:** Visual Studio, Git, Blender, Adobe AE/PS/AI, Figma
- **Systems:** RESTful APIs, MySQL, XML, Unity Timeline, NavMesh, Animation Rigging