ANTONIO ESPINOSA GARCÍA

GRAPHICS ENGINEER

Graphics Engineer specialized in low-level APIs (DirectX 12, Vulkan) and real-time rendering architecture. Proven track record of shipping AAA titles and developing high-performance solutions for both production and academic research. Particularly drawn to roles involving custom engine architecture, GPU optimization, and the implementation of state-of-the-art rendering techniques.

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SKILLS

- **Programming Languages**: ***Advanced***: C++, C, GLSL, HLSL, C# | ***Familiar***: SLANG, Python, JS
- **APIs**: ***Advanced***: Vulkan, DirectX 12, Xbox, OpenGL | ***Familiar***: PS5, CUDA, NVDiffRast, PyTorch
- **Engines & Tools**: ***Advanced***: Proprietary Engines, RenderDoc, PIX, Razor, Perforce, Unity | ***Familiar***: Unreal Engine, ThreeJS
- **Techniques**: ***Advanced***: GPU Optimization, Rasterization, Rendergraph, GPU-Driven Rendering | ***Familiar***: Real-time Path Tracing, Neural Rendering

WORK EXPERIENCE

RENDERING ENGINEER
Feb 2026 - Present

GRIP STUDIOS, REMOTE

- Primary engineer responsible for implementing the DirectX 12 graphics backend from scratch for the Xbox Series X|S versions of Mafia: Definitive Edition and Mafia III, seamlessly integrating it into the engine's existing RHI.
- Modernized the legacy RHI architecture to support modern graphic API paradigms, designing and implementing a custom resource state tracker and frame synchronization mechanisms.
- Assisted the AGC counterpart implementation for PlayStation 5, adapting backend modules to ensure parity and consistent performance across current-gen consoles.
- Optimized CPU and GPU performance by profiling workloads, eliminating legacy renderer bottlenecks, and refining core algorithmic logic.

GRAPHICS ENGINEER
Jan 2025 - Feb 2026

SEABERY SOLUCIONES S.L, MADRID (HYBRID)

- Achieved a 200% rendering performance increase by resolving wait-idle pipeline bottlenecks and implementing a custom Vulkan resource state tracker for automatic barrier generation, following an extensive profiling audit.
- Architected a new GPU scene management system to efficiently translate high-level assets into optimized GPU resources, synchronizing acceleration structure creation and maximizing operation batching.

RESEARCH FELLOW
Sept 2023 - Jan 2025

MSLAB-REY JUAN CARLOS UNIVERSITY, MADRID (ON-SITE)

- Engineered an extensible Vulkan renderer for a European R&D project on ML-driven avatar visualization, specifically designed for real-time human hair and skin shading.
- Designed a light-weight API closely mapped to the RHI to enable rapid prototyping of rendering techniques without high-level framework bloat.
- Delivered lectures to Master's students in advanced 3D mathematics and rendering techniques using Vulkan API.

GRAPHICS ENGINEER INTERN
Jan 2023 - Jul 2023

SEDDI/DESILICO, MADRID (HYBRID)

- Implemented a real-time WebGL fur rendering and combing system within the proprietary Three.js-based engine (Author) by researching and adapting academic papers on hair illumination algorithms.

SELECTED PROJECTS

VULKAN-ENGINE

C++, VULKAN, GLSL | github.com/AEspinosaDev/Vulkan-Engine

- **Overview**: A comprehensive 3D rendering library acting as an accessible wrapper for verbose Vulkan API components, recognized by the community with 45 stars.
- **Implementation**: Engineered both forward and deferred rendering pipelines from scratch. Implemented advanced rendering techniques including Global Illumination using Voxel Cone Tracing, Diffuse and Specular IBL, Physically Based Bloom (CoD), Raytraced Support (Shadows/AO) and SSR.

AXION-ENGINE

C++, DIRECTX 12, VULKAN | github.com/AEspinosaDev/AxionEngine

- **Overview**: High-performance real-time render engine built to scale from experimental rendering research to fully featured real-time applications. Axion is graphics-API-agnostic, supporting both Vulkan and DirectX 12.
- **Implementation**: Implemented an API-agnostic RHI featuring a RenderGraph with automatic barrier insertion and transient resource management. Developed a GPU-driven pipeline using mesh shaders, indirect drawing, compute-based culling and pure bindless architecture powered by a hot-reloaded SLANG shader system. Currently implementing Visibility Buffer.

EDUCATION

PHD CANDIDATE IN COMPUTER GRAPHICS

2024 - Present

REY JUAN CARLOS UNIVERSITY, MADRID

- Researching and developing inverse rendering pipelines to extract complex hair material parameters from both synthetic (Mitsuba Renderer) and real-world photographic datasets.
- Tackling global illumination inversion challenges to infer hair physical material parameters, serving as priors for a potential ML-driven hair neural material.
- Engineered a volumetric hair GI pipeline based on Cem Yuksel's dual scattering approximation, implementing raymarching techniques to accurately simulate complex light transport through the hair volume.

MASTER'S DEGREE IN COMPUTER GRAPHICS

2023 - 2024

REY JUAN CARLOS UNIVERSITY, MADRID | First in Class (9.2/10 GPA)

DEGREE IN VIDEOGAME DEVELOPMENT

2019 - 2023

REY JUAN CARLOS UNIVERSITY, MADRID

LANGUAGES

- **Spanish** | Native
- **English** | Cambridge C1
- **Japanese** | Basic