Daniel **Martinez Amigo**

Computer Systems Engineer

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Education

University of Bath — *Bath, UK*

M.Eng in Computer Systems Engineering — *Oct. 2016 - Jun. 2020*

- First-Class Honours.

Engineering Experience

Unreal Engine Developer — *Madrid, Spain*

EPAM Systems (OptivaMedia) — *Jul. 2022 - Jul. 2023*

- Developed an in-house prototype for a multiplayer virtual reality cinema and multimedia application using Unreal Engine 5.
- Completed an 8 week professional power work shop for Unreal Engine 5 run by INCAS training.
- Co-led technical and game design aspects of a small team to create educational gameplay experiences using UEFN (Unreal Editor for Fortnite) to be used within EPAMS eKids learning programme.

Density UE5: Recreating Destiny 2 in Unreal Engine — *Madrid, Spain*

Unreal Engine 5 Personal Project — *Jul. 2023 - present*

- Created a custom damage pipeline with UE5's Gameplay Ability System (using both blueprints and C++) allowing for custom damage types/buffs/debuffs.
- Implemented gameplay systems in a way that can function in both single player and multiplayer.
- Recreated ability VFX using Niagara and custom materials and integrated them in gameplay.
- Implemented first person shooter gameplay and weapon mechanics such as recoil kickback, spread, recoil recovery and procedural FPS locomotion and animation.

Veist Engine : Vulkan renderer/game engine — *Madrid, Spain*

Graphics programming personal project — *2021*

- Vulkan based engine written in C++17 with the objective of learning the graphics API.
- Command buffer recording abstraction layer that allows for easy creation and recording of Vulkan commands.
- Physically Based Rendering of GLTF models using GLSL shaders. The shaders can be compiled at runtime using SPIRV-Reflect or loaded from a cache.
- Image Based Lighting based on "Real Shading in Unreal Engine 4" from Siggraph 2013.
- Entity component system handles scenes and provides a data driven approach to scene simulation that improves performance.
- Scene editor that allows adding/editing/removing entities and their components.
- Forward and Deferred Rendering.
- Framegraph rendering system that enables custom rendering architectures to be easily created and altered, as well as automatically handling descriptor sets and synchronisation of Vulkan GPU structures such as barriers.

SRGB : Software Renderer — *Madrid, Spain*

Graphics programming personal project — *2020*

- Software renderer written in C++ capable of physically based rendering of 3D models with multiple directional lights.
- The dependencies are SDL2 for window management and stbimage for texture loading. Everything else was written from scratch including math utilities such as vector and matrix operations and an .obj file parser. CMake can be used to build the project.
- Programmable vertex and fragment shader graphics pipeline using C++ virtual functions.
- Main shader achieves PBR rendering using Cook Torrance BRDF shader.
- Parallellism with OpenMP is used in multiple stages of the main render pipeline including vertex shader, primitive clipping, the rasterizer and fragment shaders to greatly increase performance.

Skills

Programming	***Experienced:*** C++, C, MATLAB ***Familiar:*** C#, Python, Java, JavaScript
Graphics	***Experienced:*** Vulkan, GLSL ***Familiar:*** OpenGL, HLSL
Other software/Game Engines	***Experienced:*** Unreal Engine 5 (Blueprints & C++) ***Familiar:*** Unity, GameMaker
Developer Tools	***Experienced:*** Visual Studio, RenderDoc, Git, Github, Jira
Languages	***Native:*** Spanish ***Fluent:*** English