Mateo Vargas Junior Graphics Engineer

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PROFILE SUMMARY

- **Junior Graphics Engineer** with **3 years** at a **port and co-development studio**, bringing **console games to PC and Steam Deck** with a focus on **shaders and GPU performance**.
- Writes **HLSL** and **C++20** in **Unreal Engine 5** and partner engines, targets **DirectX 12** and **Vulkan**, and profiles in **RenderDoc**, **PIX** and **Radeon GPU Profiler**.
- Strongest in **shader permutation cleanup**, **upscaler integration** and **low-end GPU tuning**, after two ship cycles chasing shader compile stutter and VRAM limits on 6 GB and 8 GB graphics cards.
- Works with the **partner studio's rendering team**, **QA** and **tech art**, joins the weekly performance review, and turns QA's hardware test results into ranked GPU bugs.
- Wrote the studio's **RenderDoc capture checklist** for new hires and walked **3 interns** through their first shader fixes.

TECHNICAL SKILLS

Programming & Shading Languages:	C++20, HLSL, GLSL, Python
Graphics APIs:	DirectX 12, Vulkan, DirectX 11
Rendering Techniques:	PBR, deferred shading, TAA, FSR, DLSS, HDR tone mapping
GPU Compute & Ray Tracing:	Compute shaders, GPU particles, DXR (prototype work)
GPU Profilers & Debuggers:	RenderDoc, PIX, Radeon GPU Profiler, Nsight Graphics
Engines & Renderers:	Unreal Engine 5, Unreal Engine 4, partner proprietary engines
Platforms & GPU Hardware:	PC (NVIDIA, AMD, Intel Arc), Steam Deck, PS5, Xbox Series X|S

EDUCATION

DePaul University — **B.S. in Computer Science (Game Development)** — Chicago, IL · Sep 2019 to Jun 2023

WORK EXPERIENCE

Iron Galaxy Studios — **Junior Graphics Engineer** — Chicago, IL · Jul 2023 to Present

- Moved material feature switches from compiled permutations to static branches in **HLSL** for a PC port, so first-launch shader compilation on a 6-core CPU dropped from 11 min to **4 min**.
- Profiled the Steam Deck build in **RenderDoc** and **Radeon GPU Profiler**, ran volumetric fog and reflections at half resolution, and raised the average frame rate in the heaviest city scene from 24 to **31 fps**.
- Fixed **23** resource barrier and descriptor bugs in the **DirectX 12** back end that the debug layer and GPU-based validation caught, which ended the device-removed crashes QA logged on AMD cards.
- Integrated **FSR 3.1** and **DLSS** into the port's upscaler path with correct motion vectors for skinned meshes and particles, cutting the ghosting bugs QA reported from 40 to **3** before release.
- Added GPU frustum culling for foliage instances in a compute shader and tightened LOD distances with tech art, cutting draw calls in the densest forest level by **38%**.

NetherRealm Studios — **Graphics Programming Intern** — Chicago, IL · Jun 2022 to Aug 2022

- Built a GPU timing view for each render stage in **C++** for the studio's Unreal Engine 4 based renderer, which the rendering team used to find a **0.8 ms** redundant depth copy in the character pipeline.
- Prototyped contact shadows for fighter close-ups with a screen-space ray march in **HLSL**, adding self-shadowing detail on faces and hands at a cost of **0.3 ms** on PS5.
- Tested **DXR** ray-traced ambient occlusion in a sample arena on an RTX 3070 and wrote up the comparison with SSAO, measuring a **2.6 ms** cost at 1440p before denoising.