Semih Güreşçi

GPU Rendering & Performance Engineer

Vulkan / GLSL / C++ / Mobile XR / GPU Profiling

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Summary

GPU Rendering Engineer with 10+ years building real-time rendering, simulation, and XR systems. Specialized in C++ and Vulkan on mobile/tile-based GPUs, with proven gains including 35% faster stereo rendering, 30% lower memory bandwidth, and 50% faster sparse-volume rendering. Focused on GPU memory systems, synchronization, profiling, render graphs, and data-oriented architecture for performance-critical graphics software.

Technical Skills

Languages: C++17/20/23, C, GLSL, Python **Graphics:** Vulkan, OpenGL, OpenXR, PBR, Multiview, Volume Rendering, glTF, Render Graphs
GPU Systems: VMA, Pipeline Barriers, Synchronization, Resource Lifetime, Compute Shaders, GPU Culling, Cache-Aware Layouts
Performance/Tools: Bandwidth Optimization, Tile-Based Rendering, RenderDoc, Nsight Graphics/Compute, CMake, Git **Platforms:** Android/Adreno, Linux, Windows

Experience

Computer Graphics Engineer 2022 -- Present
Arspectra Sàrl Luxembourg

- Designed and optimized Vulkan GPU pipelines for mobile XR architectures under strict frame-time, memory, and bandwidth constraints.
- Implemented Vulkan multiview stereo rendering, eliminating redundant per-eye draw calls and improving Adreno GPU performance by 35%.
- Built tile-based rendering architecture with Vulkan render passes/subpasses, reusing on-chip memory and reducing global memory bandwidth by 30%.
- Developed compute-driven volume path tracing with octree acceleration and empty-space skipping, reducing sparse-volume rendering time by 50%.
- Designed GPU memory/synchronization strategies with VMA and Vulkan pipeline barriers; used RenderDoc/Nsight to identify bottlenecks.

Technical Lead (Graphics / Mobile) 2020 -- 2021
Roar Games Studio Ankara

- Managed a multidisciplinary team of around 10 developers, artists, and designers, coordinating prototype delivery and technical direction.
- Led 40+ mobile game prototypes, defining rendering approaches, performance budgets, and low-level CPU/GPU optimization strategies.

Senior Game Developer (Simulation / VR) 2016 -- 2020
SimBT Ankara

- Built real-time VR/AR simulation systems integrating rendering, physics, networking, and internal tooling.
- Developed performance-critical rendering and interaction systems for training applications and geographic visualization tools.

Game Developer (VR Systems) 2015 -- 2016
A Information Technologies Ankara

- Developed VR simulation systems with motion tracking using Kinect and IMU sensors.

Selected Projects

VulkanSceneRenderer -- C++23 Vulkan Renderer github.com/semihguresci/VulkanSceneRenderer

- Real-time glTF/BIM/USD scene renderer with PBR materials, shadows, GPU culling, debug views, render-graph-oriented subsystems, and renderer telemetry.
- Implemented frame-pipeline components including depth prepass, G-buffer, cascaded shadows, tiled lighting, GTAO, OIT, bloom, and post-process outputs.

GPU Memory Access & Cache Behavior Benchmark github.com/semihguresci/gpu-memory-access-benchmark

- 45 Vulkan compute experiments covering AoS/SoA, coalescing, locality, bandwidth saturation, BVH layout, tiled lights, and GPU-driven blocks.

vk-profiling-benchmark -- Vulkan Profiling Playground github.com/semihguresci/vk-profiling-benchmark

- Focused Vulkan benchmark app with triangle, million-triangle raster stress, and compute-copy workloads, plus JSON timing, Docker/local runners, and Nsight capture scripts.

Education

B.Sc. Computer Education and Instructional Technology, Middle East Technical University GPA: 3.35/4.00
Languages: English (Advanced), Turkish (Native)