

KARIM SAYED

GRAPHICS PROGRAMMER

Riyadh, Saudi Arabia | +966573166308 | karimsayedre@gmail.com | karimsayedre.github.io | github.com/karimsayedre

EXPERIENCE

Owner, Private Fork of The Chernobyl's Hazel Engine

October 2023 - Present

- Integrated NVIDIA DLSS, enabling higher performance and visual quality through AI upscaling techniques.
- Optimized CPU-side performance, achieving significant improvements in frame times and overall efficiency.
- Engineered a custom ray tracer using Vulkan's hardware-accelerated ray tracing pipeline.
- Integrated NVIDIA RTX Global Illumination (RTXGI) to enable real-time dynamic global illumination.
- Designed a physically-based path tracer to improve rendering quality for cinematic scenes.
- Optimized memory usage with Block Compression (BCn) formats and caching strategies.
- Enhanced rendering performance and flexibility using bindless descriptors.

Independent Contractor, The Forge Interactive Inc.

April 2024 - July 2024

- Maintained the cross-platform framework for PlayStation, Xbox, Switch and other gaming platforms.
- Upgraded software ray-traced shadows to hardware-accelerated ray-traced shadows.
- Worked with platform-specific graphics debuggers, learning troubleshooting and optimization techniques.
- Worked on the internal testing of the framework, improving testability and stability.

Independent Contractor, Sensor Foundries Inc.

May 2022 - April 2024

- Transitioned numerous features from Vulkan-based Hazel to the OpenGL-based software.
- Implemented Planar Reflections, significantly improving reflection quality in rendered scenes.
- Integrated Linearly Transformed Cosines (LTC) area lights, improving lighting effects and visual appeal.
- Introduced Weighted Blended Order-Independent Transparency (WBOIT), enhancing transparency rendering.
- Utilized Atlas-Based Shadow Maps, improving shadow mapping efficiency.

Intern and Contributor, The Chernobyl's Hazel Engine

March 2021 - April 2022

- Developed a Forward+ Renderer to enhance lighting performance. (Watch: youtu.be/e0YTtO0Ur4o)
- Implemented Screen Space Reflections (SSR), utilizing cone tracing for rough reflections.
- Integrated Ground Truth Ambient Occlusion (GTAO), leading to more realistic ambient lighting.
- Introduced Horizon-Based Ambient Occlusion (HBAO) for improved visual depth.
- Implemented Percentage-Closer Soft Shadows (PCSS) tailored for point/spot lights.

SKILLS AND EXPERTISE

Programming & Rendering:

- Proficient in C++, Intel x86 Assembly, GLSL, HLSL, Premake, and Cmake.
- Extensively experienced in Vulkan and OpenGL, focusing on real-time rendering and optimization.
- Skilled in shader programming, ray tracing, and advanced post-processing techniques.
- Experienced in multi-threading, SIMD, and efficient parallel processing on GPUs.

Tools & Engines:

- Experience in game engines like: Unreal Engine, Unity Engine, and Godot Engine.
- Skilled in performance analysis and graphics debugging tools like: VTune Profiler, NVIDIA Nsight, PIX, RenderDoc, and Razor.
- Skilled in Autodesk Maya and Blender for 3D modeling.

EDUCATION

[Multimedia University in Malaysia](#)

Bachelor of Computer Science, specializing in Software Engineering.

GPA: 3.11

July 2018 - July 2021