

KARIM SAYED

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EXPERIENCE

The Forge Interactive Inc. | Graphics Programmer (Remote) **April 2024 - July 2024**

- Maintained 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 and improved testability and stability

Sensor Foundries Inc. | Graphics Programmer (Remote) **May 2022 - April 2024**

- Transitioned multiple rendering features from Vulkan-based Hazel to OpenGL engine maintaining performance
- Implemented Planar Reflections and LTC area lights enhancing realism in reflections and lighting
- Integrated WB-OIT transparency and Atlas-Based Shadow Maps improving rendering efficiency
- Restructured core rendering and asset management systems improving performance and maintainability

Studio Chernobyl | Rendering Engineer Contributor (Remote) **March 2021 - April 2022**

- Developed tiled renderer enhancing lighting performance with depth prepass to reduce overdraw
- Implemented screen-space techniques including SSR with cone tracing, GTAO, and HBAO
- Integrated PCSS for point and spot lights improving shadow softness and quality

PROJECTS

Beyond Engine: Custom fork of Hazel Engine with an advanced renderer

- Integrated NVIDIA DLSS and RTXGI for AI-driven upscaling and global illumination
- Engineered a physically-based hardware accelerated path tracer in Vulkan for real-time ray tracing
- Optimized CPU performance via shader metadata caching, reducing load times by 40%
- Improved rendering efficiency with bindless descriptors, cutting descriptor handling from 1ms to 0.02ms
- Reduced header parsing to cut compilation time by 20%

CUDA Ray Tracing in One Weekend: High-performance GPU path tracer

[\[GitHub Repository\]](#) [\[Project Article\]](#)

- Built a CUDA-based path tracer achieving sub-9ms frame times on RTX 3080 using SAH-based BVH acceleration
- Minimized VRAM usage by fitting data into L1 cache via SoA layouts, yielding 99% L1 hit rate
- Eliminated virtual function calls using data-oriented design, achieving 92% branch efficiency
- Tuned SM occupancy and register pressure to maintain high throughput without RT cores

SKILLS

Languages: C, C++, CUDA, GLSL, HLSL, Slang, Intel x86 Assembly, Python, Java, JavaScript

Graphics & Compute: Vulkan, OpenGL, CUDA

Game Engines & Frameworks: Unreal, Unity, Godot, Hazel, The Forge

Profiling & Debugging Tools: RenderDoc, Nsight Graphics, Nsight Compute, PIX, Intel VTune

Build & DevOps: Premake, CMake, Git, Jenkins, VCPKG

3D Tools: Blender, Autodesk Maya

Expertise: Real-time rendering, ray tracing, shader development, GPU optimization, SIMD, multi-threading

EDUCATION

B.Sc. (Hons.) in Computer Science | Multimedia University, Malaysia **July 2018 – July 2021**

Specialization: Software Engineering / *CGPA: 3.11 / 4.00*