Aman Sachan

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Skills

Graphics: Vulkan, DirectX 11/12, GLSL/HLSL, USD, MaterialX, Threejs, CUDA, WebGL/OpenGL, Maya API
Programming: C/C++, Python, C#, Javascript, HTML/CSS, Java, MEL
Software: Unity, Unreal, Maya, Houdini, RenderDoc, Pix & other profilers

Experience

Software Engineer II, Office of the CTO (OCTO), Microsoft Feb, 2023 – Present

Software Engineer II, Synthetics, Microsoft June, 2022 – Feb, 2023

- Developed powerful & scalable rendering pipelines for *synthetic data generation* on Microsoft Cloud across industries & use cases: People Safety, Object Tracking, Defect Detection, GeoSpatial, Entertainment;
- Migrated the engine from Arnold to the Radeon Pro Renderer (RPR) and *saved ~20%* of our total simulation costs (*about $496K annually* at that time); Managed our priorities and relationship with the RPR team;
- Performed profiling and handled hardware performance & scaling decisions;
- Set up Continuous Integration (CI) testing; used combinatorics & patterning to greatly increase test coverage;
- Developed Arbitrary Output Variables (AOVs) for auto-exposure, shadow & background compositing, etc;

Intermediate Graphics Engineer, Obsidian Entertainment, Microsoft Jan, 2021 – June, 2022

- Analysed, implemented, and optimised Rendering systems for *The Outer Worlds 2*, in a heavily modified fork of the Unreal Engine; primarily using C++, HLSL, and *Unreal's RDG (Render Graph) & RHI (Render Hardware Interface)* APIs;
- Improved *static lighting systems* (for baking massive open worlds), *real-time lighting and shadowing systems*, shading models, *subsurface scattering*, ambient lighting, and fog of war systems for PC and XBox;
- Worked on game performance passes, as well as miscellaneous crashes and bugs;

Software Engineer II, Havok, Microsoft March, 2020 – Jan, 2021

Software Engineer, Havok, Microsoft Aug, 2018 – March, 2020

- Developed features & improvements across the Havok SDK suite focussing primarily on the *Visual Debugger (VDB)*, *Physics*, and *Havok Graphics (HKG)*; contributed to the *UE4 integration*, *Cloth*, and *AI*;
- Support developers by tracking & fixing bugs, implementing custom features, and identifying client errors
- Manage relationships with clients; Identified risks & set expectations; Drove product roadmaps;
- Helped *ship multiple AAA titles* across many studios & game engines;

Teaching Assistant, University of Pennsylvania | Procedural Graphics (CIS 566) Jan – May, 2018

Research Assistant, SIG Center for Computer Graphics | Under Dr. Stephen Lane May – Aug, 2017

Education

University of Pennsylvania – MSE Computer Graphics & Game Technology | *GPA: 3.57/4.0* May, 2018

Visvesvaraya Technological University – BE Electrical and Electronics Engineering July, 2016

Projects (See more at amansachan.com for a complete portfolio)

Meteoros ◆ *C++, Vulkan, GLSL, HLSL* ◆ *Group Project* 🔗REEL🔗 Nov – Dec, 2017

- Realistic procedural cloudscape rendering in under 3ms/frame on a notebook GTX 1070

Monte Carlo Path Tracer ◆ *C++, CUDA, OpenGL* 🔗REEL🔗 Feb – April, 2017

- *CUDA Optimised*: material sorting; stream compaction; first bounce caching; subsurface scattering; anti-aliasing
- *CPU Generalised*: multiple importance sampling; volumetric rendering; BVH acceleration; multi-threading; micro-facet materials; fresnel reflectance model; realistic modelling of light sources; thin lens camera models;

Jello Simulator Using FEM ◆ *C++, Houdini* ◆ *Group Project* 🔗REEL🔗 March, 2018

- The simulation uses the finite element method (FEM) with a fixed corotated elastic model

Clustered Deferred & Clustered Forward Plus Shading ◆ *WebGL, Javascript, GLSL* 🔗REEL🔗 Oct, 2017

- Real-time (60+ FPS) rendering of more than 2100 dynamic lights in complex scenes