Aman Sachan

amansachan.com github.com/AmanSachan1 aman9740@gmail.com 1-267-361-8276

Skills

Graphics: Vulkan, WebGL/OpenGL, DirectX 11/DirectX 12, GLSL/HLSL, Threejs
Programming: C/C++, Python, C#, Javascript, HTML/CSS
Software: Unreal, Unity, Maya, Houdini, RenderDoc, Pix

Experience

Graphics Engineer, Obsidian Entertainment, Microsoft Jan, 2021 – Present

- 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;
- Specifically worked to improve 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 Mar, 2020 - Jan, 2021
Software Engineer I, Havok, Microsoft Aug, 2018 - Mar, 2020

- Developed features and improvements across the Havok SDK suite focussing primarily on the Visual Debugger (VDB), Physics, and Havok Graphics (HKG); but also contributing to the UE4 integration, Cloth, and AI;
- Support developers by tracking & fixing bugs, implementing custom features, and identifying client errors
- Manage relations with clients; Identify risks & set expectations; use feedback to drive 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 May – Aug, 2017

Subliminally Directing Gaze in VR under Dr. Stephen Lane at the University of Pennsylvania

- Developed a VR game that used visual stimuli to subliminally (without conscious perception) direct user attention
- Supervised & taught an undergraduate intern working on the project; implemented a realtime CMA-ES algorithm

Education

University of Pennsylvania – MSE Computer Graphics | *GPA: 3.57/4.0* May, 2018
Visvesvaraya Technological University – BE Electrical and Electronics Engineering July, 2016

Projects (See more projects at amansachan.com)

Vulkan Cloudscape Rendering ◈ *C++, Vulkan, GLSL, HLSL* ◈ *Group Project* Nov – Dec, 2017

- Realistic cloud rendering in under **3ms/frame** on a notebook GTX 1070.
- **Responsibilities**: **Vulkan framework**; 2D and 3D texture support; **ray marching** of cloud shapes; **reprojection** and cheap sampling optimizations; **post-processing** (god rays, tone mapping, **temporal anti-aliasing**);

Monte Carlo Path Tracer ◈ *C++, CUDA, OpenGL* 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* March, 2018

- The simulation uses the **finite element method** with a **fixed corotated elastic model**
- Implemented **collisions**, fixed point constraints, in a **data driven architecture**

Clustered Deferred & Clustered Forward Plus Shading ◈ *WebGL, Javascript, GLSL* Oct, 2017

- **Real-time (60+ FPS)** rendering of more than **2100 dynamic lights** in complex scenes using a **compacted g-buffer**

Hand Of God ◈ *Unreal Engine 4* ◈ *Group Project* Oct, 2017

- Asymmetric co-op endless runner game **merging** traditional **non-VR and VR gameplay**.

CUDA Rasterizer ◈ *CUDA, C++, OpenGL* | **tile based** & **scanline** Rasterization in **real-time (60+ FPS)** Oct, 2017

Mesh Editor ◈ *C++, OpenGL* Nov, 2016

- Implemented an interactive **Half-Edge Mesh data structure**, **Catmull-Clark Subdivision**, **Interactive Skeleton** Structure, **Skinning**, and Shader Based **Skin Deformation**