

# Aman Sachan

amansachan.com

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## Skills

**Graphics:** Vulkan, CUDA, WebGL/OpenGL, DirectX 11, GLSL/HLSL, Threejs, Maya API

**Programming:** C/C++, C#, Javascript, Python, HTML/CSS

**Software:** Unity, Unreal, Maya, Houdini, RenderDoc & other profilers

**Engineering Tools:** Visual Studio, Qt, Git, Perforce, CMake

## Experience

**Software Engineer II, Havok, Microsoft**

March, 2020 – Present

**Software Engineer, Havok, Microsoft**

Aug, 2018 - Feb, 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

**Vishvesvaraya 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 Generalized:** Multiple importance sampling; Volumetric rendering; BVH acceleration; Multi-threading;
- Micro-facet materials; Fresnel reflectance model; Realistic modeling 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**.

**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**

**CUDA Rasterizer** ♦ CUDA, C++, OpenGL | Tile based & Scanline Rasterization in Real-time (60+ FPS)

Oct, 2017

## Leadership and Awards

**Project Helios** – 2016

Project Lead; Awarded Rs. 1,20,000/-  
Finalist of KPIT Sparkle & Engineer Infinite

**Earthian** – 2014

Project Lead  
Awarded Rs. 1,50,000/-

**Vidyut 2k14**

Head of Sponsorship;  
Prime Coordinator & Public Spokesperson

