

AMAN SACHAN

amansachan.com

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SKILLS

PROGRAMMING

- C/C++
- GLSL
- MEL
- Javascript
- C#
- HTML/CSS
- Java

GRAPHICS

- CUDA
- Vulkan
- OpenGL, WebGL
- Maya API
- Threejs

SOFTWARE

- Git
- Unity
- Maya
- Unreal
- Qt
- Visual Studio

COURSEWORK

- Physically Based Animation (current)
- GPU Programming
- Advanced Computer Graphics
- Procedural Graphics
- Game Design
- Computer Animation
- Data Structures and Algorithms

LEADERSHIP & AWARDS

HELIOS - 2016

- ◆ Project Lead; Received Rs. 1,20,000/- in funding
- ◆ Finalist of KPIT Sparkle & Engineer Infinite

EARTHIAN - 2014

- ◆ Team Lead; Awarded Rs. 1,50,000/-

VIDYUT 2k14

- ◆ Prime Coordinator; Head of Sponsorship; Public Speaking

EDUCATION

UNIVERSITY OF PENNSYLVANIA, Pennsylvania, USA

May, 2018

M.S.E. COMPUTER GRAPHICS ---- GPA: 3.57/4.0

VISVESVARAYA TECHNOLOGICAL UNIVERSITY, Bangalore, India

July, 2016

B.E. ELECTRICAL AND ELECTRONICS ENGINEERING

EXPERIENCE

UNIVERSITY OF PENNSYLVANIA | TA for Procedural Graphics (CIS 566) Jan - May, 2018

SIG CENTER FOR COMPUTER GRAPHICS | RA for Dr. Stephen Lane May - Aug, 2017

SUBLIMINALLY DIRECTING GAZE IN VR ◆ C#, Unity ◆ Oculus DK2, SMI Eye Tracker

- Implemented a **real time CMA-ES algorithm** (a machine learning algorithm)
- Developed a **game in Virtual Reality** that used visual stimuli to subliminally (without conscious perception) direct user attention
- Supervised and taught an undergraduate intern working on the project

PROJECTS (See more projects at amansachan.com)

VULKAN CLOUDSCAPE RENDERING ◆ Vulkan, C++, GLSL

Nov - Dec, 2017

- Realistic real-time rendering of clouds in under **3ms/frame** on a notebook 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**);

CPU MONTE CARLO PATH TRACER ◆ C++, OpenGL

Feb - April, 2017

- Supports **Volumetric Rendering, Multiple Importance Sampling, BVH Acceleration (9800% speed up), Multi-Threading**
- Handled materials with **Micro-facet** surfaces and **Fresnel reflectance** models;
- **Realistic** modeling of **Light** sources and Thin Lens **Camera Models**;

CLUSTERED DEFERRED AND FORWARD PLUS ◆ WebGL, Javascript, GLSL Oct, 2017

- Implemented **Clustered Deferred** and **Clustered Forward Plus** Shading in WebGL
- Supports a **compacted g-buffer** (total of 8 channels) and **2 component normals**
- **Real-time (60+ FPS)** rendering of more than **2100 dynamic lights** in complex scenes.

HAND OF GOD ◆ Group Project ◆ Unreal Engine 4, HTC Vive

Oct, 2017

- Implemented AI, player and enemy movements, controls, weapons, and helped establish networked gameplay.
- Hand of God is an asymmetric co-op game **merging** traditional **non-VR and VR gameplay**.

CUDA RASTERIZER ◆ CUDA, C++, OpenGL

Oct, 2017

- **Real-time (60+ FPS) Rasterizer** implementing **Tile based** and Scanline Rasterization

ART OF COLLISIONS ◆ Group Project ◆ C++, MEL, Maya API

March - April, 2017

- Implemented a **particle based rigid-body simulator** as a Maya Plugin based on the paper "Unified Particle Physics for Real-Time Applications" by Macklin, Muller, Chentanez, and Kim.
- Jointly implemented **Shape Matching Constraints** and **Position Based Dynamics**

INTERESTING LEVEL GENERATOR ◆ Javascript, WebGL, GLSL, Threejs

April, 2017

- **Procedural Multi-Layer Dungeon Generator** that creates levels based on a voronoi-like graph after it has been heavily modified by various filters to create interesting level layouts
- Also implemented: **Realistic Fog**, **Terrain**, and a controllable **Crumbling Pathway** aesthetic

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**