

AMAN SACHAN

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EDUCATION

UNIVERSITY OF PENNSYLVANIA

M.S.E. COMPUTER GRAPHICS AND GAME TECHNOLOGY

Coursework: GPU Programming (current), Advanced Computer Graphics, Procedural Graphics, Game Design (current), Computer Animation, Data Structures and Algorithms

May, 2018
(Expected)

VISVESVARAYA TECHNOLOGICAL UNIVERSITY

B.E. ELECTRICAL AND ELECTRONICS ENGINEERING

July, 2016

EXPERIENCE

SUMMER RESEARCH, SIG CENTER FOR COMPUTER GRAPHICS

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

- Worked for Dr. Stephen Lane to develop a **whack-a-mole game in Virtual Reality** that used visual stimuli to subliminally direct user attention, with Dr. Stephen Lane
- Implemented a real time **CMA-ES algorithm** (a machine learning algorithm)
- Used the SMI Eye Tracking API to record eye gaze data and feed it into the game

May - Aug, 2017

PROJECTS

(See more projects at
amansachan.com)

MONTE CARLO PATH TRACER ♦ **C++, OpenGL**

- Developed a CPU based Path Tracer with:
Volumetric Rendering; Multiple Importance Sampling; BVH Acceleration; Multi-Threaded;
- Handled materials with **Micro-facet** surfaces and **Fresnel reflectance** models;
- **Realistic** modeling of **light** sources and Thin Lens **camera models**;

Feb - May, 2017

ART OF COLLISIONS (MAYA PLUGIN) ♦ **Group Project** ♦ **C++, MEL, Maya API**

- Implemented a particle based system for simulating rigid-body dynamics 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**.
- Implemented all of the interfacing with the Maya API and also programmed the conversion of arbitrary meshes into particle groups.

March - April, 2017

PROCEDURALISM ♦ **Multiple Projects** ♦ **Javascript, WebGL, GLSL, Nodejs, Thre**

Built multiple projects on the principles of procedural graphics and dynamic interactivity:

- **Bio Crowds** - A **real time crowd simulation** using a space colonization algorithm
- **Implicit Surfaces** - Generated **metaballs** in **real time** using the **marching cubes** algorithm.
- **Procedural City** - A city built using **shape grammar**, that changes with every build
- **Shaders** - Post Processing Filters, and a variety of shaders

Jan - April, 2017

INTERESTING LEVEL GENERATOR ♦ **Javascript, WebGL, GLSL, Nodejs, Thre**

- A procedural **multi-layer dungeon generator** that generates levels based on a voronoi-like graph after it has been heavily modified by various filters to create interesting level layouts.
- Implemented: a **Realistic Fog** shader; Biome and Elevation dependent **Terrain** on the GPU;
- Implemented a controllable **Crumbling Pathway** aesthetic.

April, 2017

MINI-MINECRAFT ♦ **Group Project** ♦ **C++, OpenGL, GLSL**

- **Efficient Terrain Rendering** with interleaved VBO's and 'mesh hull' drawing
- Programmed a general scheme for texture, normal, and specular maps for meshes
- Implemented **Weather** (rain and snow), Clouds, a Day and Night Cycle, and Animated textures;

Nov, 2016

HALF-EDGE MESH, CATMULL CLARK, and SKINNING ♦ **C++, OpenGL**

- Implemented an interactive **Half-Edge Mesh data structure**
- Implemented **Catmull-Clark subdivision**, extrusion, triangulation for mesh manipulation
- **Interactive Skeleton Structure, Skinning**, and Shader Based **Skin Deformation**

Nov, 2016

LEADERSHIP and AWARDS

HELIOS ♦ **Project Lead; Funding (Rs.1,20,000/-) From IEEMA and BMSIT&M**

- Set up a 250W custom solar PV system with a tracked auxiliary reflector system that significantly improve the efficiency at lower than market cost..
- Finalist of **KPIT Sparkle 2016** and **Engineer Infinite 2016**

March, 2015 -
June, 2016

EARTHIAN 2014 ♦ **Team Lead; Awarded Rs. 1,50,000/-**

2014

VIDYUT 2k14 ♦ **Prime Coordinator; Head of Sponsorship; Public Speaking**

2014

SKILLS

PROGRAMMING

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

GRAPHICS

OpenGL, WebGL,
Maya API, Threejs

SOFTWARE

Git, Unity, Maya, Qt, Visual Studio,
AutoCAD