AMAN SACHAN

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EDUCATION

UNIVERSITY OF PENNSYLVANIA

M.S.E. COMPUTER GRAPHICS AND GAME TECHNOLOGY
May, 2018 | Pennsylvania, PA

VISVESVARAYA TECHNOLOGICAL UNIVERSITY

B.E. ELECTRICAL AND ELECTRONICS ENGINEERING
July, 2016 | Bangalore, India

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*

COURSEWORK

- *GPU Programming (Fall '17)*
- *Advanced Computer Graphics*
- *Procedural Graphics*
- *Game Design (Fall '17)*
- *Computer Animation*
- *Data Structures and Algorithms*

LANGUAGES

English, Hindi

HOBBIES

Video games, Football, Trekking, Chess, Kayaking

EXPERIENCE

SIG CENTER FOR COMPUTER GRAPHICS — May - Aug, 2017

RESEARCH ASSISTANT ◈ *C#, Unity* ◈ *Oculus DK2, SMI Eye Tracker*

SUBLIMINALLY DIRECTING GAZE IN VR

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

PROJECTS (See more projects at amansachan.com)

MONTE CARLO PATH TRACER ◈ *C++, OpenGL* — Feb - May, 2017

- Developed a CPU based Path Tracer with:
  Volumetric Rendering; **Multiple Importance Sampling**;
  BVH Acceleration *(9800% speed up)*; **Multi-Threaded**;
- Handled materials with **Micro-facet** surfaces and **Fresnel reflectance** models;
- **Realistic** modeling of **light** sources and Thin Lens **camera models**;

ART OF COLLISIONS ◈ *Group Project* ◈ *C++, MEL, Maya API* — March - April, 2017

- 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 of the native C++ code with the Maya API and also programmed the conversion of arbitrary meshes into particle groups.

PROCEDURALISM ◈ *Javascript, WebGL, GLSL, Threejs* — Jan - April, 2017

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

INTERESTING LEVEL GENERATOR ◈ *Javascript, WebGL, GLSL, Threejs* — April, 2017

- 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.

MESH EDITOR ◈ *C++, OpenGL* — Nov, 2016

- 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**

LEADERSHIP and AWARDS

HELIOS ◈ *Project Lead; Funded Project* — March, 2015 - June, 2016

- Received cumulative **funding** of (**Rs.1,20,000/-**) from **IEEMA** and **BMSIT&M**
- Finalist of **KPIT Sparkle 2016** and **Engineer Infinite 2016**

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

VIDYUT 2k14 ◈ *Prime Coordinator; Head of Sponsorship; Public Speaking* — 2014