

# AMAN SACHAN

amansachan.com

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## SKILLS

### PROGRAMMING

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

### GRAPHICS

- CUDA
- OpenGL, WebGL
- Maya API
- Threejs

### SOFTWARE

- Git
- Unity
- Maya
- Qt
- Visual Studio

## EDUCATION

UNIVERSITY OF PENNSYLVANIA, Pennsylvania, USA

May, 2018

M.S.E. COMPUTER GRAPHICS AND GAME TECHNOLOGY

GPA: 3.45/4.0

VISVESVARAYA TECHNOLOGICAL UNIVERSITY, Bangalore, India

July, 2016

B.E. ELECTRICAL AND ELECTRONICS ENGINEERING

## EXPERIENCE

### SIG CENTER FOR COMPUTER GRAPHICS

May - Aug, 2017

RESEARCH ASSISTANT ♦ C#, Unity ♦ Oculus DK2, SMI Eye Tracker

SUBLIMINALLY DIRECTING GAZE IN VR under DR. STEPHEN LANE

- 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 intern working on the project

## PROJECTS (See more projects at amansachan.com)

### GPU BOID FLOCKING ♦ C++, CUDA

Sept, 2017

- Implemented Craig Reynold's crowd simulation algorithm to model flocking behavior
- Visualize **1.6 million particles** running at **60 FPS** on a notebook GTX 1070

### CPU MONTE CARLO PATH TRACER ♦ C++, OpenGL

Feb - May, 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**;

### 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

### GRAVITY WELLS ♦ C#, Unity

Sept, 2017

- A puzzle game that involves slingshotting your ship using black holes
- Designed and Implemented the gameplay and physics

### IMPLICIT SURFACES ♦ Javascript, WebGL, GLSL, Threejs

Feb, 2017

- Generated **metaballs** in **real time** using the **marching cubes** algorithm
- **~1700 triangles** dynamic triangles running at **60 FPS** on a GTX 1070

### ART OF COLLISIONS ♦ Group Project ♦ C++, MEL, Maya API

March - April, 2017

- Implemented a particle based rigid-body simulator 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 the conversion of arbitrary meshes into particle groups

### 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**

## COURSEWORK

- GPU Programming (Fall '17)
- Advanced Computer Graphics
- Procedural Graphics
- Game Design (Fall '17)
- 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