AMAN SACHAN

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EDUCATION

UNIVERSITY OF PENNSYLVANIA
M.S.E. COMPUTER GRAPHICS AND GAME TECHNOLOGY
May, 2018 | Pennsylvania, USA

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*

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

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 **whack-a-mole 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
- **5 million particles** running at **11fps** on a notebook GTX 1070

GRAVITY WELLS ◈ *C#, Unity*   Sept, 2017
- A puzzle game that involves slingshotting your ship using black holes
- Implemented gameplay and physics

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

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

IMPLICIT SURFACES ◈ *Javascript, WebGL, GLSL, Threejs*   Feb, 2017
- Generated **metaballs** in **real time** using the **marching cubes** algorithm
- ~**3500 triangles** dynamic triangles running at **32 fps** on a notebook GTX 1070

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**

LEADERSHIP and AWARDS

HELIOS ◈ *Project Lead; Received Rs. 1,20,000/- in funding*   March, 2015 - June, 2016
- 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