AMAN SACHAN

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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*

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*

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 working on the project

PROJECTS (See more projects at amansachan.com)

CLUSTERED DEFERRED AND FORWARD PLUS ◈ *WebGL, Javascript* — 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.

CUDA RASTERIZER ◈ *CUDA, C++, OpenGL* — Oct, 2017
- **Real-time (60+ FPS) Rasterizer** implementing **Tile based** and Scanline Rasterization
- Also implemented: Texture Mapping, Backface Culling, and Line & Point Rasterization

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**;

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
- 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

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**

IMPLICIT SURFACES ◈ *Javascript, WebGL, GLSL, Threejs* — Feb, 2017
- Generates **Metaballs** in **real time** using the **Marching cubes** algorithm
- **~1700 dynamic triangles** running at **60 FPS** on a GTX 1070