

# Aseem Apastamb

Software Engineer

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## Skills:

- **Languages:** C++, C#, Lua, C, GLSL, Python
- **Other Software:** Unity, Unreal, RenderDoc

## Projects:

### Academic

#### 3D Isometric Car Game - DTBB

Aug '22 – Apr '23

- Developed in a custom engine using C++, Lua, and OpenGL
- Designed player mechanics like car drifting and gadgets like magnet bomb
- Worked on a Lua scripting system for use in gameplay systems and behaviours
- Integrated a C++ type reflection system for automatic serialization of common types
- Experimented with post-processing effects like screen-space motion blur

#### 3D Rendering Framework

Jan '23 – Apr '23

- Rendered a scene using deferred shading that allows for a large number of local light sources
- Implemented soft shadows using different techniques – Variance Method and Moments Method
- Added physically-based and image-based lighting
- Improved look of scene by adding ambient occlusion effects

#### 2D Puzzle Platformer - Lights Out

Jan '22 – Apr '22

- Developed in C++, using an ECS based game engine
- Contributed to the level design, physics engine, and gameplay systems
- Learnt the basics of an Entity-Component-System architecture pattern

#### 3D Animation Framework

Aug '22 – Dec '22

- C++ graphics framework that loads complex 3D models and animations
- Supports soft body simulation and cloth simulation
- Developed a path following model that generates a Bezier curve from given control points
- Built a quaternion library for use in inverse kinematics-based bone animations

#### Non Realtime Raytracing

Jan '23 – Apr '23

- Created a CPU raytracing framework that renders a static 3D scene
- Rays are traced from each pixel on screen, and intersections with basic shapes are calculated
- Lighting calculation provides features like reflection and transmission through objects
- Extended framework to include depth of field and image based environmental lighting

#### Behaviour Tree - Planning System Hybrid

Jan '22 – Apr '22

- C++ graphics framework that loads complex 3D models and animations
- Combines the benefits of Behaviour Trees and Planning Systems
- Implements the simplicity and control of BTs with the flexibility of planning

### Personal

#### Unity Projects

Dec '20 - Jan '21

- Box Shooter – 3D FPS, demonstrates player input, interactive UI, some basic scripting, and 2 different levels
- Roller Madness – 3D ball rolling game, showcased user input, physics-based movement, and enemy behaviour

#### Publication

Jun '21

- A research paper on data analysis and machine learning called *Investigating the Impact of Data Analysis and Classification on Parametric and Non-Parametric Machine Learning Techniques: A Proof of Concept* - published for Springer's 3rd ICCNCT 2020

## Education

### Master of Science in Computer Science

Graduated Apr '23

DigiPen Institute of Technology

### Bachelor of Engineering in Computer Engineering

Graduated Nov '20

Maharashtra Institute of Technology, Pune (Savitribai Phule Pune University)