Sourabh Mittal

Game Programmer/Software Engineer

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PROJECTS

Unreal Engine Game Mechanics— Modified ShooterGame Sample for Multiplayer Environment

- Implemented Several Game Mechanics in Unreal Engine C++ using Advanced Character Movement Component for Massive Networked Environments.
- Tested with Network packet lag of 500ms and variance of 30%.
- Teleport functionality to teleport players 10m ahead.
- Jetpack functionality in game. Jetpack recharges when not in use.
- Time Rewind functionality which rewinds players back in time. Similar to Overwatch and Prince of Persia.
- Shrink Gun shrinks player upon hit. If the player is stomped when shrunk then he dies. After a fixed time, the player automatically unshrinks.
- Freeze Gun freezes players for a fixed amount of time.
- Wall Run functionality allows the player to run on walls. Similar to Overwatch and Prince of Persia.
- Wall Jump functionality allows the player to jump against a wall when flying close to it.
- Drop Weapon where the player drops its weapon upon dying which may either be picked up or disappears after a fixed time.
- All these functionalities have been implemented to work in a massive multiplayer environment using a server-authoritative model.

Unreal Engine Artificial Intelligence — AI projects in Unreal Engine

- Integrated Blackboard with Behavior tree and set up an AI controller to use the tree.
- Explored Unreal Navigation System using NavMesh and modified it using Navigation areas, links and filters.
- Used Environment Querying System to explore and create custom generators, tests and contexts.
- Implemented sight and hearing in an agent for awareness with unreal's perception functionality.
- Extended Behavior trees by creating custom tasks, decorators and services.
- Managed Crowd in Unreal Engine using RVO avoidance and Crowd Manager.
- Designed and Implemented Behavior tree demonstrating an AI agent chasing a player.
- Explored Debugging methods in unreal such as logging, navigation, EQS, profiling and gameplay debugger.
- Used both C++ and Blueprints to understand the all rounded approach to Unreal Engine.
- Inspected Unreal Engine Source Code to understand unreal engine workings in depth.

Artificial Intelligence for Games — *AI Games and demos written in C++ using Windows GUI*

- State Driven Agent Design using Finite State Machines with Messaging capabilities.
- Steering Behaviors such as seek, flee, arrive, pursuit, evade, wander, obstacle

SKILLS

C++ , Python

Unreal Engine

AI/Gameplay Programming

Data Structures and Algorithms

PORTFOLIO LINK

github.com/sourabhgo

avoidance, wall avoidance, interpose, hide, path following, offset pursuit.
- Group Behaviors such as separation, alignment, cohesion and flocking.
- Combining steering behaviors using various techniques, ensuring non-penetration, implementing spatial partitioning for managing crowds and smoothing to reduce jitter.
- Simplified version of Soccer game implementing key sports game techniques using strategic decision making at agent level and team level.
- Graph algorithms such as depth-first search, breadth-first search, dijkstra's algorithm and A-star algorithm for navigating game maps demonstrated using interactive demo.
- A full-fledged shooter game Raven with a fully functional navigation system using map loading and practical path planning, weapon system with selection using fuzzy logic and goal driven agent behavior. Used lua scripts to load parameters.

SpaceWar — *2D Game written in C++ using DirectX*

- Wrote a complete 2D Game Engine from scratch.
- Included Input support for keyboard and Xbox game controllers.
- Built 2D Graphics Engine for rendering Sprites with Textures.
- Incorporated 2D Physics Engine for collision detection among entities in game.
- Added Audio functionality using XACT.
- Programmed Text functionality with support for both sprite based text as well as directx font based text.
- Implemented console functionality within the game.
- Extended the SpaceWar game with networking functionalities in Client and Server side versions of the game.

Enhanced Appearance — *Different techniques for enhancing the appearance of 2D Games*

- Bitmap Scrolling Demo to allow infinite scrolling in any direction.
- Parallax Scrolling Demo to create an illusion of depth.
- Shadow and Reflection Demo to form visible shadow and reflections of an object on a surface.
- Message Dialogs for displaying text messages to players and Input Dialogs to get user input from players used within the SpaceWar game.
- Dashboard demo with a multiple digit seven segment display,an adjustable length bar, a dial gauge, a simple flashing light, a toggle switch, a push button switch and a bar graph or VU meter.

Tiled Games — *Different projection techniques for 2D Tiled Games*

- Flower Power Game using Orthogonal Projection showcasing a tile based game.
- Drawing Checkerboard using various projection techniques such as Oblique Projection, Isometric Projection with Diamond Shape and Isometric Projection with Stagger Shape.
- Drawing a terrain map using Isometric Projection with Elevations of multiple layers.

Data Structures and Algorithms in Python — *Standard DS & Algo implemented in Python*

EDUCATION

University School of Information and Communication Technology, Delhi — *Bachelor of Technology in Information Technology*

AUG 2016 - AUG 2020