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Introduction to Game AI

Unlocking the Secrets of Intelligent Game Behaviors

DEFINITION

> Game AI refers to the techniques used to create responsive, adaptive, and intelligent behaviors in non-player characters (NPCs) within video games.

KEY CONCEPTS

Pathfinding

Pathfinding is the process of determining the shortest route for an NPC to reach a target.

Finite State Machines

Finite State Machines (FSMs) are used to manage different states of an NPC, like idle, attacking, or fleeing.

Behavior Trees

Behavior Trees provide a hierarchical structure for managing complex NPC behaviors in a modular way.

Decision Making

Decision making involves algorithms that help NPCs choose actions based on game conditions.

Learning Algorithms

Learning algorithms allow NPCs to adapt their behaviors based on player actions or environmental changes.

EXAMPLES

→ An NPC using pathfinding to navigate around obstacles to chase a player.

→ A guard NPC switching between patrolling and alert states based on player proximity.

→ An enemy adapting its attack strategy after observing the player's tactics.

MEMORY TIPS

★ Remember FSM as 'Follow State Model' for state management.

★ Think of Behavior Trees as 'Branching Decisions' for NPC actions.

★ Link pathfinding with 'Finding the Path' to visualize navigation.

COMMON MISTAKES

✗ Overcomplicating AI behavior when simple solutions work.

✗ Neglecting performance optimization for complex AI systems.

✗ Failing to test AI in various game scenarios.

QUICK RECAP

Game AI is essential for creating engaging and realistic NPC behaviors. Key concepts include pathfinding, FSMs, and decision-making. Understanding these elements helps in designing smarter game characters.