

AI+ Game Design Agent Specialty™ Training

OEM: AI CERTs • Duration: 1 Day (8 hrs) • Code: AP-6012

COURSE MODULES & TOPICS

Module 1: Understanding AI Agents

- 1.1 What are AI Agents?
- 1.2 Agent Architectures and Environments
- 1.3 Decision Making and Behavior Basics
- 1.4 Introduction to Multi-Agent Systems
- 1.5 Case Study: Pac-Man Ghost AI
- 1.6 Hands On: Build a Basic Reactive AI Agent Navigating a Simple Environment Using Pygame

Module 2: Introduction to AI Game Agent

- 2.1 What is an AI Game Agent?
- 2.2 Key Components of AI Game Agent
- 2.3 Agent Architectures
- 2.4 AI Game Agent Behaviors
- 2.5 Case Study: Racing Games (e.g., Mario Kart, Forza Horizon)
- 2.6 Hands-On: Creating a Simple Box Movement Game in Playcanvas

Module 3: Reinforcement Learning in Game Design

- 3.1 Basics of Reinforcement Learning
- 3.2 Key Algorithms: Q-Learning and SARSA
- 3.3 Applying RL to Game Agents
- 3.4 Challenges and Solutions in Game-based RL
- 3.5 Case Study: AlphaZero in Games: Mastering Chess, Shogi, and Go through Self-Play and Reinforcement Learning
- 3.6 Hands On: Train a simple RL agent in OpenAI Gym environment

Module 4: AI for NPCs and Pathfinding

- 4.1 Understanding NPCs as AI Agents
- 4.2 Simple AI Techniques for NPCs
- 4.3 Pathfinding Algorithms
- 4.4 Obstacle Avoidance and Movement Optimization
- 4.5 Case Study

- 4.6 Hands-On

Module 5: AI for Strategic Decision-Making

- 5.1 Decision Trees and Minimax for Game AI
- 5.2 Monte Carlo Tree Search (MCTS) for AI Agent
- 5.3 Utility-Based Decision Making for Game AI
- 5.4 AI in Real-Time Strategy (RTS) Games
- 5.5 Case Study: StarCraft II AI by DeepMind
- 5.6 Hands-On: Implement a Basic MCTS Agent for Tic-Tac-Toe Using Pygame

Module 6: AI Game Agent in 3D Virtual Environments

- 6.1 3D Environment Representation and Challenges for AI Agents
- 6.2 Navigation Mesh Generation for AI Agents in 3D
- 6.3 Complex Agent Behaviors in 3D Worlds
- 6.4 Case Study: The Last of Us
- 6.5 Hands On: Develop a 3D AI Agent with Navigation and Interaction in Unity Using NavMesh and C#

Module 7: Future Trends in AI Game Design

- 7.1 Current and Future AI Trends
- 7.2 The Future of Generalist AI in Gaming
- 7.3 Case Study

Module 8: Capstone Project

- 8.1. Task Description
- 8.2. Practical Implementation
- 8.3. Testing and Debugging
- 8.4. Hands-on