Chapter 2
The Gaming Experience With AI

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ABSTRACT

There are several uses of artificial intelligence in games that are useful for the better game design. With the help of AI, we can improve the games in different ways by simply playing them. In the game industry, when artificial intelligence of the game enhances to the profitable value of the game, this adds to better game reviews, which results to improve the experience of the player. By using AI, we can control both the player as well as non-player characters of the game. AI emphasizes on optimizing the performance of play, which means to measure the degree to which a player comes across the goals of the game, in case of player character. Whereas the role of AI in case of a non-player character emphasizes automatic game balancing mechanisms as well as allow dynamic difficulty adjustment. The use of AI for the empathetic player experience can improve and drive the design process of games. This chapter explores gaming with AI.

INTRODUCTION

There are several uses of Artificial Intelligence in games which are useful for the better game design. With the help of AI we can improve the games in different ways by simply playing them. In the game industry, when Artificial Intelligence of the game enhances to the profitable value of the game, then this adds to better game reviews. Which results to improve the experience of the player. By using AI, we can control both the characters that is the player as well as non-player character of the game. AI emphases on optimizing the performance of play which means to measure as the degree to which a player come across the goals of the game, in case of player character. Whereas the role of AI in case of a non-player character, it emphasis on automatic game balancing mechanisms as well as to allow dynamic difficulty adjustment. The use of AI for the empathetic of player experience which can improve and drive the design process of games (John & Jeannie, 2008).

In this chapter we will discuss about different Artificial Intelligence (AI) methods for game playing. These methods consists of generating interesting characters in the different types of games. At every stage of game playing, if Artificial Intelligence features are to be added, then it will enhance the game

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playing features like, in case of winning the game, performing human-like and also provides entertainment .But they experience several of the similar challenges. Actually, there are various reasons why AI methods are used while in game designing as well as while in playing the game (Bob, 2002).

In this chapter we will discuss about different things and challenges while game design. Irrespective of why we want to introduce Artificial Intelligence in a game playing. With the help of different characteristics of the game, we will analyse, which methods be used efficiently to play the game. We will also discuss different Artificial Intelligence algorithms for game playing. Once these algorithms understood then we can make a well-versed choice about AI algorithms that is, which algorithm to play it. Depending upon the characteristics of the game, we could also analyse various methods which can be used in game designing as well as to play the games (John & Jeannie, 2008). We will also discuss about different applications of these methods while game playing. This chapter also emphasis on how Artificial Intelligence methods that can be applied in different types of games. We will demonstrate different types of examples of games using the methods of Artificial Intelligence. In this chapter we will also discuss about different types and most commonly used game-based frameworks. In this chapter we will also compare and analyse for testing AI game-playing algorithms. We will show the comparison between different games with AI features enabled. This chapter mainly discuss the use of AI methods to play to win, but also make several references to the experience-making characteristic of game-playing.

ARTIFICIAL INTELLIGENCE METHODS FOR GAME DESIGN

There are a numerous number of basic AI methods which are commonly used in Games like Finite state machines, behavior trees and utility based AI methods.

Finite State Machines (FSM) Method

A Finite State Machine is the game AI method which conquered the control.

FSMs are signified as graphs and these graphs are abstract representation of an interconnected set of symbols, events, objects, properties or actions of the phenomenon that is required. The graph consists of different states or nodes and these are enclosed with mathematical abstraction and transitions (to represent a conditional relationship between different nodes). A Finite State Machine belongs to the expert-knowledge systems area (Dave & Kevin, 2010).

The main property of FSM s that it can only be in one state at a time. It means if the condition in the equivalent transition is satisfied then the current state can change to another one.

We can define with the help of three main components:

- **States:** It consists of a number of states which are used to store information regarding a particular job.
- **Transitions:** In between states, there are large number of transitions which specify a state change. These transitions are defined by a condition which must be satisfied.
- **Actions:** It consists of a large number of set of actions and these actions must be monitored and followed within each state.

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