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Chapter 15

Board Game Overview

Contents

In this section we are going to create a pair of games where the computer has to actually think. While the thinking in these games are more of algorithmic sort, throughout this section we will look at the concept of artificial intelligence and how it is used to create computer opponents in games.

The first game we are creating is Pent Up Anger, which is a fairly traditional board game. The second game is a three dimensional version of the game everyone knows how to play, tic tac toe.

- Board Games - A look at what board games are.
- Why Computer Versions? - Why make a computer version of a board game?
- Pent Up Anger - A look at the first game we are creating in this part.
- Three Dimensional Tic Tac Toe - A look at the second game that we are creating.

Board games

Board games are games that are played on a board. There are a huge variety of board games. While card games could be placed in this category, I have placed them in the previous part of the book. In this part of the book we will be looking at games that have some type of playing board.

Some board games are strictly based on luck. These tend to be the track based board games where the goal is to reach an end point by following a track. Players move along the track by rolling a die or dice and moving the amount they rolled along the boards path. Sometimes points on the track will have actions associated with them, such as move back three places. Some may even have spots that require the player to pick up a card, with the card having instructions on it.

Another way luck based games try to make it look like there is more than luck involved in winning is by having points or cash determine the winner. Essentially these types of games are the same as the track game but add some type of points to the game. Points are awarded or lost by entering a specific location or by getting a certain card.

On the opposite end are games that are won strictly by skill. These games start the players off on an even playing field and through the rules of the game determine the winner. The best examples of this type of game is chess, with checkers and go being other good examples.

My favourite category of game is the game that fits in between the two. These are games that have some type of playing field and turn rules as with the skill game, but also deploy some type of random element. The best example of this type of game is backgammon.

Why is the middle ground my favourite? Simply put it allows two players of different skill levels to have fun while still allowing the less skilled player a chance at winning the game. Why is this important? Most people hate losing. What is the point of playing a game if I know I am always going to lose?

Why computer versions?

One question that a lot of people have is why even bother to create a computer version of a board game when you can just play the game using the board? There are five main reasons that I would do a computerized version of a board game.

Convenience. Let's face it, when you want to play a board game you have to dig out the board, then sort out all the pieces and set up the board before you can even start playing. With the computer, all you have to do is run the software. All the setup work is done for you. For an online game, you have the additional task of going to the website that the game is on, but that is easily book marked.

No lost pieces. Losing a games piece is a fairly common occurrence. I am sure that most people have played a board game using coins or some other non-game object to represent missing pieces. In computer versions, all the pieces are created by the computer and therefore can never be lost.

Fair Referee. Cheating in board games is more common than it should be. Even if no one does cheat, arguments over the rules still happen. On the computer, the rules are coded into the game so there can be no arguments over fair play. Likewise, because the computer controls all the movement of the pieces and exchange of money, no one has to worry about someone “mis-counting” or making “adding mistakes.”

Solo Play. It is not always possible to find someone to play a game with. Computers have the ability to take the roll of missing people. While the computer may not be as fun as playing against a real human, it can still be an enjoyable time. More to the point, if you are not familiar with the rules to a particular game, playing a computer version of that game can teach you how to play that game without looking dumb in front of your friends.

Enhancements. In some ways, computers can do things that are not possible with normal board games. Animated sequences are one example. Handling complex rules with ease is another. Strategy board games in particular can benefit by being converted into computer games as most of those games have really complicated rules.

Pent up Anger

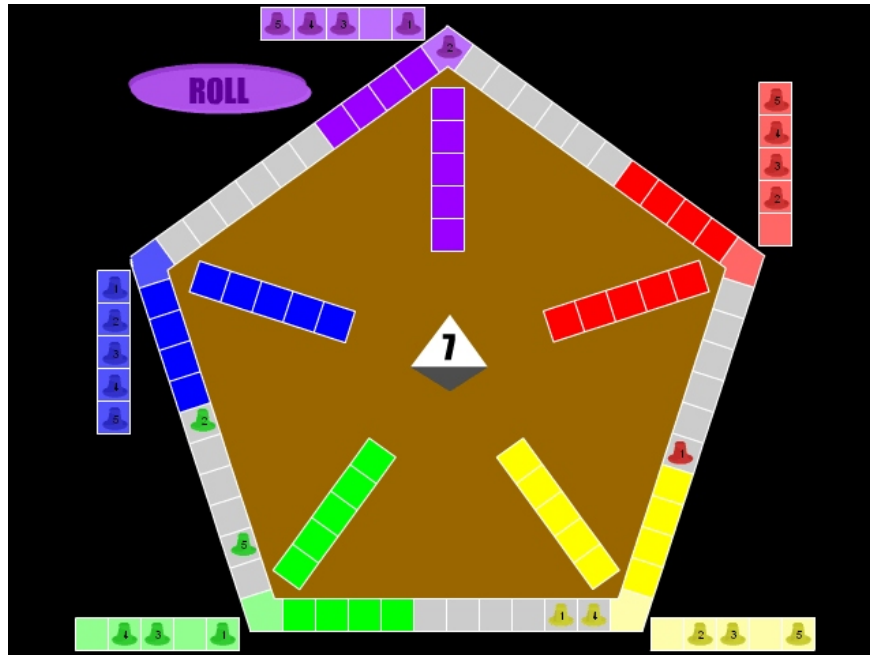


Figure 1: Pent Up Anger Screen shot

The first game is a traditional track based board game, but with a bit of a twist. First, the players each have five pieces, with the ability to move any piece in a given turn. Second, the game uses an eight sided die. Third, the game is played on a five sided (Pentagram) board. The goal is to get all of your pieces from their starting location to their ending location. However, if you land on an opponent's piece, you send them to their starting location.

By giving the player control over multiple pieces and adding the ability to send opponents back to the start a bit of skill is added to the game. The shape of the board and the use of an eight sided die add a uniqueness to the game, which is always nice to have.

The game will be developed in two stages. The first stage of development we will create a five player version of the game for strictly human players. This lets us develop all the game play mechanics and get the game to a fully playable state.

Once we have a functional game we will give the player the option of assigning some of the colors to be controlled by the computer as well as the ability to automatically skip over other colors. This will require the creation of a title sequence which allows players to select who will control each of the colors. It will also require the creation of a computer controlled player (referred to as an AI in computer game terminology).

Three Dimensional Tic Tac Toe

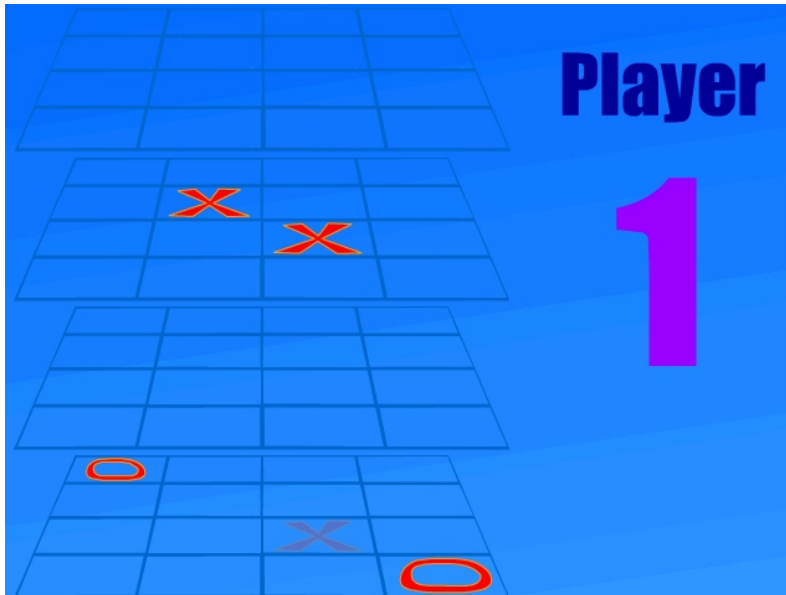


Figure 2: Three Dimensional Tic Tac Toe Screen Shot

The second is a three dimensional version of the classic game Tic Tac Toe. The way you win this game is by forming a line consisting of four of your pieces while preventing your opponent from doing the same. The board is made up of 4 layers. Each of these layers is made up of 4 rows and four columns. You may place your piece on any of the 64 locations available, but can not place a piece on an occupied location.

As with the previous game, we are going to develop this game in two stages. In the first stage we create a two player game. This allows us to get all the game mechanics working properly.

The second stage we create a computer opponent. While originally I had planned on creating a recursive AI, after studying the game, I found that all the work that would have gone into a recursive AI could be essentially pre-calculated making the AI much faster.