Game Informatical Analysis of Chinese Checker

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Introduction

Chinese checker (See the figure of right side) is a strategy board game which can be played by two, three, four, or six people, playing individually or with partners. The game is a modern and simplified variant of the American game Halma. The objective is to be first to race all of one's pieces across the hexagram-shaped board into "home"—the corner of the star opposite one's starting corner—using single-step moves or moves that jump over other pieces.

This research firstly created such a multiplayer computer game based on Visual Studio 2015. The second part is the application of Game Refinement Theory.

Game Refinement Theory has been proposed earlier by Iida et al. [1] to determine level of sophistication of games. It has started to provide some interesting tools to measure sophistication of board games, sport games, and so on. Here, we show the idea of the formula to calculate the game information progress of board games. Let B and D be average branching factor (number of possible options) and game length (depth of whole game tree), respectively. Then we have a realistic game progress model for board games, which is given by equation 1.

$$x(t) = B\left(\frac{t}{D}\right)^n. \qquad (1)$$

In this research, Game Refinement Theory is applied to Chinese checker. Specifically, the research analyzed game refinement value zone of Chinese checker and reveal recommended number of players to play. Furthermore, we compared the measure of enjoyment between the players.

REFERENCE
[1] H. Ida, N. Makeshift, and J. Hiroshima, "A metric for entertainment of board games: Its implication for evolution of chess variants," Entertainment Computing Technologies and Applications, pp. 65–72, 2003.
[2] Game Refinement Theory and Multiplayer Games: Case Study Using UNO，A. Ramadhan, H. Ida, N. U. Maulidevi，The Seventh International Conference on Information, Process, and Knowledge Management，119-125，2015/02/22.

Research Target

This research finished five battle modes of Chinese checker and realized the battle between computer and computer.

After developing the game, Game Refinement Theory is applied to this game. Then, the refined value can be calculated among the 5 battle modes. Game refined measure is the point in this theory. Therefore, those values were used to analyze the playability of each mode. Then the results tried to infer the most suitable number of players. It is believed that multiplayer can also become a funny way to play this game.

Details

This research was conducted in the order which is showed in the right side flow chart. The enjoyment measure is the point in this game theory. We tried to investigate recommended number of players by analyzing the measure which leads to find who are the players enjoying the most the game.

In this research, C# was used to develop the game. The platform is Visual Studio 2015. The interfaces from two players to six players were created(See the picture at the bottom).

Also, the simple version of two computer battle mode and multiple AI battle modes between different players were realized.

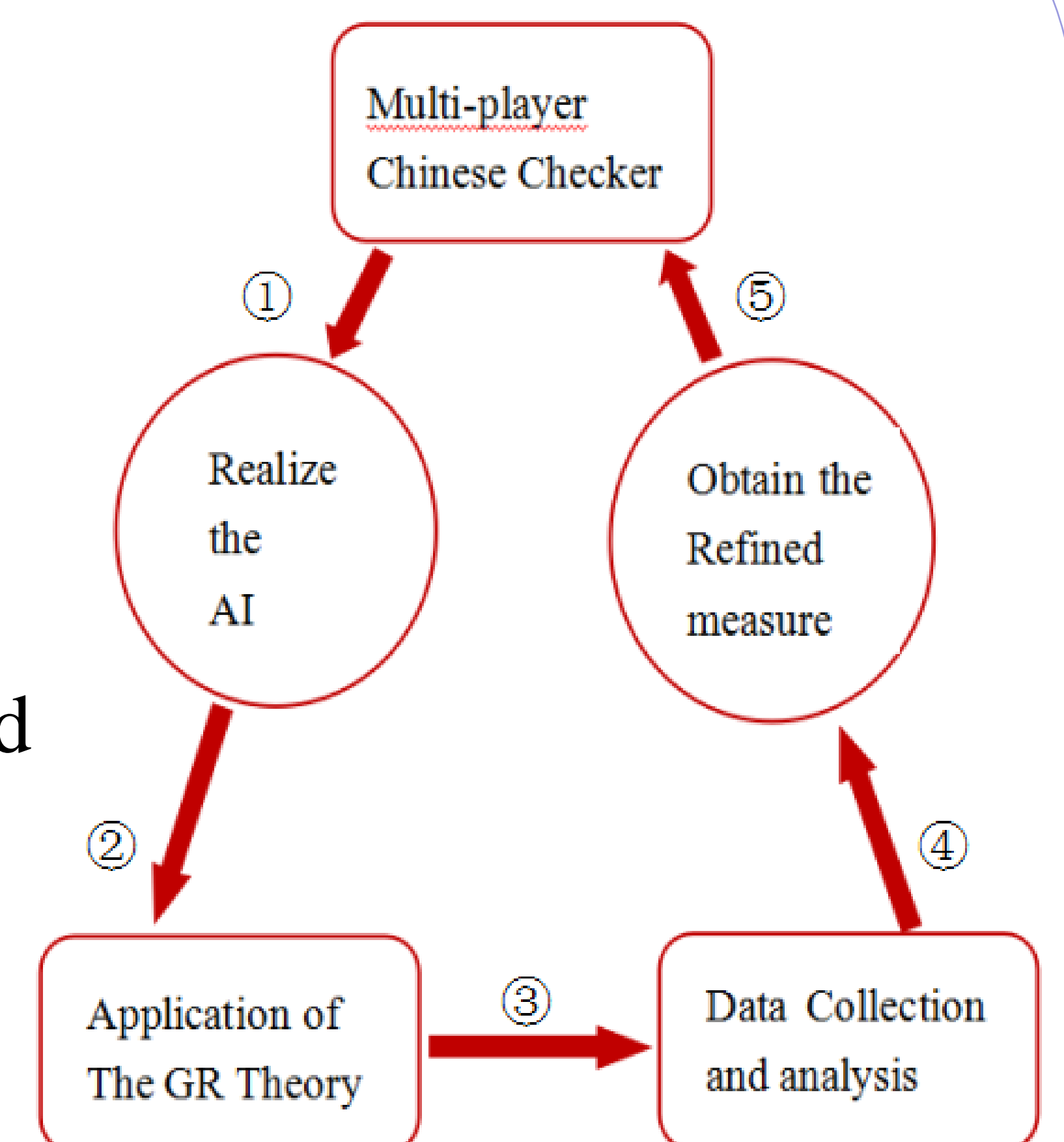We started the data collection and data analysis after the game is completely finished

Summary

In the former play method of Chinese checker, two-person mode is the main way to play. However, this game actually can be played by more than two person. How to enjoy a multiplayer game is a point in this research. All the work hopes to explore more possibilities about Chinese checker.