Gomoku Game in Haskell

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1 Introduction

Gomoku is an abstract strategy board game and is also called Five in a Row. It is played on a board with size 10*10. Players alternate turns to place a stone of their color on an empty intersection. The winner is the first player to form an unbroken chain of five stones horizontally, vertically, or diagonally.

2 Rules

- Free-style gomoku requires a row of five or more stones for a win.

- This is an AI vs. human game. AI and human players have the same opportunity to be the first player.

- The board has 10x10 squares.

- Human player uses $(row, column)$ tuple to represent the square to place a stone of his color. There is no time limit for each move.

3 Strategies

- We implement a **minimax** search algorithm employing the **alpha-beta** cut-off strategy to reduce the size of the search space. It is expected to search to a depth of 3. The minimax algorithm was designed to address two players playing against each other, it works by building a tree of possible outcomes where the minimax player will attempt to maximize it's own score, whilst the other player will try to minimize the minimax player's score by maximizing it's own score.

- We will collect statistics on the computing time difference with and without parallel computing in alpha-beta pruning algorithm.

4 Resources

1. http://faculty.washington.edu/gennari/teaching/AI-171/GomokuProject.pdf

2. http://cs.oswego.edu/ yxia/coursework/csc466/project/paper.pdf