

The playing rules of Outer-Open Gomoku(外圍開局五子棋) are described below.

1. The object of this two-player game is to create a horizontal, vertical or diagonal line of 5 stones of the player's colour on a square grid of a 15x15 board.
2. Black starts first and stones are laid down alternately on the grid. Black can only play at the two outer rows (i.e. row 1, 2, 14, or 15) or columns (i.e. column A, B, O, or P) of the board for the first move. From the second move, there are no prohibited moves for both sides. The game is a draw if the board is filled and no horizontal, vertical or diagonal line of 5 stones has been created.
3. If the number of participants is twelve or below, the tournament will be an all-play-all tournament in which the time of play will be all moves in 20 minutes for each program. If the number of participants is six or below a double (exchange color each) all-play-all tournament will be considered. If the number of participants is higher than twelve, it will be an 11-round Swiss tournament.

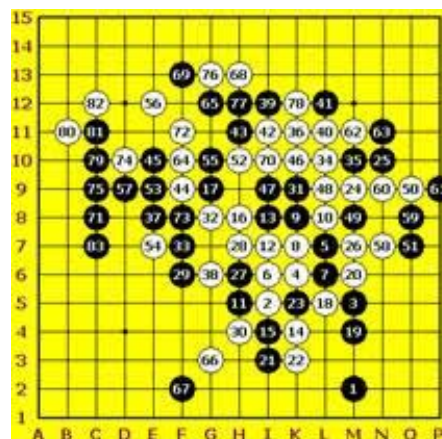
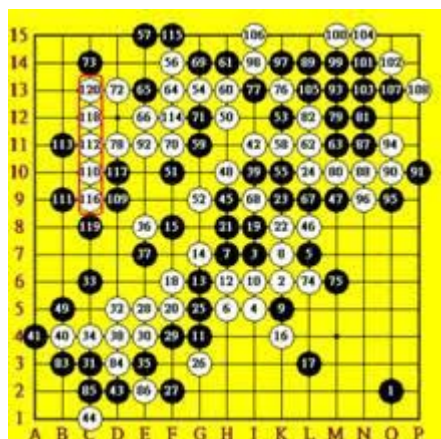
More details are shown below.

===== More details =====

The game of Gomoku has a long history. Its board size is roughly the same as that of Go and its search space complexity is very large. But the free-style Gomoku (without any restriction on Black) is known to favor Black over White, hence it is realized as an unfair game long ago. Along with the progress of computer algorithms, Black has been proved to win in the free-style Gomoku by Allis using "Threat Space Search" in 1994. Furthermore, Black has still been proved to win under Renju restrictions by Wagner and Virag in 2001. Many people attempted to increase the fairness of the game by imposing new rules. However, lots of the new rules still need to be improved for this game due to their deficiencies. Unfortunately, adding more rules also increases the difficulty of learning and playing the game. To the best of our knowledge, this evolution phenomenon didn't appear in other kinds of games.

Aiming at the serious difficulty of Gomoku, the game of Outer-Open Gomoku was proposed by Prof. Shun-Shii Lin in 2011 and formally presented in (Lin and Chen, 2012), which has three goals: "maintaining connect five", "simple rule" and "fairness", to try to save the fate of Gomoku. Its playing rules are the same as the free-style Gomoku but it only restricts Black to play at the two outer rows (or columns) of the board for the first move. From the second move, there are no prohibited moves for both sides. After the preliminary use of some Gomoku software to do experiment and study, we verified its feasibility and hope to give Gomoku a newborn chance. This simple new rule can be expected to be used in the near future. Then we will have a fair game for

both sides, and will create a new era of this adversarial game. The following two figures show two Outer-Open Gomoku game records. Note that Black plays the first move at O2 and M2, which are inside the two outer rows.



TCGA 2014 (<http://www.csie.ntnu.edu.tw/tcga2014/computer-tournaments/tournaments/eng/>) is the first time that Outer-Open Gomoku was played in formal in a big tournament. Six computer programs participated. Both OOGIVEMEFIVE and SHARK won the gold while THACH won the bronze. TAAI 2014 (<http://www.tcga.tw/taai2014/eng/>) is the second time that Outer-Open Gomoku was played. Five teams participated. OOGIVEMEFIVE won the gold while SHARK and THACH won the silver and bronze, respectively. From the game records of TCGA 2014 and TAAI 2014, both sides have about the same chance to win. The coming TCGA 2015 (<http://tcga2015.math.cycu.edu.tw/tournaments/eng/index.htm>) will also have the Outer-Open Gomoku game competition. Hopefully this will be a good new game rule for Gomoku in the future.

Reference

Lin, S.-S., Chen, C.-Y. (2012). How to rescue Gomoku? The introduction of Lin's new rule.(in Chinese) *The 2012 Conference on Technologies and Applications of Artificial Intelligence (TAAI 2012)*, Tainan, Taiwan, November 2012.