

Heuristic Analysis

Summary

The euclidean distance of the number moves available to the two players as a heuristic score is evaluated. It seems that heuristic score is outperform to compare with AlphaBetaPlayer using iterative deepening alpha-beta search and the improved_score.

Heuristic Score

The number moves available to the two players in the euclidean distance are weighted. The opponent weight is weight for opponent moves (opp_weight) and the own weight is weight for own moves (own_weight). The code is [here](#).

Results

Results of win rate are below.

	Improved Score	Custom Score 1	Custom Score 2	Custom Score 3
Win Rate	58.6%	54.3%	68.6%	71.4%

Where:

Custom Score 1: opp_weight = 1.0, own_weight = 1.0

Custom Score 2: opp_weight = 3.0, own_weight = 1.0

Custom Score 3: opp_weight = 1.0, own_weight = 3.0

Custom Score 2 are Custom Score 3 are outperform to compare with Improved Score.

Appendix

Full tournament results are below.

***** Playing Matches *****									
Match #	Opponent	AB_Improved		AB_Custom		AB_Custom_2		AB_Custom_3	
		Won	Lost	Won	Lost	Won	Lost	Won	Lost
1	Random	9	1	9	1	10	0	9	1
2	MM_Open	6	4	1	9	6	4	7	3
3	MM_Center	6	4	8	2	8	2	10	0
4	MM_Improved	5	5	7	3	9	1	8	2
5	AB_Open	5	5	4	6	4	6	6	4
6	AB_Center	7	3	5	5	8	2	5	5
7	AB_Improved	3	7	4	6	3	7	5	5

Win Rate:		58.6%		54.3%		68.6%		71.4%	

In particular, Custom Score 2 and Custom Score 3 defeat random and minimax opponents.