

Tournament result

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

Win Rate:		65.7%		57.1%		65.7%		68.6%	

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Heuristic analysis

1. $*improved* = own_moves - opp_moves$:
use the number of own moves subtract the number of opponent's moves, and win rate is 65.7%.
2. $*custom* = own_moves - 2 * opp_moves$:
add a weight factor to opp_moves compared to $*improved*$, but performance is usually worse than $*improved*$.
3. $*custom2* = own_moves^2 - opp_moves^2$:
use square of move numbers compared to $*improved*$, and the result is slightly better than $*improved*$.
4. $*custom3* = own_moves / (opp_moves + 1)$:
divide own moves over opponent's moves, and average win rate is the best one among all test heuristics.

Recommendation

- The $*custom2*$ is recommended, and here are the reasons:
1. It's the only heuristic that can defeat AB_Improved,
 2. The win rate is not the highest, but it's fairly good -- 65.7%.
 3. It could defeat all minimax algorithms.