Custom Heuristic Performance

Games experiment – 100 rounds with fair matches

Baseline heuristic: #my_moves - #opponent_moves
Custom heuristic: #my_moves - 2* #opponent_moves + #my_future_moves - #opponent_future_moves

# Matches	Opponent	Player Search Depth	Time-Limit	Player Win %
200	Greedy	1	150 ms	71.5
200	Minimax	1	150 ms	48.5
200	Minimax	3	150 ms	63.8
200	Minimax	5	300 ms	65.8
200	Minimax	10	1000 ms	0.0 [Game Timeout]

What features of the game does your heuristic incorporate, and why do you think those features matter in evaluating states during search?

The custom heuristic considers the current open liberties and the subsequent liberties that the player and the opponent have at a given search depth. It multiplies the opponents current liberties by a factor of 2. This is done to penalize the player to pick stronger moves/states which gives the player maximum number of open liberties in the subsequent moves and hence has better chance of winning.

Analyze the search depth your agent achieves using your custom heuristic. Does search speed matter than accuracy to the performance of your heuristic?

The heuristic works good with search depth level of 3 within the 150 ms time limit. However, the agent does not gain much by going even deeper in the search level 5, even with increased time-limits. The search becomes ineffective at deeper levels with the game timing out no matter how much you increase the time limit. Hence the search speed matters less to the performance of the chosen custom metric.