Choosing a heuristic

How to compare heuristics

In order to choose the best heuristic, we must define what is the metric used to compared the performance of a new evaluation function against the improved scored evaluation function. Because we do not know the strategy used by the adversary it is not wise to simply play them against each other and choose the one that can defeat the Improved ID most times, it is plausible to have a scenario where an evaluation function reliably beat the improved function but manages to loose against simpler strategies like random moving.

For this reason I decided to run the provided tournament and log the results, after running a moderate number of times I applied a t-student test with the “greater” alternative and choose one for which the data suggest the mean winning percentage is greater than the winning percentage of the agents running with the improved score evaluation function.

I chose to use the t-test to avoid having to run the greater number of tournaments that would be required to use a z-test. In this case I decided ahead of time to set the number of samples at 5 (running tournaments is time consuming), the significance level at 95% and the alternative hypothesis to be that the custom function had a greater mean number of victories.

Best Heuristic

The heuristic I choose performed better than ID improved with a p-value of 0.0008564.When compared to the difference of sets function the fractional heuristic performed better with a p-value of 0.03048.