GIB: Imperfect Information In A Computationally Challenging Game

**Summary**

1. Bidding and card-play relies on the ability to analyze bridge’s perfect-information variant
2. Double dummy problems are solved using partition search
3. Monte Carlo simulation is used for both card play and bidding
4. (Section 5). To deal with difficulties with the Monte Carlo approach, the value of a bridge deal is modeled as a distributive lattice.
5. (Section 6). Alpha Beta pruning is introduced
6. Squeaky wheel optimization (Joslin & Clements, 1999) to approximate the overall problem

**Partition Search**

Use of transposition table

If player x can move to a position that is a member of a set known to be a win for x, the given position is a win as well. If every move is to a position that is a loss, the original position is also.

Given a set of position S ⊆ G, the set of positions R0(S) that can reach S are those that can reach in one move. The set of positions C0(S) that is constrained to reach S is the set of all p for which s(p) ⊆ S.

Define a function R that is a conservative representation of R0(S) such that R(S) ⊆ R0(S).

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