A new formulation for the Winner Determination Problem

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1 Introduction

Auctions are frequently used tools for fairly distributing goods among players. Combinatorial auctions are those in which each player can offer a different bid for as many combinations of goods as he is interested in. In combinatorial auctions, bidders make bids for bundles of items, an auctioneer collects these bids and an optimal assignment is computed according to some action's rules. Given a combinatorial auction, the Winner Determination Problem (WDP) is the problem of maximizing the benefit that the auctioneer obtains from the auction. The usual formulation for the (WDP) corresponds to a set packing problem. In this paper, we propose a new formulation which reduces the LP-gap. We introduce several families of valid inequalities strengthening the formulation. The performance of these inequalities is illustrated with computational experiments. Finally, we extend our results to other set packing problems.

References

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