Abstract

For *bin packing*, the input consists of n items with sizes $s_1, \ldots, s_n \in [0, 1]$ which have to be assigned to a minimum number of bins of size 1. Recently, the second author gave an LP-based polynomial time algorithm that employed techniques from *discrepancy theory* to find a solution using at most $OPT + O(\log OPT \cdot \log \log OPT)$ bins. In this paper, we build on the techniques of Rothvoss to present an approximation algorithm that has an additive gap of only $O(\log OPT)$ bins. This gap matches certain combinatorial lower bounds, and any further improvement would have to use more algebraic structure.