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Almost-tight Bounds for Online Vector Bin Packing

In the d-dimensional bin packing problem (VBP), one is given vectors $x_1, x_2, \ldots, x_n \in [0,1]^d$ and the goal is to find a partition into a minimum number of feasible sets, i.e., sets that fit into a d-dimensional bin 1^d.

It has been outstanding for 20 years to clarify the gap between the best lower bound on the competitive ratio (of 2) versus the best upper bound of $O(d)$ (Garey,Graham, Johnson, Rao 1976). We show a lower bound of $d^{1-\epsilon}$ for any $\epsilon > 0$.

(joint with Y. Azar, I. Cohen, S. Kamara)