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Polynomial-Time Solvability for Optimization Problems over Integer Cones in Fixed Dimension

Given two d-dimensional polytopes P and Q, we consider the problem of finding the smallest number of integer points of P whose sum lies in Q. We show that this can be solved in polynomial time for any fixed dimension. As applications, we show that the bin packing problem with a constant number of item types or many high-multiplicity scheduling problems can be solved in polynomial time.

This is joint work with Thomas Rothvoss.