Polyhedral Approximations of Completely Positive Optimization Problems

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Abstract

Completely positive optimization deals with the optimization of a linear matrix function over an affine subspace of the cone of completely positive matrices. Recently, it has been shown that every quadratic optimization problem with a mix of binary and continuous variables can be formulated as an instance of a completely positive optimization problem. Therefore, despite the convex nature of this class of optimization problems, the cone of completely positive matrices is computationally intractable. We discuss polyhedral approximations of completely positive optimization problems. We present our results on the quality of these polyhedral approximations on certain classes of quadratic optimization problems.