
HENRY WOLKOWICZ, University of Waterloo

Complete Stable Facial Reduction in One Step for Spectrahedra

A spectrahedron is the feasible set of a semidefinite program, SDP. While strict feasibility is a generic property for random problems, there are many classes of problems where strict feasibility fails and this means that strong duality can fail as well. We propose a *single* parametric optimization problem and prove that the optimal solution is unique and in the relative interior of the spectrahedron. This allows for facial reduction and regularization and guarantees strong duality. Numerical tests illustrate the efficacy of our approach and usefulness in regularizing SDPs.