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A Restricted Dual Peaceman-Rachford Splitting Method for a Strengthened DNN Relaxation for QAP

Splitting methods in optimization arise when one can divide an optimization problem into two or more simpler subproblems. They have proven particularly successful for relaxations of problems involving discrete variables. We revisit and strengthen splitting methods for solving doubly nonnegative, DNN, relaxations of the particularly difficult, NP-hard quadratic assignment problem, QAP. We use a modified restricted contractive splitting method, PRSM, approach. In particular, we show how to exploit redundant constraints in the subproblems. Our strengthened bounds exploit these new subproblems, as well as new dual multiplier estimates, to improve on the bounds and convergence results in the literature.