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PLENARY LECTURE

Asymmetric Long-Step Primal-Dual Interior-Point Methods with Dual Centering

KEYNOTE SPEAKER

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PLENARY LECTURE ABSTRACT

We discuss a new way of development of asymmetric Interior-Point Methods for solving primal-dual problems of Conic Optimization. It is very efficient for problems, where the dual problem is simpler than the primal one. The problems of this type arise often in Semidefinite Optimization (SDO), for which we propose a new primal-dual method with very attractive computational cost. In this approach, we do not need sophisticated Linear Algebra, restricting ourselves by standard Cholesky factorization. However, our complexity bounds correspond to the best-known polynomial-time results. Moreover, for symmetric cones the bounds automatically depend on the minimal barrier parameter between the primal and the dual feasible sets. We show by SDO-examples that the corresponding gain can be very big. We discuss some classes of SDO-problems, where the complexity bounds are proportional to the square root of the number of linear equality constraints and the computational cost of one iteration is as in Linear Optimization. Our theoretical developments are supported by encouraging numerical testing.

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