

1158-90-256

**Ali Mohammad Nezhad\*** (mohamm42@purdue.edu), 150 N. University St., West Lafayette, IN 47906, and **Saugata Basu**. *On the central path of semidefinite optimization: degree and worst-case convergence rate*. Preliminary report.

Semidefinite optimization is the optimization of a linear objective function over the cone of positive semidefinite matrices intersected with an affine subspace. From an algorithmic point of view, primal-dual interior point methods have been comprehensively studied for an approximate optimal solution of semidefinite optimization problems. However, the worst-case convergence rate of the central path, which lies at the heart of primal-dual path-following interior point methods, is still unknown. In this talk, we address this question and derive upper bounds on the worst-case convergence rate of the central path and the degree of its Zariski closure. Since a primal-dual interior point method closely follows the central path, the worst-case convergence rate serves as a quantitative measure of hardness for numerically solving a semidefinite optimization problem. Joint work with Saugata Basu. (Received March 02, 2020)