INVITATION TO THE LECTURE

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INTRODUCTION TO INTERIOR POINT METHODS

Jakub Kružík

Institute of Geonics of the Czech Academy of Sciences, Ostrava

The interior point methods (IPMs) represent a class of second-order algorithms for solving linear and nonlinear convex optimization problems. As they are second-order methods, they typically exhibit fast convergence. However, the fast convergence may come at the cost of potentially expensive solutions of inner systems of linear equations that arise in IPMs.

In this talk we derive a primal-dual path-following IPM for the solution of linear and quadratic programming problems and discuss their implementation. Particularly, we look at the solution of the inner systems of linear equations and emphasize difficulties solving these systems with a (Krylov subspace) iterative algorithm.

Lastly, we compare the performance of IPMs with the gradient-based MPRGP algorithm on several benchmarks.