

CORR 2000-23

**convergence of an infeasible short-step path-following
algorithm based on the Gauss-newton direction**

Serge Kruk & Henry Wolkowicz

Abstract This short note proves the polynomial time convergence of a short step, approximate path following, interior-point primal-dual algorithm for semidefinite programs based on the Gauss-Newton direction obtained from minimizing the norm of the perturbed optimality conditions. This is the first proof of convergence for Gauss-Newton direction. The proof relies solely on classical results of nonlinear optimization and does not explicitly require feasibility or positive definiteness of the iterates.

Keywords Interior-point method, Semidefinite programming, Gauss-Newton