

Dynamic Control of Infeasibility for Nonlinear Programming

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Abstract

We present a strategy to control the iterates of a composite-step method for nonlinear programming. This strategy, called *Trust Cylinders*, allows large steps far from the solution, while enforcing the primal infeasibility to be proportional to the dual infeasibility. Along with interior-point techniques, we can show that the method achieves global convergence and has superlinear two-step local convergence.

This method extends the Dynamic Control of Infeasibility (DCI) method devised for equality constrained problems by Bielschowsky and Gomes, allowing the application to any nonlinear programming problem with inequalities and bounds.

Numerical experiments show that the algorithm is a good competitor against the well-known methods IPOPT and ALGENCAN.

Keywords: Nonlinear Programming, Constrained Optimization, Dynamic Control of Infeasibility, Composite-Step Methods