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An affine scaling trust-region approach to bound-constrained nonlinear systems â˜†

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Abstract

This paper presents an iterative method for solving bound-constrained systems of nonlinear equations. It combines ideas from the classical trust-region Newton method for unconstrained nonlinear equations and the recent interior affine scaling approach for constrained optimization problems. The method generates feasible iterates and handles the bounds implicitly. It reduces to a standard trust-region method for unconstrained problems when there are no upper or lower bounds on the variables. Global and local fast convergence properties are obtained. The numerical performance of the method is shown on a large number of test problems.

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