A line search filter inexact reduced Hessian method for nonlinear equality constrained optimization.


Summary: An inexact two-piece update of projected Hessian method is proposed for nonlinear equality constrained optimization using a line search filter technique. Unlike most existing filter methods, our proposed method does not require a second order correction to improve the search direction and present the Maratos effect. Global convergence properties of the proposed algorithm are analyzed. The line search filter inexact reduced Hessian method has $q$-superlinear local convergence rate if at least one of the update formulae is updated at each iteration. Numerical results on a collection of test problems illustrate the practical behavior of the method.

Keywords: optimization; line search filter method; projected Hessian method; two-piece update
doi:10.1007/s12190-014-0807-0