Newton’s-Like Method for Solving Systems of Nonlinear Equations with Singular Jacobian

Abstract

It is well known that when the Jacobian of nonlinear systems is nonsingular in the neighborhood of the solution, the convergence of Newton method is guaranteed and the rate is quadratic. Violating this condition, i.e., the Jacobian to be singular the convergence may be unsatisfactory and may even be lost. In this paper we present a modification of Newton's method via extra updating for nonlinear equations with singular Jacobian which is very much faster and significantly cheaper than classical Newton method. Numerical experiments are carried out which shows that, the proposed method is very encouraging.

Index Terms

Computer Science 
Applied Mathematics

Keywords