Yamashita, N.; **Fukushima, M.**

On the rate of convergence of the Levenberg-Marquardt method. (English) Zbl 1001.65047

Alefeld, G. (ed.) et al., Topics in numerical analysis. With special emphasis on nonlinear problems. Dedicated to Prof. Tetsuro Yamamoto on his 65th birthday. Wien: Springer. Comput. Suppl. 15, 239-249 (2001).

The authors consider the Levenberg-Marquart method for the solution of a system of nonlinear equations. They consider this as an unconstrained minimisation problem and find the conditions under which the convergence is quadratic. They show that the sequence generated of the method is a Cauchy sequence and therefore convergent. They extend the method by using an Armijo step-size rule and set up an appropriate algorithm with line search. The results are applied to the linear complementarity problem.

For the entire collection see [Zbl 0973.00063].

Reviewer: Ll.G.Chambers (Bangor)

MSC:

65H10 Numerical computation of solutions to systems of equations
65K05 Numerical mathematical programming methods
90C33 Complementarity and equilibrium problems and variational inequalities (finite dimensions) (aspects of mathematical programming)

Keywords:

error bound; quadratic convergence; Levenberg-Marquart method; system of nonlinear equations; unconstrained minimisation problem; Armijo step-size rule; algorithm; line search; linear complementarity problem