

Coleman, Thomas F.; Conn, Andrew R.

On the local convergence of a quasi-Newton method for the nonlinear programming problem. (English) [Zbl 0566.65046](#)

SIAM J. Numer. Anal. 21, 755-769 (1984).

Let $i = 1, \dots, k$ und $f, c_i : \mathbb{R}^m \rightarrow \mathbb{R}$ be C^2 -mappings. The authors consider the approximate solution of the nonlinear programming problem in the presence of nonlinear equality constraints, i.e. (*) minimize $f(x)$ subject to $c_i(x) = 0, i = 1, \dots, k$, by means of a new local quasi-Newton method. The main feature of this algorithm is that a projection of the Hessian of the Lagrangian is approximated by a sequence of symmetric positive definite matrices. The matrix approximation is updated at every iteration step by a projected version of the DFP or BFGS formula. Without assuming convexity the authors prove that the method converges locally 2-step Q-superlinearly to a solution of (*). They say that the performance of this method in practice is still unknown and will be the subject of future work. The results given here are directly applicable to the inequality constrained problem.

Reviewer: [B.Döring](#)

MSC:

[65K05](#) Numerical mathematical programming methods

[90C30](#) Nonlinear programming

Cited in **2** Reviews

Cited in **35** Documents

Keywords:

projected version of DFB/BFGS; superlinear convergence; local quasi-Newton method

Full Text: [DOI Link](#)