New quasi-Newton methods via higher order tensor models.

ABSTRACT

Many researches attempt to improve the efficiency of the usual quasi-Newton (QN) methods by accelerating the performance of the algorithm without causing more storage demand. They aim to employ more available information from the function values and gradient to approximate the curvature of the objective function. In this paper we derive a new QN method of this type using a fourth order tensor model and show that it is superior with respect to the prior modification of Wei et al. (2006) [4]. Convergence analysis gives the local convergence property of this method and numerical results show the advantage of the modified QN method.

Keyword: Curvature approximation; Modified quasi-Newton methods; Quasi-Newton equation; Superlinear convergence.