

A new diagonal gradient-type method for large scale unconstrained optimization

ABSTRACT

The main focus of this paper is to derive new diagonal updating scheme via the direct weak secant equation. This new scheme allows us to improve the accuracy of the Hessian's approximation and is also capable to utilize information gathered about the function in previous iterations. It follows by an scaling approach that employs scaling parameter based upon the proposed weak secant equation to guarantee the positive definiteness of the Hessian's approximation. Moreover, we also prove the convergence of the proposed method under a simple monotone strategy. Numerical results show that the method is promising and frequently outperforms its competitors.

Keyword: Diagonal updating; Global convergence; Large scale problem; Unconstrained optimization; Weak secant equation.