BFGS method: a new search direction

ABSTRACT

In this paper we present a new line search method known as the HBFGS method, which uses the search direction of the conjugate gradient method with the quasi-Newton updates. The Broyden-Fletcher-Goldfarb-Shanno (BFGS) update is used as approximation of the Hessian for the methods. The new algorithm is compared with the BFGS method in terms of iteration counts and CPU-time. Our numerical analysis provides strong evidence that the proposed HBFGS method is more efficient than the ordinary BFGS method. Besides, we also prove that the new algorithm is globally convergent.

Keyword: BFGS method; Conjugate gradient method; Globally convergent; HBFGS method