

## **BFGS method: a new search direction**

### **ABSTRACT**

In this paper we present a new line search method known as the HBFSG 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 HBFSG 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; HBFSG method