A new gradient method via quasi-Cauchy relation which guarantees descent

ABSTRACT

We propose a new monotone algorithm for unconstrained optimization in the frame of Barzilai and Borwein (BB) method and analyze the convergence properties of this new descent method. Motivated by the fact that BB method does not guarantee descent in the objective function at each iteration, but performs better than the steepest descent method, we therefore attempt to find stepsize formula which enables us to approximate the Hessian based on the Quasi-Cauchy equation and possess monotone property in each iteration. Practical insights on the effectiveness of the proposed techniques are given by a numerical comparison with the BB method.