

Multi-steps symmetric rank-one update for unconstrained optimization.

ABSTRACT

In this paper, we present a generalized Symmetric Rank-one (SR1) method by employing interpolatory polynomials in order to possess a more accurate information from more than one previous step. The basic idea is to incorporate the SR1 update within the framework of multi-step methods. Hence iterates could be interpolated by a curve in such a way that the consecutive points define the curves. However to preserve the positive definiteness of the SR1 updates a restart procedure is applied, in which we restart the SR1 update by a scale of the identity. Comparison to multi-steps BFGS method, the proposed algorithm shows significant improvements in numerical results.

Keyword: Unconstrained optimization; Symmetric rank-one update; Multi-step methods; Hessian approximation.