Multi-dimensional Search Method for Unconstrained Optimization *

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Abstract

By combining line search method and trust region method, we propose a new algorithm for unconstrained optimization problems. The new method is called multi-dimensional search method which has global convergence theoretically and good performance in practical computation. Especially, it is suitable to solve large scale unconstrained optimization problems because it avoids the computation and storage of matrices associated with Hessian of objective function. Moreover, the new method sufficiently uses previous iterative information and multi-dimensional search technique to generate next iterative point, so that it is robust and stable. Numerical experiments show that the algorithm is very efficient in practice in many situations.

Key words: Unconstrained optimization, multi-dimensional search method, global convergence.

AMS subject classifications: 90C30, 49M, 65K05

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