

Master's Thesis

A regularized limited memory BFGS method for
box-constrained minimization problems

Guidance

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Abstract

A regularized limited memory BFGS (RL-BFGS) method is one of the efficient solution methods for large-scale unconstrained minimization problems, and it adjusts a certain regularization parameter for global convergence. Some limited numerical results indicate that the RL-BFGS method is better than the well known limited memory BFGS method with line search. However, we cannot directly apply the RL-BFGS method for the constrained minimization problem.

In this paper, we propose a RL-BFGS method for solving box-constrained minimization problems. The proposed method exploits a subspace technique given by Ni and Yuan. We show that the proposed method has global convergence under usual conditions. Moreover, we report some numerical experiments that compare the proposed method with the state-of-art method L-BFGS-B, for the box-constrained minimization problems. The results show that through the proposed method is inferior to the well-coded L-BFGS-B for most of test problems, it can get optimal solutions of some problems that cannot be solved by L-BFGS-B.