

基于次梯度选取的非光滑优化强次可行方向法

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Strongly Sub-feasible Direction Method with Subgradient Selection for Nonsmooth Optimization

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摘要 本文结合次梯度选取技术及割平面法和强次可行方向法的思想, 提出了一个求解目标函数非光滑约束优化问题的强次可行方向算法. 通过设计一个新的寻找搜索方向子问题和构造新型线搜索, 算法不仅能接受不可行的初始点, 而且能保持迭代点的强次可行性, 同时避免在可行域外目标函数值的不适度增加. 算法具备全局收敛性, 且初步的数值试验表明算法是稳定有效的.

关键词: 次梯度选取 非光滑优化 强次可行方向法 全局收敛

Abstract: In this paper, by combining subgradient selection technique with the ideas of cutting plane method and strongly sub-feasible direction method, a strongly sub-feasible direction algorithm is proposed for the solution of constrained optimization problems with nonsmooth objective function. By introducing a new search direction finding subproblem and constructing a new line search, the algorithm can not only accept infeasible starting points, but also preserve the sub-feasibility of the iterations, and meanwhile prevent the objective value from increasing unduly. The algorithm possesses global convergence, and some preliminary numerical results show that the proposed algorithm is stable and efficient.

Key words: subgradient selection nonsmooth optimization strongly sub-feasible direction method global convergence

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[1] Zoutendijk G. Methods of Feasible Directions. Amsterdam: Elsevier, 1960

[2] Topkis D M, Veinott Jr A F. On the Convergence of Some Feasible Direction Algorithms for Nonlinear Programming. SIAM J. Control, 1967, 5: 268-279 

[3] Panier E R, Tits A L. A Superlinearly Convergent Feasible Method for the Solution of Inequality Constrained Optimization Problems.

- [4] Lawrence C T, Tits A L. A Computationally Efficient Feasible Sequential Quadratic Programming Algorithm. SIAM Journal on Optimization, 2001, 11: 1092-1118 
- [5] Jian J B. New Sequential Quadratically Constrained Quadratic Programming Norm-relaxed Method of Feasible Directions. Journal of Optimization Theory and Applications, 2006, 129: 109-130 
- [6] Kostreva M M. Applications of MFD in Engineering Design Optimization. <http://www.math.clemson.edu/flstgla/mfdapp.ps>, Department of Mathematical Sciences, Clemson University
- [7] 简金宝. 光滑约束优化快速算法-理论分析与数值试验. 北京: 科学出版社, 2010 (Jian J B. Fast Algorithms for Smooth Constrained Optimization-Theoretical Analysis and Numerical Experiments. Beijing: Science Press, 2010)
- [8] Jian J B, Tang C M, Hu Q J, Zheng H Y. A New Superlinearly Convergent Strongly Sub-feasible Sequential Quadratic Programming Algorithm for Inequality-constrained Optimization. Numerical Functional Analysis and Optimization, 2008, 29: 376-409 
- [9] Jian J B, Tang C M, Zheng H Y. Sequential Quadratically Constrained Quadratic Programming Algorithm of Strongly Sub-feasible Directions. European Journal of Operational Research, 2010, 200: 645-657 
- [10] Kiwiel K C. Methods of Descent for Nondifferentiable Optimization. Lecture Notes in Mathematics 1133, Springer-Verlag, 1985
- [11] Kelley J E. The Cutting Plane Method for Solving Convex Programs. Journal of the SIAM, 1960, 8: 703-712
- [12] Rustem B, Nguyen Q. An Algorithm for the Inequality-constrained Discrete Minimax Problem. SIAM Journal on Optimization, 1998, 8: 265-283 
- [13] Karmita N. Test Problems for Large-scale Nonsmooth Minimization. Reports of the Department of Mathematical Information Technology, Series B, Scientific computing, No. B 4/2007, University of , 2007
- [14] Lukvsan L, Vlvcek J. Test Problems for Nonsmooth Unconstrained and Linearly Constrained Optimization. Technical Report 798, Institute of Computer Science, Academy of Sciences of the Czech Republic, Prague, 2000
- [1] 孙中波, 段复建. 不等式约束优化的非单调可行信赖域-SQP算法[J]. 应用数学学报, 2011, 34(4): 655-670.
- [2] 闫晖, 陈兰平. 一个新的具有充分下降性的混合共轭梯度算法[J]. 应用数学学报, 2011, 34(4): 634-643.
- [3] 何郁波, 林晓艳, 董晓亮. 非线性不等式组的光滑近似方法及其收敛性[J]. 应用数学学报, 2011, 34(4): 723-733.
- [4] 汤京永, 贺国平, 董丽. 一类新的多步曲线搜索下的超记忆梯度法[J]. 应用数学学报, 2011, 34(2): 353-362.
- [5] 汤京永, 贺国平, 董丽. 一类新的多步曲线搜索下的超记忆梯度法[J]. 应用数学学报, 2011, 34(1): 353-362.
- [6] 金鉴禄, 王秀玉, 贺莉, 刘庆怀. 约束序列极大极小问题的凝聚同伦内点方法[J]. 应用数学学报, 2010, 33(5): 792-804.
- [7] 刘金魁, 杜祥林, 王开荣. 两类新的变参数下降算法及收敛性[J]. 应用数学学报, 2010, 33(2): 222-232.
- [8] 金鉴禄, 王秀玉, 贺莉, 刘庆怀. 约束序列极大极小问题的凝聚同伦内点方法[J]. 应用数学学报, 2010, 33(1): 792-804.
- [9] 谭玲, 段复建, 范林. 非线性互补约束问题一个全局收敛的SQP算法[J]. 应用数学学报, 2009, 32(1): 37-49.
- [10] 刘洪伟. 基于非单调自适应信赖域法求解非线性方程组[J]. 应用数学学报, 2008, 31(6): 1128-1136.
- [11] 朱志斌, 张可村. 一个新的共轭投影梯度算法及其超线性收敛性[J]. 应用数学学报, 2004, 27(1): 149-161.
- [12] Ju Liang ZHANF, Xiang Sun ZHANG, Zhong Wen CHEN. 一个无正则条件下一般约束最优化问题的信赖域算法的收敛性[J]. 应用数学学报, 2003, 26(1): 1-10.
- [13] 张菊亮, 章祥荪. 一个等式约束问题的SQP方法及其收敛性[J]. 应用数学学报, 2001, 24(1): 1-009.
- [14] 李正锋, 邓乃扬. 一类新的非单调信赖域算法及其收敛性[J]. 应用数学学报, 1999, 22(3): 457-405.