

数学与系统科学研究院

计算数学所学术报告

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报告题目:

**BB-like methods for several
optimization problems**

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报告地点: 数学院南楼七层

702 会议室

Abstract:

Due to its simplicity, low memory requirement and efficiency, the Barzilai--Borwein (BB) method has attracted much attention. Designing effective BB-like methods for different problems is one of the hotspots in recent years. In this talk, we present BB-like methods for several optimization problems. In particular, we propose a quadratic regularization projected BB method for the nonnegative matrix factorization (NMF) by making use of the Lipschitz constant of the gradient. We further exploit the structure of the objective and present an efficient monotone projected BB method for the NMF. Then we present a BB-like method for a class of nonsmooth unconstrained optimization problems, where the objective is the sum of a smooth function and a convex function. We show that our method converges sublinearly for a convex smooth term while the rate of convergence is R -linear when the smooth term is strongly convex. Then, by combining the smoothing technique and active strategy, we propose a smoothing affine-scaling BB method for a class of nonsmooth optimization problems with nonnegative constraints. Under mild conditions, we prove that the proposed method converges to a stationary point associated with the smoothing function. Finally, we propose a smoothing projected BB method for a class of non-Lipschitz constrained optimization problems, where the objective is the sum of a smooth function and a non-Lipschitz function. We show that the proposed method converges to a scaled stationary point. Numerical results are reported to demonstrate the effectiveness of our methods.

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