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Approximate Augmented Lagrangian Functions and Nonlinear Semidefinite Programs

X. X. Huang(1), K. L. Teo(2), X. Q. Yang(2)

(1)重庆师范大学数学系; (2)Department of Applied Mathematics, The Hong Kong Polytechnic University, Kowloon, Hong Kong, China

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摘要 In this paper, an approximate augmented Lagrangian function for nonlinear semidefinite programs is introduced. Some basic properties of the approximate augmented Lagrange function such as monotonicity and convexity are discussed. Necessary and sufficient conditions for approximate strong duality results are derived. Conditions for an approximate exact penalty representation in the framework of augmented Lagrangian are given. Under certain conditions, it is shown that any limit point of a sequence of stationary points of approximate augmented Lagrangian problems is a KKT point of the original semidefinite program and that a sequence of optimal solutions to augmented Lagrangian problems converges to a solution of the original semidefinite program.

关键词 [semidefinite programming](#) [augmented Lagrangian](#) [duality](#) [exact penalty](#) [convergence](#) [stationary point](#)

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X. X. Huang(1), K. L. Teo(2), X. Q. Yang(2)

(1)Department of Mathematics and Computer Science, Chongqing Normal University, Chongqing 400047, P. R. China (2)Department of Applied Mathematics, The Hong Kong Polytechnic University, Kowloon, Hong Kong, China

Abstract In this paper, an approximate augmented Lagrangian function for nonlinear semidefinite programs is introduced. Some basic properties of the approximate augmented Lagrange function such as monotonicity and convexity are discussed. Necessary and sufficient conditions for approximate strong duality results are derived. Conditions for an approximate exact penalty representation in the framework of augmented Lagrangian are given. Under certain conditions, it is shown that any limit point of a sequence of stationary points of approximate augmented Lagrangian problems is a KKT point of the original semidefinite program and that a sequence of optimal solutions to augmented Lagrangian problems converges to a solution of the original semidefinite program.

Key words [semidefinite programming](#) [augmented Lagrangian](#) [duality](#) [exact penalty](#) [convergence](#) [stationary point](#)

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通讯作者 X. Q. Yang mayangxq@polyu.edu.hk

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