

An exponential augmented Lagrangian method with second order convergence

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Abstract

An Augmented Lagrangian method for solving problems with inequality and box constraints is defined in the present research. The Augmented Lagrangian function uses, to penalize the inequality constraints, an exponential penalty function in place of the usual quadratic one. Inexact resolution of the box-constrained subproblems is considered in each step of the proposed algorithm. We analyze conditions under which it is possible to prove convergence to points that verify the first-order and the second order necessary optimality condition.

Key words: Nonlinear programming, Augmented Lagrangian methods, the exponential penalty function, second order convergence, constraint qualifications.

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