An inexact restoration strategy for the globalization of the sSQP method

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Abstract

An algorithm to solve equality constrained optimization problems based on stabilized sequential quadratic programming, augmented Lagrangian and inexact restoration methods is presented. This formulation has attractive features in the sense that no constraint qualifications are needed at the limit point, and that it overcomes ill-conditioning of the subproblems when the penalty parameter is large. Well-definition of the algorithm is shown, and also it is proved that any limit point of the sequence generated by the algorithm is a KKT point or a stationary point of the problem that minimizes the infeasibility. Under suitable hypotheses the sequence generated by the algorithm converges Q-linearly. Numerical experiments on a set of problems from the Cuter collection are given to confirm theoretical results.

Keywords: Augmented Lagrangian, nonlinear programming, global convergence.