

QÜESTIÓ, vol. 26, 1-2, p. 141-171, 2002

On superlinear multiplier update methods for partial augmented Lagrangian techniques

E. Mijangos

Department of Applied Mathematics and Statistics and O.R., Zientzi Fakultatea (UPV/EHU), P.O. Box 644, 48080-Bilbao, Spain. Fax 34 944648500, e-mail: mepmifee@lg.ehu.es.

The minimization of a nonlinear function with linear and nonlinear constraints and simple bounds can be performed by minimizing an augmented Lagrangian function, including only the nonlinear constraints. This procedure is particularly interesting in case that the linear constraints are flow conservation equations, as there exist efficient techniques to solve nonlinear network problems. It is then necessary to estimate their multipliers, and variable reduction techniques can be used to carry out the successive minimizations. This work analyzes the possibility of estimating these multipliers using Newton-like methods. Several procedures are put forward which combine first and second-order estimation, and are compared with each other and with the Hestenes-Powell multiplier estimation by means of computational tests.

Keywords: Partial Augmented Lagrangian, Variable Reduction, Lagrange Multipliers, Superlinear-order Estimation, Nonlinear Network

AMS Classification (MSC 2000): 90C30, 90C35
