

An unified approach to multiplier and proximal methods

Authors:

Romulo Castillo (UFPR-UCLA)

Elizabeth Karas, Luis Matioli (UFPR)

Clovis Gonzaga (UFSC)

Abstract

We present an unified approach for obtaining most of the known augmented Lagrangian methods for solving nonlinear programming problems with inequality constraints. This approach involves a family of penalty functions, a shift and some real parameters in its general expression. A notable fact is that this approach shows how to get a family of quadratic multiplier methods that includes the classical one as a particular case. Applying Fenchel's duality theory in the convex case we get a unified approach to proximal methods for solving the dual problem that includes the classical quadratical kernel, Bregman distances and entropic distance-like functions as particular cases.

Keywords:

Convex programming, augmented Lagrangian methods, proximal point methods.

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