NOTEBOOK OF ABSTRACTS

AND

OTHER RELEVANT INFORMATION

School of Applied Mathematics of Fundação Getúlio Vargas, Rio de Janeiro, Brazil

PLENNARY TALKS

On theory and practice of augmented Lagrangian methods

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Abstract

In this talk, we present recent developments concerning the safeguarded augmented Lagrangian method for general non-convex smooth optimization. In particular, we will discuss weak conditions that guarantee boundedness of the sequence of dual approximations and the practical implications of this phenomenon, including the application of a scaled stopping criterion for the subproblems. Extensions to other classes of problems will be discussed, as well.

A Riemannian convex bundle method

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Abstract

Bundle methods are versatile algorithms to solve non-smooth, convex and non-convex optimization problems in vector spaces. In this presentation, we introduce a bundle method to solve convex, non-smooth optimization problems on Riemannian manifolds. Each step of our method is based on a model that involves the convex hull of previously collected and parallely transported subgradients. This generalizes the dual form of classical bundle subproblems in Euclidean space. We prove that, under mild conditions, the convex bundle method converges to a minimizer. Numerical examples implemented using the Julia package manopt.jl illustrate the performance of the method compared to the subgradient method, the cyclic proximal point, as well as the proximal bundle algorithm.

New Perspectives on Deriving Compact Extended Formulations for Optimization Problems with Indicator Variables

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Abstract

Applications in statistics and data sciences require modeling an inherit sparsity as well as structural relationships among variables and often lead to NP-Hard nonconvex problems. Sparsity and structural relations in such problems are usually modeled by introducing indicator (binary) variables associated with the original continuous variables and enforcing complementarity relations between them. We consider optimization problems with convex objective functions of the continuous variables and arbitrary constraints on their associated indicators, and study the resulting conic