PRIMAL-DUAL METHODS IN STOCHASTIC PROGRAMMING WITH APPLICATION TO ENERGY PROBLEMS

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Resumo/Abstract:
Real-life optimization problems often depend on data subject to unknown variations that can be due to imprecise measurements or to the stochastic nature of the data itself. When decisions need to be taken with high precision, it is important to employ methods that are reliable when subject to data variability.

Advanced nonsmooth optimization techniques, referred to as *bundle methods with on-demand accuracy*, combined with Lagrangian decomposition provide a satisfactory answer, at least from a dual point of view.

For some energy optimization problems, having good primal solutions is also a concern. In this case, the classical Lagrangian approach needs to be complemented with combinatorial heuristics that can be prohibitive for complex real-life models. To address such issues, we propose a new approach, based on generalized Lagrangian functions such as the so-called *Sharp* and *Proximal*. Throughout, the main concepts are illustrated by examples on optimal power management.

Joint work with Marcelo Córdoba (UFSC, Florianópolis) and Welington de Oliveira (UERJ, Rio de Janeiro).