Séminaire du CIRRELT Seminar

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THE GENERALIZED SKELETON SOLUTION: A NEW MEASURE OF THE QUALITY OF THE DETERMINISTIC SOLUTION IN STOCHASTIC PROGRAMMING

Abstract: Stochastic programs, stochastic integer ones in particular, are usually hard to solve when applied to realistic sized problems. A common approach is to consider the simpler deterministic program in which random parameters are replaced by their expected values, with a loss in terms of the quality solution.

In this seminar we investigate the reasons of the gap between the deterministic and the stochastic solutions and which information can be inherited from the deterministic solution in building a stochastic one [1]-[2]. In detail, we provide a comprehensive understanding of the structure of the optimal solution of stochastic problems and its links to the one of the corresponding deterministic version (or its linear relaxation for integer formulations). In particular, we show how and under which conditions the reduced costs associated to the variables in the expected value problem can be used as an indicator for excluding decision variables in the stochastic problem.

We then define a new measure of goodness/badness of the deterministic solution with respect to the stochastic one, namely the Generalized Loss Using Skeleton Solution. The possible usage of GLUSS, as well as its interest and value in addressing stochastic programming models, are investigated by means of an extensive experimental campaign.

[1] Maggioni, F. & Wallace, S.W. (2012) Analyzing the quality of the expected value solution in stochastic programming. Annals of Operations Research, 200(1), 37–54.

[2] Maggioni, F., Crainic, T.G., Perboli, G. & Rei, W. (2015) The Generalized Skeleton Solution: a new measure of the quality of the deterministic solution in Stochastic Programming, CIRRELT-2015-21, (under evaluation).

Note: Francesca Maggioni is Assistant Professor in Mathematics at the Department of Management, Economics and Quantitative Methods. Her research interests are stochastic programming and geometric, topological and energetic aspects associated with application to elastic filaments, magnetic relaxation of magnetic flux tubes and vortex knots and unknots. francesca.maggioni@unibg.it / http://www.matapp.unimib.it/~maggioni

VENDREDI / FRIDAY

30 octobre 2015 /
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Salle / Room 5441
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Université de Montréal

Ouvert à tous / Open to all

**Organisateur / Organizer
Teodor Gabriel Crainic**