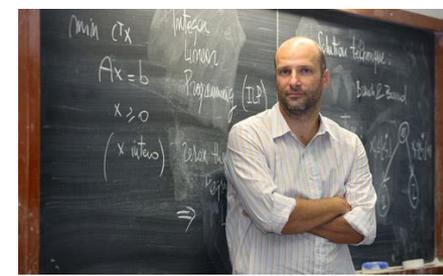




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ON MATHEMATICAL PROGRAMMING WITH INDICATOR CONSTRAINTS

Abstract: In this paper we review the relevant literature on mathematical optimization with logical implications, i.e., where constraints can be either active or disabled depending on logical conditions to hold. In the case of convex functions, the theory of disjunctive programming allows one to formulate these logical implications as convex nonlinear programming problems in a space of variables lifted with respect to its original dimension. We concentrate on the attempt of avoiding the issue of dealing with large NLPs. In particular, we review some existing results that allow to work in the original space of variables for two relevant special cases where the disjunctions corresponding to the logical implications have two terms. Then, we significantly extend these special cases in two different directions, one involving more general convex sets and the other with disjunctions involving three terms. Computational experiments comparing disjunctive programming formulations in the original space of variables with straightforward bigM ones show that the former are computationally viable and promising.

Joint work with Pierre Bonami, Andrea Tramontani and Sven Wiese

Note: Dr. Andrea Lodi is a leading international researcher in mixed linear and nonlinear programming. As Canada Excellence Research Chair in Data Science for Real-Time Decision-Making at Polytechnique Montréal, he holds Canada's main chair in operations research. Before joining the Polytechnique, Lodi was a professor in operations research in the faculty of electrical and information engineering at Italy's University of Bologna. He earned his doctorate in systems engineering from this same university in 2000. andrea.lodi@polymtl.ca

JEUDI / THURSDAY

17 septembre 2015 /
September 17th, 2015
10h30

Salle / Room 5441
Pavillon André-Aisenstadt
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