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Convex mixed-integer optimization algorithms with Boscia.jl and applications

vendredi 6 octobre 2023 11:30 (30 minutes)

Nonlinear and mixed-integer optimization have long remained separate fields with their own techniques, representations, and algorithms.
In this talk, we will introduce a novel approach leveraging first-order methods for convex optimization based on the Frank-Wolfe algorithm.
First-order methods are the usual choices for large-scale smooth optimization but are typically not prime candidates in branch-and-bound algorithms because of their slower convergence and lower accuracy, which does not systematically provide a safe dual bound necessary to prune nodes in a branch-and-bound framework.
We will show how we designed a convex mixed-integer algorithm leveraging techniques and algorithms both from the first-order convex and mixed-integer literature, implemented in the Boscia.jl package built on top of FrankWolfe.jl, and showcase two applications where the constraint structure can be efficiently exploited in a Frank-Wolfe type approach.

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Classification de Session: Optimisation non-linéaire