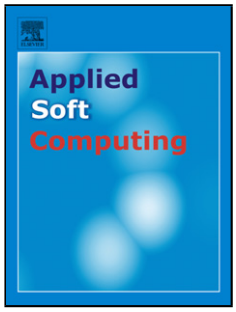

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Integrating LP-guided variable fixing with MIP heuristics in the robust design of hybrid wired-wireless FTTx access networks ☆

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Abstract

This study investigates how to model and solve the problem of optimally designing FTTx telecommunications access networks integrating wired and wireless technologies, while taking into account the uncertainty of wireless signal propagation. We propose an original robust optimization model for the related robust 3-architecture Connected Facility Location problem, which includes additional variables and constraints to model wireless signal coverage represented through signal-to-interference ratios. Since the resulting robust problem can prove very challenging even for a modern state-of-the art optimization solver, we propose to solve it by an original primal heuristic that combines a probabilistic variable fixing procedure, guided by peculiar Linear Programming relaxations, with a Mixed Integer Programming heuristic, based on an exact very large neighborhood search. A numerical study carried out on a set of realistic instances show that our heuristic can find

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