INFORMS Seminar Series

New Algorithms for a Generalized Maximum Coverage Location Problem and Generalized Cut-Generation Approaches for Mixed Integer Programs

SEMINAR SESSION INFORMATION

DATE: Wednesday, Sept. 14

TIME: 12:15pm

LOCATION: Durham 260

PROVIDED: Pizza and Soda

SPEAKER INFORMATION

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MEMBERSHIP INFORMATION

Fees are as follows and include all weekly seminars (22+) & workshops.

FIRST MEETING: FREE
MEETING: $5
SEMESTER: $25
YEAR: $40

The agenda of this talk is to give a high-level view of my research on solving a generalization of well-known maximum coverage location problem (MCLP), followed by some unifying results in cutting planes theory for mixed integer programs (MIPs). In addition, we will briefly discuss about a convexification approach for solving two-stage stochastic MIPs and its computational effectiveness. The emphasis will be on simple-language explanation of ideas instead of delving into complicated technical details. More specifically, in the first part of this talk we present a new generalization of MCLP, referred to as planar MCLP-PCR, by positioning a given number of rectangular service zones on the two-dimensional plane to (partially) cover a set of existing (possibly overlapping) rectangular demand zones such that the total covered demand is maximized. We present theoretical properties, a customized branch-and-bound exact algorithm, a heuristic, and results of our computational experiments for the planar MCLP-PCR.

We begin the second part with a short overview of cutting planes and basic ideas behind cut generation for MIPs. Then we present facets and extended formulation for a multi-parameter multi-constraint mixed integer set, which we call continuous multi-mixing set. We show that this research generalizes several existing concepts in cutting plane theory. We also present our computational results which show that our cuts are very effective in solving multi-module lot-sizing problems. Finally if time permits, we briefly discuss about conditions under which the second stage MIPs of two-stage stochastic MIPs can be convexified by adding parametric cuts and present our computational results for solving variants of two-stage capacitated lot-sizing problem.

Questions? Comments? Send an e-mail to shafae1@vt.edu