



Faculty of Computer Science 2005–2006 Seminar Series

Shedding some light on Mixed Integer Linear Programming

By

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Friday, December 2nd, 2005

3:30pm

ITC317

Given that:

- We can usually find an optimal solution to a linear program (LP) in polynomial time using a (variant of) the simplex algorithm,
- Once we have a solution to a relaxed LP, there are heuristic techniques to quickly find near optimal (local minima) solutions in (expected) polynomial time to the full mixed integer linear program (MILP) that defined the relaxed LP,
- LPs and MILPs are well defined and well understood constructs that consist of a set of decision variables, (linear) constraint equations, and an objective function, and that
- We have a mountain of literature on LP and MILP programming and entire text books of compliant models for manufacturing, production, sourcing, profit, risk, diet, blending, transportation, routing, and even scheduling problems.

One might hypothesize that there are standard techniques to formulate models for management science problems in the LP and MILP domain. However, this is not the case. In reality, if our problem does not closely match a previously studied problem for which a model already exists, we are often in the dark as there is a lack of standard techniques and methodologies for LP and MILP model formulation.

Even though it is true that a lack of a common methodology is true of mathematical modeling in general, when you consider the restriction on the representation (MI) LP, the breadth of previous work, and state of the art advances in modeling in computer science, you might be led to believe that one can do better. To an extent, we can. How? That is the question this talk will address.

STUDENTS ARE ENCOURAGED TO ATTEND
