

Detecting and Exploiting Global Structures in MIP

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Current state-of-the-art MIP technology lacks a powerful modeling language based on global constraints, a tool which has long been standard in constraint programming. In general, even basic semantic information about variables and constraints is hidden to the underlying solver. For this reason, it has become standard practice in MIP implementations to devise algorithms that basically try to reverse-engineer combinatorial substructures from a flat list of linear inequalities. In the present talk we will overview several classes of global structures that are of interest to MIP solvers, how they can be reconstructed from a flat model, and how their knowledge can be exploited to improve the performance of the solver. We will also comment on the limitations of the current approach.