A comparative analysis of optimization solvers

This paper provides a brief comparison of the best-known commercial solvers (Xpress, GuRoBi and CLPEX) in terms of capability. It also provides a timeline of the development of these solvers, as well as some information about different non-commercial solvers. The observed conclusions when analyzing the attributes of these three solvers qualitatively is that there is no single best solver for all types of problems. In general, CPLEX and GuRoBi provide more competitive results on real life problems, with CPLEX being more efficient on highly dimensional problems but GuRoBi being faster due to its use of multiple cores. Xpress however, better at more complex problems and has higher scalability.

Benchmarks for current linear and mixed integer optimization problems

A more quantitative comparison of the Xpress, GuRoBi and CPLEX is performed by the author,u sing the MIPLIB 2010 library which contains test cases of both Mixed Integer and LP problems . This library contains easy, hard and open problems. For the purpose of the benchmark only easy problems were chosen, i.e problem that are considered solvable by commercial solvers in under an hour. Using 30 out of 215 easy instances, that were randomly picked GuRoBi was found to be the fastest of them all in 14 instances, CPLEX in 9 instances and Xpress in 7. Xpress was only quicker in instances in which all solvers performed similarly, while also not managing to solve (under an hour 3 problems), so was ranked last. Gurobi was managed to terminate across all instances and faster in most, so was deemed best.