

ABACUS is now available in COIN-OR!

We are happy to announce that ABACUS has become part of COIN-OR. Sources and Documentation can be found under the project url:

<https://projects.coin-or.org/ABACUS>

ABACUS is a software system written in C++ that provides a framework for the implementation of branch-and-bound algorithms using linear programming relaxations. Cutting planes or columns can be generated dynamically (branch-and-cut, branch-and-price, branch-and-cut-and-price).

ABACUS allows the software developer to concentrate merely on the problem specific parts, i.e., the separation of cutting planes, column generation, and primal heuristics.

Moreover, ABACUS provides a variety of general algorithmic concepts such as a list of different enumeration and branching strategies from which the best alternative for the user's application can be chosen.

Finally, ABACUS provides many basic data structures and useful tools for the implementation of such algorithms. It is designed both for general mixed integer optimization problems and for combinatorial optimization problems. It unifies cutting plane and column generation within one algorithmic framework. Simple reuse of code and the design of abstract data structures and algorithms are met by object oriented programming modules.

The first version of ABACUS was written by Stefan Thienel. Since then, it has been maintained and further developed by several members of the group of Michael Jünger at the Department of Computer Science at the University of Cologne.

The current version 3.0 of ABACUS supports the Open Solver Interface (Osi) that is also part of COIN-OR. This means that any solver supported by OSI can be used to solve the relaxations.

For further literature we refer to:

M. Jünger and S. Thienel, The ABACUS system for branch-and-cut-and-price algorithms in integer programming and combinatorial optimization, *Software Practice and Experience* 30 (2000), 1325-1352.

M. Elf, C. Gutwenger, M. Jünger, and G. Rinaldi, Branch and cut algorithms for combinatorial optimization and their implementation in ABACUS, in: M. Jünger and D. Naddef (eds.), *Computational Combinatorial Optimization*, Lecture Notes in Computer Science 2241, Springer, 2001, pp. 157-222.