Andreas Wächter

An Algorithmic Framework for Convex Mixed Integer Nonlinear Programs

Department of Mathematical Sciences
IBM T J Watson Research Center
P O Box 218
Yorktown Heights
NY 10598
andreasw@watson.ibm.com
Pierre Bonami
Lorenz T. Biegler
Andrew R. Conn, Gérard Cornuéjols, Ignacio E. Grossmann, Carl D. Laird,
Jon Lee, Andrea Lodi, François Margot, Nicolas Sawaya

We present a hybrid framework for convex mixed-integer nonlinear programming. In one extreme case, the method becomes the branch-and-bound approach, where a nonlinear optimization problem is solved in each node of the enumeration tree, and in the other extreme it reduces to the polyhedral outer approximation algorithm, which alternates between the solution of a nonlinear optimization problem and a mixed-integer linear program.

Numerical results are presented, using an open source software implementation available on http://www.coin-or.org.

This work results from an on-going research collaboration between IBM and CMU.