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A Primal Heuristic for Nonsmooth Mixed Integer Nonlinear Optimization

Abstract

Complex real-world optimization tasks often lead to mixed-integer nonlinear problems (MINLPs). However, current MINLP algorithms are not always able to solve the resulting large-scale problems. One remedy is to develop problem specific primal heuristics that quickly deliver feasible solutions. This paper presents such a primal heuristic for a certain class of MINLP models. Our approach features a clear distinction between nonsmooth but continuous and genuinely discrete aspects of the model. The former are handled by suitable smoothing techniques; for the latter we employ reformulations using complementarity constraints. The resulting mathematical programs with equilibrium constraints (MPEC) are finally regularized to obtain MINLP-feasible solutions with general purpose NLP solvers.

Facets of
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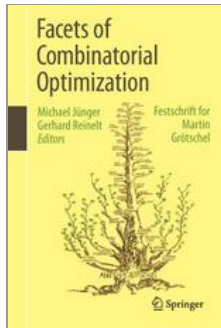
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Editors

- Michael Jünger ✉ [2]

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Editor Affiliations

- 2. Dept. of Computer Science, University of Cologne

- 3. Dept. of Computer Science, University of Heidelberg

Authors

- Martin Schmidt [1]

- Marc C. Steinbach [1]

- Bernhard M. Willert [1]

Author Affiliations

- 1. Institut für Angewandte Mathematik, Leibniz Universität Hannover, Welfengarten 1, 30167, Hannover, Germany

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