

Compact Extended Linear Programming Models

This book provides a handy, unified introduction to the theory of compact extended formulations of exponential-size integer linear programming (ILP) models. Compact extended formulations are equally powerful, but polynomial-sized, models whose solutions do not require the implementation of separation and pricing procedures. The book is written in a general, didactic form, first developing the background theoretical concepts (polyhedra, projections, linear and integer programming) and then delving into the various techniques for compact extended reformulations. The techniques are illustrated through a wealth of examples touching on many application areas, such as classical combinatorial optimization, network design, timetabling, scheduling, routing, computational biology and bioinformatics. The book is intended for graduate or PhD students – either as an advanced course on selected topics or within a more general course on ILP and mathematical programming – as well as for practitioners and software engineers in industry exploring techniques for developing optimization models for their specific problems.

Presents, perhaps for the first time, the theory of compact extended ILP models in the most general and didactic form possible
Provides a compact yet comprehensive introduction into exponential-size integer linear programming models
Includes a wealth of examples from various application areas
Some chapters are self-contained and can be used as short tutorials to the corresponding topics



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