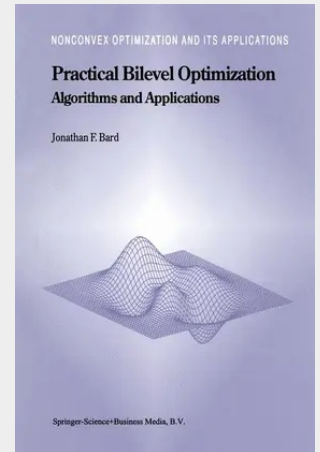


Practical Bilevel Optimization

Algorithms and Applications

The use of optimization techniques has become integral to the design and analysis of most industrial and socio-economic systems. Great strides have been made recently in the solution of large-scale problems arising in such areas as production planning, airline scheduling, government regulation, and engineering design, to name a few. Analysts have found, however, that standard mathematical programming models are often inadequate in these situations because more than a single objective function and a single decision maker are involved. Multiple objective programming deals with the extension of optimization techniques to account for several objective functions, while game theory deals with the inter-personal dynamics surrounding conflict. Bilevel programming, the focus of this book, is in a narrow sense the combination of the two. It addresses the problem in which two decision makers, each with their individual objectives, act and react in a noncooperative, sequential manner. The actions of one affect the choices and payoffs available to the other but neither player can completely dominate the other in the traditional sense.

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