

Kwantitatieve Methoden

Book Review Section

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Book review 72B37

EISELT, H.A.,; SANDBLOM, C.-L. (2004).

Decision Analysis, Location Models, and Scheduling Problems.

Springer-Verlag, Berlin.

ISBN 3-540-40338-8, XII, 457 p. 147 illus., 48 tabs., Hardcover, EUR 99,95.

This hardcover book deals with a wide variety of optimization problems. The layout is very good and the mathematics is good to follow for someone who is not professional in this area.

The book starts with a thorough description of all used definitions with respect to optimization and statistics. Although not easy to read, this chapter is a useful basis.

Chapter 1 describes many different multicriteria decision making problems. The emphasis is on discrete problems with a finite number of possible decisions. The major task of this theory is to avoid asking decision makers directly to specify utilities and weights, but to derive those based on information that decision makers are more likely able to specify.

Chapter 2 handles about games against nature in which a rational player has to make decisions against a player which takes decisions at random. The method to use strongly depends on the availability of information about the probabilities for the several states of nature. Visualization tools like decision trees and tornado diagrams are introduced and discussed.

The principles of game theory are introduced in chapter 3. The most straightforward game; the Two-Person Zero-Sum game gets the most attention. More complicated games (n -player, multi-stage etc) are only mentioned briefly. The short introduction about coalitions in n -player games makes the reader interested to learn more about this.

Part II is dedicated to location models and layout problems. Covering problems (i.e. finding a number of facilities so that the maximum distance to a certain facility is always below a certain value) and median problems (i.e. locate facilities so that a certain cost function is minimized) are described for location models on networks and continuous location models. The authors emphasize that the use of those models in practice easily becomes so complex that finding analytical solutions becomes very difficult. The same applies to layout problems in which is per example searched for an

optimal design of a plant with regard to an objective function which can contain cost, time, convenience or investment as factor which must be optimized.

Part III deals with project scheduling and Part IV with Machine Scheduling problems. It was not clear to me why those topics were divided into different parts. Those last 100 pages of the book were dealing with problems of assigning jobs or tasks (eventually processed on a set of available machines) in such a way that all processing conditions are satisfied and some objective function is optimized. Most of the discussed optimization methods assume that the time needed for a certain task is known with certainty. Especially when tasks are performed by humans this is hardly ever the case, which makes the optimization more complex.

The authors have chosen to aim more at the width of the field than the depth of it which makes the book interesting as introduction to the fields specified in the title.

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