

Preface

Real-life decisions are usually made in the state of uncertainty. How do we model optimization problems in uncertain environments? How do we solve these models? The main purpose of the book is just to provide uncertain programming theory to answer these questions.

By uncertain programming we mean the optimization theory in uncertain environments. Stochastic programming, fuzzy programming and hybrid programming are subtopics of uncertain programming.

This book provides a self-contained, comprehensive and up-to-date presentation of uncertain programming theory, including numerous modeling ideas and applications in system reliability design, project scheduling problem, vehicle routing problem, facility location problem, and machine scheduling problem.

Numerous intelligent algorithms such as genetic algorithms and neural networks have been developed by researchers of different backgrounds. A natural idea is to integrate these intelligent algorithms to produce more effective and powerful algorithms. In order to solve uncertain programming models, a spectrum of hybrid intelligent algorithms are documented in the book. The author also maintains a website at <http://orsc.edu.cn/liu> to post the C++ source files of simulations, genetic algorithms, neural networks, and hybrid intelligent algorithms.

For this new edition the entire text has been totally rewritten. More importantly, hybrid variable and hybrid programming are completely new.

It is assumed that readers are familiar with the basic concepts of mathematical programming, and elementary knowledge of C++ language. In order to make the book more readable, some background topics that will be useful in reading the book are also presented. The book is suitable for researchers, engineers, and students in the field of operations research, information science, management science, system science, computer science, and engineering. The readers will learn numerous new modeling ideas and effective algorithms, and find this work a stimulating and useful reference.

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