

Book Reviews

George Isac, *Complementarity Problems*, Lecture Notes in Mathematics, No. 1528, Springer-Verlag, Berlin, 1992.

This book is a monograph which introduces the complementarity problem to a mathematical audience assumed to have suitable maturity. The author is an enthusiastic researcher and teacher who has contributed a great deal to the literature of complementarity problems in recent years. He will convince you to work on complementarity problems as you read this book, because his enthusiasm is infectious.

I first studied complementarity problems in a graduate course given by Professor Carl Lemke at RPI in 1973–1974. Professor Lemke distributed mimeographed notes to the class, and there was no other text. At that time there was no book which contained the information we would learn in that class. Eventually, I became interested enough in complementarity problems to write my Ph.D. dissertation on the subject. It is one of the most beautiful subjects within optimization theory, and the most widely applicable. It is a subject which intersects many others, and if one looks at equilibrium problems in almost any field, it is possible to see complementarity problems.

The mathematical theory of complementarity problems is given in this book by Isac, and it does not exist at the same level of completeness and correctness in any other book. To get this information from any other source, one must read many research papers, and these papers are in many different journals. Isac performed a great service to the community by writing this book. It is a fitting entry in the Lecture Notes of Springer-Verlag, which is in many libraries.

The Chapter headings are as follows:

1. Preliminaries and Definitions
2. Models and Applications
3. Equivalences
4. Existence Theorems
5. The Order Complementarity Problem
6. The Implicit Complementarity Problem
7. Isotone Projection Cones and Complementarity
8. Topics on Complementarity Problems

The book contains a bibliography and a subject index. The bibliography contains four parts and a total of 412 references. The subject index does not contain proper nouns. There are 269 pages of text.

If you want to learn complementarity problems, take the time to read this book. You will find your interest in increasing as you go along, and you will benefit a great deal from the experience.

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M. M. KOSTREVA

Ding-Zhu Du and Panos M. Pardalos (eds), *Network Optimization Problems: Algorithms, Applications and Complexity*, Series on Applied Mathematics, Volume 2, Published by World Scientific, 1993, 401 pp. (price \$80.00).

An enormous number of problems in a great variety of fields can be modelled with the help of networks. Such fields include communication systems, electrical networks, computer design, transportation scheduling, facility location, and modelling of combinatorial optimization problems. Therefore, the field of networks is very lively, both in terms of theoretical developments and in terms of the diversity of its many applications.

This volume reflects the wide spectrum of recent research activities in the design and analysis of algorithms and the applications of networks. Here is the table of contents:

- *Ilan Adler and Ron Shamir,*
Greedy Solvable Transportation Networks and Edge-Guided Vertex Elimination
- *Thomas Colthurst, Chris Cox, Joel Foisy, Hugh Howards, Kathryn Kollett, Holly Lowy, and Stephen Root,*
Networks Minimizing Length Plus the Number of Steiner Points
- *Joachim R. Daduna, Miodrag Mojsilovic, and Peter Schütze,*
Practical Experiences Using an Interactive Optimization Procedure for Vehicle Scheduling
- *Ding-Zhu Du and Panos M. Pardalos,*
Subset Interconnection Designs: Generalizations of Spanning Trees and Steiner Trees
- *Dorit S. Hochbaum,*
Polynomial and Strongly Polynomial Algorithms for Convex Network Optimization
- *Frank K. Hwang and Wen-Ching Winnie Li,*
Hamiltonian Circuits for 2-Regular Interconnection Networks
- *Bassam N. Houry, Panos M. Pardalos, and Donald W. Hearn,*
Equivalent Formulations for the Steiner Problem in Graphs

- *Bettina Klinz and Hoang Tuy,*
Minimum Concave-Cost Network Flow Problem with a Single Nonlinear Arc Cost
- *Bruce W. Lamar,*
A Method for Solving Network Flow Problems with General Nonlinear Arc Costs
- *Jonas Mockus,*
Application of Global Line Search in Optimization of Networks
- *Mustafa Ç. Pinar and Stavros A. Zenios,*
Solving Nonlinear Programs with Embedded Network Structures
- *Warren B. Powell, Elif Berkkam, and Irvin J. Lustig,*
On Algorithms for Nonlinear Dynamic Networks
- *Hanif D. Sherali and Quaid J. Saifee,*
Strategic and Tactical Models and Algorithms for the Coal Industry Under the 1990 Clean Air Act
- *J. MacGregor Smith,*
Multi-Objective Routing in Stochastic Evacuation Networks
- *Jie Sun, K.-H. Tsai, and L. Qi,*
A Simplex Method for Network Programs with Convex Separable Piecewise Linear Costs and Its Application to Stochastic Transshipment Problems
- *Marinus Veldhorst,*
A Bibliography on Network Flow Problems
- *Stefan Voß,*
Tabu Search: Applications and Prospects
- *Guo-Liang Xue and Shang-Zhi Sun,*
The Shortest Path Network and Its Applications in Bicriteria Shortest Path Problems
- *Lan Zhao and Anna Nagurney,*
A Network Formalism for Pure Exchange Economic Equilibria
- *Sourav Bhattacharya and Bhaskar Dasgupta,*
Steiner Problem in Multistage Computer Networks

The authors are leading experts in the field, and all articles are well-written and very instructive. The book is highly recommended to everyone interested in the development of network problems.

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