OPTIMA

No. 41
Nov. 1993

MATHEMATICAL PROGRAMMING SOCIETY NEWSLETTER

XV *International Symposium on Mathematical Programming*

Second Announcement Mailed

All Mathematical Programming Society members should have received the second announcement of the XV International Symposium on Mathematical Programming, which will be held Aug. 15-19, 1994, at the University of Michigan in Ann Arbor, MI, USA. The conference chairs are John Birge and Katta Murty. The opening conference session on Monday, Aug. 15, 1994, will include a special presentation in celebration of George Dantzig's 80th birthday by R. Wets. The opening session also will include the awarding of Society prizes: the George B. Dantzig prize (for major contribution in mathematical programming, joint with SIAM), the Fulkerson Prize (for discrete mathematics, joint with AMS), the Beale-Orchard-Hays Prize (for computational mathematical programming), and the A.W. Tucker Prize (for outstanding student paper).

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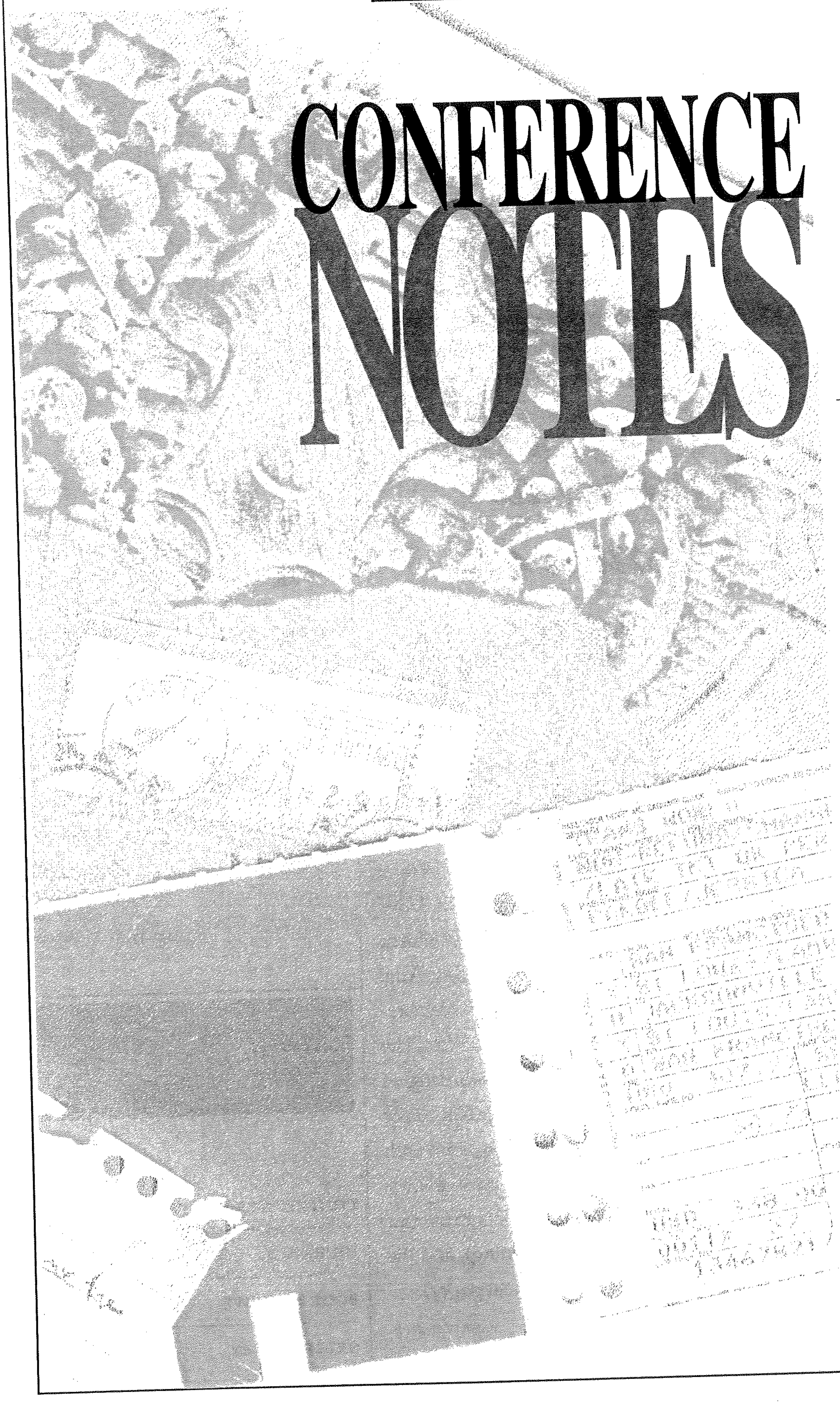

CONFERENCE NOTES

CORS 1994 & Optimization Days

MONTREAL, MAY 30-JUNE 1, 1994

Call for Proposals

1997 INTERNATIONAL MATHEMATICAL PROGRAMMING SYMPOSIUM

CORS 1994 & Optimization Days

Montreal, May 30-June 1, 1994

For the first time in their histories, the Canadian Operational Research Society (CORS) and Optimization Days will be holding their annual meetings jointly in Montreal May 30, 31 and June 1, 1994.

This first joint conference is expected to have around 50 or more sessions, with more than 200 papers, making it the largest O.R. meeting of its kind to be held in Montreal.

Plenary speakers will be:

- M. Brandeau, Stanford University
  O.R. and AIDS Research
- H. Mahmassani, University of Texas
  Intelligent Vehicle-Highway Systems
- J.-M. Rousseau, GIRO
  Marketing O.R.: From University to Industry
- S. Zenios, Wharton School
  Parallel Computing

Tutorials will be given by:

- E. Erkut, University of Alberta
  Logistics of Hazardous Materials
- M. Gendreau, Université de Montréal
  Tabu Search
- P. Hansen, École des Hautes Études Commerciales
  Classification Algorithms
- P. L'Ecuyer, Université de Montréal
  Simulation/Optimization Hybrid Algorithms
- R. Sharda, Oklahoma State University
  LP-ILP Software

The site will be the Delta Hotel, located in the downtown area of this exciting bi-cultural city within easy walking distance of business, shopping, dining and entertainment districts. Oversized guest rooms, some with balconies, have views overlooking Mount Royal and the St. Lawrence River.

The theme of the conference will be "Transportation and Logistics." However, the conference welcomes papers dealing with all aspects of O.R.: Mathematical programming; stochastic methods; applications to engineering, transportation, economics, management sciences, urban and environmental problems, fisheries, forestry, oil industry, military operations, health care, biology, and telecommunications; networks; robotics; expert systems; decision support systems, etc.

The languages of the conference will be English and French. A 50-150 word abstract clearly defining the content of the presentation should be sent before Dec. 31, 1993, to the program chairman. Authors will be notified concerning acceptance of their papers by March 31, 1994.

Gilbert Laporte, Program Chairman
Center for Research on Transportation
Université de Montréal
P.O. Box 6128, Station A
Montreal, Canada H3C 3J7
Telephone: (514) 343-6143
FAX: (514) 343-7121

Delta Hotel
450 Sherbrooke St. West
Montreal, Canada H3A 2T4
Telephone: 1-800-387-1265
FAX: (514) 284-4342

Ask for the CORS'94 special rate.

Call for Proposals

1997 INTERNATIONAL MATHEMATICAL PROGRAMMING SYMPOSIUM

The XV International Mathematical Programming Symposium will be held in Ann Arbor, MI, Aug. 15-19, 1994.

Proposals for the location of the XVI International Mathematical Programming Symposium in 1997 are being solicited now. The Symposium will be held every three years under the auspices of the Mathematical Programming Society. According to a certain tradition of the society, the site of the Symposium should alternate between places in and out of North America. Thus, for the 1997 Symposium, locations outside of North America are preferred. However, proposals for any site will be considered. The meeting preferably should take place during the month of August.

The main criteria for selection of the location are:

1) **Existence of mathematical programming researchers in the geographic area who are interested in organizing the Symposium.**
2) **Attendance open to prospective participants from all nations.**
3) **Availability of an attractive facility with a sufficient number of meeting rooms, standard lecture equipment, etc.**
4) **Availability of a sufficient supply of reasonably economical hotel and/or university dormitory rooms fairly near the meeting facility.**

A copy of the Society's "Guidelines for Submission of Proposals" and further information can be obtained from the chairman of the Advisory Committee:

Bernhard Korte, Research Institute of Discrete Mathematics, Nassestrasse 2, D-53113 Bonn, Germany, e-mail: dm@or.uni-bonn.de.

The advisory committee consists of J. Birge, Ann Arbor; C. Gonzaga, Rio de Janeiro; B. Korte, Bonn; and A. Schrijer, Amsterdam.

JOURNALS

Contents of Mathematical Programming

Vol. 61 No. 1

Michele Conforti and M.R. Rao, *"Testing balancedness and perfection of linear matrices."*

Jorge Nocedal and Ya-Xiang Yuan, *"Analysis of a self-scaling quasi-Newton method."*

Ilan Adler and Ron Shamir, *"A randomization scheme for speeding up algorithms for linear and convex programming problems with high constraints-to-variables ratio."*

Yves Cramer, *"Concave extensions for nonlinear 0-1 maximization problems."*

Arnon Boneh, Shahar Boneh and Richard J. Caron, *"Constraint classification in mathematical programming."*

Le Dung Muu, *"An algorithm for solving convex programs with an additional convex-concave restraint."*

S. Bolintineanu, *"Minimization of a quasi-concave function over an efficient set."*

Stein W. Wallace and Tiecheng Yan, *"Bounding multi-stage stochastic programs from above."*

G.S.R. Murthy, T. Parthasarathy and G. Ravindran, *"A copositive matrix Q-matriz which is not R_0."*

Vol. 61 No. 2

Leonid G. Khachiyan and Michael J. Todd, *"On the complexity of approximating the maximal inscribed ellipsoid for a polytope."*

Donald Goldfarb and Shucheng Liu, *"An $O(n^3L)$ primal-dual potential reduction algorithm for solving convex quadratic programs."*

Jayaram K. Sankaran, *"Some new results regarding spikes and a heuristic for spike construction."*

Hedy Attouch and Roger J.B. Wets, *"Quantitative stability of variational systems: III. e-approximate solutions."*

Paul H. Calamai, Luis N. Vicente and Joaquim J. Judice, *"A new technique for generating programming test problems."*

Kazuyuki Sekitani and Yoshitsugu Yamamoto, *"A recursive algorithm for finding the minimum norm point in a polytope and a pair of closest points in two polytopes."*

Jonathan M. Borwein, *"On the failure of maximum entropy reconstruction for Fredholm equations and other infinite systems."*

Vol. 61 No. 3

Masakazu Kojima, Nimrod Megiddo and Shinji Mizuno, *"A primal-dual infeasible-interior-point algorithm for linear programming."*

Jia Hao Wu, Michael Florian and Patrice Marcotte, *"A general descent framework for the monotone variational inequality problem."*

François Louveaux and Maarten J. Van Der Vlerk, *"Stochastic programming with simple integer recourse."*

B. Curtis Eaves and Uriel Rothblum, *"A class of "onto" multifunctions."*

G.S.R. Murthy, *"A note on sufficient conditions for Q_0 and $Q_0 \cap P_0$ matrices."*

Jianming Miao, *"Ky Fan's N-matrices and linear complementarity problems."*

Paul Armand, *"Finding all maximal efficient faces in multiobjective linear programming."*

John J. Dinkel and Marietta J. Tretter, *"Characterization of perturbed mathematical programs and interval analysis."*

X. Zhou, F. Sharifi Mokhtarian and Z. Zlobec, *"A simple constraint qualification in convex programming."*

What's

NEW

from

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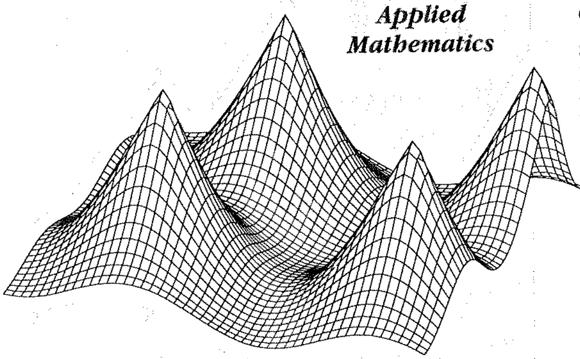
Society for Industrial and Applied Mathematics



Optimization Software Guide

Jorge J. MORÉ and Stephen J. WRIGHT

Frontiers in Applied Mathematics 14

Here is a reference tool that includes discussions of developments in optimization theory, including emphasis on large problems and on interior-point methods for linear programming, and names software packages that incorporate the results of theoretical research.

Contents

Preface; *Part I: Overview of Algorithms.* Optimization Problems and Software; Unconstrained Optimization; Nonlinear Least Squares; Nonlinear Equations; Linear Programming; Quadratic Programming; Bound-Constrained Optimization; Constrained Optimization; Network Optimization; Integer Programming; Miscellaneous Optimization Problems; *Part II: Software Packages.* AMPL; BQPD; BT; BTN; CNM; CONOPT; CONSOL-OPTCAD; CPLEX; C-WHIZ; DFNLP; DOC; DOT; FortLP; FSQP; GAMS; GAUSS; GENESIS; GENOS; GINO; GRG2; HOMPACK; IMSL Fortran and C Library; LAMPS; LANCELOT; LBFGS; LINDO; LNOS; LINGO; LPsolver; LSGRG2; LSNNO; LSSOL; M1QN2 and M1QN3; MATLAB; MINOS; MINPACK-1; MIPIII; MODULOPT; NAG C library; NAG Fortran Library; NETFLOW; NETSOLVE; NITSOL; NLPE; NLPQL; NLPQLB; NLSFIT; NLSSOL; NLPSPR; NPSOL; OB1; ODRPACK; OPSYC; OptiA; OPTIMA Library; OPTPACK; OSL; PC-PROG; PITCON; PORT 3; PROC NLP; Q01SUBS; QAPP; QPOPT; SQP; SPEAKEASY; TENMIN; TENSOLVE; TNPACK; TN/TNBC; UNCMIN; VE08; VE10; VIG; VIMDA; What's Best!; Bibliography.

Available November 1993 / Approx. 152 pp. / Softcover
0-89871-322-6 / List Price $24.50 / SIAM Member Price $19.60
Order Code FR14

Interior Point Polynomial Algorithms in Convex Programming

Yurii NESTEROV and Arkadii NEMIROVSKII

Studies in Applied Mathematics 13

Here is the first unified theory of polynomial-time interior-point methods. This focus on the theoretical aspects allows for new possibilities for constructing efficient methods for nonlinear convex problems. Researchers involved in the development of interior-point methods can investigate more general problems rather than focusing on linear programming.

Contents

Self-Concordant Functions and Newton Method; Path-Following Interior-Point Methods; Potential Reduction Interior-Point Methods; How to Construct Self-Concordant Barriers; Applications in Convex Optimization; Variational Inequalities with Monotone Operators; Acceleration for Linear and Linearly Constrained Quadratic Problems; Bibliography; Appendix 1; Appendix 2.

Available November 1993 / Approx. 400 pp. / Hardcover / 0-89871-319-6 / List Price $68.50
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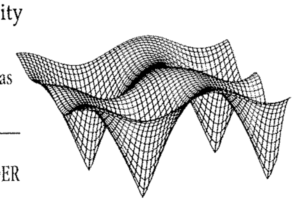
SIAM Journal on Optimization

Contains research and expository articles on the theory and practice of optimization, and papers that link optimization theory with computational practice and applications. Among the areas addressed are linear and quadratic programming, large scale optimization including the solution of large nonlinear systems of equations, stochastic optimization, combinatorial optimization, mixed integer programming, nonsmooth optimization, convex analysis, numerical optimization including optimization algorithms for parallel architectures, and applications in engineering, management, and the sciences. *Published quarterly.*

Editor-in-Chief: J.E. Dennis, Jr., Rice University

1994 List Price: $188.00 domestic / $215.00 overseas
1994 SIAM Member Price: $44.00 domestic / $47.00 overseas



Also of INTEREST

Handbook of Writing for the Mathematical Sciences

Nicholas J. HIGHAM

Contents

Preface; General Principles; Writer's Tools and Recommended Reading; Mathematical Writing; English Usage; When English is a Foreign Language; Writing a Paper; Revising a Draft; Publishing a Paper; Writing a Talk; Computer Aids for Writing and Research; Appendices: The Greek Alphabet; Summary of TeX and LaTeX Symbols; GNU Emacs—The Sixty+ Most Useful Commands; Mathematical Organizations; Winners of Prizes for Expository Writing; Glossary; Bibliography; Index.

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BOOK REVIEWS

Linear Programs and Related Problems

by Evar D. Nering and
Albert W. Tucker
Academic Press, San Diego, 1993
ISBN 0-12-515440-2

A good introductory textbook in any mathematical field should possess careful exposition, clear and illuminating examples, elegance, and, to the greatest extent possible, unification in the underlying mathematics. This text has all these in abundance. The motivating examples in the first chapter are so clear, and so carefully developed, that they lead naturally into the careful and elegant mathematical exposition of linear programming which follows.

A good introductory textbook also should give the student a grasp of the field as it is practiced, and the ability to build on the acquired knowledge to obtain full technical competence in the field. Here, unfortunately, the book has serious deficiencies.

For the past decade, linear programming has been a subject of intensive research. This research has led to such great improvements in algorithms for solving linear programming problems that workstations now solve in minutes problems that just a few years ago were considered intractable on supercomputers. While the topic of most of the research activity has been on interior-point methods, the improvements in the simplex method have been dramatic, leading to computational efficiency comparable to interior-point codes on the problems of a size previously considered to be totally beyond the simplex method's capabilities.

This vast explosion of knowledge makes the task of the textbook writer complex, for it is difficult to decide what should be included in an introductory text. Certainly, it is not unreasonable for an introduction to focus on the simplex method and related topics, while largely ignoring interior-point methods as the proper subject of a second course. However, the method of development of the simplex method should be such that current implementations can be made understandable. Here, the book clearly fails.

Specifically, the problem lies with the fact that the entire theory is developed using Tucker tableaus. The concept of basis matrix is never mentioned, and is not even mentioned in the index. The greatly increased efficiency of modern simplex codes is derived in large measure from better basis crashes, improved partial pricing algorithms, primal and dual steepest-edge algorithms, and more stable basis factorizations. All of these topics are easily explained in the standard basis matrix development of the simplex method, and are cumbersome at best and impossible at worst in the tableau development of this book. Further, such important developments as random perturbation of degenerate non-optimal basic solutions cannot be developed within this context.

The book is divided into two parts. The first deals with the classic development of linear programming using Tucker tableaus, with brief digressions on the ellipsoid method and Karmarkar's method. The second part deals with related topics and is far more extensive than is standard for introductory texts. The topics covered include matrix games, assignment and matching problems, the transportation problem, network flow problems, the transshipment problem, and nonlinear programming.

The chapters on assignment and matching problems, the transportation problem, network flows and the transshipment problem are extremely good. Special algorithms, such as the Ford-Fulkerson algorithm and the Hungarian algorithm, are carefully developed and clearly explained. Many clear illustrative examples are included. This material is fully appropriate for an introductory course, although, as the authors state in the preface, the total content of the text is more than a student could hope to absorb in one semester.

One easy omission would be the chapter on nonlinear programming. This is a field so rich that it is difficult to fit an introductory course into a single semester. The topics covered here are a minute subset of nonlinar programming, and highly specialized in content. They add little to the remainder of the book, and in no way represent current practice in solving the problems addressed.

Throughout, the book contains many well-thought-out problems, together with a complete solution set, which contains illuminating explanations for some of the problems.

Overall, the book is a valuable reference for anyone knowledgeable in the field, an excellent source of problems for an instructor, and a valuable text for many of the topics developed in the second section. It also is useful for the examples of the first section, but, in the opinion of this reviewer, is not the proper introduction to modern linear programming required by the great advances of the last decade. I recommend it as a valuable addition to anyone's reserve list, but not as the principal text for an introductory course.

— DAVID SHANNO

"Overall, the book is a valuable reference for anyone knowledgeable in the field, an excellent source of problems for an instructor, and a valuable text for many of the topics developed in the second section."

Matroid Decomposition

by Klaus Truemper
Academic Press, San Diego, 1993

ISBN 0-12-701225-7

The present book develops a structure theory of matroids, especially binary matroids, in great depth from the point of view of the decomposition and composition of matroids. The author has been carrying out a series of very active researches on matroid decompositions, which largely make up this book.

The book begins with an elementary introduction of matroids and is, for the most part, self-contained. Even readers who are not familiar with matroids can enjoy the matroid theory from an elementary level to its forefront of recent researches on matroid decompositions.

The structure theory of matroids has two facets: one is concerned with characterizations of a class of matroids in terms of excluded minors and the other is with decompositions (or compositions) of matroids into (or from) basic elements. The latter often leads to polynomial algorithms for recognizing certain properties and relevant structures of matroids, which also gives constructive proofs of excluded-minor characterizations of matroids. The author naturally takes the latter constructive approach to the structure theory of matroids.

Though extensions to general matroids also are offered, emphasis is placed on binary matroids throughout this book. The argument frequently uses (standard) matrix representations of (binary) matroids. Readers should get used to the useful framework of matrix representations given in Chapter 2 before moving into the principal part of the book, starting form Chapter 3.

OPTIMA

Chapter 1 gives a summary of the book and historical notes on matroid decompositions.

Chapter 2 offers basic definitions of technical terms on graphs and matrices and briefly of computational complexity.

In Chapter 3, starting from graphic matroids, basic matroidal notions are defined and a characterization of binary matroids is given.

Chapter 4 treats elementary constructions of graphs and binary matroids by series-parallel steps and delta-wye exchanges.

Chapter 5 furnishes an important proof technique, called the path-shortening technique, which is used for determining the connectivity and for solving the problems of intersection and partitioning of matroids.

Chapter 6 introduces the notion of (exact) k-separation associated with connectivity and gives the so-called separation algorithm, one of the main tools for the subsequent development.

The results of Chapters 4-6 lay the basis for the latter development of constructive proofs and polynomial algorithms for matroid decompositions.

Chapter 7 introduces the concept of splitters and gives their characterization, called the splitter theorem, due to P.D. Seymour. From the splitter theorem follow some existence theorems of sequences of nested minors that give Tutte's wheel theorem for graphs as a corollary. A result about sequences of nested minors also offers a tool for Thomassen's ingenious proof of Kuratowski's characterization of planar graphs.

Chapter 8 discusses the decomposition and composition of binary matroids by k-sums. Also considered are D-sums and Y-sums as alternatives of 3-sums.

Chapter 9 investigates regular matroids and their excluded-minor characterization. A characterization of ternary matroids also is given.

Chapter 10 is concerned with graphic matroids. Characterizations of planar matroids, nongraphic regular matroids, graphic or cographic matroids, etc. are investigated. Also, a polynomial algorithm for testing graphicness of binary matroids is given.

Chapter 11 shows Seymour's celebrated decomposition theorem for regular matroids, employing the results and tools developed in Chapters 2-10.

Chapter 12 considers almost regular matroids by introducing the notions of alpha-balanced graphs, minimal violation matrices of regularity, complement totally unimodular matrices, almost representative matrices, etc.

In Chapter 13, the author considers the max-flow min-cut matroids, i.e., the matroids on which the max-flow min-cut theorem holds. Structural properties of max-flow min-cut matroids are examined and a polynomial max-flow algorithm is shown.

This book is an excellent exposition of the structure theory of (binary) matroids and shows us, especially, a nice pathway to Seymour's decomposition of regular matroids and the author's structural and algorithmic development of matroid decompositions.

— SATORU FUJISHIGE

"This book is an excellent exposition of the structure theory of (binary) matroids and shows us, especially, a nice pathway to Seymour's decomposition of regular matroids and the author's structural and algorithmic development of matroid decompositions."

Model Solving in Mathematical Programming

by H.P. Williams,
John Wiley and Sons,
Chichester, 1993

ISBN 0-471-93722-3

This is an excellent book, which uses a unique style to introduce the different methods used in solving mathematical programs. The author carefully explains the ideas behind each method, then uses numerical examples to clarify and remove any ambiguity related to the topic under discussion. A few questions are raised through additional special-case examples, but, once again, the author intervenes to help his readers by providing insight into the problem.

Chapter 1, "The Nature of Mathematical Programming," describes the main models used in mathematical programming, namely linear, non-linear and integer programs. Simple examples are presented with their graphical interpretations. The concepts of convexity, local and global optimum, and complexity also are introduced.

In the second chapter, "General Methods for Linear Programming," Gaussian elimination and the concept of a basic solution are presented. The steps of the simplex algorithm, and the different strategies for choosing an entering variable, to avoid cycling (circling), also appear in this chapter. The author goes on to discuss the concept of duality and the related theorems, and develops the dial simplex algorithm using the optimality conditions of a linear program.

"Methods for Specialist Linear Programming Models" is the title of Chapter 3. It considers some of the topics related to network programming: minimum-cost and maximum flow through a network. The Hungarian method for solving the assignment problem then is mentioned briefly.

I found Chapter 4, "Computational Implementation of the Simplex Algorithm," very interesting. It talks about an important issue that often is ignored in linear programming books: efficient computer implementation of the simplex algorithm. The author starts with the revised simplex algorithm and the product form of the inverse. He then goes on to discuss the advantages of using L/U decomposition and how one can update the decomposition at the end of each simplex iteration. Instead of devoting a separate chapter for sensitivity analysis and parametric programming, they are presented at the end of this one, which, in my opinion, disturbs the smooth flow of the ideas presented earlier in the chapter.

The book introduces the reader to "Non-Calculus Methods for Non-Linear Programming." The author is able to describe, through a nice example, the concept of separability in non-linear programs, and shows how the program can be approximated using a piecewise-linear function. A word at the end of the chapter is given to Kuhn-Tucker conditions for local optimality.

"General Methods for Integer Programming" is the topic of Chapter 6. Branch-and-bound and cutting planes methods are presented and applied to a couple of examples. The duality gap is shown through an example. As in the linear case, the book discusses "Computational Implementation of the Linear-Programming-Based Branch-and-Bound Algorithm."

The book's last chapter is titled "Specialist Methods for Integer Programming Models." Methods for problems with pure 0-1 variables, such as implicit enumeration and boolean algebra are studied. Some special problems, such as the matching problem, traveling salesman problem, etc. are studied in some depth. The reader is introduced to heuristics and local search methods in the last few pages of the book.

At the end of each chapter, numerous exercises are provided to strengthen one's understanding of the material, and encourage further research of the topic. The book is intended for both undergraduate and first-year graduate students who have not had a previous knowledge of this topic. I think the style of this book makes it an excellent self teacher for those who want to learn more about mathematical programming.

— SAMER TAKRITI

"The book is intended for both undergraduate and first-year graduate students who have not had a previous knowledge of this topic. I think the style of this book makes it an excellent self teacher for those who want to learn more about mathematical programming."

FROM PAGE ONE

XV International Symposium on Mathematical Programming

The Sunday preceding the opening will include a golf outing on the University of Michigan course and an evening concert presentation of an original composition by the Pulitzer Prize-winning composer, William Bolcum. A reception for all participants will be hosted on Monday evening. The MPS business meeting will be on Wednesday afternoon, followed by a banquet at the historic Greenfield Village.

The program will include multiple parallel sessions on a wide range of topics in mathematical programming. Several one-hour tutorial lectures also have been scheduled. One-hour tutorial speakers include: R. Bixby, W. Cook, G. Cornuejols, C. Gonzaga, A. Frank, A. Griewank, J. Holland, N. Karmarkar, U. Karmarkar, R. Karp, L. Lovasz, J. Mulvey, W. Murray, G. Nemhauser, A. Nemirovski, J. Nocedal, P. Pardalos, R.T. Rockafellar, G. Smale and P. Toth.

Early registration deadline is April 29, 1994. Abstracts are due by June 1. Hotel reservations should be made before July 15. Registration for members is $150 before April 29 and $190 after April 29. Reduced student and retiree fees also apply. The banquet fee is $36.50. Addresses, forms and other information appear in the announcement. The symposium coordinators' address is:

University of Michigan
Conferences and Seminars, Room 112
541 Thompson St.
Ann Arbor, MI 48109-1360 USA
Telephone: (313) 764-5305
FAX: (313) 764-2990
e-mail: xvismp@um.cc.umich.edu

Application for Membership

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Nº 41 *Nov.* 1993

Irvin Lustig, formerly at Princeton University, is now Director of Numerical Optimization at CPLEX Optimization, Inc. His e-mail address is irv@dizzy.cplex.com. ¶A workshop on Parallel Processing of Discrete Optimization Problems will be held at the Center for Discrete Mathematics and Theoretical Computer Science (DIMACS), Rutgers University, April 28-29, 1994. Organizers are **P.M. Pardalos**, University of Florida (pardalos@math.ufl.edu), and **M.G.C. Resende** (mgcr@research.att.com) and **K.G. Ramakrishnan** (kgr@research.att.com) of AT&T Bell Labs. ¶Deadline for the next OPTIMA is Feb. 1, 1994.

Books for review should be sent to the Book Review Editor, Professor Dolf Talman Department of Econometrics Tilburg University P.O. Box 90153 5000 LE Tilburg Netherlands

Journal contents are subject to change by the publisher.

Donald W. Hearn, EDITOR
Dolf Talman, ASSOCIATE EDITOR
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Richard Jones, ASSISTANT EDITOR
Elsa Drake, DESIGNER

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