METHODS OF OPERATIONS RESEARCH

60

XIII. SYMPOSIUM ON OPERATIONS RESEARCH

Organized by
Gesellschaft für Mathematik, Ökonomie und Operations Research e.V.

University of Paderborn, September 7-9, 1988

Proceedings

Edited by: Benno Fuchssteiner, Paderborn
Thomas Lengauer, Paderborn
Heinz J. Skala, Paderborn

ANTON HAIN

TABLE OF CONTENTS

INVITED LECTURES

John S. CHIPMAN, Minneapolis

A General-Equilibrium Econometric Model of an Open Economy - With Special Reference to the Phenomenon of Intra-Industry Trade 3

Wolfgang EICHHORN, Karlsruhe

Inequalities in the Theory of Economic Inequality 15

Karl-Heinz ELSTER, Ilmenau
Rosalind ELSTER, Merseburg
Alfred GÖPFERT, Merseburg

On Approaches to Duality Theory in Geometric Vector Optimization 23

Hermann HAKEN, Stuttgart

Synergetics: Theory of Self-Organization in Complex Systems 39

Bodil O.HANSEN, Kopenhagen
Hans KEIDING, Kopenhagen

Reaction Equilibria 61

Karl HINDERER, Karlsruhe

Looking at the Structure of Dynamic Programs With PC Support - A Review - 75

Christian HIPP, Hamburg

Some Applications of the Bootstrap in Risk Theory 87

Prabhakar RAGHAVAN, Yorktown Heights; NY

Integer Programming in VLSI Design 89

Bimal K. SINHA, Maryland

Berkson's Bioassay Problem: Issues and Controversies 91

Mervyn STONE, London

Continuum Regression Incorporating Cross-Validated OLS, PLS and PCR 103

Aleksei SUKHAREV, Moscow

Minimax Models for Constructing Optimal Deterministic and Stochastic Numerical Algorithms 111

Wolfgang WEIDLICH, Stuttgart

Synergetics and Social Science 113

Gerhard ZIMMERMANN, Kaiserslautern

PLAYOUT - A Hierarchical Layout System 117

SECTION 1: APPLICATIONS IN MANAGEMENT

Jože Andrej CIBEJ, Ljubljana

Specific Problems of Mathematical Modelling and Optimization in Yugoslav Small (Private) Firms 121

Jobst-Walter DIETZ, Göttingen
Reinhold ROSKI, Wiesbaden

Discontinuities in Innovation-Management 131

Marion SWITALSKI, Bielefeld

Fields of Application of Hierarchical Production Planning (HPP) 145

Jan WEGLARZ, Poznań

Multicriteria Scheduling Under Continuous, Doubly Constrained Resources 153

SECTION 2: COMBINATORIAL AND DISCRETE OPTIMIZATION

Richard J.ANDERSON, Seattle
Ernst W.MAYR, Frankfurt
Manfred K.WARMUTH, Santa Cruz

Parallel Approximation Algorithms for Bin Packing 165

Matthias BÜCKER, Karlsruhe

How to Treat Cycles in Minimizing The Expected Weighted Flowtime in 1-Machine Scheduling Problems With EOR-Precedence Constraints 183

Krzysztof DUDZINSKI, Warsaw

On a Special Type Linear Programming Knapsack Problem 191

Ulrich FAIGLE, Enschede
György TURAN, Szeged
Static On-Line Decomposition of Series-Parallel and Interval Orders 197

Gerd FINKE, Halifax
Flexible Manufacturing Systems in the Framework of Resource Constrained Scheduling Theory 205

Marek KUBALE, Gdańsk
Preemptive Scheduling of 2-Processor Tasks on Dedicated Processors 209

Christoph MAAS, Darmstadt
Polynomial Algorithms for Checking a Uniqueness-Criterion for Electrical Networks 211

Ekkehard SCHNEIDER, Berlin
Combinatorial Aspects of a Combined Circulation and Potential Difference Problem 213

Dietmar SCHWEIGERT, Kaiserslautern
Linear Extensions and Vector-Valued Spanning Trees 219

Maciej SYSLO, Wroclaw
Optimal Covers in Planar Graphs 231

Cyril VAN NUFFELEN, Antwerpen
Martin VAN WOUWE, Antwerpen
A Bound for the Dilworth Number 233

SECTION 3: COMBINATORIAL PROBLEMS IN VLSI

Emile AARTS, Eindhoven
Jan KORST, Eindhoven
Jan Karel LENSTRA, Amsterdam
Constrained Scheduling of VLSI Algorithms 239

Thomas ANDREAE, West Berlin
Visibility Representations of Planar Graphs 247

Claudio ARBIB, Rom
Mario LUCERTINI, Rom
Sara NICOLOSO, Rom
Minimal Area Layout of Two-Level Boolean Functions: Combinatorial Models and Algorithmic Approaches 249

Ajay K. GUPTA, West Lafayette
Susanne E. HAMBRUSCH, West Lafayette
New Cost Measures in Graph Embeddings 253

Burkhard MONIEN, Paderborn
Simulating Binary Trees on X-Trees 255

Stefan VOß, Darmstadt
Steiner's Problem in Graphs: Heuristic Methods 259

Dorothea WAGNER, Berlin
Frank WAGNER, Aachen
A Parallel Algorithm for the Channel Routing Problem 263

Dorothea WAGNER, Berlin
Frank WAGNER, Aachen
Graph Separation is *NP*-Complete 269

SECTION 4: COMPUTER SCIENCE ASPECTS

Frank BAETKE, München
Vector Computers - Useful for Operations Research? 277

Rudolf KRUSE, Braunschweig
Jörg GEBHARDT, Braunschweig
Jörg KNOP, Braunschweig
On a Dialog-System for Modelling and Statistical Analysis of Linguistic Data 289

SECTION 5: CONTROL THEORY

Gerhard SORGER, Vienna
Some New Results on the Global Asymptotic Stability of Optimal Control Systems 299

SECTION 6: DECISION AND GAME THEORY

P.E.M. BORM, Nijmegen
S.H. TIJS, Nijmegen
J.C.M. VAN DEN AARSSEN, Nijmegen
Pareto Equilibria in Multiobjective Games 303

Theo DRIESSEN, Enschede
On Cores of Subconvex Games and Permutationally Convex Games 313

Zoltán FARKAS, Budapest

On Some Extension of Quasi-Arithmetic Means and their Connection with Solution of Certain Decision Problems 325

A.P. JURG, Nijmegen
S.H. TIJS, Nijmegen
M.J.M. JANSEN
T. PARTHASARATHY

Weakly Completely Mixed Games 327

J. POTTERS, Nijmegen
S. MUTO, Kawauchi, Sendai
S.H. TIJS, Nijmegen

Bargaining Set and Kernel of Big Boss Games 329

Antoon VAN DEN ELZEN, Tilburg

Interpretation and Generalization of the Lemke-Howson Algorithm 337

SECTION 7: DECISION SUPPORT AND EXPERT SYSTEMS

Matthias BÖHMER, Trier

Quantity Flow Graphs - A Powerful Tool for Generating Linear Structured Decision Models by OR-Laymen 349

SECTION 8: LINEAR AND NONLINEAR OPTIMIZATION

Jacob DE VRIES, Trier
Nguyen V.THOAI, Hanoi

Numerical Experiments on Concave Minimization Problems 363

Vincentiu DUMITRU, Bucharest
Florica LUBAN, Bucharest

Monotone Operators and Pareto Invariance in Multicriteria Optimization 367

Efim A. GALPERIN, Montréal

The Non Lipschitzian Cubic Algrorithm 379

Siegfried HELBIG, Frankfurt

An Algorithm for a Vector Optimization Problem over a Disjunctive Feasible Set 397

Hans KREMERS, Tilburg
Dolf TALMAN, Tilburg

Solving the Nonlinear Complementarity Problem with Lower and Upper Bounds 407

Leszek MIKULSKI, Kraków

Stability and Optimization of Bars with Variable Thin-Walled Cross-Section 419

Christian MÜLLER, Berlin

Algorithms for the Maxflow Problem with One Side Constraint 431

SECTION 9: MATHEMATICAL ECONOMICS

Walter BOSSERT

A Note on Intermediate Inequality Indices which are Quasilinear Means 443

Satya R. CHAKRAVARTY, Calcutta and Karlsruhe

On Quasi-Orderings of Income Profiles 455

Jean-Luc DORMOY, Clamart
Jérôme COLLET, Paris

New Methods in Qualitative Calculus 475

Karl FARMER, Graz

Unanimity in a Post-Walrasian One-Sector Economy with Incomplete Capital Markets 483

Susanne FUCHS-SELIGER, Karlsruhe

On the Continuity of Income Compensation Functions 497

Wolfgang LEINIGER, Bonn

Patent Competition, Rent Dissipation and the Persistence of Monopoly: The Role of Research Budgets 499

Gunter STEPHAN, Bern
Gerhard WAGENHALS, Heidelberg

Competitive and Intertemporal Valuation Equilibria in Overlapping Generations Economies: A Neo-Austrian Perspective 501

Ton STORCKEN, Tilburg

A Possibility in Aggregating Social Welfare 517

Christof WEINHARDT, Karlsruhe
Currency Independence in Inequality Measurement 525

SECTION 10: RISK THEORY AND INSURANCE

T. BAUWELINCKX, Leuven
M. VAN WOUWE, Antwerpen
M. GOOVAERTS, Leuven
The Application of Credibility Theory to the Analysis of Deductibles 539

Bart HEIJNEN, Antwerpen
Trees of Reinsurance 549

Claudia KLÜPPELBERG, Mannheim
Asymptotic Ruin Probabilities and Hazard Rates 567

SECTION 11: STATISTICS; ECONOMETRICS

R. AVENHAUS, München
H.-P. BATTENBERG, München
B.-J. FALKOWSKI, München
Average Run Lengths of Simple Sequential Tests for Random Variables with Systematic Components 579

Helena BACELAR-NICOLAU, Lisbon
Classifying Integer Scale Data by the Affinity Coefficient 587

Fred BÖKER, Göttingen
Measuring the Similarity of Brands of Products 597

Drago CEPAR, Ljubljana
Zoran RADALJ, Ljubljana
Some Asymptotic Behaviour of the Bootstrap Estimates on a Finite Sample 607

Czeslaw DOMANSKI, Lodz
Andrzej S. TOMASZEWICZ, Lodz
Critical Values for David-Hellwig Normality Test 609

Norbert GAFFKE, Augsburg
Rudolf MATHAR, Augsburg
Linear Minimax Estimation and Related Bayes L-Optimal Design 617

Reza NAKHAEIZADEH, Karlsruhe

Vergleich ökonometrischer separater Modelle. Theoretische Analyse und ökonomische Anwendungen 629

Detlof PLACHKY, Münster

A Simple Measure for the Degree of Sufficiency of Sub-σ-Algebras for Dominated Families of Probability Distributions 643

Gerd RONNING, Konstanz
Martin KUKUK, Konstanz

Econometric Models based on Polychoric Correlation. A New Approach to the Analysis of Business Test Data 653

SECTION 12: STOCHASTIC AND DYNAMIC OPTIMIZATION

H. MOLANA, Glasgow
V. MUSCATELLI, Glasgow

Cost of Adjustment and Fluctuations in the Money Stock 673

Carl-Louis SANDBLOM, Halifax
Kurt O. JÖRNSTEN, Bergen

On Scenario Aggregation for Optimizing Economic Models with Uncertainty 687

Gideon WEISS, Atlanta

Turnpike Optimality of Smith's Rule in Parallel Machines Stochastic Scheduling 689

SECTION 13: SYNERGETICS

Pierre FRANKHAUSER, Stuttgart

Fractal Structures of Urban Systems 697

Günter HAAG, Stuttgart
Peter WUNDERLE, Stuttgart

Quality Improvement and Self-Reinforcing Mechanisms in Economy 709

Thomas LANDES, Paderborn
Otto LOISTL, Paderborn

Modelling an Expert System of Capital Markets by Means of Synergetic 723

Martin MUNZ, Stuttgart
Rolf REINER, Stuttgart
Chaotic Evolution of Migratory Systems 725

Rolf REINER, Stuttgart
Martin MUNZ, Stuttgart
Quantitative Analysis of Migratory Systems 737

SECTION 14: SOFTWARE DEMONSTRATIONS

Katharina BELLING-SEIB, Berlin
Software Tools for Developing and Demonstrating Algorithms on Graphs 751

Lech KRZANIK, Krakow
Reference Models and Algorithm of Evolutionary Development 753

Frank WAGNER, Aachen
Barbara WOLFERS, Aachen
A Fast VLSI Routing Algorithm for Convex Grids Producing Short Wires 761