## Contents

### Preface

### Plenary Talk and GOR-Awards

<table>
<thead>
<tr>
<th>Title</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>The Role of Operations Research in Public Policy</td>
<td>1</td>
</tr>
<tr>
<td>Jonathan P. Caulkins</td>
<td></td>
</tr>
<tr>
<td>Risk-Return Optimization of the Bank Portfolio</td>
<td>14</td>
</tr>
<tr>
<td>Ursula Theiler</td>
<td></td>
</tr>
<tr>
<td>Resource-orientated Purchase Planning and Supplier Selection - Models and Algorithms for Supply Chain Optimization and E-Commerce</td>
<td>20</td>
</tr>
<tr>
<td>Gabriele Reith-Ahlemeier</td>
<td></td>
</tr>
<tr>
<td>A Combinatorial Approach to Orthogonal Placement Problems</td>
<td>26</td>
</tr>
<tr>
<td>Gunnar W. Klau</td>
<td></td>
</tr>
<tr>
<td>Assigning Frequencies in GSM Networks</td>
<td>33</td>
</tr>
<tr>
<td>Andreas Eisenblätter</td>
<td></td>
</tr>
<tr>
<td>Optimal Control of Methadone Treatment in Preventing Blood-Borne Disease</td>
<td>41</td>
</tr>
<tr>
<td>Julia Almeder</td>
<td></td>
</tr>
</tbody>
</table>

### Section 1: Production, Logistics and Supply Chain

<table>
<thead>
<tr>
<th>Title</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strategien zur Rüstzeitvermeidung in der Elektronikfertigung</td>
<td>47</td>
</tr>
<tr>
<td>Claus-Burkard Böhnelin</td>
<td></td>
</tr>
<tr>
<td>Optimale Belegung von Stranggießanlagen mittels 2-dimensionaler Bin-Packing-Modelle</td>
<td>53</td>
</tr>
<tr>
<td>Thomas Spengler, Oliver Seefried</td>
<td></td>
</tr>
<tr>
<td>Short-term Capacity Planning in Manufacturing Companies with a Decentralized Organization</td>
<td>59</td>
</tr>
<tr>
<td>Peter Letmathe</td>
<td></td>
</tr>
<tr>
<td>Performance Analysis of Make to Stock Supply Chains using Discrete-Time Queueing Models</td>
<td>65</td>
</tr>
<tr>
<td>Sandeep Jain, N. R. Srinivasa Raghavan</td>
<td></td>
</tr>
<tr>
<td>Title</td>
<td>Page</td>
</tr>
<tr>
<td>----------------------------------------------------------------------</td>
<td>------</td>
</tr>
<tr>
<td>A New Optimal Demand Forecast Model</td>
<td>71</td>
</tr>
<tr>
<td>Joachim Althaler, Herbert Jodlbauer</td>
<td></td>
</tr>
<tr>
<td>A Multi-Product Batch-Available-to-Promise Model for Make-to Stock</td>
<td>77</td>
</tr>
<tr>
<td>Manufacturing</td>
<td></td>
</tr>
<tr>
<td>Richard Pibernik</td>
<td></td>
</tr>
<tr>
<td>Scheduling of Rolling Ingots Production</td>
<td>83</td>
</tr>
<tr>
<td>Christoph Schwindt, Norbert Trautmann</td>
<td></td>
</tr>
<tr>
<td>Determination of Economic Production Quantity for a Multi-Stage</td>
<td>89</td>
</tr>
<tr>
<td>Production System with Limited Storage Capacity</td>
<td></td>
</tr>
<tr>
<td>U. Buscher, G. Lindner</td>
<td></td>
</tr>
<tr>
<td>A Reverse Logistics Model with Integer Setup Numbers</td>
<td>95</td>
</tr>
<tr>
<td>Knut Richter, Imre Dobos</td>
<td></td>
</tr>
<tr>
<td>Lotsizing in a Production System with Rework</td>
<td>102</td>
</tr>
<tr>
<td>and Product Deterioration</td>
<td></td>
</tr>
<tr>
<td>K. Inderfurth, G. Lindner, N.P. Rahaniotis</td>
<td></td>
</tr>
<tr>
<td>Mathematical Programming Models for Strategic Supply Chain Planning</td>
<td>108</td>
</tr>
<tr>
<td>and Design</td>
<td></td>
</tr>
<tr>
<td>J. Kalcsics, M.T. Melo, S. Nickel</td>
<td></td>
</tr>
<tr>
<td>Ein dynamisches Verhandlungsmodell des Supply Chain Management</td>
<td>114</td>
</tr>
<tr>
<td>Eric Sucky</td>
<td></td>
</tr>
<tr>
<td>Modeling the Interaction between Operational and Financial Decisions</td>
<td>120</td>
</tr>
<tr>
<td>in the Inventory Pooling of Repairable Spare Parts Problem</td>
<td></td>
</tr>
<tr>
<td>Hartanto Wong, Dirk Cattrysse, Dirk Van Oudheusden</td>
<td></td>
</tr>
<tr>
<td>Section 2: Marketing and Data Analysis</td>
<td>127</td>
</tr>
<tr>
<td>Die Schätzung von Markentreue, Nichtkäuferanteil und Marktpotenzial</td>
<td>127</td>
</tr>
<tr>
<td>aus Handelspaneldaten</td>
<td></td>
</tr>
<tr>
<td>Heribert Reisinger, Udo Wagner, Matthias Schuster</td>
<td></td>
</tr>
<tr>
<td>Section 3: Transportation and Traffic</td>
<td>133</td>
</tr>
<tr>
<td>A Conjugate Direction Frank-Wolfe Method with Applications to the</td>
<td>133</td>
</tr>
<tr>
<td>Traffic Assignment Problem</td>
<td></td>
</tr>
<tr>
<td>Maria Daneva, Per Olov Lindberg</td>
<td></td>
</tr>
</tbody>
</table>
Online-Algorithmus zur Steuerung von Verkehrslichtsignalanlagen
Klaus Ladner

Optimal Sorting Machine Allocation in the Postal Distribution Network
Jaroslav Janáček

A Combined Approach to Solve the Pickup and Delivery Selection Problem
Jörn Schönberger, Herbert Kopfer, Dirk C. Mattfeld

VRP with interdependent Time Windows - A Case Study for the Austrian Red Cross Blood Program
Karl Doerner, Manfred Gronalt, Richard F. Hartl, Marc Reimann, Kerstin Zisser

Incident Management based on Real Time Simulation
Jürgen Zajicek, Martin Linauer, Katja Schechtner

Online-Dispatching of Automobile Service Units
Martin Grötschel, Sven O. Krumke, Jörg Rambau, Luis M. Torres

Multi-Class User Equilibria under Social Marginal Cost Pricing
Leonid Engelson, Per Olov Lindberg, Maria Daneva

School Bus Routing and Scheduling Problem
Michela Spada, Michel Bierlaire, Thomas M. Liebling

Covering Population Areas by Railway Stops
Anita Schöbel, Michael Schröder

Innovative Lösungen im bimodalnen Transport Straße / Binnenstraße
Joachim R. Daduna, Johannes Schröter

Optimal Routing of Snowplows - A Column Generation Approach
Nima Golbaharan, Per Olov Lindberg, Maud Göthe Lundgren

Savings based Ants for large-scale Vehicle Routing Problems
Marc Reimann, Karl Doerner
Section 4: Scheduling and Project Management

Single Machine Scheduling Problems with Exponentially Start Time Dependent Job Processing Times
Adam Janiak, Maciej Lichtenstein

Scheduling Problems with Optimal Due Interval Assignment Subject to some Generalized Criteria
Adam Janiak, Marcin Marek

A New Exact Resource Allocation Model with Hard and Soft Resource Constraints
Ferenc Kruzslicz

Minimizing Total Weighted Tardiness on Parallel Batch Process Machines Using Genetic Algorithms
Lars Mönch, Hari Balasubramanian, John W. Fowler, Michele E. Pfund

Sorting with Line Storage Systems
Thomas Epping, Winfried Hochstättler

On Solvability of the Project Scheduling Problem with Accumulative Resources of an Arbitrary Sign
Edward Gimadi, Sergey Sebastianov

Section 5: Telecommunication and Information Technology

Cost Optimized Layout of Fibre Optic Networks in the Access Net Domain
Peter Bachhiesl, Gernot Paulus, Markus Prossegger Joachim Werner, Herbert Stögner

Ein Algorithmus zur sicheren elektronischen Stimmabgabe über das Internet
Alexander Prosser, Robert Müller-Török

Section 6: Energy and Environment

Accelerated MILP-Strategies for the Optimal Operation Planning of Energy Supply System
Peter Hackländer, Johannes F. Verstege

On On-line Systems for Short-term Forecasting for Energy systems
Henrik Aalborg Nielsen, Torben Skov Nielsen, Henrik Madsen
Combining Bottom-up and Finance Modelling for Electricity Markets 272
Christoph Weber

Gestaltung von Stoffstrom-Netzwerken zum Produktrecycling 278
Thomas Spengler, Grit Walther

Ein Ansatz zur Bewertung von Remanufacturingstrategien 284
Axel Tuma, Baptiste Lebreton

Environmental Coordination of Supply Chain Networks Based on a Multi-Agent System 290
Axel Tuma, Jürgen Friedl

Jutta Geldermann, Nurten Avci, Stefan Wenzel, Otto Rentz

Fuzzy Scheduling for the Dismantling of Complex Products 302
Frank Schultmann, Otto Rentz

Section 7: Public Economy, Health, Agriculture, Education 309

Group Decision Making Versus Expert Opinion in the Multi-Objective Analysis of Ecosystem Management 309
Lidija Zadnik Stirn

Section 8: Banking, Finance, Insurance, Risk Management 315

Roland Mestel, Henryk Gurgul, Christoph Schleicher

On Tail Index Estimation and Financial Risk Management Implications 321
Niklas Wagner

Project Risk Management by a Probabilistic Expert System 329
Andre Ahuja, Wilhelm Rödder
Regulatory Impacts on Credit Portfolio Management
Ursula Theiler, Vladimir Bugera, Alla Revenko, Stanislav Uryasev

Verfahren zur Risikokapitalallokation im Eigenhandel von Banken
Mario Straßerger

Section 9: Continuous Optimization

Process Optimization via Conventional Factorial Designs and Simulated Annealing on the Path of Steepest Ascent for a CSTR
Pongchanun Luangpaiboon

Optimization on Directionally Convex Sets
Vladimir Naidenko

Section 10: Discrete and Combinatorial Optimization

Meta-Heuristiken in Virtuellen Lernumgebungen
Torsten Reiners, Imke Sassen, Stefan Voß

An evolutionary algorithm for Bayesian network triangulation
Tomasz Łukaszewski

Approximation algorithms for the k-center problem: an experimental evaluation
Jurij Mihelic, Borut Robic

MaxFlow-MinCut Duality for a Paint Shop Problem
Thomas Epping, Winfried Hochstättler, Marco E. Lübbecke

From Edge Decomposition Formulae to Composition Algorithms
André Pöritz

The Complexity of Some Problems on Maximal Independent Sets in Graphs
Igor Zverovich, Yury Orlovich

Section 11: Stochastic and Dynamic Programming

Testing Solution Quality In Stochastic Programs
David P. Morton
Scenario Updating Method for Stochastic Mixed-integer Programming Problems
Guglielmo Lulli, Suvrajeet Sen

Pricing of Multidimensional Resources in Revenue Management
Jens Feller

A Note on Quantitative Stability and Empirical Estimates in Stochastic Programming
Vlasta Kanková, Michal Houda

Splitting and Localization of the Epi-Topology Combined with Randomness
Petr Lachout

Section 12: Simulation

Standards für Modellierung und Simulation
Claus-Burkard Böhnlein

Section 13: Control Theory, System Dynamics, Dynamic Games

System Dynamics(SD) - An Approach within Corporate Planning
Peter Bradl

Optimal Decision Rules in a Monetary Union
Doris A. Behrens, Reinhard Neck

Impact of Feedback Loop on Group Decision Process when Applying System Dynamic Simulators
Andrej Skraba, Miroljub Kljajic

Section 14: Game Theory, Auctioning and Bidding, Experimental Economics

The Management Game SINTO-Market - Report on some recent Experiments
Otwin Becker, Tanja Feit, Ulrike Leopold-Wildburger, Susanne Lind-Braucher, Jörg Schütze, Reinhard Selten

Bounds & Likelihood Procedure Revisited
Otwin Becker, Johannes Leitner, Ulrike Leopold-Wildburger, Jörg Schütze
On the Allocation of Excess of Resources in Linear Production Problems 465
F. R. Fernandez, G. Fiestras, I. Garcia-Jurado, J. Puerto

Section 15: Econometrics, Statistics and Mathematical Economics 471

Simulation eines CO₂-Zertifikatenhandels und algorithmische Optimierung von Investitionen 471
Silja Meyer-Nieberg, Stefan Pickl

Indirect Expenditure Functions and Shephard’s Lemma 474
S. Fuchs-Seliger

Bayesian Estimation of the Heston Stochastic Volatility Model 480
Sylvia Frühwirt-Schnatter, Leopold Sögner

Forecasting with Leading Economic Indicators - A Neural Network Approach 486
Timotej Jagric

Estimating Multivariate Conditional Distributions - An Application to the Truck Sales Forecast 492
Eric A. Stützle, Tomas Hrycej

Application of Techniques of Functional Data Analysis to Spectroscopic Data 498
Vera Hofer

Integrating Exchange Rate Theory in Data Mining 504
Bernd Brandl

The Ability of Artificial Neural Networks to Exploit Non-Linearity by Data Mining Models Compared to Statistical Methods 510
Lutz Beinsen, Bernd Brandl

Section 16: Fuzzy Logic, Multicriteria Decision Making, Decision Theory 517

Preference Measurement with Conjoint Analysis and AHP: An Empirical Comparison 517
Roland Helm, Laura Manthey, Armin Scholl, Michael Steiner

Further Development of MADM-Approaches in China and in Germany 525
Jutta Geldermann, Kejing Zhang, Otto Rentz
Wissensrevision in einer MaxEnt/MinREnt-Umgebung 533
Elmar Reucher, Wilhelm Rödder

Innovation, Operations Research & Decision Support in the Military 539
Heiner Micko

Von der Prädikatenlogik zur unternehmerischen Entscheidungsunterstützung 545
Friedhelm Kulmann, Wilhelm Rödder
Operations Research Proceedings 2002
Selected Papers of the International Conference on
Operations Research (SOR 2002), Klagenfurt,
September 2-5, 2002
Leopold-Wildburger, U.; Rendl, F.; Wascher, G. (Eds.)
2003, XVIII, 550 p. 103 illus., Softcover
ISBN: 978-3-540-00387-8