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Modellierung von Planungs- und Entscheidungsproblemen des Operations Research mit OPL Springer

With the growth of renewable energy sources, microgrids have become a key component in the distribution of power to localized areas while connected to the traditional grid or operating in a disconnected island mode. Based on the extensive real-world experience of the authors, this cutting-edge resource provides a basis for the design, installation, and day-by-day management of microgrids. Professionals find coverage of the critical aspects they need to understand, from the initial planning and the selection of the most appropriate technologies and equipment, to optimal management and real-time control. Moreover, this forward-looking book places emphasis on new architectures of the energy systems of the future. Written in accessible language with practical examples, the book explains advanced topics such as optimization algorithms for energy management systems, control issues for both on-grid and island mode, and microgrid protection. Practitioners are also provided with a complete vision for the deployment of the microgrid in smart cities.

Conference on Declarative Programming, DECLARE 2019, Unifying INAP, WLP, and WFLP, Cottbus, Germany, September 9–12, 2019, Revised Selected Papers
Artech House

This proceedings volume contains research trends, issues and developments in global economics and management with particular focus on the digital postindustrial economy—Economy 4.0. Featuring papers presented at the Economic and Management session of the 2018 Prospects of Fundamental Science Development International Conference (PFSD 2018) held in Tomsk, Russia, this book presents new models, methods, analyses, and approaches to different sectors of economics and management such as tax policy, labor economics, econometrics, municipal management systems, and international finance, among others. The papers are related to three main topics:

Theoretical approaches to the development of Economy 4.0, the construction of a postindustrial society, and their impact on the labor market, finance,

public and social values. Innovative methods and models are mentioned as well. The creation and implementation of cryptocurrencies and block chain technology. Comparative analysis of regional and institutional economics in different countries such as Russia, China, the United States and the EU, among others. Regulation, supervision, accounting and economic security measures are also explored. Featuring industry-specific case studies in sectors such as oil and gas, agriculture, pharmaceuticals, IT and ecology, this book is a useful reference for academics, students, practitioners, and scholars in economics.

Advances in Vehicular Networks John Wiley & Sons

This Special Issue “ Power System Simulation, Control and Optimization ” offers valuable insights into the most recent research developments in these topics. The analysis, operation, and control of power systems are increasingly complex tasks that require advanced simulation models to analyze and control the effects of transformations concerning electricity grids today: Massive integration of renewable energies, progressive implementation of electric vehicles, development of intelligent networks, and progressive evolution of the applications of artificial intelligence.

Bridging the Gap between Theory and Practice Cengage Learning

This volume LNCS 12735 constitutes the papers of the 18th International Conference on the Integration of Constraint Programming, Artificial Intelligence, and Operations Research, CPAIOR 2021, which was held in Vienna, Austria, in 2021. Due to the COVID-19 pandemic the conference was held online. The 30 regular papers presented were carefully reviewed and selected from a total of 75 submissions. The conference program included a Master Class on the topic "Explanation and Verification of Machine Learning Models".

Optimization and Decision Support Systems for Supply Chains Optimization and Decision Support Design Guide: Using IBM ILOG Optimization Decision Manager

This book constitutes revised selected papers from the 22nd International Conference on Applications of Declarative Programming and Knowledge Management, INAP 2019, the 33rd Workshop on Logic Programming, WLP 2019, and the 27th Workshop on Functional and (Constraint) Logic Programming, WFLP 2019. The 15 full papers and 1 short paper presented in this volume were carefully reviewed and selected from 24 submissions. The contributions present current research activities in the areas of declarative languages and compilation techniques, in particular for constraint-based, logical and functional languages and their extensions, as well as discuss new approaches and key findings in constraint-solving, knowledge representation, and reasoning techniques.

23rd European Symposium on Computer Aided Process Engineering CRC Press

Delays and cost overruns are common facts in construction projects due to its increasing complexity, the day-to-day dynamic changes, the stricter execution constraints, and the general lack of efficient scheduling tools to support the optimization of construction plans. Currently, many scheduling tools and techniques are available, in addition to a large body of literature that focus on schedule optimization. Such tools and techniques, however, do not adequately represent or incorporate various practical decisions and constraints, nor provide the project

manager with the ability to examine the combinations of actions in order to either plan or bring the project back within the constraints. This research enhances the schedule optimization research by efficiently modeling real-life decisions and constraints, and develops a framework to optimize planning and corrective-action decisions; dynamically before and during construction. The development of the proposed framework starts with a basic model that suits the schedule optimization decisions at the preconstruction stage. This model is then extended to a generic model that accommodates the dynamic schedule optimization needs during construction. The enhancements and extensions are formulated in a generic mathematical formulation to optimize the schedule's decisions at any stage. This formulation integrates a wide range of scheduling options (e.g., linear crashing, activity multimodes, overlapping, and multipath networks), and incorporates the project manager's preferences about the corrective-action decisions' implementation. The formulation also considers a variety of practical constraints (e.g., variable resource availability, correlated modes, and intermediate milestones); and uses a multi-objective optimization to tradeoff among the project time, cost, resources, and permissible schedule changes during construction. Based on the mathematical formulation, the proposed framework was then coded using the advanced v constraint programming tool "IBM ILOG CPLEX Optimization Studio". To validate the model, multiple experiments on four case studies were used to prove the functionality, practicality, and its better representation of real-life construction challenges. Two of these case studies are taken from the literature to prove the ability of the comprehensive model to achieve better solutions. Construction experts were also consulted at multiple stages of this work to investigate the relevance of the framework. Introducing the proposed framework as an add-on to standard project management software is expected to change the practitioners' perception that optimization is a theoretical and complex tool. Therefore, it helps to present optimization as a useful decision support tool for construction scheduling.

Principles and Practice of Constraint Programming IBM Redbooks

This contributed volume presents a collection of materials on supply chain management including industry-based case studies addressing petrochemical, pharmaceutical, manufacturing and reverse logistics topics. Moreover, the book covers sustainability issues, as well as optimization approaches. The target audience comprises academics, industry managers, and practitioners in the field of supply chain management, being the book also beneficial for graduate students

Optimization and Decision Support Design Guide: Using IBM ILOG Optimization Decision Manager Academic Press

Das Buch führt anwendungsorientiert in die Optimization Programming Language (OPL) zur Modellierung linearer und ganzzahliger linearer Optimierungsprobleme im Rahmen des IBM ILOG CPLEX Optimization Studio ein. Es beinhaltet zehn aufeinander aufbauende Lektionen, ergänzt um zahlreiche Aufgaben und Anwendungsstudien. Das Buch richtet sich an Lehrende und Studierende der Betriebswirtschaftslehre mit quantitativer Ausrichtung (Operations Research), (Wirtschafts-)Informatiker, (Wirtschafts-)Mathematiker und Wirtschaftsingenieure und kann an Universitäten und Hochschulen in entsprechenden Vorlesungs- und Kursangeboten eingesetzt werden. Zudem eignet es sich zum Selbststudium für Praktiker, die mit der Modellierung und Optimierung von Planungs- und Entscheidungsproblemen befasst sind und einen fundierten Einstieg in die Software benötigen. Über die buchbegleitende Website sind unter anderem Aufgabenlösungen und sämtliche Programm-Codes abrufbar: www.opl-buch.de

Angewandte Optimierung mit IBM ILOG CPLEX Optimization Studio Springer Nature

This book constitutes the refereed proceedings of the 12th International Conference on Optimization and Applications, OPTIMA 2021, held in Petrovac, Montenegro, in September-October 2021. The 22 full and 3 short papers presented were carefully reviewed and selected from 63 submissions. The papers are organized into the following topical sub-headings: mathematical programming, global optimization, discrete and combinatorial optimization,

optimal control, optimization and data analysis, and game theory and mathematical economics. *12th International Conference, OPTIMA 2021, Petrovac, Montenegro, September 27 – October 1, 2021, Proceedings* Springer Nature

A PRACTICAL GUIDE TO OPTIMIZATION PROBLEMS WITH DISCRETE OR INTEGER VARIABLES, REVISED AND UPDATED The revised second edition of Integer Programming explains in clear and simple terms how to construct custom-made algorithms or use existing commercial software to obtain optimal or near-optimal solutions for a variety of real-world problems. The second edition also includes information on the remarkable progress in the development of mixed integer programming solvers in the 22 years since the first edition of the book appeared. The updated text includes information on the most recent developments in the field such as the much improved preprocessing/presolving and the many new ideas for primal heuristics included in the solvers. The result has been a speed-up of several orders of magnitude. The other major change reflected in the text is the widespread use of decomposition algorithms, in particular column generation (branch-(cut)-and-price) and Benders' decomposition. The revised second edition: Contains new developments on column generation Offers a new chapter on Benders' algorithm Includes expanded information on preprocessing, heuristics, and branch-and-cut Presents several basic and extended formulations, for example for fixed cost network flows Also touches on and briefly introduces topics such as non-bipartite matching, the complexity of extended formulations or a good linear program for the implementation of lift-and-project Written for students of integer/mathematical programming in operations research, mathematics, engineering, or computer science, Integer Programming offers an updated edition of the basic text that reflects the most recent developments in the field.

Wired/Wireless Internet Communication Springer

This book presents healthcare logistics solutions that have been successfully implemented at a variety of healthcare facilities. In each case, a major challenge is presented, along with the solution approach and implementation steps, followed by the impact on hospital operations. Problems encountered when implementing the results in practice are also discussed. Much of the work presented is drawn from the experiences of members of the Center for Healthcare Operations Improvement and Research (CHOIR) at Twente, along with the CHOIR spin-off company, Rhythm.

Principles and Practice of Constraint Programming Springer

This textbook addresses the conceptual and practical aspects of the various phases of the lifecycle of service systems, ranging from service ideation, design, implementation, analysis, improvement and trading associated with service systems engineering. Written by leading experts in the field, this indispensable textbook will enable a new wave of future professionals to think in a service-focused way with the right balance of competencies in computer science, engineering, and management. Fundamentals of Service Systems is a centerpiece for a course syllabus on service systems. Each chapter includes a summary, a list of learning objectives, an opening case, and a review section with questions, a project description, a list of key terms, and a list of further reading bibliography. All these elements enable students to learn at a faster and more comfortable pace. For researchers, teachers, and students who want to learn about this new emerging science, Fundamentals of Service Systems provides an overview of the core disciplines underlying the study of service systems. It is aimed at students of information systems, information technology, and business and economics. It also targets business and IT practitioners, especially those who are looking for better ways of innovating, designing, modeling, analyzing, and optimizing service systems.

Algorithm-Driven Truss Topology Optimization for Additive Manufacturing MDPI

Multi-Objective Combinatorial Optimization Problems and Solution Methods discusses the results of a recent multi-objective combinatorial optimization achievement that considered metaheuristic, mathematical programming, heuristic, hyper heuristic and hybrid approaches. In other words, the book presents various multi-objective combinatorial optimization issues that may benefit from different methods in theory and practice. Combinatorial optimization problems appear in a wide range of applications in operations research, engineering, biological sciences and computer science, hence many optimization approaches have been developed that link the discrete universe to the continuous universe through geometric, analytic and algebraic techniques. This book covers this important topic as computational optimization has become increasingly popular as design optimization and its applications in engineering and industry have become ever more important due to more stringent design requirements in modern engineering practice. Presents a collection of the most up-to-date research, providing a complete overview of multi-objective combinatorial optimization problems and applications Introduces new approaches to handle different engineering and science problems, providing the field with a collection of related research not already covered in the primary literature Demonstrates the efficiency and power of the various algorithms, problems and solutions, including numerous examples that illustrate concepts and algorithms

Modeling and Solving Problems in the Complex World Elsevier Inc. Chapters

Computer-aided process engineering (CAPE) plays a key design and operations role in the process industries, from the molecular scale through managing complex manufacturing sites. The research interests cover a wide range of interdisciplinary problems related to the current needs of society and industry. ESCAPE 23 brings together researchers and practitioners of computer-aided process engineering interested in modeling, simulation and optimization, synthesis and design, automation and control, and education. The proceedings present and evaluate emerging as well as established research methods and concepts, as well as industrial case studies. Contributions from the international community using computer-based methods in process engineering Reviews the latest developments in process systems engineering Emphasis on industrial and societal challenges

Multi-Objective Combinatorial Optimization Problems and Solution Methods John Wiley & Sons

This work presents a novel, efficient and expressive Constraint Programming (CP) approach to the short-term scheduling problem of multistage batch plants. The CP model accounts for many features found in industrial settings and allows modeling operational policies that group batches of the same product into campaigns. Product campaigns simplify the plant operation and allow reducing scrap and changeover times. The formulation has been extensively tested with various examples, including large-scale ones, and different objective functions. Comparisons with results reported in recent contributions are also presented and discussed.

Angewandte Optimierung mit IBM ILOG CPLEX Optimization Studio Springer

AMPL, developed at AT&T's Bell Laboratories, is a powerful, yet easy-to-use modeling environment for problems in linear, nonlinear, network, and integer programming. Users can formulate optimization models and analyze solutions using common algebraic notation; the computer manages the interface to advanced optimizers. In less advanced programming software, students must write out every variable and constraint explicitly. AMPL's powerful display commands encourage creative responses to modeling assignments. The AMPL Student Edition is a full-featured version of the AMPL and optimizer software that accepts problems up to 300 variables and 300 constraints. AMPL's modeling approach can handle real-world problems. AMPL student models easily scale up to optimization problems of realistic size. AMPL Student

Edition comes with both the MINOS and CPLEX solvers. Beginners need only type solve to invoke an optimizer, but advanced students have full access to algorithmic options because the AMPL Student Edition works just like the professional editions that run on computers from PCs to Crays. Classroom skills transfer directly to the job environment.

Applying Constraint Programming to Scheduling Problems Springer Nature

This book constitutes the proceedings of the 26th International Conference on Principles and Practice of Constraint Programming, CP 2020, held in Louvain-la-Neuve, Belgium, in September 2020. The conference was held virtually due to the COVID-19 pandemic. The 55 full papers presented in this volume were carefully reviewed and selected from 122 submissions. They deal with all aspects of computing with constraints including theory, algorithms, environments, languages, models, systems, and applications such as decision making, resource allocation, scheduling, configuration, and planning. The papers were organized according to the following topics/tracks: technical track; application track; and CP and data science and machine learning.

Business Analytics for Decision Making MDPI

This book constitutes the proceedings of the 16th International Conference on Integration of Constraint Programming, Artificial Intelligence, and Operations Research, CPAIOR 2019, held in Thessaloniki, Greece, in June 2019. The 34 full papers presented together with 9 short papers were carefully reviewed and selected from 94 submissions. The conference brings together interested researchers from Constraint Programming (CP), Artificial Intelligence (AI), and Operations Research (OR) to present new techniques or applications and to provide an opportunity for researchers in one area to learn about techniques in the others. A main objective of this conference series is also to give these researchers the opportunity to show how the integration of techniques from different fields can lead to interesting results on large and complex problems.

Handbook of Healthcare Logistics Springer Nature

Optimization and Decision Support Design Guide: Using IBM ILOG Optimization Decision Manager IBM Redbooks

25th International Conference, CP 2019, Stamford, CT, USA, September 30 – October 4, 2019, Proceedings Springer

This book constitutes the proceedings of the 25th International Conference on Principles and Practice of Constraint Programming, CP 2019, held in Stamford, CT, USA, France, in September/October 2019. The 44 full papers presented in this volume were carefully reviewed and selected from 118 submissions. They deal with all aspects of computing with constraints including theory, algorithms, environments, languages, models, systems, and applications such as decision making, resource allocation, scheduling, configuration, and planning. The papers were organized according to the following topics/tracks: technical track; application track; multi-agent and parallel CP track; testing and verification track; CP and data science track; computational sustainability; and CP and life sciences track.