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KEY=THEORY - MATA MARSHALL

SCHEDULING

THEORY, ALGORITHMS, AND SYSTEMS

Springer Science & Business Media *This new edition of the well established text Scheduling - Theory, Algorithms, and Systems provides an up-to-date coverage of important theoretical models in the scheduling literature as well as significant scheduling problems that occur in the real world. It again includes supplementary material in the form of slide-shows from industry and movies that show implementations of scheduling systems. The main structure of the book as per previous edition consists of three parts. The first part focuses on deterministic scheduling and the related combinatorial problems. The second part covers probabilistic scheduling models; in this part it is assumed that processing times and other problem data are random and not known in advance. The third part deals with scheduling in practice; it covers heuristics that are popular with practitioners and discusses system design and implementation issues. All three parts of this new edition have been revamped and streamlined. The references have been made completely up-to-date. Theoreticians and practitioners alike will find this book of interest. Graduate students in operations management, operations research, industrial engineering, and computer science will find the book an accessible and invaluable resource. Scheduling - Theory, Algorithms, and Systems will serve as an essential reference for professionals working on scheduling problems in manufacturing, services, and other environments. Reviews of third edition: This well-established text covers both the theory and practice of scheduling. The book begins with motivating examples and the penultimate chapter discusses some commercial scheduling systems and examples of their implementations." (Mathematical Reviews, 2009)*

SCHEDULING

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PLANNING AND SCHEDULING IN MANUFACTURING AND SERVICES

Springer Science & Business Media *Pinedo is a major figure in the scheduling area (well versed in both stochastics and combinatorics) , and knows both the academic and practitioner side of the discipline. This book includes the integration of case studies into the text. It will appeal to engineering and business students interested in operations research.* IOS Press

OPERATIONS SCHEDULING WITH APPLICATIONS IN MANUFACTURING AND SERVICES

Irwin Professional Publishing *This text provides coverage of scheduling for operations, both manufacturing and services. It includes: reservations systems; systems design; flexible system scheduling; workforce scheduling; and future scheduling issues such as Web-based systems.*

DATA-INTENSIVE WORKFLOW MANAGEMENT

Springer Nature *Workflows may be defined as abstractions used to model the coherent flow of activities in the context of an in silico scientific experiment. They are employed in many domains of science such as bioinformatics, astronomy, and engineering. Such workflows usually present a considerable number of activities and activations (i.e., tasks associated with activities) and may need a long time for execution. Due to the continuous need to store and process data efficiently (making them data-intensive workflows), high-performance computing environments allied to parallelization techniques are used to run these workflows. At the beginning of the 2010s, cloud technologies emerged as a promising environment to run scientific workflows. By using clouds, scientists have expanded beyond single parallel computers to hundreds or even thousands of virtual machines. More recently, Data-Intensive Scalable Computing (DISC) frameworks (e.g., Apache Spark and Hadoop) and environments emerged and are being used to execute data-intensive workflows. DISC environments are composed of processors and disks in large-commodity computing clusters connected using high-speed communications switches and networks. The main advantage of DISC frameworks is that they support and grant efficient in-memory data management for large-scale applications, such as data-intensive workflows. However, the execution of workflows in cloud and DISC environments raise many challenges such as scheduling workflow activities and activations, managing produced data, collecting provenance data, etc. Several existing approaches deal with the challenges mentioned earlier. This way, there is a real need for understanding how to manage these workflows and various big data platforms that have been developed and introduced. As such, this book can help researchers understand how linking workflow management with Data-Intensive Scalable Computing can help in understanding and analyzing scientific big data. In this book, we aim to identify and distill the body of work on workflow management in clouds and DISC environments. We start by discussing the basic principles of data-intensive scientific workflows. Next, we present two workflows that are executed in a single site and multi-site clouds taking advantage of provenance. Afterward, we go towards workflow management in DISC environments, and we present, in detail, solutions that enable the optimized execution of the workflow using frameworks such as Apache Spark and its extensions.*

HANDBOOK OF SCHEDULING

ALGORITHMS, MODELS, AND PERFORMANCE ANALYSIS

CRC Press *Researchers in management, industrial engineering, operations, and computer science have intensely studied scheduling for more than 50 years, resulting in an astounding body of knowledge in this field. Handbook of Scheduling: Algorithms, Models, and Performance Analysis, the first handbook on scheduling, provides full coverage of the most re*

MULTIDISCIPLINARY SCHEDULING: THEORY AND APPLICATIONS

1ST INTERNATIONAL CONFERENCE, MISTA '03 NOTTINGHAM, UK, 13-15 AUGUST 2003. SELECTED PAPERS

Springer Science & Business Media *Multidisciplinary Scheduling: Theory and Applications is a volume of nineteen reviewed papers that were selected from the sixty-seven papers presented during the First Multidisciplinary International Conference of Scheduling (MISTA). This is the initial volume of MISTA—the primary forum on interdisciplinary research on scheduling research. Each paper in the volume has been rigorously reviewed and carefully copyedited to ensure its readability. The MISTA volume focuses on the following leading edge topics: Fundamentals of Scheduling, Multi-Criteria Scheduling, Personnel Scheduling, Scheduling in Space, Scheduling the Internet, Machine Scheduling, Bin Packing, Educational Timetabling, Sports Scheduling, and Transport Scheduling.*

MINING GOES DIGITAL

PROCEEDINGS OF THE 39TH INTERNATIONAL SYMPOSIUM 'APPLICATION OF COMPUTERS AND OPERATIONS RESEARCH IN THE MINERAL INDUSTRY' (APCOM 2019), JUNE 4-6, 2019, WROCLAW, POLAND

CRC Press *The conferences on 'Applications for Computers and Operations Research in the Minerals Industry' (APCOM) initially focused on the optimization of geostatistics and resource estimation. Several standard methods used in these fields were presented in the early days of APCOM. While geostatistics remains an important part, information technology has emerged, and nowadays APCOM not only focuses on geostatistics and resource estimation, but has broadened its horizon to Information and Communication Technology (ICT) in the mineral industry. Mining Goes Digital is a collection of 90 high quality, peer reviewed papers covering recent ICT-related developments in: - Geostatistics and Resource Estimation - Mine Planning - Scheduling and Dispatch - Mine Safety and Mine Operation - Internet of Things, Robotics - Emerging Technologies - Synergies from other industries - General aspects of Digital Transformation in Mining Mining Goes Digital will be of interest to professionals and academics involved or interested in the above-mentioned areas.*

TIME-DEPENDENT SCHEDULING

Springer Science & Business Media *Time-dependent scheduling involves problems in which the processing times of jobs depend on when those jobs are started. This book is a comprehensive study of complexity results and optimal and suboptimal algorithms concerning time-dependent scheduling in single-, parallel- and dedicated-machine environments. In addition to complexity issues and exact or heuristic algorithms which are typically presented in scheduling books, the author also includes more advanced topics such as matrix methods in time-dependent scheduling, and time-dependent*

scheduling with two criteria. The reader should be familiar with basic notions of calculus, discrete mathematics and combinatorial optimization theory, while the book offers introductory material on NP-complete problems, and the basics of scheduling theory. The author includes numerous examples, figures and tables, he presents different classes of algorithms using pseudocode, and he completes the book with an extensive bibliography, and author, symbol and subject indexes. The book is suitable for researchers working on scheduling, problem complexity, optimization, heuristics and local search algorithms.

EVOLUTIONARY SCHEDULING

Springer Science & Business Media *Evolutionary scheduling is a vital research domain at the interface of artificial intelligence and operational research. This edited book gives an overview of many of the current developments in the large and growing field of evolutionary scheduling. It demonstrates the applicability of evolutionary computational techniques to solve scheduling problems, not only to small-scale test problems, but also fully-fledged real-world problems.*

RECENT ADVANCES IN MEMETIC ALGORITHMS

Springer *Memetic algorithms are evolutionary algorithms that apply a local search process to refine solutions to hard problems. Memetic algorithms are the subject of intense scientific research and have been successfully applied to a multitude of real-world problems ranging from the construction of optimal university exam timetables, to the prediction of protein structures and the optimal design of space-craft trajectories. This monograph presents a rich state-of-the-art gallery of works on memetic algorithms. Recent Advances in Memetic Algorithms is the first book that focuses on this technology as the central topical matter. This book gives a coherent, integrated view on both good practice examples and new trends including a concise and self-contained introduction to memetic algorithms. It is a necessary read for postgraduate students and researchers interested in recent advances in search and optimization technologies based on memetic algorithms, but can also be used as complement to undergraduate textbooks on artificial intelligence.*

ANT COLONY OPTIMIZATION

MIT Press *An overview of the rapidly growing field of ant colony optimization that describes theoretical findings, the major algorithms, and current applications. The complex social behaviors of ants have been much studied by science, and computer scientists are now finding that these behavior patterns can provide models for solving difficult combinatorial optimization problems. The attempt to develop algorithms inspired by one aspect of ant behavior, the ability to find what computer scientists would call shortest paths, has become the field of ant colony optimization (ACO), the most successful and widely recognized algorithmic technique based on ant behavior. This book presents an overview of this rapidly growing field, from its theoretical inception to practical applications, including descriptions of many available ACO algorithms and their uses. The book first describes the translation of observed ant behavior into working optimization algorithms. The ant colony metaheuristic is then introduced and viewed in the general context of combinatorial optimization. This is followed by a detailed description and guide to all major ACO algorithms and a report on current theoretical findings. The book surveys ACO applications now in use, including routing, assignment, scheduling, subset, machine learning, and bioinformatics problems. AntNet, an ACO algorithm designed for the network routing problem, is described in detail. The authors conclude by summarizing the progress in the field and outlining future research directions. Each chapter ends with bibliographic material, bullet points setting out important ideas covered in the chapter, and exercises. Ant Colony Optimization will be of interest to academic and industry researchers, graduate students, and practitioners who wish to learn how to implement ACO algorithms.*

MULTIAGENT SCHEDULING

MODELS AND ALGORITHMS

Springer Science & Business Media *Scheduling theory has received a growing interest since its origins in the second half of the 20th century. Developed initially for the study of scheduling problems with a single objective, the theory has been recently extended to problems involving multiple criteria. However, this extension has still left a gap between the classical multi-criteria approaches and some real-life problems in which not all jobs contribute to the evaluation of each criterion. In this book, we close this gap by presenting and developing multi-agent scheduling models in which subsets of jobs sharing the same resources are evaluated by different criteria. Several scenarios are introduced, depending on the definition and the intersection structure of the job subsets. Complexity results, approximation schemes, heuristics and exact algorithms are discussed for single-machine and parallel-machine scheduling environments. Definitions and algorithms are illustrated with the help of examples and figures.*

HANDBOOK OF PRODUCTION SCHEDULING

Springer Science & Business Media *This book concentrates on real-world production scheduling in factories and industrial settings. It includes industry case studies that use innovative techniques as well as academic research results that can be used to improve production scheduling. Its purpose is to present scheduling principles, advanced tools, and examples of innovative scheduling systems to persons who could use this information to improve their own production scheduling.*

ALGORITHMS AND THEORY OF COMPUTATION HANDBOOK, SECOND EDITION, VOLUME 1

GENERAL CONCEPTS AND TECHNIQUES

CRC Press *Algorithms and Theory of Computation Handbook, Second Edition: General Concepts and Techniques provides an up-to-date compendium of fundamental computer science topics and techniques. It also illustrates how the topics and techniques come together to deliver efficient solutions to important practical problems. Along with updating and revising many of the existing chapters, this second edition contains four new chapters that cover external memory and parameterized algorithms as well as computational number theory and algorithmic coding theory. This best-selling handbook continues to help computer professionals and engineers find significant information on various algorithmic topics. The expert contributors clearly define the terminology, present basic results and techniques, and offer a number of current references to the in-depth literature. They also provide a glimpse of the major research issues concerning the relevant topics.*

EMBEDDED SYSTEM DESIGN

EMBEDDED SYSTEMS FOUNDATIONS OF CYBER-PHYSICAL SYSTEMS

Springer Science & Business Media *Until the late 1980s, information processing was associated with large mainframe computers and huge tape drives. During the 1990s, this trend shifted toward information processing with personal computers, or PCs. The trend toward miniaturization continues and in the future the majority of information processing systems will be small mobile computers, many of which will be embedded into larger products and interfaced to the physical environment. Hence, these kinds of systems are called embedded systems. Embedded systems together with their physical environment are called cyber-physical systems. Examples include systems such as transportation and fabrication equipment. It is expected that the total market volume of embedded systems will be significantly larger than that of traditional information processing systems such as PCs and mainframes. Embedded systems share a number of common characteristics. For example, they must be dependable, efficient, meet real-time constraints and require customized user interfaces (instead of generic keyboard and mouse interfaces). Therefore, it makes sense to consider common principles of embedded system design. Embedded System Design starts with an introduction into the area and a survey of specification models and languages for embedded and cyber-physical systems. It provides a brief overview of hardware devices used for such systems and presents the essentials of system software for embedded systems, like real-time operating systems. The book also discusses evaluation and validation techniques for embedded systems. Furthermore, the book presents an overview of techniques for mapping applications to execution platforms. Due to the importance of resource efficiency, the book also contains a selected set of optimization techniques for embedded systems, including special compilation techniques. The book closes with a brief survey on testing. Embedded System Design can be used as a text book for courses on embedded systems and as a source which provides pointers to relevant material in the area for PhD students and teachers. It assumes a basic knowledge of information processing hardware and software. Courseware related to this book is available at http://ls12-www.cs.tu-dortmund.de/~marwedel.*

PRINCIPLES OF SEQUENCING AND SCHEDULING

John Wiley & Sons *An updated edition of the text that explores the core topics in scheduling theory The second edition of Principles of Sequencing and Scheduling has been revised and updated to provide comprehensive coverage of sequencing and scheduling topics as well as emerging developments in the field. The text offers balanced coverage of deterministic models and stochastic models and includes new developments in safe scheduling and project scheduling, including coverage of project analytics. These new topics help bridge the gap between classical scheduling and actual practice. The authors—noted experts in the field—present a coherent and detailed introduction to the basic models, problems, and methods of scheduling theory. This book offers an introduction and overview of sequencing and scheduling and covers such topics as single-machine and multi-machine models, deterministic and stochastic problem formulations, optimization and heuristic solution approaches, and generic and specialized software methods. This new edition adds coverage on topics of recent interest in shop scheduling and project scheduling. This important resource: Offers comprehensive coverage of deterministic models as well as recent approaches and developments for stochastic models Emphasizes the application of generic optimization software to basic sequencing problems and the use of spreadsheet-based optimization methods Includes updated coverage on safe scheduling, lognormal modeling, and job selection Provides basic coverage of robust scheduling as contrasted with safe scheduling Adds a new chapter on project analytics, which supports the PERT21 framework for project scheduling in a stochastic environment. Extends the coverage of PERT 21 to include hierarchical scheduling Provides end-of-chapter references and access to advanced Research Notes, to aid readers in the further exploration of advanced topics Written for upper-undergraduate and graduate level courses covering such topics as scheduling theory and applications, project scheduling, and operations scheduling, the second edition of Principles of Sequencing and Scheduling is a resource that covers scheduling techniques and contains the most current research and emerging topics.*

MANUFACTURING SCHEDULING SYSTEMS

AN INTEGRATED VIEW ON MODELS, METHODS AND TOOLS

Springer Science & Business Media *The book is devoted to the problem of manufacturing scheduling, which is the efficient allocation of jobs (orders) over machines (resources) in a manufacturing facility. It offers a comprehensive and integrated perspective on the different aspects required to design and implement systems to efficiently and effectively support manufacturing scheduling decisions. Obtaining economic and reliable schedules constitutes the core of excellence in customer service and efficiency in manufacturing operations. Therefore, scheduling forms an area of vital importance for competition in manufacturing companies. However, only a fraction of scheduling research has been translated into practice, due to several reasons. First, the inherent complexity of scheduling has led to an excessively fragmented field in which different sub problems and issues are treated in an independent manner as goals themselves, therefore lacking a unifying view of the scheduling problem.*

Furthermore, mathematical brilliance and elegance has sometimes taken preference over practical, general purpose, hands-on approaches when dealing with these problems. Moreover, the paucity of research on implementation issues in scheduling has restricted translation of valuable research insights into industry. "Manufacturing Scheduling Systems: An Integrated View on Models, Methods and Tools" presents the different elements constituting a scheduling system, along with an analysis the manufacturing context in which the scheduling system is to be developed. Examples and case studies from real implementations of scheduling systems are presented in order to drive the presentation of the theoretical insights. The book is intended for an ample readership including industrial engineering/operations post-graduate students and researchers, business managers, and readers seeking an introduction to the field.

PARTICLE SWARM OPTIMIZATION AND INTELLIGENCE: ADVANCES AND APPLICATIONS

ADVANCES AND APPLICATIONS

IGI Global "*This book presents the most recent and established developments of Particle swarm optimization (PSO) within a unified framework by noted researchers in the field*"--*Provided by publisher.*

INTRODUCTION TO COMPUTATIONAL OPTIMIZATION MODELS FOR PRODUCTION PLANNING IN A SUPPLY CHAIN

Springer Science & Business Media *An easy-to-read introduction to the concepts associated with the creation of optimization models for production planning starts off this book. These concepts are then applied to well-known planning models, namely mrp and MRP II. From this foundation, fairly sophisticated models for supply chain management are developed. Another unique feature is that models are developed with an eye toward implementation. In fact, there is a chapter that provides explicit examples of implementation of the basic models using a variety of popular, commercially available modeling languages.*

OPTIMIZING CURRENT STRATEGIES AND APPLICATIONS IN INDUSTRIAL ENGINEERING

IGI Global *The field of industrial engineering continues to advance at a rapid rate due to innovative technologies such as robotics and automation that improve performance and efficiencies. Emerging research on these latest trends, strategies, and techniques is needed to ensure that industry professionals remain up to date on the best practices for success. Optimizing Current Strategies and Applications in Industrial Engineering is a pivotal reference source that provides vital research on the development, improvement, implementation, and evaluation of integrated systems in engineering. While highlighting topics such as engineering economy, material handling, and operations management, this book is ideally designed for engineers, policymakers, educators, researchers, and practitioners.*

RESOURCE-CONSTRAINED PROJECT SCHEDULING

MODELS, ALGORITHMS, EXTENSIONS AND APPLICATIONS

John Wiley & Sons *This title presents a large variety of models and algorithmsdedicated to the resource-constrained project scheduling problem(RCPSP), which aims at scheduling at minimal duration a set ofactivities subject to precedence constraints and limited resourceavailabilities. In the first part, the standard variant of RCPSP is presented andanalyzed as a combinatorial optimization problem. Constraintprogramming and integer linear programming formulations are given.Relaxations based on these formulations and also on relatedscheduling problems are presented. Exact methods and heuristics aresurveyed. Computational experiments, aiming at providing anempirical insight on the difficulty of the problem, areprovided. The second part of the book focuses on several other variants ofthe RCPSP and on their solution methods. Each variant takes accountof real-life characteristics which are not considered in thestandard version, such as possible interruptions of activities,production and consumption of resources, cost-based approaches anduncertainty considerations. The last part presents industrial case studies where the RCPSPplays a central part. Applications are presented in various domainssuch as assembly shop and rolling ingots production scheduling,project management in information technology companies andinstruction scheduling for VLIW processor architectures.*

HANDBOOK OF HEALTHCARE OPERATIONS MANAGEMENT

METHODS AND APPLICATIONS

Springer Science & Business Media *From the Preface: Collectively, the chapters in this book address application domains including inpatient and outpatient services, public health networks, supply chain management, and resource constrained settings in developing countries. Many of the chapters provide specific examples or case studies illustrating the applications of operations research methods across the globe, including Africa, Australia, Belgium, Canada, the United Kingdom, and the United States. Chapters 1-4 review operations research methods that are most commonly applied to health care operations management including: queuing, simulation, and mathematical programming. Chapters 5-7 address challenges related to inpatient services in hospitals such as surgery, intensive care units, and hospital wards. Chapters 8-10 cover outpatient services, the fastest growing part of many health systems, and describe operations research models for primary and specialty care services, and how to plan for patient no-shows. Chapters 12 – 16 cover topics related to the broader integration of health services in the context of public health, including optimizing the location of emergency vehicles, planning for mass vaccination events, and the coordination among different parts of a health system. Chapters 17-18 address supply chain management within hospitals, with a focus on pharmaceutical supply management, and the challenges of managing inventory for nursing units. Finally, Chapters 19-20 provide examples of important and emerging research in the realm of humanitarian logistics.*

OPERATIONS IN FINANCIAL SERVICES

PROCESSES, TECHNOLOGIES, AND RISKS

Foundations and Trends in Technology, Information and Operations Management *Operations in Financial Services establishes a framework for this research area from an operations management perspective. The first section presents an introduction and provides an overview of the topic. The second section establishes links between the current state of the art in relevant areas of operations management and operations research and three of the more important aspects of operations in financial services - (i) financial product design and testing, (ii) process delivery design, and (iii) process delivery management. The third section focuses on the current issues that are important in the financial services operations area. These issues center primarily on mobile online banking and trading in a global environment. The fourth section discusses operational risk aspects of financial services. The final section concludes with a discussion on research directions that may become of interest in the future.*

HANDBOOK OF MAINTENANCE MANAGEMENT AND ENGINEERING

Springer Science & Business Media *To be able to compete successfully both at national and international levels, production systems and equipment must perform at levels not even thinkable a decade ago. Requirements for increased product quality, reduced throughput time and enhanced operating effectiveness within a rapidly changing customer demand environment continue to demand a high maintenance performance. In some cases, maintenance is required to increase operational effectiveness and revenues and customer satisfaction while reducing capital, operating and support costs. This may be the largest challenge facing production enterprises these days. For this, maintenance strategy is required to be aligned with the production logistics and also to keep updated with the current best practices. Maintenance has become a multidisciplinary activity and one may come across situations in which maintenance is the responsibility of people whose training is not engineering. This handbook aims to assist at different levels of understanding whether the manager is an engineer, a production manager, an experienced maintenance practitioner or a beginner. Topics selected to be included in this handbook cover a wide range of issues in the area of maintenance management and engineering to cater for all those interested in maintenance whether practitioners or researchers. This handbook is divided into 6 parts and contains 26 chapters covering a wide range of topics related to maintenance management and engineering.*

EXTREME VALUE THEORY AND APPLICATIONS

PROCEEDINGS OF THE CONFERENCE ON EXTREME VALUE THEORY AND APPLICATIONS, VOLUME 1 GAITHERSBURG MARYLAND 1993

Springer Science & Business Media *It appears that we live in an age of disasters: the mighty Missis sippi and Missouri flood millions of acres, earthquakes hit Tokyo and California, airplanes crash due to mechanical failure and the seemingly ever increasing wind speeds make the storms more and more frightening. While all these may seem to be unexpected phenomena to the man on the street, they are actually happening according to well defined rules of science known as extreme value theory. We know that records must be broken in the future, so if a flood design is based on the worst case of the past then we are not really prepared against floods. Materials will fail due to fatigue, so if the body of an aircraft looks fine to the naked eye, it might still suddenly fail if the aircraft has been in operation over an extended period of time. Our theory has by now penetrated the so cial sciences, the medical profession, economics and even astronomy. We believe that our field has come of age. In or~er to fully utilize the great progress in the theory of extremes and its ever increasing acceptance in practice, an international conference was organized in which equal weight was given to theory and practice. This book is Volume I of the Proceedings of this conference. In selecting the papers for Volume lour guide was to have authoritative works with a large variety of coverage of both theory and practice.*

HANDBOOK OF SIMULATION

PRINCIPLES, METHODOLOGY, ADVANCES, APPLICATIONS, AND PRACTICE

John Wiley & Sons *The only complete guide to all aspects and uses of simulation-from the international leaders in the field There has never been a single definitive source of key information on all facets of discrete-event simulation and its applications to major industries. The Handbook of Simulation brings together the contributions of leading academics, practitioners, and software developers to offer authoritative coverage of the principles, techniques, and uses of discrete-event simulation. Comprehensive in scope and thorough in approach, the Handbook is the one reference on discrete-event simulation that every industrial engineer, management scientist, computer scientist, operations manager, or operations researcher involved in problem-solving should own, with an in-depth examination of: * Simulation methodology, from experimental design to data analysis and more * Recent advances, such as object-oriented simulation, on-line simulation, and parallel and distributed simulation * Applications across a full range of manufacturing and service industries * Guidelines for successful simulations and sound simulation project management * Simulation software and simulation industry vendors*

AUTOMATED TECHNOLOGY FOR VERIFICATION AND ANALYSIS

5TH INTERNATIONAL SYMPOSIUM, ATVA 2007 TOKYO, JAPAN, OCTOBER 22-25, 2007 PROCEEDINGS

Springer *This book constitutes the refereed proceedings of the 5th International Symposium on Automated Technology for Verification and Analysis, ATVA 2007. The 29 revised full papers presented*

together with seven short papers address theoretical methods to achieve correct software or hardware systems, including both functional and non functional aspects; as well as applications of theory in engineering methods and particular domains and handling of practical problems occurring in tools.

THEORY OF SCHEDULING

Dover Publications *This comprehensive text explores the mathematical models underlying the theory of scheduling. Organized according to scheduling problem type, it examines three solution techniques: algebraic, probabilistic, and Monte Carlo simulation by computer. Topics include problems of sequence, measures for schedule evaluation, finite sequencing for a single machine, and further problems with one operation per job. Additional chapters cover flow-shop scheduling, the general n/m job-shop problem, general network problems related to scheduling, selection disciplines in a single-server queuing system, single-server queuing systems with setup classes, multiple-server queuing models, and experimental investigation of the continuous job-shop process. 1967 edition.*

CONTROL TECHNIQUES FOR COMPLEX NETWORKS

Cambridge University Press *From foundations to state-of-the-art; the tools and philosophy you need to build network models.*

SCHEDULING ALGORITHMS

Springer Science & Business Media *Besides scheduling problems for single and parallel machines and shop scheduling problems, the book covers advanced models involving due-dates, sequence dependent change-over times and batching. A discussion of multiprocessor task scheduling and problems with multi-purpose machines is accompanied by the methods used to solve such problems, such as polynomial algorithms, dynamic programming procedures, branch-and-bound algorithms and local search heuristics, and the whole is rounded off with an analysis of complexity issues.*

SEQUENCING AND SCHEDULING WITH INACCURATE DATA

Nova Science Pub Incorporated *In many real-world applications, the problems with the data used for scheduling such as processing times, set-up times, release dates or due dates is not exactly known before applying a specific solution algorithm which restricts practical aspects of scheduling theory. During the last decades, several approaches have been developed for sequencing and scheduling with inaccurate data, depending on whether the data is given as random numbers, fuzzy numbers or whether it is uncertain (ie: it can take values from a given interval). This book considers the four major approaches for dealing with such problems: a stochastic approach, a fuzzy approach, a robust approach and a stability approach. Each of the four parts is devoted to one of these approaches. First, it contains a survey chapter on this subject, as well as between further chapters, presenting some recent research results in the particular area. The book provides the reader with a comprehensive and up-to-date introduction into scheduling with inaccurate data. The four survey chapters deal with scheduling with stochastic approaches, fuzzy job-shop scheduling, min-max regret scheduling problems and a stability approach to sequencing and scheduling under uncertainty. This book will be useful for applied mathematicians, students and PhD students dealing with scheduling theory, optimisation and calendar planning.*

ANIMAL LIVES WORTH LIVING

PROCEEDINGS OF THE 53RD CONGRESS OF THE INTERNATIONAL SOCIETY FOR APPLIED ETHOLOGY

Wageningen Academic Publishers *The main theme of this year’s congress is 'Animal lives worth living'. This theme focuses on our responsibility for all animals kept or influenced by humans, to ensure that we can provide a life for them that takes into account all relevant aspects of animal welfare, aided by applied ethology as the key scientific discipline. This not only means avoiding and alleviating suffering but also promoting resilience and positive experiences. By monitoring and interpreting animal behaviour, we gain important insights into each of these aspects of quality of life.*

THE CROSS-ENTROPY METHOD

A UNIFIED APPROACH TO COMBINATORIAL OPTIMIZATION, MONTE-CARLO SIMULATION AND MACHINE LEARNING

Springer Science & Business Media *Rubinstein is the pioneer of the well-known score function and cross-entropy methods. Accessible to a broad audience of engineers, computer scientists, mathematicians, statisticians and in general anyone, theorist and practitioner, who is interested in smart simulation, fast optimization, learning algorithms, and image processing.*

HANDBOOK ON SCHEDULING

FROM THEORY TO APPLICATIONS

Springer Science & Business Media *This book provides a theoretical and application-oriented analysis of deterministic scheduling problems in advanced planning and computer systems. The text examines scheduling problems across a range of parameters: job priority, release times, due dates, processing times, precedence constraints, resource usage and more, focusing on such topics as computer systems and supply chain management. Discussion includes single and parallel processors, flexible shops and manufacturing systems, and resource-constrained project scheduling. Many applications from industry and service operations management and case studies are described. The handbook will be useful to a broad audience, from researchers to practitioners, graduate and advanced undergraduate students.*

INTRODUCTION TO SCHEDULING

CRC Press *Full of practical examples, Introduction to Scheduling presents the basic concepts and methods, fundamental results, and recent developments of scheduling theory. With contributions from highly respected experts, it provides self-contained, easy-to-follow, yet rigorous presentations of the material. The book first classifies scheduling problems and their complexity and then presents examples that demonstrate successful techniques for the design of efficient approximation algorithms. It also discusses classical problems, such as the famous makespan minimization problem, as well as more recent advances, such as energy-efficient scheduling algorithms. After focusing on job scheduling problems that encompass independent and possibly parallel jobs, the text moves on to a practical application of cyclic scheduling for the synthesis of embedded systems. It also proves that efficient schedules can be derived in the context of steady-state scheduling. Subsequent chapters discuss scheduling large and computer-intensive applications on parallel resources, illustrate different approaches of multi-objective scheduling, and show how to compare the performance of stochastic task-resource systems. The final chapter assesses the impact of platform models on scheduling techniques. From the basics to advanced topics and platform models, this volume provides a thorough introduction to the field. It reviews classical methods, explores more contemporary models, and shows how the techniques and algorithms are used in practice.*

ALGORITHMS AND ORDER

Springer Science & Business Media *This volume contains the texts of the principal survey papers presented at ALGORITHMS -and ORDER, held· at Ottawa, Canada from June 1 to June 12, 1987. The conference was supported by grants from the N.A.T.O. Advanced Study Institute programme, the University of Ottawa, and the Natural Sciences and Engineering Research Council of Canada. We are grateful for this considerable support. Over fifty years ago, the Symposium on Lattice Theory, in Charlottesville, U.S.A., proclaimed the vitality of ordered sets. Only twenty years later the Symposium on Partially Ordered Sets and Lattice Theory, held at Monterey, U.S.A., had solved many of the problems that had been originally posed. In 1981, the Symposium on Ordered Sets held at Banff, Canada, continued this tradition. It was marked by a landmark volume containing twenty-three articles on almost all current topics in the theory of ordered sets and its applications. Three years after, Graphs and Orders, also held at Banff, Canada, aimed to document the role of graphs in the theory of ordered sets and its applications. Because of its special place in the landscape of the mathematical sciences order is especially sensitive to new trends and developments. Today, the most important current in the theory and application of order springs from theoretical computer seience. Two themes of computer science lead the way. The first is data structure. Order is common to data structures.*

STOCHASTIC SCHEDULING

EXPECTATION-VARIANCE ANALYSIS OF A SCHEDULE

Cambridge University Press *Stochastic scheduling is in the area of production scheduling. There is a dearth of work that analyzes the variability of schedules. In a stochastic environment, in which the processing time of a job is not known with certainty, a schedule is typically analyzed based on the expected value of a performance measure. This book addresses this problem and presents algorithms to determine the variability of a schedule under various machine configurations and objective functions. It is intended for graduate and advanced undergraduate students in manufacturing, operations management, applied mathematics, and computer science, and it is also a good reference book for practitioners. Computer software containing the algorithms is provided on an accompanying website for ease of student and user implementation.*

MULTICRITERIA DECISION MAKING

ADVANCES IN MCDM MODELS, ALGORITHMS, THEORY, AND APPLICATIONS

Springer Science & Business Media *At a practical level, mathematical programming under multiple objectives has emerged as a powerful tool to assist in the process of searching for decisions which best satisfy a multitude of conflicting objectives, and there are a number of distinct methodologies for multicriteria decision-making problems that exist. These methodologies can be categorized in a variety of ways, such as form of model (e.g. linear, non-linear, stochastic), characteristics of the decision space (e.g. finite or infinite), or solution process (e.g. prior specification of preferences or interactive). Scientists from a variety of disciplines (mathematics, economics and psychology) have contributed to the development of the field of Multicriteria Decision Making (MCDM) (or Multicriteria Decision Analysis (MCDA), Multiattribute Decision Making (MADM), Multiobjective Decision Making (MODM), etc.) over the past 30 years, helping to establish MCDM as an important part of management science. MCDM has become a central component of studies in management science, economics and industrial engineering in many universities worldwide. Multicriteria Decision Making: Advances in MCDM Models, Algorithms, Theory and Applications aims to bring together `state-of-the-art' reviews and the most recent advances by leading experts on the fundamental theories, methodologies and applications of MCDM. This is aimed at graduate students and researchers in mathematics, economics, management and engineering, as well as at practicing management scientists who wish to better understand the principles of this new and fast developing field.*