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Job Shop Scheduling with Consideration of Due Dates Computational Intelligence in Flow Shop and Job Shop Scheduling **Adventures Between Lower Bounds and Higher Altitudes** *Applying Systematic Local Search to Job Shop Scheduling Problems* Test Instances for the Flexible Job Shop Scheduling Problem with Work Centers *Proceedings of the First International Conference on Genetic Algorithms and their Applications* **Learning and Intelligent Optimization A Book of Open Shop Scheduling** Advanced Job Shop Scheduling **A computational study of the job-shop scheduling problem Approach for Integrating Predictive-Reactive Job Shop Scheduling with PLC-Controlled Material Flow Planning and Scheduling in Manufacturing and Services Random keys for Job Shop Scheduling** *Network and Parallel Computing* **Job-shop Scheduling with Limited Buffer Capacities Job-Shop Scheduling in Textile Manufacturing** Job Shop Scheduling with Consideration of Due Dates **International Virtual Conference on Industry 4.0** Generic Multi-Agent Reinforcement Learning Approach for Flexible Job-Shop Scheduling *A Job Shop Scheduling Approach to Part Type Selection i Flexible Manufacturing Systems Integration of AI and OR Techniques in Constraint Programming for Combinatorial Optimization Problems Flow Shop Scheduling* A Model Predictive Control Framework for Flexible Job Shop Scheduling *Information Processing and Management of Uncertainty in Knowledge-Based Systems* **Job-shop Scheduling with Limited Buffer Capacities** The threshold waving algorithm for job shop scheduling **Essays and Surveys in Metaheuristics Job-Shop-Scheduling Job Shop Scheduling with Stochastic Precedence Constraints** Machine Scheduling Problems *Some New Results on Simulated Annealing Applied to the Job Shop Scheduling Problem* Job Shop and Flow Shop Scheduling with OR Network Precedence Constraints The Disjunctive Graph Machine Representation of the Job Shop Scheduling Problem **Look-ahead Techniques for Micro-opportunistic Job Shop Scheduling Scheduling Algorithms** Parallel Problem Solving from Nature - PPSN VII **Unit Time Job Shop Scheduling Via Mixed Graph Coloring Handbook on Scheduling Planning and Scheduling in Manufacturing and Services** Computer-Aided Design, Engineering, and Manufacturing

Computer-Aided Design, Engineering, and Manufacturing Jun 18 2019 In the competitive business arena companies must continually strive to create new and better products faster, more efficiently, and more cost effectively than their competitors to gain and keep the competitive advantage. Computer-aided design (CAD), computer-aided engineering (CAE), and computer-aided manufacturing (CAM) are now the industry standa

Parallel Problem Solving from Nature - PPSN VII Oct 23 2019 We are proud to introduce the proceedings of the Seventh International Cference on Parallel Problem Solving from Nature, PPSN VII, held in Granada, Spain, on 7–11 September 2002. PPSN VII was organized back-to-back with the Foundations of Genetic Algorithms (FOGA) conference, which took place in Torremolinos, Malaga, Spain, in the preceding week. ThePPSNseriesofconferencesstartedinDortmund,Germany[1].Fromthat pioneering meeting, the event has been held biennially, in Brussels, Belgium [2], Jerusalem, Israel [3], Berlin, Germany [4], Amsterdam, The Netherlands [5], and Paris, France [6]. During the Paris conference,

several bids to host PPSN 2002 were put forward; it was decided that the conference would be held in Granada with Juan J. Merelo Guerv́ os as General Chairman. The scienti?c content of the PPSN conference focuses on problem-solving paradigms gleaned from natural models, with an obvious emphasis on those that display an innate parallelism, such as evolutionary algorithms and ant-colony optimization algorithms. The majority of the papers, however, concentrate on evolutionary and hybrid algorithms, as is shown in the contents of this book and itspredecessors.Thiseditionoftheconferenceproceedingshasalargesection on applications,betheytoclassicalproblemsortoreal-worldengineeringproblems, which shows how bioinspired algorithms are extending their use in the realms of business and enterprise.

Job Shop and Flow Shop Scheduling with OR Network Precedence Constraints Feb 25 2020

Planning and Scheduling in Manufacturing and Services Nov 16 2021 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.

Job Shop Scheduling with Consideration of Due Dates Oct 27 2022 Jens Kuhpfahl analyzes the job shop scheduling problem with minimizing the total weighted tardiness as objective. First, he provides a suitable graph representation based on a disjunctive graph formulation. Second, several key components of local search procedures are analyzed and enhanced. The resulting outputs of these investigations contribute to the development of a new solution procedure whose performance quality leads to superior computational results.

Job-shop Scheduling with Limited Buffer Capacities Oct 03 2020 Recent developments in manufacturing processes have increased the role of just-in-time production systems. Just-in-time production leads to highly coordinated manufacturing processes, continuous flow of products between work stations, and reduced storage capacities in the shop floor. In this book, Silvia Heitmann investigates job-shop problems where

limited capacity buffers to store jobs in non-processing periods are present. Besides a general buffer model, also specific configurations are considered. The key issue to develop fast heuristics for the job-shop problem with buffers is to find a compact representation of solutions. In this work, two solution representations for the job-shop problem with buffers are proposed and it is investigated whether the given solution representations can be simplified for specific buffer configurations. Based on the given solution representations, local search heuristics are developped in the second part of the book. The book addresses to scientists in mathematics, informatics, and economics as well as staff coordinating production processes.

The Disjunctive Graph Machine Representation of the Job Shop Scheduling Problem Jan 26 2020

Unit Time Job Shop Scheduling Via Mixed Graph Coloring Sep 21 2019

International Virtual Conference on Industry 4.0 May 10 2021 This book presents the proceedings of the International Virtual Conference on Industry 4.0 (IVCI4.0 2020). This conference brings together specialists from the academia and industry sectors to promote the exchange of knowledge, ideas, and information on the latest developments and applied technologies in the field of Industry 4.0. The book discusses a wide range of topics such as the design of smart and intelligent products, developments in recent technologies, rapid prototyping and reverse engineering, multistage manufacturing processes, manufacturing automation in the Industry 4.0 model, cloud-based products, and cyber-physical and reconfigurable systems, etc. The volume supports the transfer of vital knowledge to the next generation of academics and practitioners.

Flow Shop Scheduling Jan 06 2021 Using simplified notation and revealing unifying concepts, this book covers flow shop systems including two-machine, flexible and stochastic, and examines the reentrant flow shop, in which a job may be reprocessed at the same station or sequence of stations.

Planning and Scheduling in Manufacturing and Services Jul 20

2019 This book focuses on planning and scheduling applications. Planning and scheduling are forms of decision-making that play an important role in most manufacturing and services industries. The planning and scheduling functions in a company typically use analytical techniques and heuristic methods to allocate its limited resources to the activities that have to be done. The application areas considered in this book are divided into manufacturing applications and services applications. The book covers five areas in manufacturing: project scheduling, job shop scheduling, scheduling of flexible assembly systems, economic lot scheduling, and planning and scheduling in supply chains. It covers four areas in services: reservations and timetabling, tournament scheduling, planning and scheduling in transportation, and workforce scheduling. At the end of each chapter, a case study or a system implementation is described in detail. Numerous examples and exercises throughout the book illustrate the material presented. The fundamentals concerning the methodologies used in the application chapters are covered in the appendices. The book comes with a CD-ROM that contains various sets of powerpoint slides. The CD also contains several planning and scheduling systems that have been developed in academia as well as generic optimization software that has been developed in industry. This book is suitable for more advanced students in industrial engineering and operations research as well as graduate students in business. Michael Pinedo is the Julius Schlesinger Professor of Operations Management in the Stern School of Business at New York University. His research interests lie in the theoretical and applied aspects of planning and scheduling. He has written numerous papers on the theory of deterministic and stochastic scheduling and has also consulted extensively in industry. He has been actively involved in the development of several large industrial planning and scheduling systems.

Job-shop Scheduling with Limited Buffer Capacities Aug 13 2021
Job Shop Scheduling with Stochastic Precedence Constraints May 30 2020
A Book of Open Shop Scheduling Mar 20 2022 This book provides an in-depth presentation of algorithms for and complexity of open shop scheduling. Open shops allow operations of a job to be executed in any order, contrary to flow and job shops where the order is pre-specified. The author brings the field up to date with more emphasis on new and recent results, and connections with graph edge coloring and mathematical programming. The book explores applications to production and operations management, wireless network scheduling, and timetabling. The book is addressed to researchers, graduate students, and practitioners in Operations Research, Operations Management, computer science and mathematics, who are developing and using mathematical approaches to applications in manufacturing, services and distributed wireless network scheduling.

Look-ahead Techniques for Micro-opportunistic Job Shop Scheduling Dec 25 2019
Job-Shop Scheduling in Textile Manufacturing Jul 12 2021 Unlike some other reproductions of classic texts (1) We have not used OCR(Optical Character Recognition), as this leads to bad quality books with introduced typos. (2) In books where there are images such as portraits, maps, sketches etc We have endeavoured to keep the quality of these images, so they represent accurately the original artefact. Although occasionally there may be certain imperfections with these old texts, we feel they deserve to be made available for future generations to enjoy.

Random keys for Job Shop Scheduling Oct 15 2021
A computational study of the job-shop scheduling problem Jan 18 2022

Machine Scheduling Problems Apr 28 2020 1. Introduction.- 2. Problem Formulation.- 2.1. Notations and representations.- 2.2. Restrictive assumptions.- 2.3. Optimality criteria.- 2.3.1. Regular measures.- 2.3.1.1. Criteria based on completion times.- 2.3.1.2. Criteria based on due dates.- 2.3.1.3. Criteria based on inventory cost and utilization.- 2.3.2. Relations between criteria.- 2.3.3. Analysis of scheduling costs.- 2.4. Classification of problems.- 3. Methods of Solution.- 3.1. Complete enumeration.- 3.2. Combinatorial analysis.- 3.3. Mixed integer and non-linear programming.- 3.3.1. [Bowman 1959].- 3.3.2. [Pritsker et al. 1969].

Essays and Surveys in Metaheuristics Aug 01 2020 Finding exact solutions to many combinatorial optimization problems in busi ness, engineering, and science still poses a real challenge, despite the impact of recent advances in mathematical programming and computer technology. New fields of applications, such as computational biology, electronic commerce, and supply chain management, bring new challenges and needs for algorithms and optimization techniques. Metaheuristics are master procedures that guide and modify the operations of subordinate heuristics, to produce improved approx imate solutions to hard optimization problems with respect to more simple algorithms. They also provide fast and robust tools, producing high-quality solutions in reasonable computation times. The field of metaheuristics has been fast evolving in recent years. Tech niques such as simulated annealing, tabu search, genetic algorithms, scatter search, greedy randomized adaptive search, variable neighborhood search, ant systems, and their hybrids are currently among the most efficient and robust optimization strategies to find high-quality solutions to many real-life optimiza tion problems. A very large nmnber of successful applications of metaheuristics are reported in the literature and spread throughout many books, journals, and conference proceedings. A series of international conferences entirely devoted to the theory, applications, and computational developments in metaheuristics has been attracting an increasing number of participants, from universities and the industry.

A Job Shop Scheduling Approach to Part Type Selection i Flexible Manufacturing Systems Mar 08 2021

Scheduling Algorithms Nov 23 2019 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.

Approach for Integrating Predictive-Reactive Job Shop Scheduling with PLC-Controlled Material Flow Dec 17 2021 In a rapidly changing environment, good coordination of production and logistics at an operational level is required to handle rapidly evolving technology, frequently changing customer demand and satisfaction, and remain competitive. The job shop scheduling and the material flow control are two important factors influencing productivity and cost-controlling activities in any manufacturing system. Finding optimal solutions, however, requires an enormous computational effort, which becomes critical for large problems, particularly in situations where frequent changes in the environment occur. The material flow control system has to ensure the schedule is met. But the planned production schedules often become ineffective when being executed on the shop floor. Given the high degree of automation in material flow systems, automated control systems have to support frequent changes. Although these two problems are strongly connected and solving one significantly impacts the performance of the other, often these problems are solved independently. The complexity of the scheduling problem is increased when the material flow control is involved since not only a proper schedule must be created but an appropriate material flow needs to be provided. Due to this challenge, this dissertation has been designed to bridge the gap by initiating an approach for integrating predictive-reactive job shop scheduling with Programmable Logics Controlled (PLC) material flow. The objective is to develop an integrated control system that supports changes of routing strategy and schedule due to unexpected events. Features offered by state of the art material flow simulation software such as Open Platform Communications (OPC) interfaces and genetic algorithms have given the opportunity to realise this approach. The integrated control system consists of a system model, a control model and a schedule generator. Through combinations of these system components, the OPC connection with the physical system enables the integrated control system to be used for generating schedules, analysing the physical system through simulation and controlling the material flow system. As verification and validation, a

demonstration prototype of integrated control system has been developed and applied in an industrial environment. The exemplary implementations prove not only that the planning and operation of material flow system is systematic, but significantly rescheduling and reconfiguration of the integrated control system can be performed with minimal effort.

Learning and Intelligent Optimization Apr 21 2022 This book constitutes the thoroughly refereed post-conference proceedings of the 5th International Conference on Learning and Intelligent Optimization, LION 5, held in Rome, Italy, in January 2011. The 32 revised regular and 3 revised short papers were carefully reviewed and selected from a total of 99 submissions. In addition to the contributions to the general track there are 11 full papers and 3 short papers presented at the following four special sessions; IMON: Intelligent Multiobjective OptimizatioN, LION-PP: Performance Prediction Self* EAs: Self-tuning, self-configuring and self-generating evolutionary algorithms LION-SWAP: Software and Applications.

Adventures Between Lower Bounds and Higher Altitudes Aug 25 2022 This Festschrift volume is published in honor of Juraj Hromkovič on the occasion of his 60th birthday. Juraj Hromkovič is a leading expert in the areas of automata and complexity theory, algorithms for hard problems, and computer science education. The contributions in this volume reflect the breadth and impact of his work. The volume contains 35 full papers related to Juraj Hromkovič's research. They deal with various aspects of the complexity of finite automata, the information content of online problems, stability of approximation algorithms, reoptimization algorithms, computer science education, and many other topics within the fields of algorithmics and complexity theory. Moreover, the volume contains a prologue and an epilogue of laudatios from several collaborators, colleagues, and friends.

A Model Predictive Control Framework for Flexible Job Shop Scheduling Dec 05 2020 How can modern techniques from systems and control theory contribute to the developments in Industry 4.0 and in particular to the production scheduling of flexible manufacturing systems? Motivated by this very general research question, we develop a novel scheduling framework, in which we integrate the modeling and scheduling of flexible manufacturing systems. It allows exploiting the flexibility of manufacturing systems for the production of customer specific goods in the scope of Industry 4.0. The basis of the proposed framework is a modular description of the manufacturing system in the form of a flexible job shop. Automatic model generation algorithms lead to a Petri net model of the system, which enables systems theoretic analysis and the application of model predictive control (MPC), a modern feedback control method. In the MPC formulation of the scheduling problem, the economic goal of the manufacturing system is pursued. By considering feedback from the system, the MPC is able to react to unexpected changes in the manufacturing system and to make optimal use of the flexibility to adjust the production process. The advantages of the framework are its applicability to a wide range of scheduling problems, its ability to model and to exploit the available flexibility for economically optimal operation, and its guarantee to solve the production problem in closed loop operation.

Job-Shop-Scheduling Jun 30 2020 Für die Ablaufplanung in der Werkstattfertigung, das sogenannte Job-Shop-Scheduling, untersucht Jukka Siedentopf auf der Basis einer modular aufgebauten Verfahrensschablone verschiedene schwellenwertbasierte lokale Suchverfahren.

Integration of AI and OR Techniques in Constraint Programming for Combinatorial Optimization Problems Feb 07 2021 This book constitutes the refereed proceedings of the First International Conference on Integration of AI and OR Techniques in Constraint Programming for Combinatorial Optimization Problems, CPAIOR 2004, held in Nice, France in April 2004. The 23 revised full papers and 7 revised short papers presented together with an invited talk were carefully reviewed and selected from 56 submissions. Methodological and foundational issues from AI, OR, and algorithmics are presented as well as applications to the solution of combinatorial optimization problems in various fields via constraint programming.

Computational Intelligence in Flow Shop and Job Shop Scheduling Sep 26 2022 For over fifty years now, the famous problem of flow shop and job shop scheduling has been receiving the attention of researchers in operations research, engineering, and computer science. Over the past several years, there has been a spurt of interest in computational intelligence heuristics and metaheuristics for solving this problem. This book seeks to present a study of the state of the art in this field and also directions for future research.

Network and Parallel Computing Sep 14 2021 This proceedings contains the papers presented at the 2004 IFIP International Conference on Network and Parallel Computing (NPC 2004), held at Wuhan, China, from October 18 to 20, 2004. The goal of the conference was to establish an international forum for engineers and scientists to present their ideas and experiences in network and parallel computing. A total of 338 submissions were received in response to the call for papers. These papers werefrom Australia, Brazil,Canada,China, Finland, France, G- many, Hong Kong, India, Iran, Italy, Japan, Korea, Luxemburg, Malaysia, N- way, Spain, Sweden, Taiwan, UK, and USA. Each submission was sent to at least three reviewers.Each paper was judged according to its originality,inno- tion, readability, and relevance to the expected audience. Based on the reviews received, a total of 69 papers were accepted to be included in the proceedings. Among the 69 papers, 46 were accepted as full papers and were presented at the conference.Wealso accepted23papersasshortpapers;eachofthesepaperswas given an opportunity to have a brief presentation at the conference, followed by discussions in a poster session. Thus, due to the limited scope and time of the conference and the high number of submissions received, only 20% of the total submissions were included in the ?nal program.

Advanced Job Shop Scheduling Feb 19 2022

Some New Results on Simulated Annealing Applied to the Job Shop Scheduling Problem Mar 28 2020

Handbook on Scheduling Aug 21 2019 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.

Generic Multi-Agent Reinforcement Learning Approach for Flexible Job-Shop Scheduling Apr 09 2021 The production control of flexible manufacturing systems is a relevant component that must go along with the requirements of being flexible in terms of new product variants, new machine skills and reaction to unforeseen events during runtime. This work focuses on developing a reactive job-shop scheduling system for flexible and re-configurable manufacturing systems. Reinforcement Learning approaches are therefore investigated for the concept of multiple agents that control products including transportation and resource allocation.

Job Shop Scheduling with Consideration of Due Dates Jun 11 2021 Jens Kuhpfahl analyzes the job shop scheduling problem with minimizing the total weighted tardiness as objective. First, he provides a suitable graph representation based on a disjunctive graph formulation. Second, several key components of local search procedures are analyzed and enhanced. The resulting outputs of these investigations contribute to the development of a new solution procedure whose performance quality leads to superior computational results.

Information Processing and Management of Uncertainty in Knowledge-Based Systems Nov 04 2020 This three volume set (CCIS 1237-1239) constitutes the proceedings of the 18th International Conference on Information Processing and Management of Uncertainty in Knowledge-Based Systems, IPMU 2020, in June 2020. The conference was scheduled to take place in Lisbon, Portugal, at University of Lisbon, but due to

COVID-19 pandemic it was held virtually. The 173 papers were carefully reviewed and selected from 213 submissions. The papers are organized in topical sections: homage to Enrique Ruspini; invited talks; foundations and mathematics; decision making, preferences and votes; optimization and uncertainty; games; real world applications; knowledge processing and creation; machine learning I; machine learning II; XAI; image processing; temporal data processing; text analysis and processing; fuzzy interval analysis; theoretical and applied aspects of imprecise probabilities; similarities in artificial intelligence; belief function theory and its applications; aggregation: theory and practice; aggregation: pre-aggregation functions and other generalizations of monotonicity; aggregation: aggregation of different data structures; fuzzy methods in data mining and knowledge discovery; computational intelligence for logistics and transportation problems; fuzzy implication functions; soft methods in statistics and data analysis; image understanding and explainable AI; fuzzy and generalized quantifier theory; mathematical methods towards dealing with uncertainty in applied sciences; statistical image processing and analysis, with applications in neuroimaging; interval uncertainty; discrete models and computational intelligence;

current techniques to model, process and describe time series; mathematical fuzzy logic and graded reasoning models; formal concept analysis, rough sets, general operators and related topics; computational intelligence methods in information modelling, representation and processing.

The threshold waving algorithm for job shop scheduling Sep 02 2020
Test Instances for the Flexible Job Shop Scheduling Problem with Work Centers Jun 23 2022
Proceedings of the First International Conference on Genetic Algorithms and their Applications May 22 2022 Computer solutions to many difficult problems in science and engineering require the use of automatic search methods that consider a large number of possible solutions to the given problems. This book describes recent advances in the theory and practice of one such search method, called Genetic Algorithms. Genetic algorithms are evolutionary search techniques based on principles derived from natural population genetics, and are currently being applied to a variety of difficult problems in science, engineering, and artificial intelligence.
Applying Systematic Local Search to Job Shop Scheduling Problems Jul 24 2022