MULTIAGENT SCHEDULING MODELS AND ALGORITHMS

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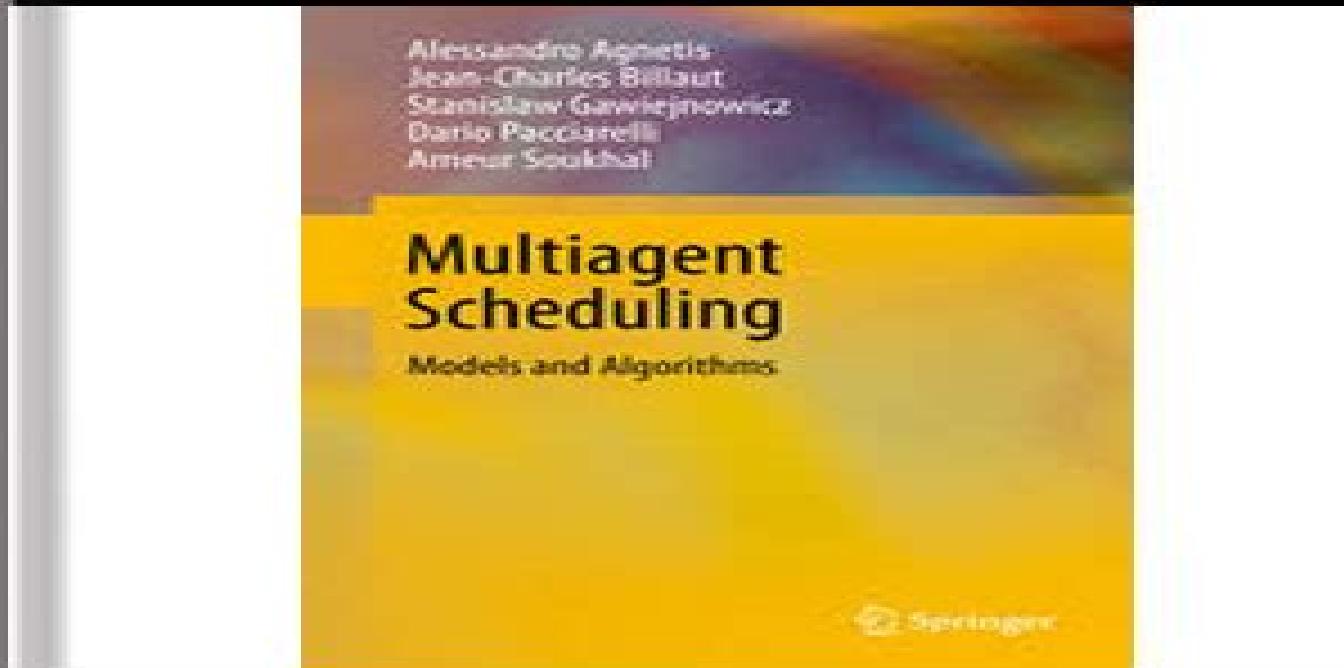Ameur Soukhal

Multiagent Scheduling

Models and Algorithms

Springer

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Jie Zhang

Multiagent Scheduling Models And Algorithms:

   Multiagent Scheduling Alessandro Agnetis,Jean-Charles Billaut,Stanisław Gawiejnowicz,Dario Pacciarelli,Ameur Soukhal,2014-01-31 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   **Due Date-Related Scheduling with Two Agents** Yunqiang Yin,Dujuan Wang,T.C.E. Cheng,2020-02-19 This book provides an introduction to the models methods and results of some due date related scheduling problems in the field of multiagent scheduling In multiagent scheduling two or more agents share a common processing resource and each agent wants to optimize its own objective function with respect to its own set of jobs Since the agents have conflicting objective functions they have to negotiate among themselves with regard to sharing the common resource to optimize their own objective functions A key feature of due date related scheduling concerns the way in which due dates are considered they can be given parameters or decision variables For the former case the motivation stems from the need to improve inventory and production management For the latter case due date assignment becomes a challenging issue since the decision maker has to balance inventory holding costs against the benefits of fulfifilling orders in time As for due dates this book addresses the following three different scenarios i The due dates of the jobs from either one or both of the two agents are decision variables which are determined using some due date assignment models ii The due dates of jobs in each job set are considered as given parameters whereas which due date corresponds to a given job needs to determine and iii The due date of each job is exogenously given When the last case is involved the objective function of each agent is related to the number of just in time jobs that are completed exactly on their due dates For each considered scenario depending on the model settings and on the objective function of each agent this book addresses the complexity and the design of efficient exact or approximated algorithms This book aims at introducing the author s research achievements in due date related scheduling with two agents It is written for researchers and Ph D students working in scheduling theory and other members of scientific community who are interested in recent scheduling models Our goal is to enable the reader to know about some new achievements on this topic   Highlights of Practical Applications of Agents, Multi-Agent Systems, and Sustainability: The PAAMS Collection Javier Bajo,Kasper Hallenborg,Pawel Pawlewski,Vicente Botti,Nayat Sánchez-Pi,Nestor Darío Duque

Méndez,Fernando Lopes,Vicente Julian,2015-05-12 This book constitutes the refereed proceedings of the workshops which complemented the 13th International Conference on Practical Applications of Agents and Multi Agent Systems PAAMS 2015 held in Salamanca Spain in June 2015 The 36 revised full papers presented were carefully reviewed and selected from 91 submissions This volume presents the papers that have been accepted for the following workshops Workshop on Agents and multi agent Systems for AAL and e HEALTH Workshop on Agent Based Solutions for Manufacturing and Supply Chain Workshop on MAS for Complex Networks and Social Computation Workshop on Intelligent Systems for Context based Information Fusion Workshop on Multi agent based Applications for Smart Grids and Sustainable Energy Systems Workshop on Multiagent System based Learning Environments Workshop in Intelligent Human Agent Societies **Distributed Computer and Communication Networks: Control, Computation, Communications** Vladimir M. Vishnevskiy,Konstantin E. Samouylov,Dmitry V. Kozyrev,2021-12-14 This book constitutes the refereed post conference proceedings of the 24th International Conference on Distributed and Computer and Communication Networks DCCN 2021 held in Moscow Russia in September 2021 The 26 revised full papers and 3 revised short papers were carefully reviewed and selected from 151 submissions The papers cover the following topics computer and communication networks analytical modeling of distributed systems and distributed systems applications **Multi-Agent-Based Production Planning and Control** Jie Zhang,2017-08-28 At the crossroads of artificial intelligence manufacturing engineering operational research and industrial engineering and management multi agent based production planning and control is an intelligent and industrially crucial technology with increasing importance This book provides a complete overview of multi agent based methods for today s competitive manufacturing environment including the Job Shop Manufacturing and Re entrant Manufacturing processes In addition to the basic control and scheduling systems the author also highlights advance research in numerical optimization methods and wireless sensor networks and their impact on intelligent production planning and control system operation Enables students researchers and engineers to understand the fundamentals and theories of multi agent based production planning and control Written by an author with more than 20 years experience in studying and formulating a complete theoretical system in production planning technologies Fully illustrated throughout the methods for production planning scheduling and controlling are presented using experiments numerical simulations and theoretical analysis Comprehensive and concise Multi Agent Based Production Planning and Control is aimed at the practicing engineer and graduate student in industrial engineering operational research and mechanical engineering It is also a handy guide for advanced students in artificial intelligence and computer engineering Service management and scheduling in cloud manufacturing Yongkui Liu,Lin Zhang,2022-08-01 The book introduces the concept of cloud manufacturing and describes the cloud service technology system behind it The authors discuss key technologies of manufacturing cloud service management including service construction evaluation and composition and scheduling With abundant case studies the book is an

essential reference for researchers and engineers in manufacturing and information management **The Multi-Agent Transport Simulation MATSim** Andreas Horni,Kai Nagel,Kay W. Axhausen,2016-08-10 The MATSim Multi Agent Transport Simulation software project was started around 2006 with the goal of generating traffic and congestion patterns by following individual synthetic travelers through their daily or weekly activity programme It has since then evolved from a collection of stand alone C programs to an integrated Java based framework which is publicly hosted open source available automatically regression tested It is currently used by about 40 groups throughout the world This book takes stock of the current status The first part of the book gives an introduction to the most important concepts with the intention of enabling a potential user to set up and run basic simulations The second part of the book describes how the basic functionality can be extended for example by adding schedule based public transit electric or autonomous cars paratransit or within day replanning For each extension the text provides pointers to the additional documentation and to the code base It is also discussed how people with appropriate Java programming skills can write their own extensions and plug them into the MATSim core The project has started from the basic idea that traffic is a consequence of human behavior and thus humans and their behavior should be the starting point of all modelling and with the intuition that when simulations with 100 million particles are possible in computational physics then behavior oriented simulations with 10 million travelers should be possible in travel behavior research The initial implementations thus combined concepts from computational physics and complex adaptive systems with concepts from travel behavior research The third part of the book looks at theoretical concepts that are able to describe important aspects of the simulation system for example under certain conditions the code becomes a Monte Carlo engine sampling from a discrete choice model Another important aspect is the interpretation of the MATSim score as utility in the microeconomic sense opening up a connection to benefit cost analysis Finally the book collects use cases as they have been undertaken with MATSim All current users of MATSim were invited to submit their work and many followed with sometimes crisp and short and sometimes longer contributions always with pointers to additional references We hope that the book will become an invitation to explore to build and to extend agent based modeling of travel behavior from the stable and well tested core of MATSim documented here Nature-Inspired Computing and Optimization Srikanta Patnaik,Xin-She Yang,Kazumi Nakamatsu,2017-03-07 The book provides readers with a snapshot of the state of the art in the field of nature inspired computing and its application in optimization The approach is mainly practice oriented each bio inspired technique or algorithm is introduced together with one of its possible applications Applications cover a wide range of real world optimization problems from feature selection and image enhancement to scheduling and dynamic resource management from wireless sensor networks and wiring network diagnosis to sports training planning and gene expression from topology control and morphological filters to nutritional meal design and antenna array design There are a few theoretical chapters comparing different existing techniques exploring the advantages of nature inspired computing over other methods and

investigating the mixing time of genetic algorithms The book also introduces a wide range of algorithms including the ant colony optimization the bat algorithm genetic algorithms the collision based optimization algorithm the flower pollination algorithm multi agent systems and particle swarm optimization This timely book is intended as a practice oriented reference guide for students researchers and professionals **Intelligent Distributed Computing XI** Mirjana Ivanović,Costin Bădică,Jürgen Dix,Zoran Jovanović,Michele Malgeri,Miloš Savić,2017-10-03 This book presents a collection of contributions addressing recent advances and research in synergistic combinations of topics in the joint fields of intelligent computing and distributed computing It focuses on the following specific topics distributed data mining and machine learning reasoning and decision making in distributed environments distributed evolutionary algorithms trust and reputation models for distributed systems scheduling and resource allocation in distributed systems intelligent multi agent systems advanced agent based and service based architectures and Smart Cloud and Internet of Things IoT environments The book represents the combined peer reviewed proceedings of the 11th International Symposium on Intelligent Distributed Computing IDC 2017 and the 7th International Workshop on Applications of Software Agents WASA 2017 both of which were held in Belgrade Serbia from October 11 to 13 2017 **Progress in Artificial Intelligence. Knowledge Extraction, Multi-agent Systems, Logic Programming, and Constraint Solving** Pavel Brazdil,2001-12-05 This book constitutes the refereed proceedings of the 10th Portuguese Conference on Artificial Intelligence EPTA 2001 held in Porto Portugal in December 2001 The 21 revised long papers and 18 revised short papers were carefully reviewed and selected from a total of 88 submissions The papers are organized in topical sections on extraction of knowledge from databases AI techniques for financial time series analysis multi agent systems AI logics and logic programming constraint satisfaction and AI planning *Models and Algorithms of Time-Dependent Scheduling* Stanisław Gawiejnowicz,2020-06-13 This is a comprehensive study of various time dependent scheduling problems 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 time dependent scheduling with two criteria and time dependent two agent scheduling The reader should be familiar with the basic notions of calculus discrete mathematics and combinatorial optimization theory while the book offers introductory material on theory of algorithms 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 he completes all chapters with extensive bibliographies and he closes the book with comprehensive symbol and subject indexes The previous edition of the book focused on computational complexity of time dependent scheduling problems In this edition the author concentrates on models of time dependent job processing times and algorithms for solving time dependent scheduling problems The book is suitable for researchers working on scheduling problem complexity optimization heuristics and local search algorithms **Multi-agent and Multi-agent-based Simulation** ,2004

Software Engineering for Multi-agent Systems ... ,2006   *Learning in Cooperative Multi-Agent Systems* Thomas Gabel,2009-09 In a distributed system a number of individually acting agents coexist In order to achieve a common goal coordinated cooperation between the agents is crucial Many real world applications are well suited to be formulated in terms of spatially or functionally distributed entities Job shop scheduling represents one such application Multi agent reinforcement learning RL methods allow for automatically acquiring cooperative policies based solely on a specification of the desired joint behavior of the whole system However the decentralization of the control and observation of the system among independent agents has a significant impact on problem complexity The author Thomas Gabel addresses the intricacy of learning and acting in multi agent systems by two complementary approaches He identifies a subclass of general decentralized decision making problems that features provably reduced complexity Moreover he presents various novel model free multi agent RL algorithms that are capable of quickly obtaining approximate solutions in the vicinity of the optimum All algorithms proposed are evaluated in the scope of various established scheduling benchmark problems   **GECCO-2000** L. Darrell Whitley,2000   GECCO-2001 Lee Spector,2001   **Multi-Agent Systems Methodologies and Applications** Chengqi Zhang,Lukose Dickson,1997-08-06 This book constitutes the strictly refereed post workshop proceedings originating from the Second Australian Workshop on Distributed Artificial Intelligence held in Cairns QLD Australia in August 1996 as a satellite meeting of PRICAI 96 The 13 revised full papers presented have been selected for inclusion in the book during a very careful and iterated process of reviewing and improvement Among these papers are three invited ones by leading scientists solicited in order to round off the overall presentation and coverage of relevant topics A wide range of multi agent systems issues is covered including methodologies cooperation conflict resolution applications mobility adaptation negotiation and implementations   *Multi-agent Systems* ,1996   Intelligent Agents and Multi-agent Systems ,2003   Multi-agent Systems and Applications ... ,2005

This book delves into Multiagent Scheduling Models And Algorithms. Multiagent Scheduling Models And Algorithms is a vital topic that needs to be grasped by everyone, from students and scholars to the general public. This book will furnish comprehensive and in-depth insights into Multiagent Scheduling Models And Algorithms, encompassing both the fundamentals and more intricate discussions.

1. The book is structured into several chapters, namely:

    - Chapter 1: Introduction to Multiagent Scheduling Models And Algorithms
    - Chapter 2: Essential Elements of Multiagent Scheduling Models And Algorithms
    - Chapter 3: Multiagent Scheduling Models And Algorithms in Everyday Life
    - Chapter 4: Multiagent Scheduling Models And Algorithms in Specific Contexts
    - Chapter 5: Conclusion

2. In chapter 1, this book will provide an overview of Multiagent Scheduling Models And Algorithms. This chapter will explore what Multiagent Scheduling Models And Algorithms is, why Multiagent Scheduling Models And Algorithms is vital, and how to effectively learn about Multiagent Scheduling Models And Algorithms.
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4. In chapter 3, the author will examine the practical applications of Multiagent Scheduling Models And Algorithms in daily life. This chapter will showcase real-world examples of how Multiagent Scheduling Models And Algorithms can be effectively utilized in everyday scenarios.
5. In chapter 4, this book will scrutinize the relevance of Multiagent Scheduling Models And Algorithms in specific contexts. This chapter will explore how Multiagent Scheduling Models And Algorithms is applied in specialized fields, such as education, business, and technology.
6. In chapter 5, the author will draw a conclusion about Multiagent Scheduling Models And Algorithms. The final chapter will summarize the key points that have been discussed throughout the book.
   This book is crafted in an easy-to-understand language and is complemented by engaging illustrations. This book is highly recommended for anyone seeking to gain a comprehensive understanding of Multiagent Scheduling Models And Algorithms.

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