Balancing And Sequencing Of Assembly Lines

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Grouping Genetic Algorithms - Michael Mutingi 2016-10-04
This book presents advances and innovations in grouping genetic algorithms, enriched with new and unique heuristic optimization techniques. These algorithms are specially designed for solving industrial grouping problems where system entities are to be partitioned or clustered into efficient groups according to a set of guiding decision criteria. Examples of such problems are: vehicle routing problems, team formation problems, timetabling problems, assembly line balancing, group maintenance planning, modular design, and task assignment. A wide range of industrial grouping problems, drawn from diverse fields such as logistics, supply chain management, project management, manufacturing systems, engineering design and healthcare, are presented. Typical complex industrial grouping problems, with multiple decision criteria and constraints, are clearly described using illustrative diagrams and formulations. The problems are mapped into a common group structure that can conveniently be used as an input scheme to specific variants of grouping genetic algorithms. Unique heuristic grouping techniques are developed to handle grouping problems efficiently and effectively. Illustrative examples and computational results are presented in tables and graphs to demonstrate the efficiency and effectiveness of the algorithms. Researchers, decision analysts, software developers, and graduate students from various disciplines will find this in-depth reader-friendly exposition of advances and applications of grouping genetic algorithms an interesting, informative and valuable resource.

Proceedings of the Eleventh International Conference on Management Science and Engineering Management - Jiuping Xu 2017-06-27
This book is organized in 2 volumes and 6 parts. Part I is Big Data Analytics, which is about new advances of analysis, statistics, coordination and data mining of big data; Part II is Information Systems Management, which is about the development of big data information system or cloud platform. Part III is Computing Methodology with Big Data, which is about the improvements of traditional computation technologies in the background of big data; Part IV is Uncertainty Decision Making, which is about the decision making methods with various uncertain information, such as fuzzy, random, rough, gray, unascertained. Part V is Intelligence Algorithm. Part VI is Data Security, which is a particularly important aspect in the modern management environment.

Assembly Line Design - Brahim Rekiek 2006-04-21
Efficient assembly line design is a problem of considerable industrial importance. Assembly Line Design will be bought by technical personnel working in design, planning and production departments in industry as well as managers in industry who want to learn more about concurrent engineering. This book will also be purchased by researchers and postgraduate students in mechanical, manufacturing or micro-engineering.

Large-Scale Scientific Computing - Ivan Lirkov 2018-01-10
This book constitutes the thoroughly refereed post-conference proceedings of the 11th International Conference on Large-Scale Scientific Computations, LSSC 2017, held in Sozopol, Bulgaria, in June 2017. The 63 revised short papers together with 3 full papers presented were carefully reviewed and selected from 63 submissions. The conference presents results from the following topics: Hierarchical, adaptive, domain decomposition and local refinement methods; Robust preconditioning algorithms; Monte Carlo methods and algorithms; Numerical linear algebra; Control and optimization; Parallel algorithms and performance analysis; Large-scale computations of environmental, biomedical and engineering problems. The chapter 'Parallel Aggregation Based on Compatible Weighted Matching for AMG' is available open access under a CC BY 4.0 license.

Responsible Manufacturing - Ammar Y. Alqahtani 2019-02-25

Responsible Manufacturing has become an obligation to the environment and to society itself, enforced primarily by customer perspective and governmental regulations on environmental issues. This is mainly driven by the escalating deterioration of the environment, such as diminishing raw material resources, overflowing waste sites, and increasing levels of pollution. Responsible Manufacturing related issues have found a large following in industry and academia, which aim to find solutions to the problems that arise in this newly emerged research area. Problems are widespread, including the ones related to the lifecycle of products, disassembly, material recovery, remanufacturing, and pollution prevention. Organized into sixteen chapters, this book provides a foundation for academicians and practitioners, and addresses several important issues faced by strategic, tactical, and operation planners of Responsible Manufacturing. Using efficient models in a variety of decision-making situations, it provides easy-to-use mathematical and/or simulation modeling-based solution methodologies for the majority of the issues. Features Addresses a variety of state-of-the-art issues in Responsible Manufacturing Highlights how popular industrial engineering and operations research techniques can be effectively exploited to find the most effective solutions to problems Presents how a specific issue can be approached or modeled in a given decision-making situation Covers strategic, tactical, and operational systems issues Provides a foundation for academicians and practitioners interested in building bodies of knowledge in this new and fast-growing area

Journal of Applied Operational Research - Kaveh Sheibani 2011-04-30
We are pleased to welcome readers to this issue of the Journal of Applied Operational Research (JAOR), Volume 3, Number 1. Since OR is an interdisciplinary applied science, it is a primarily goal of the journal to focus on and publish practical case studies which illustrate applications of OR to real-life problems.

Ant Algorithms - Marco Dorigo 2003-08-02
This book constitutes the refereed proceedings of the Third International Workshop on Ant Algorithms, ANTS 2002, held in Brussels, Belgium in September 2002. The 17 revised full papers, 11 short papers, and extended poster abstracts presented were carefully reviewed and selected from 52 submissions. The papers deal with theoretical and foundational aspects and a variety of new variants of ant algorithms as well as with a broad variety of optimization applications in networking and operations research. All in all, this book presents the state of the art in research and development in the emerging field of ant algorithms

Advances in Production Management Systems. Artificial Intelligence for Sustainable and Resilient Production Systems - Alexandre Dolgui 2021-09-01
The five-volume set IFIP AICT 630, 631, 632, 633, and 634 constitutes the refereed proceedings of the International IFIP WG 5.7 Conference on Advances in Production Management Systems, APMS 2021, held in Nantes, France, in September 2021.* The 378 papers presented were carefully reviewed and selected from 529 submissions. They discuss artificial intelligence techniques, decision aid and new and renewed paradigms for sustainable and resilient production systems at four-wall factory and value chain levels. The papers are organized in the following topical sections: Part I: artificial intelligence based optimization techniques for demand-driven manufacturing; hybrid approaches for production planning and scheduling; intelligent systems for manufacturing planning and control in the industry 4.0; learning and robust decision support systems for agile manufacturing environments; low-code and model-driven engineering for production system; meta-heuristics and optimization techniques for energy-oriented manufacturing systems; metaheuristics for production systems; modern analytics and new AI-based smart techniques for replenishment and production planning under uncertainty; system identification for manufacturing control applications; and the future of lean thinking and

practice Part II: digital transformation of SME manufacturers: the crucial role of standard; digital transformations towards supply chain resiliency; engineering of smart-product-service-systems of the future; lean and Six Sigma in services healthcare; new trends and challenges in reconfigurable, flexible or agile production system; production management in food supply chains; and sustainability in production planning and lot-sizing Part III: autonomous robots in delivery logistics; digital transformation approaches in production management; finance-driven supply chain; gastronomic service system design; modern scheduling and applications in industry 4.0; recent advances in sustainable manufacturing; regular session: green production and circularity concepts; regular session: improvement models and methods for green and innovative systems; regular session: supply chain and routing management; regular session: robotics and human aspects; regular session: classification and data management methods; smart supply chain and production in society 5.0 era; and supply chain risk management under coronavirus Part IV: AI for resilience in global supply chain networks in the context of pandemic disruptions; blockchain in the operations and supply chain management; data-based services as key enablers for smart products, manufacturing and assembly; data-driven methods for supply chain optimization; digital twins based on systems engineering and semantic modeling; digital twins in companies first developments and future challenges; human-centered artificial intelligence in smart manufacturing for the operator 4.0; operations management in engineer-to-order manufacturing; product and asset life cycle management for smart and sustainable manufacturing systems; robotics technologies for control, smart manufacturing and logistics; serious games analytics: improving games and learning support; smart and sustainable production and supply chains; smart methods and techniques for sustainable supply chain management; the new digital lean manufacturing paradigm; and the role of emerging technologies in disaster relief operations: lessons from COVID-19 Part V: data-driven platforms and applications in production and logistics: digital twins and AI for sustainability; regular session: new approaches for routing problem solving; regular session: improvement of design and operation of manufacturing systems; regular session: crossdock and transportation issues; regular session: maintenance improvement and lifecycle management; regular session: additive manufacturing and mass customization; regular session: frameworks and conceptual modelling for systems and services efficiency; regular session: optimization of production and transportation systems; regular session: optimization of supply chain agility and reconfigurability; regular session: advanced modelling approaches; regular session: simulation and optimization of systems performances; regular session: AI-based approaches for quality and performance improvement of production systems; and regular session: risk and performance management of supply chains *The conference was held online.

Mapping and Sequencing the Human Genome - National Research Council 1988-01-01
There is growing enthusiasm in the scientific community about the prospect of mapping and sequencing the human genome, a monumental project that will have far-reaching consequences for medicine, biology, technology, and other fields. But how will such an effort be organized and funded? How will we develop the new technologies that are needed? What new legal, social, and ethical questions will be raised? Mapping and Sequencing the Human Genome is a blueprint for this proposed project. The authors offer a highly readable explanation of the technical aspects of genetic mapping and sequencing, and they recommend specific interim and long-range research goals, organizational strategies, and funding levels. They also outline some of the legal and social questions that might arise and urge their early consideration by policymakers.

Modeling and Analysis of Manufacturing Systems - Ronald G. Askin 1993-01-18
Manufacturing models - Assembly lines : reliable serial systems - Transfer lines and general serial systems - Shop scheduling with many products - Flexible manufacturing systems - Machine setup and operation sequencing - Material handling systems - Warehousing : storage and retrieval systems - General manufacturing systems : analytical queueing models - General manufacturing systems : empirical simulation models.

Balancing and Sequencing of Assembly Lines - Armin Scholl 1995

Assembly Line - Waldemar Grzechca 2011-08-17
An assembly line is a manufacturing process in which parts are added to a product in a sequential manner using optimally planned logistics to create a finished product in the fastest possible way. It is a flow-oriented production system where the productive units performing the operations, referred to as stations, are aligned in a serial manner. The present edited book is a collection of 12 chapters written by experts and well-known professionals of the field. The volume is organized in three parts according to the last research works in assembly line subject. The first part of the book is devoted to the assembly line balancing problem. It includes chapters dealing with different problems of ALBP. In the second part of the book some optimization problems in assembly line structure are considered. In many situations there are several contradictory goals that have to be satisfied simultaneously. The third part of the book deals with testing problems in assembly line. This section gives an overview on new trends, techniques and methodologies for testing the quality of a product at the end of the assembling line.

Matheuristics - Vittorio Maniezzo 2009-09-18
Metaheuristics support managers in decision-making with robust tools that provide high-quality solutions to important applications in business, engineering, economics, and science in reasonable time frames, but finding exact solutions in these applications still poses a real challenge. However, because of advances in the fields of mathematical optimization and metaheuristics, major efforts have been made on their interface regarding efficient hybridization. This edited book will provide a survey of the state of the art in this field by providing some invited reviews by well-known specialists as well as refereed papers from the second Matheuristics workshop to be held in Bertinoro, Italy, June 2008. Papers will explore mathematical programming techniques in metaheuristics frameworks, and especially focus on the latest developments in Mixed Integer Programming in solving real-world problems.

Boosting Collaborative Networks 4.0 - Luis M. Camarinha-Matos 2020-11-16
This book constitutes the refereed proceedings of the 21st IFIP WG 5.5 Working Conference on Virtual Enterprises, PRO-VE 2020, held in Valencia, Spain, in November 2020. The conference was held virtually. The 53 full papers were carefully reviewed and selected from 135 submissions. They provide a comprehensive overview of major challenges and recent advances in various domains related to the digital transformation and collaborative networks and their applications with a strong focus on the following areas related to the main theme of the conference: collaborative business ecosystems; collaborative business models; collaboration platform; data and knowledge services; blockchain and knowledge graphs; maintenance, compliance and liability; digital transformation; skills for organizations of the future; collaboration in open innovation; collaboration in supply chain; simulation and analysis in collaborative systems; product and service systems; collaboration impacts; boosting sustainability through collaboration in Agri-food 4.0; digital innovation hubs for digitalizing European industry; and collaborative networks for health and wellness data management.

Advances in Sustainable and Competitive Manufacturing Systems - Américo Azevedo 2013-06-25
The proceedings includes the set of revised papers from the 23rd International Conference on Flexible Automation and Intelligent Manufacturing (FAIM 2013). This conference aims to provide an international forum for the exchange of leading edge scientific knowledge and industrial experience regarding the development and integration of the various aspects of Flexible Automation and Intelligent Manufacturing Systems covering the complete life-cycle of a company's Products and Processes. Contents will include topics such as: Product, Process and Factory Integrated Design, Manufacturing Technology and Intelligent Systems, Manufacturing Operations Management and Optimization and Manufacturing Networks and MicroFactories.

Assembly-Line Balancing under Demand Uncertainty - Celso Gustavo Stall Sikora 2022-01-11
Assembly lines are productive systems, which are very efficient for homogeneous products. In the automotive industry, an assembly line is used in the production of several vehicle variants, including numerous configurations, options, and add-ins. As a result, assembly lines must be at the same time specialized to provide high efficiency, but also flexible to allow the mass customization of the vehicles. In this book, the planning of assembly lines for uncertain demand is tackled and optimization algorithms are offered for the balancing of such lines. Building an assembly line is a commitment of several months or even years, it is understandable that the demand will fluctuate during the lifetime of an assembly line. New products are developed, others are removed from the market, and the decision of the final customer plays a role on the immediate demand. Therefore, the variation and uncertainty

of the demand must be accounted for in an assembly line. In this book, methods dealing with random demand or random production sequence are presented, so that the practitioners can plan more robust and efficient production systems.

The Disassembly Line: Balancing and Modeling - Seamus M. McGovern 2011-01-04
The definitive guide to the disassembly line The Disassembly Line: Balancing and Modeling provides in-depth information on this complex process essential to remanufacturing, recycling, and environmentally conscious manufacturing. This pioneering work offers efficient techniques required to solve problems involving the number of workstations required and the disassembly sequencing of end-of-life products on the disassembly line. In this book, the disassembly line balancing problem (DLBP) is described, defined mathematically, and illustrated by case studies. Combinatorial optimization methodologies are presented as solutions to the DLBP. Coverage includes: Graphical representations of products to be disassembled Computational complexity of combinatorial problems Description of the disassembly line and the mathematical model Computational complexity of the DLBP Combinatorial optimization searches Experimental instances Analytical methodologies Exhaustive search Genetic algorithm Ant colony optimization Greedy algorithm Greedy/adjacent element hill climbing hybrid Greedy/2-opt hybrid H-K heuristic Quantitative and qualitative comparative analysis This authoritative volume also covers product planning, line and facility design, sequencing and scheduling, inventory, just in time, revenue, and unbalanced lines.

Proceedings of the Ninth International Conference on Management Science and Engineering Management - Jiuping Xu 2015-05-20
This is the Proceedings of the Ninth International Conference on Management Science and Engineering Management (ICMSEM) held from July 21-23, 2015 at Karlsruhe, Germany. The goals of the conference are to foster international research collaborations in Management Science and Engineering Management as well as to provide a forum to present current findings. These proceedings cover various areas in management science and engineering management. It focuses on the identification of management science problems in engineering and innovatively using management theory and methods to solve engineering problems effectively. It also establishes a new management theory and methods based on experience of new management issues in engineering. Readers interested in the fields of management science and engineering management will benefit from the latest cutting-edge innovations and research advances presented in these proceedings and will find new ideas and research directions. A total number of 132 papers from 15 countries are selected for the proceedings by the conference scientific committee through rigorous referee review. The selected papers in the first volume are focused on Intelligent System and Management Science covering areas of Intelligent Systems, Logistics Engineering, Information Technology and Risk Management. The selected papers in the second volume are focused on Computing and Engineering Management covering areas of Computing Methodology, Project Management, Industrial Engineering and Decision Making Systems.

Advances in Production Management Systems. Production Management for the Factory of the Future - Farhad Ameri 2019-08-23
The two-volume set IFIP AICT 566 and 567 constitutes the refereed proceedings of the International IFIP WG 5.7 Conference on Advances in Production Management Systems, APMS 2019, held in Austin, TX, USA. The 161 revised full papers presented were carefully reviewed and selected from 184 submissions. They discuss globally pressing issues in smart manufacturing, operations management, supply chain management, and Industry 4.0. The papers are organized in the following topical sections: lean production; production management in food supply chains; sustainability and reconfigurability of manufacturing systems; product and asset life cycle management in smart factories of industry 4.0; variety and complexity management in the era of industry 4.0; participatory methods for supporting the career choices in industrial engineering and management education; blockchain in supply chain management; designing and delivering smart services in the digital age; operations management in engineer-to-order manufacturing; the operator 4.0 and the Internet of Things, services and people; intelligent diagnostics and maintenance solutions for smart manufacturing; smart supply networks; production management theory and methodology; data-driven production management; industry 4.0 implementations; smart factory and IIOT; cyber-physical systems; knowledge management in design and manufacturing; collaborative product development; ICT for

collaborative manufacturing; collaborative technoloy; applications of machine learning in production management; and collaborative technology.

Operations and Production Systems with Multiple Objectives - Behnam Malakooti 2014-02-03
The first comprehensive book to uniquely combine the three fields of systems engineering, operations/production systems, and multiple criteria decision making/optimization Systems engineering is the art and science of designing, engineering, and building complex systems—combining art, science, management, and engineering disciplines. Operations and Production Systems with Multiple Objectives covers all classical topics of operations and production systems as well as new topics not seen in any similiar textbooks before: small-scale design of cellular systems, large-scale design of complex systems, clustering, productivity and efficiency measurements, and energy systems. Filled with completely new perspectives, paradigms, and robust methods of solving classic and modern problems, the book includes numerous examples and sample spreadsheets for solving each problem, a solutions manual, and a book companion site complete with worked examples and supplemental articles. Operations and Production Systems with Multiple Objectives will teach readers: How operations and production systems are designed and planned How operations and production systems are engineered and optimized How to formulate and solve manufacturing systems problems How to model and solve interdisciplinary and systems engineering problems How to solve decision problems with multiple and conflicting objectives This book is ideal for senior undergraduate, MS, and PhD graduate students in all fields of engineering, business, and management as well as practitioners and researchers in systems engineering, operations, production, and manufacturing.

Scheduling in Supply Chains Using Mixed Integer Programming - Tadeusz Sawik 2011-08-08
A unified, systematic approach to applying mixed integer programming solutions to integrated scheduling in customer-driven supply chains Supply chain management is a rapidly developing field, and the recent improvements in modeling, preprocessing, solution algorithms, and mixed integer programming (MIP) software have made it possible to solve large-scale MIP models of scheduling problems, especially integrated scheduling in supply chains. Featuring a unified and systematic presentation, Scheduling in Supply Chains Using Mixed Integer Programming provides state-of-the-art MIP modeling and solutions approaches, equipping readers with the knowledge and tools to model and solve real-world supply chain scheduling problems in make-to-order manufacturing. Drawing upon the author's own research, the book explores MIP approaches and examples-which are modeled on actual supply chain scheduling problems in high-tech industries-in three comprehensive sections: Short-Term Scheduling in Supply Chains presents various MIP models and provides heuristic algorithms for scheduling flexible flow shops and surface mount technology lines, balancing and scheduling of Flexible Assembly Lines, and loading and scheduling of Flexible Assembly Systems Medium-Term Scheduling in Supply Chains outlines MIP models and MIP-based heuristic algorithms for supplier selection and order allocation, customer order acceptance and due date setting, material supply scheduling, and medium-term scheduling and rescheduling of customer orders in a make-to-order discrete manufacturing environment Coordinated Scheduling in Supply Chains explores coordinated scheduling of manufacturing and supply of parts as well as the assembly of products in supply chains with a single producer and single or multiple suppliers; MIP models for a single- or multiple-objective decision making are also provided Two main decision-making approaches are discussed and compared throughout. The integrated (simultaneous) approach, in which all required decisions are made simultaneously using complex, monolithic MIP models; and the hierarchical (sequential) approach, in which the required decisions are made successively using hierarchies of simpler and smaller-sized MIP models. Throughout the book, the author provides insight on the presented modeling tools using AMPL® modeling language and CPLEX solver. Scheduling in Supply Chains Using Mixed Integer Programming is a comprehensive resource for practitioners and researchers working in supply chain planning, scheduling, and management. The book is also appropriate for graduate- and PhD-level courses on supply chains for students majoring in management science, industrial engineering, operations research, applied mathematics, and computer science.

Optimizing Decision Making in the Apparel Supply Chain Using Artificial Intelligence (AI) - Calvin Wong 2013-01-24
Practitioners in apparel manufacturing and retailing enterprises in the

fashion industry, ranging from senior to front line management, constantly face complex and critical decisions. There has been growing interest in the use of artificial intelligence (AI) techniques to enhance this process, and a number of AI techniques have already been successfully applied to apparel production and retailing. Optimizing decision making in the apparel supply chain using artificial intelligence (AI): From production to retail provides detailed coverage of these techniques, outlining how they are used to assist decision makers in tackling key supply chain problems. Key decision points in the apparel supply chain and the fundamentals of artificial intelligence techniques are the focus of the opening chapters, before the book proceeds to discuss the use of neural networks, genetic algorithms, fuzzy set theory and extreme learning machines for intelligent sales forecasting and intelligent product cross-selling systems. Helps the reader gain an understanding of the key decision points in the apparel supply chain Discusses the fundamentals of artificial intelligence techniques for apparel management techniques Considers the use of neural networks in selecting the location of apparel manufacturing plants

Supply Chain Engineering - Alexandre Dolgui 2010-06-02
Supply Chain Engineering considers how modern production and operations management techniques can respond to the pressures of the competitive global marketplace. It presents a comprehensive analysis of concepts and models related to outsourcing, dynamic pricing, inventory management, RFID, and flexible and re-configurable manufacturing systems, as well as real-time assignment and scheduling processes. A significant part is also devoted to lean manufacturing, line balancing, facility layout and warehousing techniques. Explanations are based on examples and detailed algorithms while discarding complex and unnecessary theoretical minutiae. All examples have been carefully selected from an industrial application angle. This book is written for students and professors in industrial and systems engineering, management science, operations management and business. It is also an informative reference for managers looking to improve the efficiency and effectiveness of their production systems.

Assembly Line Balancing under Uncertain Task Time and Demand Volatility - Yuchen Li 2022-09-10
This book introduces several mathematical models in assembly line balancing based on stochastic programming and develops exact and heuristic methods to solve them. An assembly line system is a manufacturing process in which parts are added in sequence from workstation to workstation until the final assembly is produced. In an assembly line balancing problem, tasks belonging to different product models are allocated to workstations according to their processing times and precedence relationships among tasks. It incorporates two features, uncertain task times, and demand volatility, separately and simultaneously, into the conventional assembly line balancing model. A real-life case study related to the mask production during the COVID-19 pandemic is presented to illustrate the application of the proposed framework and methodology. The book is intended for graduate students who are interested in combinatorial optimizations in manufacturing with uncertain input.

AI 2020: Advances in Artificial Intelligence - Marcus Gallagher 2020-11-27
This book constitutes the proceedings of the 33rd Australasian Joint Conference on Artificial Intelligence, AI 2020, held in Canberra, ACT, Australia, in November 2020.* The 36 full papers presented in this volume were carefully reviewed and selected from 57 submissions. The paper were organized in topical sections named: applications; evolutionary computation; fairness and ethics; games and swarms; and machine learning. *The conference was held virtually due to the COVID-19 pandemic.

Handbook of Neural Computation - Pijush Samui 2017-07-18
Handbook of Neural Computation explores neural computation applications, ranging from conventional fields of mechanical and civil engineering, to electronics, electrical engineering and computer science. This book covers the numerous applications of artificial and deep neural networks and their uses in learning machines, including image and speech recognition, natural language processing and risk analysis. Edited by renowned authorities in this field, this work is comprised of articles from reputable industry and academic scholars and experts from around the world. Each contributor presents a specific research issue with its recent and future trends. As the demand rises in the engineering and medical industries for neural networks and other machine learning methods to solve different types of operations, such as data prediction, classification of images, analysis of big data, and intelligent decision-

making, this book provides readers with the latest, cutting-edge research in one comprehensive text. Features high-quality research articles on multivariate adaptive regression splines, the minimax probability machine, and more Discusses machine learning techniques, including classification, clustering, regression, web mining, information retrieval and natural language processing Covers supervised, unsupervised, reinforced, ensemble, and nature-inspired learning methods

Production and Operations Analysis - Steven Nahmias 1993
This text provides a survey of the analytical methods used to support the functions of production and operations management. This latest edition continues to bring the most thorough coverage of cutting-edge quantitative models used in operations, while presenting it in a clean, easy to understand fashion. There are many new problems both solved and unsolved for students to comprehend the quantitative material of the book. Furthermore, we have enhanced the technology package of this book to have more applied learning of concepts and skills for students. Lastly, technology, such as the internet, ecommerce, etc has been added to reflect the changes in how business is conducted. This text reflects Steve Nahmias' extensive teaching background and experience in both business and engineering schools. .

Design and Optimization of Production Lines - Paolo Renna 2021-01-27
This book is dedicated to the latest findings on the design and optimization of production lines. The "Fourth Industrial Revolution" (alternatively known as "Industry 4.0") supports innovative models for energy consumption and fault tolerance in automated lines, and this drives changes in the design and optimization models of production lines. The goal is to collect a series of works that can summarize the latest trends in the field of production line optimization models in order to improve the responsiveness of automated lines to failures, reduce energy consumption and peak electricity demand, and develop other methods to support robust and sustainable production lines.

Applications of Multi-Criteria and Game Theory Approaches - Lyes Benyoucef 2013-10-17
Aligning the latest practices, innovations and case studies with academic frameworks and theories, the broad area of multi-criteria and game theory applications in manufacturing and logistics is covered in comprehensive detail. Divided into two parts, part I is dedicated to 'multi-criteria applications' and includes chapters on logistics with a focus on vehicle routing problems, a multi-objective decision making approach to select the best storage policy and an exploratory study to predict the most important factors that can lead to successful mobile supply chain management adoption for manufacturing firms. Part II covers 'game theory applications' and encompasses the process of forming a coalition within a corporate network to the problem of integrating inventory and distribution optimization together with game theory to effectively manage supply networks. Providing a forum to investigate, exchange novel ideas and disseminate knowledge covering the broad area of multi-criteria and game theory applications in manufacturing and logistics, Applications of Multi-Criteria and Game Theory Approaches is an excellent reference for students, researchers but also managers and industry professionals working with manufacturing and logistics issues.

Computational Intelligence in Industrial Application - Yanglv Ling 2015-07-28
These proceedings of the 2014 Pacific-Asia Workshop on Computational Intelligence in Industrial Application (CIIA 2014) include 81 peer-reviewed papers. The topics covered in the book include: (1) Computer Intelligence, (2) Application of Computer Science and Communication, (3) Industrial Engineering, Product Design and Manufacturing, (4) Automatio

Algorithms for Scheduling Problems - FrankWerner 2018-08-24
This book is a printed edition of the Special Issue " Algorithms for Scheduling Problems" that was published in Algorithms

Balancing and Sequencing of Assembly Lines - Armin Scholl 1999
It is dealt with two main decision problems which arise when flow-line production systems are installed and operated. The assembly line balancing problem consists of partitioning the work, necessary to assemble the product(s), among different stations of an assembly line. If several models of a product are jointly processed on a line, this medium-term problem is connected with the short-term problem of determining an operating sequence of the models. In Part I balancing and sequencing problems are discussed, classified, and arranged within a hierarchical planning system. In the second edition special emphasis is given to u-shaped assembly lines which are important components of modern just-

in-time production systems. Part II is concerned with exact and heuristic procedures for solving those decision problems. For each problem type considered, a survey of existing procedures is given and new efficient solution methods are developed. Comprehensive numerical investigations are reported.

Assembly Line Planning and Control - Nick T. Thomopoulos 2013-09-11
Assembly Line Planning and Control describes the basic fundamentals of assembly lines for single model lines, mixed model make-to-stock lines, mixed model make-to-order lines and for one-station assembly. The book shows how to select the quantity of units to schedule for a shift duration, compute the number of operators needed on a line, set the conveyor speed, coordinate the main line with sub-assembly lines, assign the work elements to the operators on the line, sequence the models down the line, sequence the jobs down the line, calculate the part and component requirements for a line and for each station, determine the replenish needs of the parts and components from the suppliers, compute the similarity between the models being produced and show applications, use learning curves to estimate time and costs of assembly, and measure the efficiency of the line. The material is timeless and the book will never become obsolete. The author presents solutions with easy-to-understand numerical examples that can be applied to real-life applications.

Advances in Production Management Systems. Artificial Intelligence for Sustainable and Resilient Production Systems - Alexandre Dolgui 2021-09-01
The five-volume set IFIP AICT 630, 631, 632, 633, and 634 constitutes the refereed proceedings of the International IFIP WG 5.7 Conference on Advances in Production Management Systems, APMS 2021, held in Nantes, France, in September 2021.* The 378 papers presented were carefully reviewed and selected from 529 submissions. They discuss artificial intelligence techniques, decision aid and new and renewed paradigms for sustainable and resilient production systems at four-wall factory and value chain levels. The papers are organized in the following topical sections: Part I: artificial intelligence based optimization techniques for demand-driven manufacturing; hybrid approaches for production planning and scheduling; intelligent systems for manufacturing planning and control in the industry 4.0; learning and robust decision support systems for agile manufacturing environments; low-code and model-driven engineering for production system; meta-heuristics and optimization techniques for energy-oriented manufacturing systems; metaheuristics for production systems; modern analytics and new AI-based smart techniques for replenishment and production planning under uncertainty; system identification for manufacturing control applications; and the future of lean thinking and practice Part II: digital transformation of SME manufacturers: the crucial role of standard; digital transformations towards supply chain resiliency; engineering of smart-product-service-systems of the future; lean and Six Sigma in services healthcare; new trends and challenges in reconfigurable, flexible or agile production system; production management in food supply chains; and sustainability in production planning and lot-sizing Part III: autonomous robots in delivery logistics; digital transformation approaches in production management; finance-driven supply chain; gastronomic service system design; modern scheduling and applications in industry 4.0; recent advances in sustainable manufacturing; regular session: green production and circularity concepts; regular session: improvement models and methods for green and innovative systems; regular session: supply chain and routing management; regular session: robotics and human aspects; regular session: classification and data management methods; smart supply chain and production in society 5.0 era; and supply chain risk management under coronavirus Part IV: AI for resilience in global supply chain networks in the context of pandemic disruptions; blockchain in the operations and supply chain management; data-based services as key enablers for smart products, manufacturing and assembly; data-driven methods for supply chain optimization; digital twins based on systems engineering and semantic modeling; digital twins in companies first developments and future challenges; human-centered artificial intelligence in smart manufacturing for the operator 4.0; operations management in engineer-to-order manufacturing; product and asset life cycle management for smart and sustainable manufacturing systems; robotics technologies for control, smart manufacturing and logistics; serious games analytics: improving games and learning support; smart and sustainable production and supply chains; smart methods and techniques for sustainable supply chain management; the new digital lean manufacturing paradigm; and the role of emerging technologies in

disaster relief operations: lessons from COVID-19 Part V: data-driven platforms and applications in production and logistics: digital twins and AI for sustainability; regular session: new approaches for routing problem solving; regular session: improvement of design and operation of manufacturing systems; regular session: crossdock and transportation issues; regular session: maintenance improvement and lifecycle management; regular session: additive manufacturing and mass customization; regular session: frameworks and conceptual modelling for systems and services efficiency; regular session: optimization of production and transportation systems; regular session: optimization of supply chain agility and reconfigurability; regular session: advanced modelling approaches; regular session: simulation and optimization of systems performances; regular session: AI-based approaches for quality and performance improvement of production systems; and regular session: risk and performance management of supply chains *The conference was held online.

Supply Chain Optimisation - Alexandre Dolgui 2006-06-18
This volume collects recent results in supply chain optimisation. It presents new approaches and methods based on operations research, artificial intelligence and advanced computing techniques for design of production systems, supply and inventory management, production planning and scheduling, location, transportation and logistics, and simulation in supply flow optimisation. The text presents a wide spectrum of optimisation problems taking into account supply chain paradigms, which are pivotal to improving productivity.

Balancing and Sequencing of Assembly Lines - Armin Scholl 1999-02-26
The book deals with two main decision problems which arise when flow-line production systems are installed and operated. The assembly line balancing problem consists of partitioning the work, necessary to assemble the product(s), among different stations of an assembly line. If several models of a product are jointly processed on a line, this medium-term problem is connected with the short-term problem of determining an operating sequence of the models. In Part I balancing and sequencing problems are discussed, classified, and arranged within a hierarchical planning system. In the present second edition special emphasis is given to u-shaped assembly lines which are important components of modern just-in-time production systems. Part II is concerned with exact and heuristic procedures for solving those decision problems. For each problem type considered, a survey of existing procedures is given and new efficient solution methods are developed. Comprehensive numerical investigations showing the effectiveness of the new methods and their superiority over existing approaches are reported.

An Analysis of a Computer Method of Sequencing Assembly Line Operations - Albert Lawrence Arcus 1963

Scheduling in Industry 4.0 and Cloud Manufacturing - Boris Sokolov 2020-06-08
This book has resulted from the activities of IFAC TC 5.2 "Manufacturing Modelling for Management and Control". The book offers an introduction and advanced techniques of scheduling applications to cloud manufacturing and Industry 4.0 systems for larger audience. This book uncovers fundamental principles and recent developments in the theory and application of scheduling methodology to cloud manufacturing and Industry 4.0. The purpose of this book is to present recent developments in scheduling in cloud manufacturing and Industry 4.0 and to systemize these developments in new taxonomies and methodological principles to shape this new research domain. This book addresses the needs of both researchers and practitioners to uncover the challenges and opportunities of scheduling techniques' applications to cloud manufacturing and Industry 4.0. For the first time, it comprehensively conceptualizes scheduling in cloud manufacturing and Industry 4.0 systems as a new research domain. The chapters of the book are written by the leading international experts and utilize methods of operations research, industrial engineering and computer science. Such a multi-disciplinary combination is unique and comprehensively deciphers major problem taxonomies, methodologies, and applications to scheduling in cloud manufacturing and Industry 4.0.

Network Models and Optimization - Mitsuo Gen 2008-07-10
Network models are critical tools in business, management, science and industry. "Network Models and Optimization" presents an insightful, comprehensive, and up-to-date treatment of multiple objective genetic algorithms to network optimization problems in many disciplines, such as engineering, computer science, operations research, transportation, telecommunication, and manufacturing. The book extensively covers algorithms and applications, including shortest path problems, minimum

cost flow problems, maximum flow problems, minimum spanning tree problems, traveling salesman and postman problems, location-allocation problems, project scheduling problems, multistage-based scheduling problems, logistics network problems, communication network problem, and network models in assembly line balancing problems, and airline fleet assignment problems. The book can be used both as a student textbook and as a professional reference for practitioners who use network optimization methods to model and solve problems.

Production Planning and Scheduling in Flexible Assembly Systems
- Tadeusz Sawik 2012-12-06

The book familiarizes the reader with the flexible assembly systems planning and scheduling issues and various operations research modelling and solution approaches. Some of the many topic highlights presented are the overall structure and components of a flexible assembly system, bi-objective integer programming models and algorithms for machine loading, assembly routing, and assembly plan selection, and fast combinatorial heuristics for scheduling flexible assembly lines with limited intermediate buffers. Also the book deals with just-in-time scheduling of flexible assembly lines, and dynamic dispatching algorithms for simultaneous scheduling of assembly stations and automated guided vehicles.