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Network Analysis Literacy - Katharina A. Zweig 2016-10-26
This book presents a perspective of network analysis as a tool to find and quantify significant structures in the interaction patterns between different types of entities. Moreover, network analysis provides the basic means to relate these structures to properties of the entities. It has proven itself to be useful for the analysis of biological and social networks, but also for networks describing complex systems in economy, psychology, geography, and various other fields. Today, network analysis packages in the open-source platform R and other open-source software projects enable scientists from all fields to quickly apply network analytic methods to their data sets. Altogether, these applications offer such a wealth of network analytic methods that it can be overwhelming for someone just entering this field. This book provides a road map through this jungle of network analytic methods, offers advice on how to pick the best method for a given network analytic project, and how to avoid common pitfalls. It introduces the methods which are most often used to analyze complex networks, e.g., different global network measures, types of random graph models, centrality indices, and networks motifs. In addition to introducing these methods, the central focus is on network analysis literacy – the competence to decide when to use which of these methods for which type of question. Furthermore, the book intends to increase the reader's competence to read original literature on network analysis by providing a glossary and intensive translation of formal notation and mathematical symbols in everyday speech. Different aspects of network analysis literacy – understanding formal definitions, programming tasks, or the analysis of structural measures and their interpretation – are deepened in various exercises with provided solutions. This text is an excellent, if not the best starting point for all scientists who want to harness the power of network analysis for their field of expertise.

Innovations in Information Systems for Business Functionality and Operations Management - Wang, John 2012-04-30
"This book offers the latest research in IS/IT applications related to business and operations management, with contributions in the form of case studies, methodologies, best practices, frameworks, and research"-- Provided by publisher.

Wireless Network Design - Jeff Kennington 2010-11-10
This book surveys state-of-the-art optimization modeling for design, analysis, and management of wireless networks, such as cellular and wireless local area networks (LANs), and the services they deliver. The past two decades have seen a tremendous growth in the deployment and use of wireless networks. The current-generation wireless systems can provide mobile users with high-speed data services at rates substantially higher than those of the previous generation. As a result, the demand for mobile information services with high reliability, fast response times, and ubiquitous connectivity continues to increase rapidly. The optimization of system performance has become critically important both in terms of practical utility and commercial viability, and presents a rich area for research. In the editors' previous work on traditional wired networks, we have observed that designing low cost, survivable telecommunication networks involves extremely complicated processes. Commercial products available to help with this task typically have been based on simulation and/or proprietary heuristics. As demonstrated in this book, however, mathematical programming deserves a prominent place in the designer's toolkit. Convenient modeling languages and powerful optimization solvers have greatly facilitated the implementation of mathematical programming theory into the practice of commercial network design. These points are equally relevant and applicable in today's world of wireless network technology and design. But there are new issues as well: many wireless network design decisions, such as routing and facility/element location, must be dealt with in innovative ways that are unique and distinct from wired (fiber optic) networks. The

book specifically treats the recent research and the use of modeling languages and network optimization techniques that are playing particularly important and distinctive roles in the wireless domain.

Optimization and Cooperative Control Strategies - Michael Hirsch 2009-01-17
Cooperative, collaborating autonomous systems are at the forefront of research efforts in numerous disciplines across the applied sciences. There is constant progress in solution techniques for these systems. However, despite this progress, cooperating systems have continued to be extremely difficult to model, analyze, and solve. Theoretical results are very difficult to come by. Each year, the International Conference on Cooperative Control and Optimization (CCO) brings together top researchers from around the world to present new, cutting-edge ideas, theories, applications, and advances in the fields of autonomous agents, cooperative systems, control theory, information flow, and optimization. The works in this volume are a result of invited papers and selected presentations at the Eighth Annual International Conference on Cooperative Control and Optimization, held in Gainesville, Florida, January 30 – February 1, 2008.

Location Science - Gilbert Laporte 2020-03-16
This book presents essential information on modern location science – in a word, all you need to know about location. The second edition of this handbook has been fully revised throughout, with numerous updates and chapters added, to offer an even more comprehensive overview of methods and applications. The book is divided into three parts: basic concepts, advanced concepts and applications. Written by the most respected specialists in the field and thoroughly reviewed by the editors, it first lays out the fundamental problems in location science and provides readers with basic background information on location theory. Part II covers advanced models and concepts, broadening and expanding on the content presented in Part I. It also discusses important tools to help readers grasp and solve real-world location problems. Part III focuses on the links between location science and other areas like GIS, telecommunications, healthcare, rapid transit networks, districting problems and disaster events, and presents a wide range of applications to allow readers to understand the role of facility location in such areas and learn how to handle real-world location problems. The book is intended for researchers working on theory and applications involving location problems and models. It is also suitable as a textbook for graduate courses on facility location.

Networked Digital Technologies, Part II - Filip Zavoral 2010-06-30
On behalf of the NDT 2010 conference, the Program Committee and Charles University in Prague, Czech Republic, we welcome you to the proceedings of the Second International Conference on 'Networked Digital Technologies' (NDT 2010). The NDT 2010 conference explored new advances in digital and Web technology applications. It brought together researchers from various areas of computer and information sciences who addressed both theoretical and applied aspects of Web technology and Internet applications. We hope that the discussions and exchange of ideas that took place will contribute to advancements in the technology in the near future. The conference received 216 papers, out of which 85 were accepted, resulting in an acceptance rate of 39%. These accepted papers are authored by researchers from 34 countries covering many significant areas of Web applications. Each paper was evaluated by a minimum of two reviewers. Finally, we believe that the proceedings document the best research in the studied areas. We express our thanks to the Charles University in Prague, Springer, the authors and the organizers of the conference.

Approximation Algorithms for Combinatorial Optimization - Klaus Jansen 2003-06-30
This book constitutes the refereed proceedings of the 5th International Workshop on Approximation Algorithms for Combinatorial Optimization

Problems, APPROX 2002, held in Rome, Italy in September 2002. The 20 revised full papers presented were carefully reviewed and selected from 54 submissions. Among the topics addressed are design and analysis of approximation algorithms, inapproximability results, online problems, randomization techniques, average-case analysis, approximation classes, scheduling problems, routing and flow problems, coloring and partitioning, cuts and connectivity, packing and covering, geometric problems, network design, and applications to game theory and other fields.

Multi-Objective Combinatorial Optimization Problems and Solution Methods - Mehdi Toloo 2022-02-11
Multi-Objective Combinatorial Optimization Problems and Solution Methods discusses the results of a recent multi-objective combinatorial optimization achievement that considered metaheuristic, mathematical programming, heuristic, hyper heuristic and hybrid approaches. In other words, the book presents various multi-objective combinatorial optimization issues that may benefit from different methods in theory and practice. Combinatorial optimization problems appear in a wide range of applications in operations research, engineering, biological sciences and computer science, hence many optimization approaches have been developed that link the discrete universe to the continuous universe through geometric, analytic and algebraic techniques. This book covers this important topic as computational optimization has become increasingly popular as design optimization and its applications in engineering and industry have become ever more important due to more stringent design requirements in modern engineering practice. Presents a collection of the most up-to-date research, providing a complete overview of multi-objective combinatorial optimization problems and applications Introduces new approaches to handle different engineering and science problems, providing the field with a collection of related research not already covered in the primary literature Demonstrates the efficiency and power of the various algorithms, problems and solutions, including numerous examples that illustrate concepts and algorithms

Dynamics of Disasters - Ilias S. Kotsireas 2021-03-09
Based on the "Fourth International Conference on Dynamics of Disasters" (Kalamata, Greece, July 2019), this volume includes contributions from experts who share their latest discoveries on natural and unnatural disasters. Authors provide overviews of the tactical points involved in disaster relief, outlines of hurdles from mitigation and preparedness to response and recovery, and uses for mathematical models to describe natural and man-made disasters. Topics covered include economics, optimization, machine learning, government, management, business, humanities, engineering, medicine, mathematics, computer science, behavioral studies, emergency services, and environmental studies will engage readers from a wide variety of fields and backgrounds.

Intelligent and Fuzzy Techniques: Smart and Innovative Solutions - Cengiz Kahraman 2020-07-10
This book gathers the most recent developments in fuzzy & intelligence systems and real complex systems presented at INFUS 2020, held in Istanbul on July 21–23, 2020. The INFUS conferences are a well-established international research forum to advance the foundations and applications of intelligent and fuzzy systems, computational intelligence, and soft computing, highlighting studies on fuzzy & intelligence systems and real complex systems at universities and international research institutions. Covering a range of topics, including the theory and applications of fuzzy set extensions such as intuitionistic fuzzy sets, hesitant fuzzy sets, spherical fuzzy sets, and fuzzy decision-making; machine learning; risk assessment; heuristics; and clustering, the book is a valuable resource for academics, M.Sc. and Ph.D. students, as well as managers and engineers in industry and the service sectors.

Geospatial Analysis - Dr Michael J de Smith 2018
Geospatial Analysis: A Comprehensive Guide to Principles, Techniques and Software Tools originated as material to accompany the spatial analysis module of MSc programmes at University College London delivered by the principal author, Dr Mike de Smith. The project was discussed with Professors Longley and Goodchild. They kindly agreed to contribute to the contents of the Guide itself. As such, this Guide may be seen as a companion to the pioneering book on Geographic Information Systems and Science (now changed to Science and Systems) by Longley, Goodchild, Maguire and Rhind, particularly the chapters that deal with spatial analysis and modeling. Their participation has also facilitated links with broader "spatial literacy" and spatial analysis programmes. Notable amongst these are the GIS&T Body of Knowledge materials provided by the Association of American Geographers together with the spatial educational programmes provided through UCL and UCSB. The formats in which this Guide has been published have proved to be extremely popular, encouraging us to seek to improve and extend the material and associated resources further. Many academics and industry professionals have provided helpful comments on previous editions, and universities in several parts of the world have now developed courses which make use of the Guide and the accompanying resources. Workshops based on these materials have been run in Ireland, the USA, East Africa, Italy and Japan, and a Chinese version of the Guide (2nd ed.) has been published by the Publishing House of Electronics Industry, Beijing, PRC, www.phei.com.cn in 2009. A Chinese version of this 6th edition is due to be published in 2021 by Science Press.

Algorithms and Computation - D.T. Lee 2000-11-29
This book constitutes the refereed proceedings of the 11th International Conference on Algorithms and Computation, ISAAC 2000, held in Taipei, Taiwan in December 2000. The 46 revised papers presented together with an invited paper were carefully reviewed and selected from 87 submissions. The papers are organized in topical sections on algorithms and data structures; combinatorial optimization; approximation and randomized algorithms; graph drawing and graph algorithms; automata, cryptography, and complexity theory; parallel and distributed algorithms; computational geometry; and computational biology.

Integration of AI and OR Techniques in Constraint Programming - Domenico Salvagnin 2017-05-30
This book constitutes the proceedings of the 14th International Conference on Integration of Artificial Intelligence and Operations Research Techniques in Constraint Programming for Combinatorial Optimization Problems, CPAIOR 2017, held in Padua, Italy, in June 2017. The 32 full papers presented together with 6 abstracts were carefully reviewed and selected from numerous submissions. The conference brings together interested researchers from constraint programming, artificial intelligence, and operations research to present new techniques or applications in the intersection of these fields and provides an opportunity for researchers in one area to learn about techniques in the others, and to show how the integration of techniques from different fields can lead to interesting results on large and complex problems.

Computational Science – ICCS 2020 - Valeria V. Krzhizhanovskaya 2020-06-19
The seven-volume set LNCS 12137, 12138, 12139, 12140, 12141, 12142, and 12143 constitutes the proceedings of the 20th International Conference on Computational Science, ICCS 2020, held in Amsterdam, The Netherlands, in June 2020.* The total of 101 papers and 248 workshop papers presented in this book set were carefully reviewed and selected from 719 submissions (230 submissions to the main track and 489 submissions to the workshops). The papers were organized in topical sections named: Part I: ICCS Main Track Part II: ICCS Main Track Part III: Advances in High-Performance Computational Earth Sciences: Applications and Frameworks; Agent-Based Simulations, Adaptive Algorithms and Solvers; Applications of Computational Methods in Artificial Intelligence and Machine Learning; Biomedical and Bioinformatics Challenges for Computer Science Part IV: Classifier Learning from Difficult Data; Complex Social Systems through the Lens of Computational Science; Computational Health; Computational Methods for Emerging Problems in (Dis-)Information Analysis Part V: Computational Optimization, Modelling and Simulation; Computational Science in IoT and Smart Systems; Computer Graphics, Image Processing and Artificial Intelligence Part VI: Data Driven Computational Sciences; Machine Learning and Data Assimilation for Dynamical Systems; Meshfree Methods in Computational Sciences; Multiscale Modelling and Simulation; Quantum Computing Workshop Part VII: Simulations of Flow and Transport: Modeling, Algorithms and Computation; Smart Systems: Bringing Together Computer Vision, Sensor Networks and Machine Learning; Software Engineering for Computational Science; Solving Problems with Uncertainties; Teaching Computational Science; UNcErtainty QUantIficatiOn for ComputationAl modeLs *The conference was canceled due to the COVID-19 pandemic. Chapter 'APE: A Command-Line Tool and API for Automated Workflow Composition' is available open access under a Creative Commons Attribution 4.0 International License via link.springer.com.

Defense Transportation: Algorithms, Models and Applications for the 21st Century - Robert T. Brigantic 2004-07-22
This book contains papers divided into three general sections according to the title of this text: algorithms, models, and applications. The first section on algorithms contains papers that are theoretical in nature or contain new techniques that relate to Defense Transportation System

(DTS) processes. A sampling of the papers contained in this section deals with group theoretic "tabu" search techniques, shortest path sailing distance algorithms, and strategic airlift model validation methods. The second section contains papers on various transportation models used throughout the DoD and transportation industry, as well as some newly developed transportation modelling methods that may eventually find their way into larger scale transportation models. A review of the major strategic mobility models is also contained in this section. The third section contains papers on various transportation applications that have been used to support various DTS studies and analyses. This section also contains a diverse set of topics, with articles ranging from a paper on North Atlantic Treaty Organization (NATO) strategic lift requirements to an analysis paper on theater reception, staging, onward movement, and integration. · Preface by General John W. Handy, Commander, United States Transportation Command · Focus on land, sea, and air transportation models and methods · Manuscripts written by analysts and researchers active in the field and directly supporting the United States Defense Transportation System · Research methods were instrumental in defining the in-place DTS that so efficiently deployed forces for Operation Enduring Freedom and Operation Iraqi Freedom
Selected Topics in Information and Coding Theory -

Bridging the Socio-technical Gap in Decision Support Systems - Ana Respício 2010
Presents the advances in decision support theory and practice with a focus on bridging the socio-technical gap. This book covers a wide range of topics including: Understanding DM, Design of DSS, Web 2.0 Systems in Decision Support, Business Intelligence and Data Warehousing, Applications of Multi-Criteria Decision Analysis, and more.
Handbook of Algorithms for Physical Design Automation - Charles J. Alpert 2008-11-12
The physical design flow of any project depends upon the size of the design, the technology, the number of designers, the clock frequency, and the time to do the design. As technology advances and design-styles change, physical design flows are constantly reinvented as traditional phases are removed and new ones are added to accommodate changes in
Handbook of Military Industrial Engineering - Adedeji B. Badiru 2009-02-25
In light of increasing economic and international threats, military operations must be examined with a critical eye in terms of process design, management, improvement, and control. Although the Pentagon and militaries around the world have utilized industrial engineering (IE) concepts to achieve this goal for decades, there has been no single resource to bring together IE applications with a focus on improving military operations. Until now. Winner of the 2010 IIE/Joint Publishers Book-of-the-Year Award The Handbook of Military Industrial Engineering is the first compilation of the fundamental tools, principles, and modeling techniques of industrial engineering with specific and direct application to military systems. Globally respected IE experts provide proven strategies that can help any military organization effectively create, adapt, utilize, and deploy resources, tools, and technology. Topics covered include: Supply Chain Management and decision making Lean Enterprise Concepts for military operations Modeling and optimization Economic planning for military systems Contingency planning and logistics Human factors and ergonomics Information management and control Civilian engineers working on systems analysis, project management, process design, and operations research will also find inspiration and useful ideas on how to effectively apply the concepts covered for non-military uses. On the battlefield and in business, victory goes to those who utilize their resources most effectively, especially in times of operational crisis. The Handbook of Military Industrial Engineering is a complete reference that will serve as an invaluable resource for those looking to make the operational improvements needed to accomplish the mission at hand.
Advances in Delay-Tolerant Networks (DTNs) - Joel J.P.C. Rodrigues 2020-11-20
Advances in Delay-Tolerant Networks: Architecture and Enhanced Performance, Second Edition provides an important overview of delay-tolerant networks (DTNs) for researchers in electronics, computer engineering, telecommunications and networking for those in academia and R&D in industrial sectors. Part I reviews the technology involved and the prospects for improving performance, including different types of DTN and their applications, such as satellite and deep-space communications and vehicular communications. Part II focuses on how the technology can be further improved, addressing topics, such as data

bundling, opportunistic routing, reliable data streaming, and the potential for rapid selection and dissemination of urgent messages. Opportunistic, delay-tolerant networks address the problem of intermittent connectivity in a network where there are long delays between sending and receiving messages, or there are periods of disconnection. Reviews the different types of DTN and shows how they can be applied in satellite and deep-space communications, vehicular communications (including unmanned aerial), and during large-scale disasters Considers security concerns for DTN and potential for rapid selection and dissemination of urgent messages Reviews the breadth of areas in which DTN is already providing solutions Covers the prospects for DTN's wider adoption and development of standards
Ant Colony Optimization and Swarm Intelligence - Marco Dorigo 2008-09-20
The series of biannual international conferences "ANTS – International C- ference on Ant Colony Optimization and Swarm Intelligence", now in its sixth edition, was started ten years ago, with the organization of ANTS'98. As some readers might recall, the ?rst edition of ANTS was titled "ANTS'98 – From Ant Colonies to Arti?cial Ants: First International Workshop on Ant Colony Op- mization. " In fact, at that time the focus was mainly on ant colony optimization (ACO), the ?rst swarm intelligence algorithm to go beyond a pure scienti?c interest and to enter the realm of real-world applications. Interestingly, in the ten years after the ?rst edition there has been a gr- ing interest not only for ACO, but for a number of other studies that belong more generally to the area of swarmintelligence. The rapid growth of the swarm intelligence ?eld is attested by a number of indicators. First, the number of s- missions and participants to the ANTS conferences has steadily increased over the years. Second, a number of international conferences in computational - telligence and related disciplines organize workshops on subjects such as swarm intelligence, ant algorithms, ant colony optimization, and particle swarm op- mization. Third, IEEE startedorganizing,in 2003,the IEEE SwarmIntelligence Symposium (in order to maintain unity in this growing ?eld, we are currently establishingacooperationagreementbetweenIEEE SISandANTSsoastohave 1 IEEE SIS in odd years and ANTS in even years). Last, the Swarm Intelligence journal was born.
Python Algorithms - Magnus Lie Hetland 2014-09-17
Python Algorithms, Second Edition explains the Python approach to algorithm analysis and design. Written by Magnus Lie Hetland, author of Beginning Python, this book is sharply focused on classical algorithms, but it also gives a solid understanding of fundamental algorithmic problem-solving techniques. The book deals with some of the most important and challenging areas of programming and computer science in a highly readable manner. It covers both algorithmic theory and programming practice, demonstrating how theory is reflected in real Python programs. Well-known algorithms and data structures that are built into the Python language are explained, and the user is shown how to implement and evaluate others.
Network Flows - Ravindra K. Ahuja 1993
An introduction to network flows discusses paths, algorithms, shortest paths, maximum flows, minimum cost flows, convex cost flows, generalized flows, and other topics
Graph Theory for Operations Research and Management: Applications in Industrial Engineering - Farahani, Reza Zanjirani 2012-12-31
While typically many approaches have been mainly mathematics focused, graph theory has become a tool used by scientists, researchers, and engineers in using modeling techniques to solve real-world problems. Graph Theory for Operations Research and Management: Applications in Industrial Engineering presents traditional and contemporary applications of graph theory in the areas of industrial engineering, management science, and applied operations research. This comprehensive collection of research introduces the useful basic concepts of graph theory in real world applications.
Network Flows - Ravindra K Ahuja 2018-10-15
This work has been selected by scholars as being culturally important and is part of the knowledge base of civilization as we know it. This work is in the public domain in the United States of America, and possibly other nations. Within the United States, you may freely copy and distribute this work, as no entity (individual or corporate) has a copyright on the body of the work. Scholars believe, and we concur, that this work is important enough to be preserved, reproduced, and made generally available to the public. To ensure a quality reading experience, this work has been proofread and republished using a format that seamlessly blends the original graphical elements with text in an easy-to-read

typeface. We appreciate your support of the preservation process, and thank you for being an important part of keeping this knowledge alive and relevant.

Applications of Combinatorial Optimization - Vangelis Th. Paschos 2013-02-07
Combinatorial optimization is a multidisciplinary scientific area,lying in the interface of three major scientific domains:mathematics, theoretical computer science and management. The three volumes of the Combinatorial Optimization series aimsto cover a wide range of topics in this area. These topics alsodeal with fundamental notions and approaches as with severalclassical applications of combinatorial optimization. "Applications of Combinatorial Optimization" ispresenting a certain number among the most common and well-knownapplications of Combinatorial Optimization.

An Introduction to Project Modeling and Planning - Gündüz Ulusoy 2021-04-05
This textbook teaches the basic concepts and methods of project management but also explains how to convert them to useful results in practice. Project management offers a promising working area for theoretical and practical applications, and developing software and decision support systems (DSS). This book specifically focuses on project planning and control, with an emphasis on mathematical modeling. Models and algorithms establish a good starting point for students to study the relevant literature and support pursuing academic work in related fields. The book provides an introduction to theoretical concepts, and it also provides detailed explanations, application examples, and case studies that deal with real-life problems. The chapter topics include questions that underlie critical thinking, interpretation, analytics, and making comparisons. Learning outcomes are defined and the content of the book is structured following these goals. Chapter 1 begins by introducing the basic concepts, methods, and processes of project management. This Chapter constitutes the base for defining and modeling project management problems. Chapter 2 explores the fundamentals of organizing and managing projects from an organization's perspective. Issues related to project team formation, the role of project managers, and organization types are discussed. Chapter 3 is devoted to project planning and network modeling of projects, covering fundamental concepts such as project scope, Work Breakdown Structure (WBS), Organizational Breakdown Structure (OBS), Cost Breakdown Structure (CBS), project network modeling, activity duration, and cost estimating, activity-based costing (ABC), data and knowledge management. Chapter 4 introduces deterministic scheduling models, which can be used in constructing the time schedules. Models employing time-based and finance-based objectives are introduced. The CPM is covered. The unconstrained version of maximizing Net Present Value (NPV) is also treated here together with the case of time-dependent cash flows. Chapter 5 focuses on the time/cost trade-off problem, explaining how to reduce the duration of some of the activities and therefore reduce the project duration at the expense of additional costs. This topic is addressed for both continuous and discrete cases. Chapter 6 discusses models and methods of scheduling under uncertain activity durations. PERT is introduced for minimizing the expected project duration and extended to the PERT-Costing method for minimizing the expected project cost. Simulation is presented as another approach for dealing with the uncertainty in activity durations and costs. To demonstrate the use of the PERT, a case study on constructing an earthquake-resistant residential house is presented. Classifications of resource and schedule types are given in Chapter 7, and exact and heuristic solution procedures for the single- and multi-mode resource constrained project scheduling problem (RCPSP) are presented. The objective of maximizing NPV under resource constraints is addressed, and the capital-constrained project scheduling model is introduced. In Chapter 8, resource leveling, and further resource management problems are introduced. Total adjustment cost and resource availability cost problems are introduced. Various exact models are investigated. A heuristic solution procedure for the resource leveling problem is presented in detail. Also, resource portfolio management policies and the resource portfolio management problem are discussed. A case study on resource leveling dealing with the annual audit project of a major corporation is presented. Project contract types and payment schedules constitute the topics of Chapter 9. Contracts are legal documents reflecting the results of some form of client-contractor negotiations and sometimes of a bidding process, which deserve closer attention. Identification and allocation of risk in contracts, project control issues, disputes, and resolution management are further topics covered in this Chapter. A bidding model is presented to investigate client-contractor negotiations and the bidding process from different aspects. Chapter 10 focuses on processes and methods for project monitoring and control. Earned Value Management is studied to measure the project performance throughout the life of a project and to estimate the expected project time and cost based on the current status of the project. How to incorporate inflation into the analysis is presented. In Chapter 11, qualitative and quantitative techniques including decision trees, simulation, and software applications are introduced. Risk phases are defined and building a risk register is addressed. An example risk breakdown structure is presented. The design of risk management processes is introduced, and risk response planning strategies are discussed. At the end of the Chapter, the quantitative risk analysis is demonstrated at the hand of a team discussion case study. Chapter 12 covers several models and approaches dealing with various stochastic aspects of the decision environment. Stochastic models, generation of robust schedules, use of reactive and fuzzy approaches are presented. Sensitivity and scenario analysis are introduced. Also, simulation analysis, which is widely used to analyze the impacts of uncertainty on project goals, is presented. Chapter 13 addresses repetitive projects that involve the production or construction of similar units in batches such as railway cars or residential houses. Particularly in the construction industry repetitive projects represent a large portion of the work accomplished in this sector of the economy. A case study on the 50 km section of a motorway project is used for demonstrating the handling of repetitive project management. How best to select one or more of a set of candidate projects to maintain a project portfolio is an important problem for project-based organizations with limited resources. The project selection problem is inherently a multi-objective problem and is treated as such in Chapter 14. Several models and solution techniques are introduced. A multi-objective, multi-period project selection and scheduling model is presented. A case study that addresses a project portfolio selection and scheduling problem for the construction of a set of dams in a region is presented. Finally, Chapter 15 discusses three promising research areas in project management in detail: (i) Sustainability and Project Management, (ii) Project Management in the Era of Big Data, and (iii) the Fourth Industrial Revolution and the New Age Project Management. We elaborate on the importance of sustainability in project management practices, discuss how developments in data analytics might impact project life cycle management, and speculate how the infinite possibilities of the Fourth Industrial Revolution and the new technologies will transform project management practices.

Image Processing and Analysis with Graphs - Olivier Lezoray 2017-07-12
Covering the theoretical aspects of image processing and analysis through the use of graphs in the representation and analysis of objects, Image Processing and Analysis with Graphs: Theory and Practice also demonstrates how these concepts are indispensible for the design of cutting-edge solutions for real-world applications. Explores new applications in computational photography, image and video processing, computer graphics, recognition, medical and biomedical imaging With the explosive growth in image production, in everything from digital photographs to medical scans, there has been a drastic increase in the number of applications based on digital images. This book explores how graphs—which are suitable to represent any discrete data by modeling neighborhood relationships—have emerged as the perfect unified tool to represent, process, and analyze images. It also explains why graphs are ideal for defining graph-theoretical algorithms that enable the processing of functions, making it possible to draw on the rich literature of combinatorial optimization to produce highly efficient solutions. Some key subjects covered in the book include: Definition of graph-theoretical algorithms that enable denoising and image enhancement Energy minimization and modeling of pixel-labeling problems with graph cuts and Markov Random Fields Image processing with graphs: targeted segmentation, partial differential equations, mathematical morphology, and wavelets Analysis of the similarity between objects with graph matching Adaptation and use of graph-theoretical algorithms for specific imaging applications in computational photography, computer vision, and medical and biomedical imaging Use of graphs has become very influential in computer science and has led to many applications in denoising, enhancement, restoration, and object extraction. Accounting for the wide variety of problems being solved with graphs in image processing and computer vision, this book is a contributed volume of chapters written by renowned experts who address specific techniques or applications. This state-of-the-art overview provides application examples that illustrate practical application of theoretical algorithms.

Useful as a support for graduate courses in image processing and computer vision, it is also perfect as a reference for practicing engineers working on development and implementation of image processing and analysis algorithms.

Advances in Multiple Objective and Goal Programming - Rafael Caballero 2012-12-06
Within the field of multiple criteria decision making, this volume covers the latest advances in multiple objective and goal programming as presented at the 2nd International Conference on Multi-Objective Programming and Goal Programming, Torremolinos, Spain, May 16 - 18, 1996. The book is an undispensable source of the latest research results, presented by the leading experts of the field.

Performance Models and Risk Management in Communications Systems - Nalân Gülpınar 2010-11-02
This volume covers recent developments in the design, operation, and management of mobile telecommunication and computer systems. Uncertainty regarding loading and system parameters leads to challenging optimization and robustness issues. Stochastic modeling combined with optimization theory ensures the optimum end-to-end performance of telecommunication or computer network systems. In view of the diverse design options possible, supporting models have many adjustable parameters and choosing the best set for a particular performance objective is delicate and time-consuming. An optimization based approach determines the optimal possible allocation for these parameters. Researchers and graduate students working at the interface of telecommunications and operations research will benefit from this book. Due to the practical approach, this book will also serve as a reference tool for scientists and engineers in telecommunication and computer networks who depend upon optimization.

Encyclopedia of Optimization - Christodoulos A. Floudas 2008-09-04
The goal of the Encyclopedia of Optimization is to introduce the reader to a complete set of topics that show the spectrum of research, the richness of ideas, and the breadth of applications that has come from this field. The second edition builds on the success of the former edition with more than 150 completely new entries, designed to ensure that the reference addresses recent areas where optimization theories and techniques have advanced. Particularly heavy attention resulted in health science and transportation, with entries such as "Algorithms for Genomics", "Optimization and Radiotherapy Treatment Design", and "Crew Scheduling".

Sensors: Theory, Algorithms, and Applications - Vladimir L. Boginski 2011-11-25
The objective of this book is to advance the current knowledge of sensor research particularly highlighting recent advances, current work, and future needs. The goal is to share current technologies and steer future efforts in directions that will benefit the majority of researchers and practitioners working in this broad field of study.

Network Optimization Problems: Algorithms, Applications and Complexity - D Z Du 1993-04-27
In the past few decades, there has been a large amount of work on algorithms for linear network flow problems, special classes of network problems such as assignment problems (linear and quadratic), Steiner tree problem, topology network design and nonconvex cost network flow problems. Network optimization problems find numerous applications in transportation, in communication network design, in production and inventory planning, in facilities location and allocation, and in VLSI design. The purpose of this book is to cover a spectrum of recent developments in network optimization problems, from linear networks to general nonconvex network flow problems. Contents:Greedily Solvable Transportation Networks and Edge-Guided Vertex Elimination (I Adler & R Shamir)Networks Minimizing Length Plus the Number of Steiner Points (T Colthurst et al.)Practical Experiences Using an Interactive Optimization Procedure for Vehicle Scheduling (J R Daduna et al.)Subset Interconnection Designs: Generalizations of Spanning Trees and Steiner Trees (D-Z Du & P M Pardalos)Polynomial and Strongly Polynomial Algorithms for Convex Network Optimization (D S Hochbaum)Hamiltonian Circuits for 2-Regular Interconnection Networks (F K Hwang & W-C W Li)Equivalent Formulations for the Steiner Problem in Graphs (B N Khoury et al.)Minimum Concave-Cost Network Flow Problems with a Single Nonlinear Arc Cost (B Klinz & H Tuy)A Method for Solving Network Flow Problems with General Nonlinear Arc Costs (B W Lamar)Application of Global Line Search in Optimization of Networks (J Mockus)Solving Nonlinear Programs with Embedded Network Structures (M Ç Pinar & S A Zenios)On Algorithms for Nonlinear Dynamic Networks (W B Powell et al.)Strategic and Tactical Models and Algorithms for the Coal Industry Under the 1990 Clean Air Act (H D Sherali & Q J Saifee)Multi-Objective Routing in Stochastic Evacuation Networks (J M Smith)A Simplex Method for Network Programs with Convex Separable Piecewise Linear Costs and Its Application to Stochastic Transshipment Problems (J Sun et al.)A Bibliography on Network Flow Problems (M Veldhorst)Tabu Search: Applications and Prospects (S Voß)The Shortest Path Network and Its Applications in Bicriteria Shortest Path Problems (G-L Xue & S-Z Sun)A Network Formalism for Pure Exchange Economic Equilibria (L Zhao & A Nagurney)Steiner Problem in Multistage Computer Networks (S Bhattacharya & B Dasgupta) Readership: Applied mathematicians. keywords:"This volume reflects the wide spectrum of recent research activities in the design and analysis of algorithms and the applications of networks."Journal of Global Optimization

Encyclopedia of Operations Research and Management Science - Saul I. Gass 2012-12-06
Operations Research: 1934-1941," 35, 1, 143-152; "British The goal of the Encyclopedia of Operations Research and Operational Research in World War II," 35, 3, 453-470; Management Science is to provide to decision makers and "U. S. Operations Research in World War II," 35, 6, 910-925; problem solvers in business, industry, government and and the 1984 article by Harold Lardner that appeared in academia a comprehensive overview of the wide range of Operations Research: "The Origin of Operational Research," ideas, methodologies, and synergistic forces that combine to 32, 2, 465-475. form the preeminent decision-aiding fields of operations re search and management science (OR/MS). To this end, we The Encyclopedia contains no entries that define the fields enlisted a distinguished international group of academics of operations research and management science. OR and MS and practitioners to contribute articles on subjects for are often equated to one another. If one defines them by the which they are renowned. methodologies they employ, the equation would probably The editors, working with the Encyclopedia's Editorial stand inspection. If one defines them by their historical Advisory Board, surveyed and divided OR/MS into specific developments and the classes of problems they encompass, topics that collectively encompass the foundations, applica the equation becomes fuzzy. The formalism OR grew out of tions, and emerging elements of this ever-changing field. We the operational problems of the British and U. s. military also wanted to establish the close associations that OR/MS efforts in World War II.

Operational Research and Networks - Gerd Finke 2013-03-04
This book presents the principal concepts of operations research (OR) as tools for the planning, support, and management of various types of networks, including both physical and logical networks. It analyzes real problems, and offers a collection of models for many application areas, together with the corresponding solution techniques. Following this, important application areas are addressed, such as project scheduling, distribution networks, telecommunication networks, and planning of satellite imaging. Anyone involved in the theory or practice in this field will find this a vital resource.

Learning and Intelligent Optimization - Carlos A. Coello-Coello 2011-12-15
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.

Handbook of Discrete and Combinatorial Mathematics - Kenneth H. Rosen 2017-10-19
Handbook of Discrete and Combinatorial Mathematics provides a comprehensive reference volume for mathematicians, computer scientists, engineers, as well as students and reference librarians. The material is presented so that key information can be located and used quickly and easily. Each chapter includes a glossary. Individual topics are covered in sections and subsections within chapters, each of which is organized into clearly identifiable parts: definitions, facts, and examples. Examples are provided to illustrate some of the key definitions, facts, and algorithms. Some curious and entertaining facts and puzzles are also included. Readers will also find an extensive collection of biographies. This second edition is a major revision. It includes extensive additions

and updates. Since the first edition appeared in 1999, many new discoveries have been made and new areas have grown in importance, which are covered in this edition.

Metaheuristics and Optimization in Computer and Electrical Engineering - Navid Razmjooy 2020-11-16
The use of artificial intelligence, especially in the field of optimization is increasing day by day. The purpose of this book is to explore the possibility of using different kinds of optimization algorithms to advance and enhance the tools used for computer and electrical engineering purposes.

LATIN 2006: Theoretical Informatics - José R. Correa 2006-02-18
This book constitutes the refereed proceedings of the 7th International Symposium, Latin American Theoretical Informatics, LATIN 2006, held in March 2006. The 66 revised full papers presented together with seven invited papers were carefully reviewed and selected from 224 submissions. The papers presented are devoted to a broad range of topics in theoretical computer science with a focus on algorithmics and computations related to discrete mathematics as well as on cryptography, data compression and Web applications.

21st European Symposium on Computer Aided Process Engineering - 2011-06-10
The European Symposium on Computer Aided Process Engineering (ESCAPE) series presents the latest innovations and achievements of leading professionals from the industrial and academic communities. The ESCAPE series serves as a forum for engineers, scientists, researchers, managers and students to present and discuss progress being made in the area of computer aided process engineering (CAPE). European industries large and small are bringing innovations into our lives, whether in the form of new technologies to address environmental problems, new products to make our homes more comfortable and energy efficient or new therapies to improve the health and well being of European citizens. Moreover, the European Industry needs to undertake research and technological initiatives in response to humanity's "Grand Challenges," described in the declaration of Lund, namely, Global Warming, Tightening Supplies of Energy, Water and Food, Ageing Societies, Public Health, Pandemics and Security. Thus, the Technical Theme of ESCAPE 21 will be "Process Systems Approaches for Addressing Grand Challenges in Energy, Environment, Health, Bioprocessing & Nanotechnologies."