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Intelligent Distributed Computing XII Springer This book gathers a wealth of research contributions on recent advances in intelligent and distributed computing, and which present both architectural and algorithmic findings in these fields. A major focus is placed on new techniques and applications for evolutionary computation, swarm intelligence, multi-agent systems, multi-criteria optimization and Deep/Shallow machine learning models, all of which are approached as technological drivers to enable autonomous reasoning and decision-making in complex distributed environments. Part of the book is also devoted to new scheduling and resource allocation methods for distributed computing systems. The book represents the peer-reviewed proceedings of the 12th International Symposium on Intelligent Distributed Computing (IDC 2018), which was held in Bilbao, Spain, from October 15 to 17, 2018. Advances in Computational Intelligence in Transport, Logistics, and Supply Chain Management Springer Science & Business Media The book at hand presents a careful selection of relevant applications of CI methods for transport, logistics, and supply chain management problems. The chapters illustrate the current state-of-the-art in the application of CI methods in these fields and should help and inspire researchers and practitioners to apply and develop efficient methods. A few contributions in this book are extended versions of papers presented at EvoTransLog2007: The First European Workshop on Evolutionary Computation in Transportation and Logistics which was held in Valencia, Spain, in 2007. The majority of contributions are from additional, specially selected researchers, who have done relevant work in different areas of transport, logistics, and supply chain management. The goal is to broadly cover representative applications in these fields as well as different types of solution approaches. On the application side, the contributions focus on design of traffic and transportation networks, vehicle routing, and other important aspects of supply chain management such as inventory management, lot sizing, and lot scheduling. On the method side, the contributions deal with evolutionary algorithms, local search approaches, and scatter search combined with other CI techniques such as neural networks or fuzzy approaches. The book is structured according to the application domains. Thus, it has three parts dealing with traffic and transportation networks, vehicle routing, and supply chain management. Computational Intelligence in Expensive Optimization Problems Springer Science & Business Media In modern science and engineering, laboratory experiments are replaced by high fidelity and computationally expensive simulations. Using such simulations reduces costs and shortens development times but introduces new challenges to design optimization process. Examples of such challenges include limited computational resource for simulation runs, complicated response surface of the simulation inputs-outputs, and etc. Under such difficulties, classical optimization and analysis methods may perform poorly. This motivates the application of computational intelligence methods such as evolutionary algorithms, neural networks and fuzzy logic, which often perform well in such settings. This is the first book to introduce the emerging field of computational intelligence in expensive optimization problems. Topics covered include: dedicated implementations of evolutionary algorithms, neural networks and fuzzy logic. reduction of expensive evaluations (modelling, variable-fidelity, fitness inheritance), frameworks for optimization (model management, complexity control, model selection), parallelization of algorithms (implementation issues on clusters, grids, parallel machines), incorporation of expert systems and human-system interface, single and multiobjective algorithms, data mining and statistical analysis, analysis of real-world cases (such as multidisciplinary design optimization). The edited book provides both theoretical treatments and real-world insights gained by experience, all contributed by leading researchers in the respective fields. As such, it is a comprehensive reference for researchers, practitioners, and advanced-level students interested in both the theory and practice of using computational intelligence for expensive optimization problems. Springer Handbook of Bio-/Neuro-Informatics Springer Science & Business Media The Springer Handbook of Bio-/Neuro-Informatics is the first published book in one volume that explains together the basics and the state-of-the-art of two major science disciplines in their interaction and mutual relationship, namely: information sciences, bioinformatics and neuroinformatics. Bioinformatics is the area of science which is concerned with the information processes in biology and the development and applications of methods, tools and systems for storing and processing of biological information thus facilitating new knowledge discovery. Neuroinformatics is the area of science which is concerned with the information processes in biology and the development and applications of methods, tools and systems for storing and processing of biological information thus facilitating new knowledge discovery. The text contains 62 chapters organized in 12 parts, 6 of them covering topics from information science and bioinformatics, and 6 cover topics from information science and neuroinformatics. Each chapter consists of three main sections: introduction to the subject area, presentation of methods and advanced and future developments. The Springer Handbook of Bio-/Neuroinformatics can be used as both a textbook and as a reference for postgraduate study and advanced research in these areas. The target audience includes students, scientists, and practitioners from the areas of information, biological and neurosciences. With Forewords by Shun-ichi Amari of the Brain Science Institute, RIKEN, Saitama and Karlheinz Meier of the University of Heidelberg, Kirchhoff-Institute of Physics and Co-Director of the Human Brain Project. Heuristic Approaches for Telecommunications Network Management, Planning and Expansion A Special Issue of the Journal of Heuristics Springer Science & Business Media Telecommunications will face a tremendous challenge in the coming years to be able to design, architect, and manage networks in such a rapidly evolving industry. Develop ment and application of heuristic methods will be fundamental to our ability to meet this challenge. Robert Doverspike, AT&T Labs Research Iraj Saniee, Bell-Labs, Lucent Technologies June PI, 1999 3 '' Journal of Heuristics, 6, 9-20 (2000) •''II © 2000 Kluwer Academic Publishers Telecommunications Network Case Study: Selecting a Data Network Architecture ERIC ROSENBERG AT&T Labs, Middletown, NJ 07748, USA email: eric. rosenberg@att. com Abstract This paper documents a model that was pivotal in deciding which of two architectures should be selected for a frame relay data communications network. The choices are either to continue using the current architecture, or to make a large incremental investment in new equipment which reduces the number of high speed inter-office trunks required to interconnect the switches. The analysis requires optimizing the mix of two types of customer port cards to determine the maximum customer port capacity of a switch. Simple approximations are used to estimate the number of inter-office trunks and trunk cards required. Based in large part on the costs computed by this model, an executive level decision was made to move to the new architecture. Key Words: data communications, network architecture, network design, frame relay, virtual circuits, economic analysis 1. Introduction To design a data communications network, it is necessary to consider a variety of factors. Genetic Algorithms and Engineering Optimization John Wiley & Sons A comprehensive guide to a powerful new analytical tool by two of its foremost innovators The past decade has witnessed many exciting advances in the use of genetic algorithms (GAs) to solve optimization problems in everything from product design to scheduling and client/server networking. Aided by GAs, analysts and designers now routinely evolve solutions to complex combinatorial and multiobjective optimization problems with an ease and rapidity unthinkable withconventional methods. Despite the continued growth and refinement of this powerful analytical tool, there continues to be a lack of up-to-date guides to contemporary GA optimization principles and practices. Written by two of the world's leading experts in the field, this book fills that gap in the literature. Taking an intuitive approach, Mitsuo Gen and Runwei Cheng employ numerous illustrations and real-world examples to help readers gain a thorough understanding of basic GA concepts-including encoding, adaptation, and genetic optimizations-and to show how GAs can be used to solve an array of constrained, combinatorial, multiobjective, and fuzzy optimization problems. Focusing on problems commonly encountered in industry-especially in manufacturing-Professors Gen and Cheng provide in-depth coverage of advanced GA techniques for: * Reliability design * Manufacturing cell design * Scheduling * Advanced transportation problems * Network design and routing Genetic Algorithms and Engineering Optimization is an indispensable working resource for industrial engineers and designers, as well as systems analysts, operations researchers, and management scientists working in manufacturing and related industries. It also makes an excellent primary or supplementary text for advanced courses in industrial engineering, management science, operations research, computer science, and artificial intelligence. Parallel Problem Solving from Nature -- PPSN XIII 13th International Conference, Ljubljana, Slovenia, September 13-17,2014, Proceedings Springer This book constitutes the refereed proceedings of the 13th International Conference on Parallel Problem Solving from Nature, PPSN 2013, held in Ljubljana, Slovenia, in September 2014. The total of 90 revised full papers were carefully reviewed and selected from 217 submissions. The meeting began with 7 workshops which offered an ideal opportunity to explore specific topics in evolutionary computation, bio-inspired computing and metaheuristics. PPSN XIII also included 9 tutorials. The papers are organized in topical sections on adaption, self-adaption and parameter tuning; classifier system, differential evolution and swarm intelligence; coevolution and artificial immune systems; constraint handling; dynamic and uncertain environments; estimation of distribution algorithms and metamodelling; genetic programming; multi-objective optimisation; parallel algorithms and hardware implementations; real world applications; and theory. Nonlinear Multiobjective Optimization Springer Science & Business Media Problems with multiple objectives and criteria are generally known as multiple criteria optimization or multiple criteria decision-making (MCDM) problems. So far, these types of problems have typically been modelled and solved by means of linear programming. However, many real-life phenomena are of a nonlinear nature, which is why we need tools for nonlinear programming capable of handling several conflicting or incommensurable objectives. In this case, methods of traditional single objective optimization and linear programming are not enough; we need new ways of thinking, new concepts, and new methods - nonlinear multiobjective optimization. Nonlinear Multiobjective Optimization provides an extensive, up-to-date, self-contained and consistent survey, review of the literature and of the state of the art on nonlinear (deterministic) multiobjective optimization, its methods, its theory and its background. The amount of literature on multiobjective optimization is immense. The treatment in this book is based on approximately 1500 publications in English printed mainly after the year 1980. Problems related to real-life applications often contain irregularities and nonsmoothnesses. The treatment of nondifferentiable multiobjective optimization in the literature is rather rare. For this reason, this book contains material about the possibilities, background, theory and methods of nondifferentiable multiobjective optimization as well. This book is intended for both researchers and students in the areas of (applied) mathematics, engineering, economics, operations research and management science; it is meant

for both professionals and practitioners in many different fields of application. The intention has been to provide a consistent summary that may help in selecting an appropriate method for the problem to be solved. It is hoped the extensive bibliography will be of value to researchers. Parallel Problem Solving from Nature - PPSN XII 12th International Conference, Taormina, Italy, September 1-5, 2012, Proceedings, Part I Springer The two volume set LNCS 7491 and 7492 constitutes the refereed proceedings of the 12th International Conference on Parallel Problem Solving from Nature, PPSN 2012, held in Taormina, Sicily, Italy, in September 2012. The total of 105 revised full papers were carefully reviewed and selected from 226 submissions. The meeting began with 5 workshops which offered an ideal opportunity to explore specific topics in evolutionary computation, bio-inspired computing and metaheuristics. PPSN 2012 also included 8 tutorials. The papers are organized in topical sections on evolutionary computation; machine learning, classifier systems, image processing; experimental analysis, encoding, EDA, GP; multiobjective optimization; swarm intelligence, collective behavior, coevolution and robotics; memetic algorithms, hybridized techniques, meta and hyperheuristics; and applications. Genetic Algorithms in Molecular Modeling Academic Press Genetic Algorithms in Molecular Modeling is the first book available on the use of genetic algorithms in molecular design. This volume marks the beginning of an ew series of books, Principles in Qsar and Drug Design, which will be an indispensible reference for students and professionals involved in medicinal chemistry, pharmacology, (eco)toxicology, and agrochemistry. Each comprehensive chapter is written by a distinguished researcher in the field. Through its up to the minute content, extensive bibliography, and essential information on software availability, this book leads the reader from the theoretical aspects to the practical applications. It enables the uninitiated reader to apply genetic algorithms for modeling the biological activities and properties of chemicals, and provides the trained scientist with the most up to date information on the topic. . Extremely topical and timely . Sets the foundations for the development of computer-aided tools for solving numerous problems in QSAR and drug design . Written to be accessible without prior direct experience in genetic algorithms Routing, Flow, and Capacity Design in Communication and Computer Networks Elsevier In network design, the gap between theory and practice is woefully broad. This book narrows it, comprehensively and critically examining current network design models and methods. You will learn where mathematical modeling and algorithmic optimization have been under-utilized. At the opposite extreme, you will learn where they tend to fail to contribute to the twin goals of network efficiency and cost-savings. Most of all, you will learn precisely how to tailor theoretical models to make them as useful as possible in practice. Throughout, the authors focus on the traffic demands encountered in the real world of network design. Their generic approach, however, allows problem formulations and solutions to be applied across the board to virtually any type of backbone communication or computer network. For beginners, this book is an excellent introduction. For seasoned professionals, it provides immediate solutions and a strong foundation for further advances in the use of mathematical modeling for network design. Written by leading researchers with a combined 40 years of industrial and academic network design experience. Considers the development of design models for different technologies, including TCP/IP, IDN, MPLS, ATM, SONET/SDH, and WDM. Discusses recent topics such as shortest path routing and fair bandwidth assignment in IP/MPLS networks. Addresses proper multi-layer modeling across network layers using different technologies—for example, IP over ATM over SONET, IP over WDM, and IDN over SONET. Covers restoration-oriented design methods that allow recovery from failures of large-capacity transport links and transit nodes. Presents, at the end of each chapter, exercises useful to both students and practitioners. Image Processing & Communications Challenges 3 Springer Science & Business Media This book was written to inform prospective readers of current trends in image processing and communications area. Image processing and communications represent a dynamic part of computer science, playing increasingly important role in an information era. This book presents the new approaches, in: image processing and computer vision; telecommunications networks, Web-based information systems; mathematical methods for these applications. This book is a collection of carefully selected chapters presenting the fundamental theory and practice of various aspects of image data processing and communications. The book consists of two sections: Image processing und Communications. The image processing section of this book provides an inside on mainly on theories and methodologies as well as the emerging applications of image processing. Various aspects of new trends and techniques in this field are discussed in the book, covering the following topics: Biometrics, Low level processing, Motion, stereo and tracking, Pattern Recognition, Video, Medical Image Analysis, Applications. The book summarises new developments in these topics. Advances in Evolutionary Computing for System Design Springer Evolutionary computing paradigms offer robust and powerful adaptive search mechanisms for system design. This book's thirteen chapters cover a wide area of topics in evolutionary computing and applications, including an introduction to evolutionary computing in system design; evolutionary neuro-fuzzy systems; and evolution of fuzzy controllers. The book will be useful to researchers in intelligent systems with interest in evolutionary computing, as well as application engineers and system designers. Wireless Communications and Applications First International Conference, ICWCA 2011, Sanya, China, August 1-3, 2011, Revised Selected Papers Springer Science & Business Media This book constitutes the thoroughly refereed post-conference proceedings of the First International ICST Conference on Wireless Communications and Applications, ICWCA 2011, held in Sanya, China, in August 2011. The 43 revised full papers presented were carefully reviewed and selected from around 90 submissions and cover a wide range of topics as mobile ad hoc networks, sensor networks, network architectural design, network protocol design, local area networks, MAC, routing, and transport protocols, quality of service provisioning, reliability and fault tolerance issues, resource allocation and management, signal processing, medical imaging, data aggregation techniques, security and privacy issues, wireless computing and applications for wireless network as smart grid, agriculture, health care, smart home, conditional monitoring, etc. Evolutionary Design by Computers Morgan Kaufmann "Evolutionary Design By Computers offers an enticing preview of the future of computer-aided design: Design by Darwin." Lawrence J. Fogel, President, Natural Selection, Inc. "Evolutionary design by computers is the major revolution in design thinking of the 20th century and this book is the best introduction available." Professor John Frazer, Swire Chair and Head of School of Design, the Hong Kong Polytechnic University, Author of "An Evolutionary Architecture" "Peter Bentley has assembled and edited an important collection of papers that demonstrate, convincingly, the utility of evolutionary computation for engineering solutions to complex problems in design." David B. Fogel, Editor-in-Chief, IEEE Transactions on Evolutionary Computation Some of the most startling achievements in the use of computers to automate design are being accomplished by the use of evolutionary search algorithms to evolve designs. Evolutionary Design By Computers provides a showcase of the best and most original work of the leading international experts in Evolutionary Computation, Engineering Design, Computer Art, and Artificial Life. By bringing together the highest achievers in these fields for the first time, including a foreword by Richard Dawkins, this book provides the definitive coverage of significant developments in Evolutionary Design. This book explores related sub-areas of Evolutionary Design, including: design optimization creative design the creation of art artificial life. It shows for the first time how techniques in each area overlap, and promotes the cross-fertilization of ideas and methods. Materials Discovery and Design By Means of Data Science and Optimal Learning Springer This book addresses the current status, challenges and future directions of data-driven materials discovery and design. It presents the analysis and learning from data as a key theme in many science and cyber related applications. The challenging open questions as well as future directions in the application of data science to materials problems are sketched. Computational and experimental facilities today generate vast amounts of data at an unprecedented rate. The book gives guidance to discover new knowledge that enables materials innovation to address grand challenges in energy, environment and security, the clearer link needed between the data from these facilities and the theory and underlying science. The role of inference and optimization methods in distilling the data and constraining predictions using insights and results from theory is key to achieving the desired goals of real time analysis and feedback. Thus, the importance of this book lies in emphasizing that the full value of knowledge driven discovery using data can only be realized by integrating statistical and information sciences with materials science, which is increasingly dependent on high throughput and large scale computational and experimental data gathering efforts. This is especially the case as we enter a new era of big data in materials science with the planning of future experimental facilities such as the Linac Coherent Light Source at Stanford (LCLS-II), the European X-ray Free Electron Laser (EXFEL) and MaRIE (Matter Radiation in Extremes), the signature concept facility from Los Alamos National Laboratory. These facilities are expected to generate hundreds of terabytes to several petabytes of in situ spatially and temporally resolved data per sample. The questions that then arise include how we can learn from the data to accelerate the processing and analysis of reconstructed microstructure, rapidly map spatially resolved properties from high throughput data, devise diagnostics for pattern detection, and guide experiments towards desired targeted properties. The authors are an interdisciplinary group of leading experts who bring the excitement of the nascent and rapidly emerging field of materials informatics to the reader. Success in Evolutionary Computation Springer Evolutionary Computation (EC) includes a number of techniques such as Genetic Algorithms which have been used in a diverse range of highly successful applications. This book brings together some of these EC applications in fields including electronics, telecommunications, health, bioinformatics, supply chain and other engineering domains, to give the audience, including both EC researchers and practitioners, a glimpse of this exciting and rapidly-evolving field. Advances in Computer Science, Engineering and Applications Proceedings of the Second International Conference on Computer Science, Engineering and Applications (ICCSEA 2012), May 25-27, 2012, New Delhi, India, Volume 2 Springer Science & Business Media The International conference series on Computer Science, Engineering & Applications (ICCSEA) aims to bring together researchers and practitioners from academia and industry to focus on understanding computer science, engineering and applications and to establish new collaborations in these areas. The Second International Conference on Computer Science, Engineering & Applications (ICCSEA-2012), held in Delhi, India, during May 25-27, 2012 attracted many local and international delegates, presenting a balanced mixture of intellect and research both from the East and from the West. Upon a strenuous peer-review process the best submissions were selected leading to an exciting, rich and a high quality technical conference program, which featured high-impact presentations in the latest developments of various areas of computer science, engineering and applications research. Future Wireless Networks and Information Systems Volume 1 Springer Science & Business Media This volume contains revised and extended research articles written by prominent researchers participating in ICFWI 2011 conference. The 2011 International Conference on Future Wireless Networks and Information Systems (ICFWI 2011) has been held on November 30 ~ December 1, 2011, Macao, China. Topics covered include Wireless Information Networks, Wireless Networking Technologies, Mobile Software and Services, intelligent computing, network management, power engineering, control engineering, Signal and Image Processing, Machine Learning, Control Systems and Applications, The book will offer the states of arts of tremendous advances in Wireless Networks and Information Systems and also serve as an excellent reference work for researchers and graduate students working on Wireless Networks and Information Systems. Handbook of Optimization in Telecommunications Springer Science & Business Media This comprehensive handbook brings together experts who use optimization to solve problems that arise in telecommunications. It is the first book to cover in detail the field of optimization in telecommunications. Recent optimization developments that are frequently applied to telecommunications are covered. The spectrum of topics covered includes planning and design of telecommunication networks, routing, network protection, grooming, restoration, wireless communications, network location and assignment problems, Internet protocol, World Wide Web, and stochastic issues in telecommunications. The book's objective is to provide a reference tool for the increasing number of scientists and engineers in telecommunications who depend upon optimization. High Performance Computing -- HiPC 2003 10th International Conference, Hyderabad, India, December 17-20, 2003, Proceedings Springer Science & Business Media This book constitutes the refereed proceedings of the 10th International Conference on High-Performance Computing, HiPC 2003, held in Hyderabad, India in December 2003. The 48 revised full papers presented together with 5 keynote abstracts were carefully reviewed and selected from 164 submissions. The papers are organized in topical sections on performance issues and power-aware systems; distributed and network algorithms; routing in wireless, mobile, and cut-through networks; scientific and engineering applications; overlay networks, clusters, and grids; scheduling and

software algorithms; network design and performance; grid applications and architecture support; performance analysis; scheduling and migration. Applied Computing Second Asian Applied Computing Conference, AACC 2004, Kathmandu, Nepal, October 29-31, 2004. Proceedings Springer Science & Business Media This book constitutes the refereed proceedings of the Second Asian Applied Computing Conference, AACC 2004, held in Kathmandu, Nepal in October 2004. The 42 revised full papers presented were carefully reviewed and selected from 184 submissions. The papers are organized in topical sections on machine learning and soft computing; scheduling, optimization, and constraint solving; neural networks and support vector machines; natural language processing and information retrieval; speech and signal processing; networks and mobile computing; parallel, grid, and high performance computing; innovative applicationsfor the developing world; and cryptography and security. Evolutionary Image Analysis, Signal Processing and Telecommunications First European Workshops, EvoIASP'99 and EuroEcTel'99 Göteborg, Sweden, May 26-27, 1999, Proceedings Springer This book consitutes the refereed joint proceedings of the First European Workshop on Evolutionary Computation in Image Analysis and Signal Processing, EvoIASP '99 and of the First European Workshop on Evolutionary Telecommunications, EuroEcTel '99, held in Göteborg, Sweden in May 1999. The 18 revised full papers presented were carefully reviewed and selected for inclusion in the volume. The book presents state-of-the-art research results applying techniques from evolutionary computing in the specific application areas. Broadband Communications, Networks, and Systems 10th EAI International Conference, Broadnets 2019, Xi'an, China, October 27-28, 2019, Proceedings Springer Nature This book constitutes the refereed post-conference proceedings of the 10th International Conference on Broadband Communications, Networks, and Systems, Broadnets 2019, which took place in Xi'an, China, in October 2019. The 19 full papers presented were carefully reviewed and selected from 61 submissions. The papers are thematically grouped as follows: Wireless Networks and Applications, Communication and Sensor Networks, Internet of Things, Pervasive Computing, Security and Privacy. Telecommunications Network Design and Management Springer Science & Business Media Telecommunications Network Design And Management represents the state-of-the-art of applying operations research techniques and solutions across a broad spectrum of telecommunications problems and implementation issues. -The first three chapters of the book deal with the design of wireless networks, including UMTS and Ad-Hoc networks. -Chapters 4-6 deal with the optimal design of telecommunications networks. Techniques used for network design range from genetic algorithms to combinatorial optimization heuristics. -Chapters 7-10 analyze traffic flow in telecommunications networks, focusing on optimizing traffic load distribution and the scheduling of switches under multi-media streams and heavy traffic. -Chapters 11-14 deal with telecommunications network management, examining bandwidth provisioning, admission control, queue management, dynamic routing, and feedback regulation in order to ensure that the network performance is optimized. -Chapters 15-16 deal with the construction of topologies and allocation of bandwidth to ensure quality-of-service. Handbook of Bioinspired Algorithms and Applications CRC Press The mystique of biologically inspired (or bioinspired) paradigms is their ability to describe and solve complex relationships from intrinsically very simple initial conditions and with little or no knowledge of the search space. Edited by two prominent, well-respected researchers, the Handbook of Bioinspired Algorithms and Applications reveals the Genetic and Evolutionary Computation — GECCO 2003 Genetic and Evolutionary Computation Conference Chicago, IL, USA, July 12-16, 2003 Proceedings Springer Science & Business Media The set LNCS 2723 and LNCS 2724 constitutes the refereed proceedings of the Genetic and Evolutionary Computation Conference, GECCO 2003, held in Chicago, IL, USA in July 2003. The 193 revised full papers and 93 poster papers presented were carefully reviewed and selected from a total of 417 submissions. The papers are organized in topical sections on a-life adaptive behavior, agents, and ant colony optimization; artificial immune systems; coevolution; DNA, molecular, and quantum computing; evolvable hardware; evolutionary robotics; evolution strategies and evolutionary programming; evolutionary sheduling routing; genetic algorithms; genetic programming; learning classifier systems; real-world applications; and search based software engineering. Advances in Design Springer Science & Business Media Advances in Design examines recent advances and innovations in product design paradigms, methods, tools and applications. It presents fifty-two selected papers which were presented at the 14th CIRP International Design Seminar held in May 2004. This book will be bought by postgraduate and senior undergraduate students studying product design. It will also be of interest to researchers and practitioners working in the field of product design. Analysis and Design of Delayed Genetic Regulatory Networks Springer This book offers an essential introduction to the latest advances in delayed genetic regulatory networks (GRNs) and presents cutting-edge work on the analysis and design of delayed GRNs in which the system parameters are subject to uncertain, stochastic and/or parameter-varying changes. Specifically, the types examined include delayed switching GRNs, delayed stochastic GRNs, delayed reaction–diffusion GRNs, delayed discrete-time GRNs, etc. In addition, the solvability of stability analysis, control and estimation problems involving delayed GRNs are addressed in terms of linear matrix inequality or M-matrix tests. The book offers a comprehensive reference guide for researchers and practitioners working in system sciences and applied mathematics, and a valuable source of information for senior undergraduates and graduates in these areas. Further, it addresses a gap in the literature by providing a unified and concise framework for the analysis and design of delayed GRNs. Mathematical Aspects of Network Routing Optimization Springer Science & Business Media Before the appearance of broadband links and wireless systems, networks have been used to connect people in new ways. Now, the modern world is connected through large-scale, computational networked systems such as the Internet. Because of the ever-advancing technology of networking, efficient algorithms have become increasingly necessary to solve some of the problems developing in this area. "Mathematical Aspects of Network Routing Optimization" focuses on computational issues arising from the process of optimizing network routes, such as quality of the resulting links and their reliability. Algorithms are a cornerstone for the understanding of the protocols underlying multicast routing. The main objective in the text is to derive efficient algorithms, with or without guarantee of approximation. Notes have been provided for basic topics such as graph theory and linear programming to assist those who are not fully acquainted with the mathematical topics presented throughout the book. "Mathematical Aspects of Network Routing Optimization" provides a thorough introduction to the subject of algorithms for network routing, and focuses especially on multicast and wireless ad hoc systems. This book is designed for graduate students, researchers, and professionals interested in understanding the algorithmic and mathematical ideas behind routing in computer networks. It is suitable for advanced undergraduate students, graduate students, and researchers in the area of network algorithms. Computer-Based Analysis of the Stochastic Stability of Mechanical Structures Driven by White and Colored Noise Springer This book provides a concise introduction to the behavior of mechanical structures and testing their stochastic stability under the influence of noise. It explains the physical effects of noise and in particular the concept of Gaussian white noise. In closing, the book explains how to model the effects of noise on mechanical structures, and how to nullify / compensate for it by designing effective controllers. Applications of Evolutionary Computation EvoApplications 2010: EvoCOMNET, EvoENVIRONMENT, EvoFIN, EvoMUSART, and EvoTRANSLOG, Istanbul, Turkey, April 7-9, 2010, Proceedings Springer Science & Business Media This book constitutes the refereed proceedings of the International Workshops on the Applications of Evolutionary Computation, EvoApplications 2010, held in Istanbul, Turkey, in April 2010 colocated with the Evo* 2010 events. Thanks to the large number of submissions received, the proceedings for EvoApplications 2010 are divided across two volumes (LNCS 6024 and 6025). The present volume contains contributions for EvoCOMNET, EvoENVIRONMENT, EvoFIN, EvoMUSART, and EvoTRANSLOG. The 47 revised full papers presented were carefully reviewed and selected from a total of 86 submissions. This volume presents a careful selection of relevant EC examples combined with a thorough examination of the techniques used in EC. The papers in the volume illustrate the current state of the art in the application of EC and should help and inspire researchers and professionals to develop efficient EC methods for design and problem solving. Transmission-Efficient Design and Management of Wavelength-Routed Optical Networks Springer Science & Business Media Optical networks, employing Wavelength-Division Multiplexing (WDM) and wavelength routing, are believed to be the answer for the explosion in IP traffic and the emergence of real-time multimedia applications. These networks offer quantum leaps in transmission capacity as well as eliminate the electronic bottleneck in existing metropolitan and backbone networks. During the last decade, we witnessed a tremendous growth in the theoretical and experimental studies focusing on the cost-effective deployment of wavelength routed networks. The majority of these studies, however, assumed ideal behavior of optical devices. In this book, we argue that for the successful deployment of optical networks, design algorithms and network protocols must be extended to accommodate the non-ideal behavior of optical devices. These extensions should not only focus on maintaining acceptable signal quality (e.g., 12 maintaining BER above 10-), but should also motivate the development of optimization algorithms and signaling protocols which take transmission impairments into consideration. In addition, the design of enabling technologies, such as optical cross-connects, should be transmission-efficient. This book is a comprehensive treatment of the impact of transmission impairments on the design and management of wavelength-routed networks. We start with transparent networks, focusing on power implications such as cross-connect design, device allocation problems, and management issues. In this all-optical model, we propose a design space based on reduction in overall cost and ease of network management. This design concept, motivates various switch architectures and different optimization problems. Computational Intelligence in Software Engineering World Scientific This unique volume is the first publication on software engineering and computational intelligence (CI) viewed as a synergistic interplay of neurocomputing, granular computation (including fuzzy sets and rough sets), and evolutionary methods. It presents a unified view of CI in the context of software engineering. The book addresses a number of crucial issues: what is CI, what role does it play in software development, how are CI elements built into successive phases of the software life cycle, and what is the role played by CI in quantifying fundamental features of software artifacts? With contributions from leading researchers and practitioners, the book provides the reader with a wealth of new concepts and approaches, complete algorithms, in-depth case studies, and thought-provoking exercises. The topics coverage include neurocomputing, granular as well as evolutionary computing, object-oriented analysis and design in software engineering. There is also an extensive bibliography. Computational Intelligence In Software Engineering, Advances In Fuzzy Systems: Applications And Theory World Scientific This unique volume is the first publication on software engineering and computational intelligence (CI) viewed as a synergistic interplay of neurocomputing, granular computation (including fuzzy sets and rough sets), and evolutionary methods. It presents a unified view of CI in the context of software engineering.The book addresses a number of crucial issues: what is CI, what role does it play in software development, how are CI elements built into successive phases of the software life cycle, and what is the role played by CI in quantifying fundamental features of software artifacts?With contributions from leading researchers and practitioners, the book provides the reader with a wealth of new concepts and approaches, complete algorithms, in-depth case studies, and thought-provoking exercises. The topics coverage include neurocomputing, granular as well as evolutionary computing, object-oriented analysis and design in software engineering. There is also an extensive bibliography. Advances in Mathematical and Computational Oncology Frontiers Media SA Telecommunications Network Planning Springer Science & Business Media Telecommunications - central to our daily lives - continues to change dramatically. These changes are the result of technological advances, deregulation, the proliferation of broadband service offers, and the spectacular popularity of the Internet and wireless services. In such adynamic technological and economic environment, competition is increasing among service providers and among equipment manufacturers. Consequently, optimization of the planning process is becoming essential. Although telecommunications network planning has been tackled by the Operations Research community for some time, many fundamental problems remain challenging. Through its fourteen chapters, this book covers some new and some still challenging older problems which arise in the planning of telecommunication networks. Telecommunications Network Planning will benefit both telecommunications practitioners looking for efficient methods to solve their problems and operations researchers interested in telecommunications. The book examines network design and dimensioning problems; it explores Operation Research issues related to a new standard Asynchronous Transfer Mode (ATM); it overviews problems that arise when designing survivable SDH/SONET Networks; it considers some broadband network problems; and it concludes with three chapters on

wireless and mobile networks. Leading area researchers have contributed their recent research on the telecommunications and network topics treated in the volume. Network Synthesis Problems Springer Science & Business Media As the telecommunication industry introduces new sophisticated technologies, the nature of services and the volume of demands have changed. Indeed, a broad range of new services for users appear, combining voice, data, graphics, video, etc. This implies new planning issues. Fiber transmission systems that can carry large amounts of data on a few strands of wire were introduced. These systems have such a large bandwidth that the failure of even a single transmission link: in the network can create a severe service loss to customers. Therefore, a very high level of service reliability is becoming imperative for both system users and service providers. Since equipment failures and accidents cannot be avoided entirely, networks have to be designed so as to "survive" failures. This is done by judiciously installing spare capacity over the network so that all traffic interrupted by a failure may be diverted around that failure by way of this spare or reserve capacity. This of course translates into huge investments for network operators. Designing such survivable networks while minimizing spare capacity costs is, not surprisingly, a major concern of operating companies which gives rise to very difficult combinatorial problems. In order to make telecommunication networks survivable, one can essentially use two different strategies: protection or restoration. The protection approach preas signs spare capacity to protect each element of the network independently, while the restoration approach spreads the redundant capacity over the whole network and uses it as required in order to restore the disrupted traffic. Nanoscale Technology in Biological Systems CRC Press Nanoscale Technology in Biological Systems reviews recent accomplishments in the field of nanobiology and introduces the application of nanoscale matrices to human biology. It focuses on the applications of nanotechnology fabrication to biomedical devices and discusses new physical methods for cell isolation and manipulation and intracellular commu Telecommunications Optimization Heuristic and Adaptive Techniques John Wiley & Sons Written in an accessible and easy-to-read style, this cutting-edge book presents advanced solutions to current and future telecommunications optimization problems. The field of telecommunications is growing and changing ever more rapidly, presenting new real-world problems for optimization researchers to address. Telecommunications engineers tend to know all about the problems involved but are often not aware of developments in computer science and artificial intelligence that might solve those problems. This unique book takes a colloborative approach describing the essence of the problems and then the heuristic and adaptive techniques which are now recognised as adept at solving these problems. In addition the emerging technologies in telecommunications and increasing use of the Internet expand the role that advanced heuristic and adaptive methods can play. Topics covered include: Heuristic techniques covering local search methods and population-based search techniques Adaptive computation techniques covering neural computation, fuzzy logic and game theory Practical and successful ways to address problems in network design and planning, routing, protocol design and network management This state-of-the-art book will be an essential resource for optimization researchers needing a wider appreciation of the problems in telecommunications, and indispensable for telecommunications engineers using heuristic and adaptive techniques.