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Satellite Communications Systems Satellite Communications Systems Satellite Communications Systems Simulation of Communication Systems Using Cross-Layer Techniques for Communication Systems Wireless Communication Systems Intelligent Systems Data and Information Quality Designing High Availability Systems Structured Systems Analysis Multimedia Communication Systems Precoding Techniques for Digital Communication Systems Industrial Control Systems Model-based Fault Diagnosis in Dynamic Systems Using Identification Techniques The Engineering Design of Systems Automatic Learning Techniques in Power Systems Synchronization Techniques for Chaotic Communication Systems Engineering a Safer World Modern Testing Techniques for Structural Systems System-Level Design Techniques for Energy-Efficient Embedded Systems Information Systems Project Management New Techniques in Systems Neuroscience Fractional Dynamical Systems: Methods, Algorithms and Applications Formal Methods for Eternal Networked Software Systems Systems Analysis and Design Using Network Techniques Applying Integration Techniques and Methods in Distributed Systems and Technologies Emerging Techniques in Power System Analysis Advanced Analytic and Control Techniques for Thermal Systems with

Heat Exchangers Electric Power Systems Systems Engineering Methods Designing Complex Products with Systems Engineering Processes and Techniques Control of Complex Systems Biomedical Engineering Methods of Studying Root Systems Systems Evaluation Strongly Correlated Systems Production Systems Engineering Applying Case-Based Reasoning Structured System Analysis Performance Evaluation of Complex Systems: Techniques and Tools

New for the third edition, chapters on: Complete Exercise of the SE Process, System Science and Analytics and The Value of Systems Engineering The book takes a model-based approach to key systems engineering design activities and introduces methods and models used in the real world. This book is divided into three major parts: (1) Introduction, Overview and Basic Knowledge, (2) Design and Integration Topics, (3) Supplemental Topics. The first part provides an introduction to the issues associated with the engineering of a system. The second part covers the critical material required to understand the major elements needed in the engineering design of any system: requirements, architectures (functional, physical, and allocated), interfaces, and qualification. The final part reviews methods for data, process, and behavior modeling, decision analysis, system science and analytics, and the value of systems engineering. Chapter 1 has been rewritten to integrate the new chapters and updates were made throughout the original chapters. Provides an overview of modeling, modeling methods associated with SysML, and IDEF0 Includes a new Chapter 12 that provides a comprehensive review of the topics discussed in Chapters 6 through 11 via a simple system – an automated soda machine Features a new Chapter 15 that reviews General System Theory, systems science, natural systems, cybernetics, systems thinking, quantitative characterization of

systems, system dynamics, constraint theory, and Fermi problems and guesstimation Includes a new Chapter 16 on the value of systems engineering with five primary value propositions: systems as a goal-seeking system, systems engineering as a communications interface, systems engineering to avert showstoppers, systems engineering to find and fix errors, and systems engineering as risk mitigation The Engineering Design of Systems: Models and Methods, Third Edition is designed to be an introductory reference for professionals as well as a textbook for senior undergraduate and graduate students in systems engineering. Issues such as logistics, the coordination of different teams, and automatic control of machinery become more difficult when dealing with large, complex projects. Yet all these activities have common elements and can be represented by mathematics. Linking theory to practice, Industrial Control Systems: Mathematical and Statistical Models and Techni

System-Level Design Techniques for Energy-Efficient Embedded Systems addresses the development and validation of co-synthesis techniques that allow an effective design of embedded systems with low energy dissipation. The book provides an overview of a system-level co-design flow, illustrating through examples how system performance is influenced at various steps of the flow including allocation, mapping, and scheduling. The book places special emphasis upon system-level co-synthesis techniques for architectures that contain voltage scalable processors, which can dynamically trade off between computational performance and power consumption. Throughout the book, the introduced co-synthesis techniques, which target both single-mode systems and emerging multi-mode applications, are applied to numerous benchmarks and real-life examples including a realistic smart phone. Automatic learning is a complex, multidisciplinary field of research and development, involving theoretical

and applied methods from statistics, computer science, artificial intelligence, biology and psychology. Its applications to engineering problems, such as those encountered in electrical power systems, are therefore challenging, while extremely promising. More and more data have become available, collected from the field by systematic archiving, or generated through computer-based simulation. To handle this explosion of data, automatic learning can be used to provide systematic approaches, without which the increasing data amounts and computer power would be of little use. Automatic Learning Techniques in Power Systems is dedicated to the practical application of automatic learning to power systems. Power systems to which automatic learning can be applied are screened and the complementary aspects of automatic learning, with respect to analytical methods and numerical simulation, are investigated. This book presents a representative subset of automatic learning methods - basic and more sophisticated ones - available from statistics (both classical and modern), and from artificial intelligence (both hard and soft computing). The text also discusses appropriate methodologies for combining these methods to make the best use of available data in the context of real-life problems. Automatic Learning Techniques in Power Systems is a useful reference source for professionals and researchers developing automatic learning systems in the electrical power field. Electric Power Systems: Advanced Forecasting Techniques and Optimal Generation Scheduling helps readers develop their skills in modeling, simulating, and optimizing electric power systems. Carefully balancing theory and practice, it presents novel, cutting-edge developments in forecasting and scheduling. The focus is on understanding and solving pivotal problems in the management of electric power generation systems. Methods for Coping with Uncertainty and Risk in Electric Power

Generation Outlining real-world problems, the book begins with an overview of electric power generation systems. Since the ability to cope with uncertainty and risk is crucial for power generating companies, the second part of the book examines the latest methods and models for self-scheduling, load forecasting, short-term electricity price forecasting, and wind power forecasting. Toward Optimal Coordination between Hydro, Thermal, and Wind Power Using case studies, the third part of the book investigates how to achieve the most favorable use of available energy sources. Chapters in this section discuss price-based scheduling for generating companies, optimal scheduling of a hydro producer, hydro-thermal coordination, unit commitment with wind generators, and optimal optimization of multigeneration systems. Written in a pedagogical style that will appeal to graduate students, the book also expands on research results that are useful for engineers and researchers. It presents the latest techniques in increasingly important areas of power system operations and planning. The continuous evolution and development of experimental techniques is at the basis of any fundamental achievement in modern physics. Strongly correlated systems (SCS), more than any other, need to be investigated through the greatest variety of experimental techniques in order to unveil and crosscheck the numerous and puzzling anomalous behaviors characterizing them. The study of SCS fostered the improvement of many old experimental techniques, but also the advent of many new ones just invented in order to analyze the complex behaviors of these systems. Many novel materials, with functional properties emerging from macroscopic quantum behaviors at the frontier of modern research in physics, chemistry and materials science, belong to this class of systems. The volume presents a representative collection of the modern experimental techniques specifically tailored for

the analysis of strongly correlated systems. Any technique is presented in great detail by its own inventor or by one of the world-wide recognized main contributors. The exposition has a clear pedagogical cut and fully reports on the most relevant case study where the specific technique showed to be very successful in describing and enlightening the puzzling physics of a particular strongly correlated system. The book is intended for advanced graduate students and post-docs in the field as textbook and/or main reference, but also for any other researcher in the field who appreciates consulting a single, but comprehensive, source or wishes to get acquainted, in a as painless as possible way, with the working details of a specific technique.

Revisions to 5th Edition by: Zhili Sun, University of Surrey, UK New and updated edition of this authoritative and comprehensive reference to the field of satellite communications engineering Building on the success of previous editions, Satellite Communications Systems, Fifth Edition covers the entire field of satellite communications engineering from orbital mechanics to satellite design and launch, configuration and installation of earth stations, including the implementation of communications links and the set-up of the satellite network. This book provides a comprehensive treatment of satellite communications systems engineering and discusses the technological applications. It demonstrates how system components interact and details the relationship between the system and its environment. The authors discuss the systems aspects such as techniques enabling equipment and system dimensioning and state of the art technology for satellite platforms, payloads and earth stations. New features and updates for the fifth edition include: More information on techniques allowing service provision of multimedia content Extra material on techniques for broadcasting, including recent standards DVB-RCS and DVB-S2 (Digital Video Broadcasting -Return Channel Satellite and -

Satellite Version 2) Updates on onboard processing By offering a detailed and practical overview, Satellite Communications Systems continues to be an authoritative text for advanced students, engineers and designers throughout the field of satellite communications and engineering. Root research under natural field conditions is still a step-child of science. The reason for this is primarily methodological. The known methods are tedious, time consuming, and the accuracy of their results is often not very great. Many research workers have been discouraged by doing such root studies. The need for more information on the development and distribution of plant roots in different soils under various ecological conditions is, however, obvious in many ecological disciplines. Especially the applied botanical sciences such as agriculture, horticulture, and forestry are interested in obtaining more data on plant roots in the soil. This book will give a survey of existing methods in ecological root research. Primarily field methods are presented; techniques for pot experiments are described only so far as they are important for solving ecological problems. Laboratory methods for studying root physiology are not covered in this book. Scientific publications on roots are scattered in many different journals published all over the world. By working through the international root literature I found that about ten thousand papers on root ecology have been published at the present. This is not very much compared with the immense literature on the aboveground parts of the plants, but is, however, too much to cite in this book. This book presents a wide and comprehensive spectrum of issues and problems related to fractional-order dynamical systems. It is meant to be a full-fledge, comprehensive presentation of many aspects related to the broadly perceived fractional-order dynamical systems which constitute an extension of the traditional integer-order-type descriptions. This

implies far-reaching consequences, both analytic and algorithmic, because—in general—properties of the traditional integer-order systems cannot be directly extended by a straightforward generalization to fractional-order systems, modeled by fractional-order differential equations involving derivatives of an non-integer order. This can be useful for describing and analyzing, for instance, anomalies in the behavior of various systems, chaotic behavior, etc. The book contains both analytic contributions with state-of-the-art and theoretical foundations, algorithmic implementation of tools and techniques, and—finally—some examples of relevant and successful practical applications. "This book focuses on integration techniques, methods, and tools employed in applied distributed computing systems, architectures, and technologies. It pays particular attention to this dimension as a means of diversifying and broadening the applicability and scope of knowledge in the area of distributed systems and technologies"-- This book looks at how to design complex products that have many components with intricate relationships and requirements. It also discusses how to manage processes involved in their lifecycle, from concept generation to disposal, with the objectives of increasing customer satisfaction, quality, safety, and usability and meeting program timings and budgets. Part I covers systems engineering concepts, issues, and bases in product design. Part II examines quality, human factors, and safety engineering approaches. Part III describes important tools and methods used in these fields, and Part IV includes other relevant integration topics, interesting applications of useful techniques, and observations from a few "landmark" product development case studies. TRANSLATED BY J.C.C. NELSON. The updated 6th edition of the authoritative and comprehensive textbook to the field of satellite communications engineering The revised and updated sixth edition of Satellite

Communications Systems contains information on the most recent advances related to satellite communications systems, technologies, network architectures and new requirements of services and applications. The authors – noted experts on the topic – cover the state-of-the-art satellite communication systems and technologies and examine the relevant topics concerning communication and network technologies, concepts, techniques and algorithms. New to this edition is information on internetworking with the broadband satellite systems, more intensive coverage of Ka band technologies, GEO high throughput satellite (HTS), LEO constellations and the potential to support the current new broadband Internet services as well as future developments for global information infrastructure. The authors offer details on digital communication systems and broadband networks in order to provide high-level researchers and professional engineers an authoritative reference. In addition, the book is designed in a user-friendly format. This important text: Puts the focus on satellite communications and networks as well as the related applications and services Provides an essential, comprehensive and authoritative updated guide to the topic Contains new topics including the space segment, ground, ground satellite control and network management, relevant terrestrial networks and more Includes helpful illustrations, tables and problems to enhance learning Offers a summary at the beginning of each chapter to help understand the concepts and principles discussed Written for research students studying or researching in the areas related to satellite communications systems and networks, the updated sixth edition of Satellite Communications Systems offers an essential guide to the most recent developments in the field of satellite communications engineering and references to international standards. This book presents 15 tutorial lectures by leading researchers given at the 11th

edition of the International School on Formal Methods for the Design of Computer, Communication and Software Systems, SFM 2011, held in Bertinoro, Italy, in June 2011. SFM 2011 was devoted to formal methods for eternal networked software systems and covered several topics including formal foundations for the inter-operability of software systems, application-layer and middleware-layer dynamic connector synthesis, interaction behavior monitoring and learning, and quality assurance of connected systems. The school was held in collaboration with the researchers of the EU-funded projects CONNECT and ETERNALS. The papers are organized into six parts: (i) architecture and interoperability, (ii) formal foundations for connectors, (iii) connector synthesis, (iv) learning and monitoring, (v) dependability assurance, and (vi) trustworthy eternal systems via evolving software. A new approach to safety, based on systems thinking, that is more effective, less costly, and easier to use than current techniques. Engineering has experienced a technological revolution, but the basic engineering techniques applied in safety and reliability engineering, created in a simpler, analog world, have changed very little over the years. In this groundbreaking book, Nancy Leveson proposes a new approach to safety—more suited to today's complex, sociotechnical, software-intensive world—based on modern systems thinking and systems theory. Revisiting and updating ideas pioneered by 1950s aerospace engineers in their System Safety concept, and testing her new model extensively on real-world examples, Leveson has created a new approach to safety that is more effective, less expensive, and easier to use than current techniques. Arguing that traditional models of causality are inadequate, Leveson presents a new, extended model of causation (Systems-Theoretic Accident Model and Processes, or STAMP), then shows how the new model can be used to create techniques for

system safety engineering, including accident analysis, hazard analysis, system design, safety in operations, and management of safety-critical systems. She applies the new techniques to real-world events including the friendly-fire loss of a U.S. Blackhawk helicopter in the first Gulf War; the Vioxx recall; the U.S. Navy SUBSAFE program; and the bacterial contamination of a public water supply in a Canadian town. Leveson's approach is relevant even beyond safety engineering, offering techniques for “reengineering” any large sociotechnical system to improve safety and manage risk. A practical, step-by-step guide to designing world-class, high availability systems using both classical and DFSS reliability techniques Whether designing telecom, aerospace, automotive, medical, financial, or public safety systems, every engineer aims for the utmost reliability and availability in the systems he, or she, designs. But between the dream of world-class performance and reality falls the shadow of complexities that can bedevil even the most rigorous design process. While there are an array of robust predictive engineering tools, there has been no single-source guide to understanding and using them . . . until now. Offering a case-based approach to designing, predicting, and deploying world-class high-availability systems from the ground up, this book brings together the best classical and DFSS reliability techniques. Although it focuses on technical aspects, this guide considers the business and market constraints that require that systems be designed right the first time. Written in plain English and following a step-by-step "cookbook" format, Designing High Availability Systems: Shows how to integrate an array of design/analysis tools, including Six Sigma, Failure Analysis, and Reliability Analysis Features many real-life examples and case studies describing predictive design methods, tradeoffs, risk priorities, "what-if" scenarios, and more Delivers numerous high-impact takeaways

that you can apply to your current projects immediately Provides access to MATLAB programs for simulating problem sets presented, along with PowerPoint slides to assist in outlining the problem-solving process Designing High Availability Systems is an indispensable working resource for system engineers, software/hardware architects, and project teams working in all industries. This book provides guidelines for the analysis of systems. It develops rules for hierarchical placement of subunits and shows how information flow affects the placement of subunits of a system. The determinants contributing to instability of a system are also discussed. The guidelines are developed and the structure of systems are investigated by first defining the terms to be used and then providing a number of theorems about the attributes of systems. The theorem proofs depend solely on the definitions and previously proved theorems. Up to this time, good system design was an art form difficult to communicate to the student and to the professional. The theorems developed in this book provide a more structured framework for the analysis of systems and can lead both the novice and the advanced practitioner through the intricacies of designing systems. This book presents the tutorial lectures given by leading experts in the area at the IFIP WG 7.3 International Symposium on Computer Modeling, Measurement and Evaluation, Performance 2002, held in Rome, Italy in September 2002.The survey papers presented are devoted to theoretical and methodological advances in performance and reliability evaluation as well as new perspectives in the major application fields. Modeling and verification issues, solution methods, workload characterization, and benchmarking are addressed from the methodological point of view. Among the applications dealt with are hardware and software architectures, wired and wireless networks, grid environments, Web

services, and real-time voice and video processing.This book is intended to serve as a state-of-the-art survey and reference for students, scientists, and engineers active in the area of performance and reliability evaluation. Wireless Communication Systems: Advanced Techniques for Signal Receptionoffers a unified frameworkfor understanding today's newest techniques for signal processing in communication systems - andusing them to design receivers for emerging wireless systems. Two leading researchers cover a fullrange of physical-layer issues, including multipath, dispersion, interference, dynamism, andmultiple-antenna systems. Topics include blind, group-blind, space-time, and turbo multiuserdetection; narrowband interference suppression; Monte Carlo Bayesian signal processing; fast fadingchannels; advanced signal processing in coded OFDM systems, and more. Advanced Analytic Control Techniques for Thermal Systems with Heat Exchangers presents the latest research on sophisticated analytic and control techniques specific for Heat Exchangers (HXs) and heat Exchanger Networks (HXNs), such as Stability Analysis, Efficiency of HXs, Fouling Effect, Delay Phenomenon, Robust Control, Algebraic Control, Geometric Control, Optimal Control, Fuzzy Control and Artificial Intelligence techniques. Editor Libor Pekar and his team of global expert contributors combine their knowledge and experience of investigated and applied systems and processes in this thorough review of the most advanced networks, analyzing their dynamics, efficiency, transient features, physical properties, performance, feasibility, flexibility and controllability. The structural and dynamic analyses and control approaches of HXNs, as well as energy efficient manipulation techniques are discussed, in addition to the design of the control systems through the full life cycle. This equips the reader with an understanding of the relevant theory in a variety of settings and scenarios and the

confidence to apply that knowledge to solve problems in an academic or professional setting.Graduate students and early-mid career professionals require a robust understanding of how to suitably design thermal systems with HXs and HXNs to achieve required performance levels, which this book offers in one consolidated reference. All examples and solved problems included have been tried and tested, and these combined with the research driven theory provides professionals, researchers and students with the most recent techniques to maximize the energy efficiency and sustainability of existing and new thermal power systems. Analyses several advanced techniques, the theoretical background of these techniques and includes models, examples and results throughout Focusses on advanced analytic and control techniques which have been investigated or applied to thermal systems with HXs and HXNs Includes practical applications and advanced ideas from leading experts in the field, as well as case studies and tested problems and solutions Production Systems Engineering (PSE) is an emerging branch of Engineering intended to uncover fundamental principles of production systems and utilize them for analysis, continuous improvement, and design. This volume is the first ever textbook devoted exclusively to PSE. It is intended for senior undergraduate and first year graduate students interested in manufacturing. The development is first principle-based rather than recipe-based. The only prerequisite is elementary Probability Theory; however, all necessary probability facts are reviewed in an introductory chapter. Using a system-theoretic approach, this textbook provides analytical solutions for the following problems: mathematical modeling of production systems, performance analysis, constrained improvability, bottleneck identification and elimination, lean buffer design, product quality, customer demand satisfaction, transient behavior, and system-theoretic properties.

Numerous case studies are presented. In addition, the so-called PSE Toolbox, which implements the algorithms developed, is described. The volume includes numerous case studies and problems for homework assignment. This volume is essential reading for anyone wishing to understand the recent explosion of experimental tools in neuroscience that now make it possible to manipulate, record, and understand neuronal activity within the intact brain, and which are helping us learn how the many neurons that comprise a network act together to control behavior. Leaders in the field discuss the latest developments in optogenetics, functional imaging, circuit mapping, and the application of these tools to complex biological problems. Safety in industrial process and production plants is a concern of rising importance but because the control devices which are now exploited to improve the performance of industrial processes include both sophisticated digital system design techniques and complex hardware, there is a higher probability of failure. Control systems must include automatic supervision of closed-loop operation to detect and isolate malfunctions quickly. A promising method for solving this problem is "analytical redundancy", in which residual signals are obtained and an accurate model of the system mimics real process behaviour. If a fault occurs, the residual signal is used to diagnose and isolate the malfunction. This book focuses on model identification oriented to the analytical approach of fault diagnosis and identification covering: choice of model structure; parameter identification; residual generation; and fault diagnosis and isolation. Sample case studies are used to demonstrate the application of these techniques. This book provides a systematic and comparative description of the vast number of research issues related to the quality of data and information. It does so by delivering a sound, integrated and comprehensive overview of the

state of the art and future development of data and information quality in databases and information systems. To this end, it presents an extensive description of the techniques that constitute the core of data and information quality research, including record linkage (also called object identification), data integration, error localization and correction, and examines the related techniques in a comprehensive and original methodological framework. Quality dimension definitions and adopted models are also analyzed in detail, and differences between the proposed solutions are highlighted and discussed. Furthermore, while systematically describing data and information quality as an autonomous research area, paradigms and influences deriving from other areas, such as probability theory, statistical data analysis, data mining, knowledge representation, and machine learning are also included. Last not least, the book also highlights very practical solutions, such as methodologies, benchmarks for the most effective techniques, case studies, and examples. The book has been written primarily for researchers in the fields of databases and information management or in natural sciences who are interested in investigating properties of data and information that have an impact on the quality of experiments, processes and on real life. The material presented is also sufficiently self-contained for masters or PhD-level courses, and it covers all the fundamentals and topics without the need for other textbooks. Data and information system administrators and practitioners, who deal with systems exposed to data-quality issues and as a result need a systematization of the field and practical methods in the area, will also benefit from the combination of concrete practical approaches with sound theoretical formalisms. During the past two decades, many communication techniques have been developed to achieve various goals such as higher data rate, more robust link

quality,andmoreusercapacityinmorerigorouschannelconditions.Themost well known are, for instance, CDMA, OFDM, MIMO, multiuser OFDM, and UWB systems.All these systems havetheir ownunique superioritywhile they also induce other drawbacks that limit the system performance. Conventional way to overcome the drawback is to impose most of the computational e?ort in the receiver side and let the transmitter design much simpler than receiver. The fact is that, however, by leveraging reasonable computational e?ort to the transmitter, the receiver design can be greatly simpli?ed. For instance, multiaccess interference (MAI) has long been considered to limit the perf- mance of multiuser systems. Popular solutions to mitigate MAI issue include multiuser detection (MUD) or sophisticated signal processing for interference cancellation such as PIC or SIC. However, those solutions impose great b- den in the receiver. In this case, precoding o?er good solutions to achieve simple transceiver designs as we will mention later in this book. This book is intended to provide a comprehensive review of precoding techniques for digital communications systems from a signal processing p- spective. The variety of selected precoding techniques and their applications makes this book quite di?erent from other texts about precoding techniques in digital communication engineering. With extensive coverage of multimedia communications standards and processing techniques, this guide presents new approaches to traffic management, services deployment, and QoS for networked multimedia systems. It contains many practical examples, more than 200 figures, and over 400 references. "Emerging Techniques in Power System Analysis" identifies the new challenges facing the power industry following the deregulation. The book presents emerging techniques including data mining, grid computing, probabilistic methods, phasor measurement unit (PMU) and how to apply those techniques to solving the technical challenges.

The book is intended for engineers and managers in the power industry, as well as power engineering researchers and graduate students. Zhaoyang Dong is an associate professor at the Department of Electrical Engineering, The Hong Kong Polytechnic University, China. Pei Zhang is program manager at the Electric Power Research Institute (EPRI), USA. The articles in this book describe new developments in the area of structural testing, particularly those based upon the principle of fusing numerical and experimental methods such as real-time dynamic substructuring and hardware-in-the loop testing. In addition to the hybrid methods, chapters on the latest develoments in more established techniques, such as shaking table testing, provide a completely up-to-date survey of structural testing methods. The book is characterized by a multidisciplinary nature of the work that integrates cutting-edge research from the fields of non-linear dynamics, automatic control, numerical analysis, system modelling and mechatronics. Since the early 1990s, when synchronization of chaotic communication systems became a popular research subject, a vast number of scientific papers have been published. However, most of today's books on chaotic communication systems deal exclusively with the systems where perfect synchronization is assumed, an assumption which separates theoretical from practical, real world, systems. This book is the first of its kind dealing exclusively with the synchronization techniques for chaotic communication systems. It describes a number of novel robust synchronization techniques, which there is a lack of, for single and multi-user chaotic communication systems published and highly cited in world's leading journals in the area. In particular, it presents a solution to the problem of robust chaotic synchronization by presenting the first fully synchronized, highly secure, chaos based DS-CDMA system. The book fills a gap in the

existing literature where a number of books exist that deal with chaos and chaotic communications but not with synchronization of chaotic communication systems. It also acts as a bridge between communication system theory and chaotic synchronization by carefully explaining the two concepts and demonstrating how they link into chaotic communication systems. The book also presents a detailed literature review on the topic of synchronization of chaotic communication systems. Furthermore, it presents the literature review on the general topic of chaotic synchronization and how those ideas led to the application of chaotic signals to secure chaotic communication systems. It therefore, in addition to presenting the state of the art systems, also presents a detailed history of chaotic communication systems. In summary, the book stands out in the field of synchronization techniques for chaotic communication systems. A book in the Systems Evaluation, Prediction, and Decision-Making Series,Systems Evaluation: Methods, Models, and Applications covers the evolutionary course of systems evaluation methods, clearly and concisely. Outlining a wide range of methods and models, it begins by examining the method of qualitative assessment. Next, it describes the process and methods for building an index system of evaluation and considers the compared evaluation and the logical framework approach, analytic hierarchy process (AHP), and the data envelopment analysis (DEA) relative efficiency evaluation method. Unique in its emphasis on the practical applications of systems evaluation methods and models, the book introduces several new evaluation models of grey system, including general grey incidence model, grey incidence models based on similarity and closeness, grey cluster evaluation based on triangular whitenization functions, and multi-attribute grey target decision model. Explaining intricate concepts in language that is easy to understand it provides step-by-step

explanations of the various methods and models. The text illustrates the practical application, analysis, and computation of systems evaluation methods and models with an abundance of practical examples and empirical studies. The case studies examine post evaluation of road-bridge construction projects, the efficiency evaluation of the science and technology activities, the evaluation of energy-saving projects in China, and the evaluation and selection of international cooperation projects. Since the begining of the sixties, control theorists have developed a large body of knowledge concerning complex or large-scale systems theory. Using the state space approach, their purpose was to extend methods to cope with the increasingly sophisticated automation needs of man-made systems. Despite several remarkable contributions, and some successful applications, it can be stated that this theory has not yet become an engineering tool. On the other hand, the emergence of cheap and reliable microprocessors has profoundly transformed industrial instrumentation and control systems. Process control equipment is organized in multilevel distributed structures, closely related to the concepts introduced by complex systems control theory. This similarity should favor a fruitful intersection for practical applications. However, a gap still exists between the literature on control theory and the world of technological achievements. In the many books on complex systems, few have given attention to the technological aspects of a practical control problem. The present book is an attempt to fill this gap. To do this, it consistently reflects the viewpoints that: - Theory and technology are two indivisible facets of the same problem. -On-line implementation for real time applications is the ultimate goal of a control study. Biomedical Engineering: Health Care Systems, Technology and Techniques is an edited volume with contributions from world experts. It provides readers with unique contributions related to

current research and future healthcare systems. Practitioners and researchers focused on computer science, bioinformatics, engineering and medicine will find this book a valuable reference. Although the existing layering infrastructure--used globally for designing computers, data networks, and intelligent distributed systems and which connects various local and global communication services--is conceptually correct and pedagogically elegant, it is now well over 30 years old has started create a serious bottleneck. Using Cross-Layer Techniques for Communication Systems: Techniques and Applications explores how cross-layer methods provide ways to escape from the current communications model and overcome the challenges imposed by restrictive boundaries between layers. Written exclusively by well-established researchers, experts, and professional engineers, the book will present basic concepts, address different approaches for solving the cross-layer problem, investigate recent developments in cross-layer problems and solutions, and present the latest applications of the cross-layer in a variety of systems and networks. Case-based reasoning (CBR) is an intelligent-systems method that enables information managers to increase efficiency and reduce cost by substantially automating processes such as diagnosis, scheduling and design. A case-based reasoner works by matching new problems to "cases" from a historical database and then adapting successful solutions from the past to current situations. Organizations as diverse as IBM, VISA International, Volkswagen, British Airways, and NASA have already made use of CBR in applications such as customer support, quality assurance, aircraft maintenance, process planning, and decision support, and many more applications are easily imaginable. It is relatively simple to add CBR components to existing information systems, as this book demonstrates. The author explains the principles of CBR by

describing its origins and contrasting it with familiar information disciplines such as traditional data processing, logic programming, rule-based expert systems, and object-oriented programming. Through case studies and step-by-step examples, he goes on to show how to design and implement a reliable, robust CBR system in a real-world environment. Additional resources are provided in a survey of commercially available CBR tools, a comprehensive bibliography, and a listing of companies providing CBR software and services. Since the first edition of this book was published seven years ago, the field of modeling and simulation of communication systems has grown and matured in many ways, and the use of simulation as a day-to-day tool is now even more common practice. With the current interest in digital mobile communications, a primary area of application of modeling and simulation is now in wireless systems of a different flavor from the `traditional' ones. This second edition represents a substantial revision of the first, partly to accommodate the new applications that have arisen. New chapters include material on modeling and simulation of nonlinear systems, with a complementary section on related measurement techniques, channel modeling and three new case studies; a consolidated set of problems is provided at the end of the book.

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