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In recent years, a considerable amount of effort has been devoted, both in industry and academia, towards the development of advanced methods of control theory with focus on its practical implementation in various fields of human activity such as space control, robotics, control applications in marine systems, control processes in agriculture and food production. Control Systems: Theory and Applications consists of selected best papers which were presented at XXIV International conference on automatic control "Automatics 2017" (September 13-15, 2017, Kyiv, Ukraine) organized by Ukrainian Association on Auto-

matic Control (National member organization of IFAC - International Federation on Automatic Control) and National University of Life and Environmental Sciences of Ukraine. More than 120 presentations were discussed at the conference, with participation of the scientists from the numerous countries. The book is divided into two main parts, a first on Theory of Automatic Control (5 chapters) and the second on Control Systems Applications (8 chapters). The selected chapters provide an overview of challenges in the area of control systems design, modeling, engineering and implementation and the approaches and techniques that relevant research groups within this area are employ-

ing to try to resolve these. This book on advanced methods of control theory and successful cases in the practical implementation is ideal for personnel in modern technological processes automation and SCADA systems, robotics, space and marine industries as well as academic staff and master/research students in computerized control systems, automatized and computer-integrated systems, electrical and mechanical engineering.

This book provides a comprehensive overview of the fundamental security of Industrial Control Systems (ICSs), including Supervisory Control and Data Acquisition (SCADA) systems and touching on cyber-physical systems in general. Careful atten-

tion is given to providing the reader with clear and comprehensive background and reference material for each topic pertinent to ICS security. This book offers answers to such questions as: Which specific operating and security issues may lead to a loss of efficiency and operation? What methods can be used to monitor and protect my system? How can I design my system to reduce threats? This book offers chapters on ICS cyber threats, attacks, metrics, risk, situational awareness, intrusion detection, and security testing, providing an advantageous reference set for current system owners who wish to securely configure and operate their ICSs. This book is appropriate for non-specialists as well. Tutorial information is provided in two initial chapters and in the beginnings of other chapters as needed. The book concludes with advanced topics on ICS governance, responses to attacks on ICS, and future security of the Internet of Things.

Renewable Energy Systems: Modelling, Optimization and Control aims to cross-pollinate recent advances in the study of renewable energy control systems by bringing together diverse scientific breakthroughs on the modeling, control and optimization

of renewable energy systems by leading researchers. The book brings together the most comprehensive collection of modeling, control theorems and optimization techniques to help solve many scientific issues for researchers in renewable energy and control engineering. Many multidisciplinary applications are discussed, including new fundamentals, modeling, analysis, design, realization and experimental results. The book also covers new circuits and systems to help researchers solve many nonlinear problems. This book fills the gaps between different interdisciplinary applications, ranging from mathematical concepts, modeling, and analysis, up to the realization and experimental work. Covers modeling, control theorems and optimization techniques which will solve many scientific issues for researchers in renewable energy. Discusses many multidisciplinary applications with new fundamentals, modeling, analysis, design, realization and experimental results. Includes new circuits and systems, helping researchers solve many nonlinear problems.

The reliability of induction motors is a major requirement in many industrial applications. It is especially important where an

unexpected breakdown might result in the interruption of critical services such as military operations, transportation, aviation, and medical applications. Advanced Condition Monitoring and Fault Diagnosis of Electric Machines is a collection of innovative research on various issues related to machinery condition monitoring, signal processing and conditioning, instrumentation and measurements, and new trends in condition monitoring. It also pays special attention to the fault identification process. While highlighting topics including spectral analysis, electrical engineering, and bearing faults, this book is an ideal reference source for electrical engineers, mechanical engineers, researchers, and graduate-level students seeking current research on various methods of maintaining machinery.

A title which forms part of a series which details construction and procedures in a reference format. It is intended to aid the reader in planning projects estimating costs and materials and installing various systems as well as compliance with building specs and codes and on-site problems. Recently, artificial intelligence (AI), the internet of things (IoT), and cognitive tech-

nologies have successfully been applied to various research domains, including computer vision, natural language processing, voice recognition, and more. In addition, AI with IoT has made a significant breakthrough and a shift in technical direction to achieve high efficiency and adaptability in a variety of new applications. On the other hand, network design and optimization for AI applications addresses a complementary topic, namely the support of AI-based systems through novel networking techniques, including new architectures, as well as performance models for IoT systems. IoT has paved the way to a plethora of new application domains, at the same time posing several challenges as a multitude of devices, protocols, communication channels, architectures, and middleware exist. Big data generated by these devices calls for advanced learning and data mining techniques to effectively understand, learn, and reason with this volume of information, such as cognitive technologies. Cognitive technologies play a major role in developing successful cognitive systems which mimic “cognitive” functions associated with human intelligence, such as “learning” and “problem solving.” Thus, there is

a continuing demand for recent research in these two linked fields. The Handbook of Research on Innovations and Applications of AI, IoT, and Cognitive Technologies discusses the latest innovations and applications of AI, IoT, and cognitive-based smart systems. The chapters cover the intersection of these three fields in emerging and developed economies in terms of their respective development situation, public policies, technologies and intellectual capital, innovation systems, competition and strategies, marketing and growth capability, and governance and relegation models. These applications span areas such as healthcare, security and privacy, industrial systems, multidisciplinary sciences, and more. This book is ideal for technologists, IT specialists, policymakers, government officials, academics, students, and practitioners interested in the experiences of innovations and applications of AI, IoT, and cognitive technologies.

This book focuses on analysis and modelling of active bio potential signals addressing the real time challenges in biomedical signal processing used in a variety of applications such as analysis, classification and identification of different dis-

orders in healthcare systems.

Hybrid Nanofluids for Convection Heat Transfer discusses how to maximize heat transfer rates with the addition of nanoparticles into conventional heat transfer fluids. The book addresses definitions, preparation techniques, thermophysical properties and heat transfer characteristics with mathematical models, performance-affecting factors, and core applications with implementation challenges of hybrid nanofluids. The work adopts mathematical models and schematic diagrams in review of available experimental methods. It enables readers to create new techniques, resolve existing research problems, and ultimately to implement hybrid nanofluids in convection heat transfer applications. Provides key heat transfer performance and thermophysical characteristics of hybrid nanofluids Reviews parameter selection and property measurement techniques for thermal performance calibration Explores the use of predictive mathematical techniques for experimental properties

One of the most cited books in physics of all time, Quantum Computation and Quan-

tum Information remains the best textbook in this exciting field of science. This 10th anniversary edition includes an introduction from the authors setting the work in context. This comprehensive textbook describes such remarkable effects as fast quantum algorithms, quantum teleportation, quantum cryptography and quantum error-correction. Quantum mechanics and computer science are introduced before moving on to describe what a quantum computer is, how it can be used to solve problems faster than 'classical' computers and its real-world implementation. It concludes with an in-depth treatment of quantum information. Containing a wealth of figures and exercises, this well-known textbook is ideal for courses on the subject, and will interest beginning graduate students and researchers in physics, computer science, mathematics, and electrical engineering.

"This set of books represents a detailed compendium of authoritative, research-based entries that define the contemporary state of knowledge on technology"--Provided by publisher.

Shock wave-boundary-layer interaction (SBLI) is a fundamental phenomenon in gas

dynamics that is observed in many practical situations, ranging from transonic aircraft wings to hypersonic vehicles and engines. SBLIs have the potential to pose serious problems in a flowfield; hence they often prove to be a critical - or even design limiting - issue for many aerospace applications. This is the first book devoted solely to a comprehensive, state-of-the-art explanation of this phenomenon. It includes a description of the basic fluid mechanics of SBLIs plus contributions from leading international experts who share their insight into their physics and the impact they have in practical flow situations. This book is for practitioners and graduate students in aerodynamics who wish to familiarize themselves with all aspects of SBLI flows. It is a valuable resource for specialists because it compiles experimental, computational and theoretical knowledge in one place.

Communication and Power Engineering are the proceedings of the joint International conferences organized by IDES in the year 2016. The aim of these conference proceedings is to bringing together the researchers, scientists, engineers, and scholar students in all areas of Computer Sci-

ence, Power Engineering, Electrical & Electronics and provides an international forum for the dissemination of original research results, new ideas and practical development experiences, focused on both theory and practices. The conference deals with the frontier topics in the Computer Science, Electrical and Electronics Engineering subjects. The Institute of Doctors Engineers and Scientists - IDES is formed to promote, and organize technical research Meetings, Conference, Discussions, Seminars, Workshops, Study tours, Industry visits; and to publish professional Journals, Magazines and Newsletters; and to carry on research and development on the above fields; and to research, design, and develop products or materials and projects. There are total 35 research papers included in this book covering all the frontier topics in Computer Science, Electrical and Electronics Engineering subjects. The authors of each chapter are researchers from various universities. Contents: Foreword Handwritten Script Identification from Text Lines A Rule based Approach for Noun Phrase Extraction from English Text Document Recommending Investors using Association Rule Mining for Crowd Funding

Projects Colour Texture Classification Using Anisotropic Diffusion and Wavelet Transform Competitive Advantage of using Differential Evolution Algorithm for Software Effort Estimation Comparative Analysis of Cepstral analysis and Autocorrelation Method for Gender Classification A Simulative Study on Effects of Sensing Parameters on Cognitive Radio's Performance Analysis of Cyclotomic Fast Fourier Transform by Gate level Delay Method Dynamic Resource Allocation in Next Generation Networks using FARIMA Time Series Model Classification of Mimetic Spectral Signatures using Orthogonal Subspace Projection with Complex Wavelet Filter Bank based Dimensionality Reduction An Illumination Invariant Face Recognition Approach based on Fourier Spectrum Optimal Load Frequency Controller for a Deregulated Reheat Thermal Power System Design and Implementation of a Heuristic Approximation Algorithm for Multicast Routing in Optical Networks Infrastructure Management Services Toolkit A Novel Approach for Residential Society Maintenance Problem for Better Human Life Smart Suspect Vehicle Surveillance System Formal Performance Analysis of Web Servers us-

ing an SMT Solver and a Web Framework Modified GCC Compiler Pass for Thread-Level Speculation by Modifying the Window Size using Openmp Overview and Evaluation of an IoT Product for Application Development A TCP in CR-MANET with Unstable Bandwidth Impact of Digital Ecosystem on Business Environment A Two-Factor Single Use Password Scheme Design & Implementation of Wireless System for Cochlear Devices Software Code Clone Detection and Removal using Program Dependence Graphs Social Sentimental Analytics using Big Data Tools Predicting Flight Delay using ANN with Multi-core Map Reduce Framework New Network Overlay Solution for Complete Networking Virtualization Review upon Distributed Facts Hard Drive Schemes throughout Wireless Sensor Communities Detection of Rapid Eye Movement Behaviour Sleep Disorder using Time and Frequency Analysis of EEG Signal Applied on C4-A1 Channel Analysis of PV/ WIND/ FUEL CELL Hybrid System Interconnected With Electrical Utility Grid Analysis of Wind Speed Prediction Technique by hybrid Weibull-ANN Model An efficient FPGA Implementation of DES and Triple-DES Encryption Systems A Nov-

elty Comparison of Power with Assorted Parameters of a Horizontal Wind Axis Turbine for NACA 5512 Retaliation based Enhanced Weighted Clustering Algorithm for Mobile Ad-hoc Network (R-EWCA) Chest CT Scans Screening of COPD based Fuzzy Rule Classifier Approach Author Index

Like other sciences and engineering disciplines, software engineering requires a cycle of model building, experimentation, and learning. Experiments are valuable tools for all software engineers who are involved in evaluating and choosing between different methods, techniques, languages and tools. The purpose of Experimentation in Software Engineering is to introduce students, teachers, researchers, and practitioners to empirical studies in software engineering, using controlled experiments. The introduction to experimentation is provided through a process perspective, and the focus is on the steps that we have to go through to perform an experiment. The book is divided into three parts. The first part provides a background of theories and methods used in experimentation. Part II then devotes one chapter to each of the five experiment

steps: scoping, planning, execution, analysis, and result presentation. Part III completes the presentation with two examples. Assignments and statistical material are provided in appendixes. Overall the book provides indispensable information regarding empirical studies in particular for experiments, but also for case studies, systematic literature reviews, and surveys. It is a revision of the authors' book, which was published in 2000. In addition, substantial new material, e.g. concerning systematic literature reviews and case study research, is introduced. The book is self-contained and it is suitable as a course book in undergraduate or graduate studies where the need for empirical studies in software engineering is stressed. Exercises and assignments are included to combine the more theoretical material with practical aspects. Researchers will also benefit from the book, learning more about how to conduct empirical studies, and likewise practitioners may use it as a "cookbook" when evaluating new methods or techniques before implementing them in their organization.

Artificial neural networks, genetic algorithms and the ant colony optimization al-

gorithm have become a highly effective tool for solving hard optimization problems. As their popularity has increased, applications of these algorithms have grown in more than equal measure. While many of the books available on these subjects only provide a cursory discussion of theory, the present book gives special emphasis to the theoretical background that is behind these algorithms and their applications. Moreover, this book introduces a novel real time control algorithm, that uses genetic algorithm and ant colony optimization algorithms for optimizing PID controller parameters. In general, the present book represents a solid survey on artificial neural networks, genetic algorithms and the ant colony optimization algorithm and introduces novel practical elements related to the application of these methods to process system control.

Control Applications for Biomedical Engineering Systems presents different control engineering and modeling applications in the biomedical field. It is intended for senior undergraduate or graduate students in both control engineering and biomedical engineering programs. For control engineering students, it presents the applica-

tion of various techniques already learned in theoretical lectures in the biomedical arena. For biomedical engineering students, it presents solutions to various problems in the field using methods commonly used by control engineers. Points out theoretical and practical issues to biomedical control systems Brings together solutions developed under different settings with specific attention to the validation of these tools in biomedical settings using real-life datasets and experiments Presents significant case studies on devices and applications

This volume is part of collection of contributions devoted to analytical and experimental techniques of dynamical systems, presented at the 15th International Conference "Dynamical Systems: Theory and Applications", held in Łódź, Poland on December 2-5, 2019. The wide selection of material has been divided into three volumes, each focusing on a different field of applications of dynamical systems. The broadly outlined focus of both the conference and these books includes bifurcations and chaos in dynamical systems, asymptotic methods in nonlinear dynamics, dynamics in life sciences and bioengineering, origi-

nal numerical methods of vibration analysis, control in dynamical systems, optimization problems in applied sciences, stability of dynamical systems, experimental and industrial studies, vibrations of lumped and continuous systems, non-smooth systems, engineering systems and differential equations, mathematical approaches to dynamical systems, and mechatronics.

This best-selling introduction to automatic control systems has been updated to reflect the increasing use of computer-aided learning and design, and revised to feature a more accessible approach — without sacrificing depth.

This title describes the various research results in the field of geometric tolerancing of products, an activity that highlights the difficult scientific locks. The collection is of great importance for further innovation in the development of industrial products.

Islamic Thought is a fresh and contemporary introduction to the philosophies and doctrines of Islam. Abdullah Saeed, a distinguished Muslim scholar, traces the development of religious knowledge in Islam, from the pre-modern to the modern period. The book focuses on Muslim

thought, as well as the development, production and transmission of religious knowledge, and the trends, schools and movements that have contributed to the production of this knowledge. Key topics in Islamic culture are explored, including the development of the Islamic intellectual tradition, the two foundation texts, the Qur'an and Hadith, legal thought, theological thought, mystical thought, Islamic Art, philosophical thought, political thought, and renewal, reform and rethinking today. Through this rich and varied discussion, Saeed presents a fascinating depiction of how Islam was lived in the past and how its adherents practise it in the present. Islamic Thought is essential reading for students beginning the study of Islam but will also interest anyone seeking to learn more about one of the world's great religions.

This volume contains the peer-reviewed proceedings of the International Conference on Modelling and Simulation (MS-17), held in Kolkata, India, 4th-5th November 2017, organized by the Association for the Advancement of Modelling and Simulation Techniques in Enterprises (AMSE, France) in association with the Institution of Engineering Technology (IET, UK), Kolkata Net-

work. The contributions contained here showcase some recent advances in modelling and simulation across various aspects of science and technology. This book brings together articles describing applications of modelling and simulation techniques in fields as diverse as physics, mathematics, electrical engineering, industrial electronics, control, automation, power systems, energy and robotics. It includes a special section on mechanical, fuzzy, optical and opto-electronic control of oscillations. It provides a snapshot of the state of the art in modelling and simulation methods and their applications, and will be of interest to researchers and engineering professionals from industry, academia and research organizations.

Advances in Medical and Surgical Engineering integrates the knowledge and experience of experts from academia and practicing surgeons working with patients. The cutting-edge progress in medical technology applications is making the traditional line between engineering and medical science ever thinner. This is an excellent resource for biomedical engineers working in industry and academia on developing med-

ical technologies. It covers challenges in the application of technology in the clinic with views from an editorial team that is highly experienced in engineering, biomaterials, surgical practice, biomedical science and technology, and that has a proven track record of publishing applied biomedical science and technology. For medical practitioners, this book covers advances in technology in their domain. For students, this book identifies the opportunities of research based on the reviews of utilization of current technologies. The content in this book can also be of interest to policymakers, research funding agencies, and libraries, that are contributing to development of medical technologies. Covers circulatory support, aortic valve implantation and microvascular anastomosis Explores arthroplasty of both the knee and the shoulder Includes tribology of materials, laser treatment and machining of biomaterial

The combination of global warming and urban sprawl is the origin of the most hazardous climate change effect detected at urban level: Urban Heat Island, representing the urban overheating respect to the countryside surrounding the city. This book in-

cludes 18 papers representing the state of the art of detection, assessment mitigation and adaption to urban overheating. Advanced methods, strategies and technologies are here analyzed including relevant issues as: the role of urban materials and fabrics on urban climate and their potential mitigation, the impact of greenery and vegetation to reduce urban temperatures and improve the thermal comfort, the role the urban geometry in the air temperature rise, the use of satellite and ground data to assess and quantify the urban overheating and develop mitigation solutions, calculation methods and application to predict and assess mitigation scenarios. The outcomes of the book are thus relevant for a wide multidisciplinary audience, including: environmental scientists and engineers, architect and urban planners, policy makers and students.

This book is intended to serve as a textbook for BE., B. Tech, students of Electrical, Electronics, Computer, Instrumentation, Control and communication Engineering. It will also serve as a text reference for the students of diploma in Engineering. AMIE, GATE, UPSC Engineering services, IAS candidate would also find the book ex-

tremely useful. Subject matter in each chapter developed systematically from first principles. Written in a very simple language. Simple and clear explanation of concepts. Large number of carefully selected worked examples. Most simplified methods used. Step-by-step procedures given for solving problems. Ideally suited for self-study.

The Muslim Brotherhood in the Middle East has always attracted widely divergent attention. Scholars have regarded it both as the source of terrorism, and, more recently as the potential harbinger of democratization. The Muslim Brotherhood in Europe has attracted far less attention. But heavily influenced by its ambiguous reputation in the Middle East it has led to widespread speculation about its character. Its critics regard the European organizations as part of a suspicious, secretive, centrally led world-wide organization that enhances the alienation of Muslims in Europe. Its sympathizers, on the other hand, regard the Brotherhood as a moderate movement that has been Europeanized and promotes integration. This volume brings together experts on the European Muslim Brotherhood who address some of the main issues

on which the debate has concentrated. After an introduction dealing with the European debate in the press, the first section shows that Brotherhood consists primarily of a network of informal ties, which have developed a host of localized practices and contradictory trends. The second part deals with the Brotherhood organizations in different European countries and traces their highly specific trajectories and relations with the local non-Muslim press and authorities. The third section concentrates on the ideological developments of the movement in the Middle East and Europe.

This book creates the emergence of disruptive technologies that have led to a significant change in the role of mathematics and statistics for problem solving, with the use of sophisticated software and hardware in solving complex systems and process. In the era of digital technology, mathematics and statistics need to be highly relevant to be able to cater for the needs of IR4.0 such as big data analytics, simulation, autonomous system, and cloud computing. Motivated by this development, a total of 26 chapters are contributed by respectable experts for this book.

The main scope of the book is to conduct a new system of modeling and simulations on solving differential equations, nonlinear equations, energy, epidemiology, and risk assessment. This book is of interest for postgraduate students, researchers as well as other scientists who are working in numerical modeling and simulations based on efficient mathematical and statistical techniques.

This is an introduction to power system analysis and design. The text contains fundamental concepts and modern topics with applications to real-world problems, and integrates MATLAB and SIMULINK throughout.

Focuses on the first control systems course of BTech, JNTU, this book helps the student prepare for further studies in modern control system design. It offers a profusion of examples on various aspects of study.

High penetration of renewable energy sources (RESs) imposes several techno-economic challenges to distribution system operators (DSOs) due to their variability in power generation and, hence, increases the need for additional operational flexibility. Operational flexibility aims at securely

covering the possible variations at the minimum cost using emerging flexible alternatives or designing novel local market mechanisms to incentivize flexibility providers. In such a situation, the DSOs can use the potential of flexible options such as energy storages (ESs), demand response (DR), plug-in electric vehicles (PEVs), or on-site fast run generators. However, each of the mentioned flexible resources has its own specific characteristics and requirements that should be taken into account, and this raises the complexity. Optimal network re-configuration schemes are the other solution for increasing power system flexibility at the distribution level. There is a great research gap related to renewable-based distribution network planning from a flexibility point of view. Therefore, this book aims to discuss the additional flexibility needs introduced by RESs and describe general approaches to analyze the need for and provision of additional flexibility in future distribution networks at both the planning and operational time frames. This book successfully suggests new solutions and techniques to increase the flexibility in distribution systems. It also highlights the needs for moving towards smart distribu-

tion grids in order to enhance the flexibility in modern and future power systems.

This comprehensive text on control systems is designed for undergraduate students pursuing courses in electronics and communication engineering, electrical and electronics engineering, telecommunication engineering, electronics and instrumentation engineering, mechanical engineering, and biomedical engineering. Appropriate for self-study, the book will also be useful for AMIE and IETE students. Written in a student-friendly readable manner, the book, now in its Second Edition, explains the basic fundamentals and concepts of control systems in a clearly understandable form. It is a balanced survey of theory aimed to provide the students with an in-depth insight into system behaviour and control of continuous-time control systems. All the solved and unsolved problems in this book are classroom tested, designed to illustrate the topics in a clear and thorough way. **NEW TO THIS EDITION** • One new chapter on Digital control systems • Complete answers with figures • Root locus plots and Nyquist plots redrawn as per MATLAB output • MATLAB programs

at the end of each chapter • Glossary at the end of chapters **KEY FEATURES** • Includes several fully worked-out examples to help students master the concepts involved. • Provides short questions with answers at the end of each chapter to help students prepare for exams confidently. • Offers fill in the blanks and objective type questions with answers at the end of each chapter to quiz students on key learning points. • Gives chapter-end review questions and problems to assist students in reinforcing their knowledge. Solution Manual is available for adopting faculty.

Biopotential signals are often used by physicians to measure the activities of organs and tissues in the human body. This book describes the sources and characteristics of different biopotential signals and provides an understanding of how a range of signals can be modelled and analysed. The resulting information can be used to assist in the identification of disorders such as epilepsy, schizophrenia, PTSD and heart disease, among others. An emphasis is placed on the real challenges in biopotential signal processing due to the complex and non-stationary nature of signals. Following on from volume one, this

book starts with a collection of chapters covering some of the latest developments in electroencephalography (EEG) signal analysis, then moves on to applications of electrocardiography (ECG) and otoscope signals. The volume concludes with a discussion of other monitoring techniques. The chapters include biomedical examples and discussions of how each method can be used to study human organs. It is a valuable guide for all researchers and practitioners who are engaged in studies and research in the area of biomedical signals and their applications. **Key Features** Modelling and acquisition of biomedical signals for different disorders Implementation of methodologies and their impact on different cases Case studies and research directions Design and simulation examples Femtocell is currently the most promising technology for supporting the increasing demand of data traffic in wireless networks. Femtocells provide an opportunity for enabling innovative mobile applications and services in home and office environments. Femtocell Communications and Technologies: Business Opportunities and Deployment Challenges is an extensive and thoroughly revised version of a collec-

tion of review and research based chapters on femtocell technology. This work focuses on mobility and security in femtocell, cognitive femtocell, and standardization and deployment scenarios. Sev-

eral crucial topics addressed in this book are interference mitigation techniques, network integration option, cognitive optimization, and economic incentives to install femtocells that may have a larger impact

on their ultimate success. The book is optimized for use by graduate researchers who are familiar with the fundamentals of wireless communication and cellular concepts.