

Electrical Engineering IIT Kanpur

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2024-01-14

BARRERA STEWART

Advanced Techniques and Applications Springer Nature

Arranged chronologically and thematically, the book highlights how ideas about the appropriate relationships among science, scientists, and the state changed over time.

Proceedings of the 7th ICIECE 2018 Academic Press

This book describes two target applications for synchronous systems: regulated 3-phase voltage supply and voltage sag mitigation. It presents a detailed design procedure for converter switches and filters considering all steady-state, commutation and dynamic requirements. This work has evolved from previously published research by the authors, which in turn is part of a larger effort to expand the application domain of matrix converters to power systems. The objectives of the work have been categorized into the following: developing a dynamic model that provides adequate design insights; designing filters; and devising a control scheme. The low frequency dynamic model is first analyzed for regulated voltage supplies assuming balanced system. The system is modeled relative to a synchronous rotating (dq) frame linearized around an operating point. The input-output variables are related by non-diagonal transfer function matrices. Individual transfer function sub-matrices are sequentially investigated and it is shown that, depending on the input power, input voltage and filter parameters, the appearance of a set of right half zeros is possible. The book then considers filter design, as well as general issues like ripple attenuation, regulation, reactive current loading, and filter losses. The book also addresses additional constraints that may be imposed by dynamic requirements and commutation. In the third stage, voltage controller design is detailed for a 3-phase regulated voltage supply. In dq domain, output voltage control represents a multivariable control problem. This is reduced to a single variable control problem while retaining all possible right half zeros, thereby preserving the internal stability of the system. Consequently, the standard single variable control design technique has been used to design a controller. The analytically predicted dynamic response has been verified by experimental results. It was possible to operate the system beyond the critical power boundary where the right half zeros emerge. Lastly, the developed control approach has been extended to voltage sag mitigation with adequate modifications. A 3-wire linear load and both symmetrical and asymmetrical voltage sags have been considered. Experimentally

obtained response time for sag mitigation was found to be less than the power supply holdup time of most of the sensitive equipment. This book will be useful to both researchers and graduate students.

Select Proceedings of EPREC-2021 S. Chand Publishing

The Present Edition Of The Book Contains Almost All The Topics Connected With Protection Schemes. The Book, Which Consists Of Ten Main Chapters And Two Appendices, Starts With The Chapter On Introduction, And Includes Chapters On Fundamental And Basic Theory Of Protection Schemes, Definition Of Various Terms, Different Types Of Protective Relaying Schemes, Generalized Mathematical Theory Of Protective Relay, Relay As A Comparator, Single Input, Dual Input And Multi-Input Comparator, Different Types And Arrangement Of Protection Schemes For Various Components And Detailed Studies Of Electromechanical, Electronics, Static And Digital Relaying Schemes. The Digital Protection Of Synchronous Machines, Transformer And Transmission Line Based, Both On Fundamental And Travelling Wave Phenomena, Are Dealt With In Detail. Also Included In The Present Edition, Are The Related Topics Such As Theory And Design Of Dynamic Test Bench, P.C. Based Relay Setting And Coordination, P.C. Based Short Circuit Studies And Ultra High Speed Relaying Schemes. The Present Edition Which Contains Almost All The Topics Of Current Interest In The Area Of Protective Relaying, Will Certainly Be Very Useful To The Teachers, Students And Engineers Working With The Utilities. The Present Edition Is The Result Of Teaching By The Author To The Undergraduate And Postgraduate Level Classes And Supervising Several Doctoral And Master Thesis And Graduate Level Projects In The Area Of Power System Protection At The Indian Institute Of Technology, Kanpur, For More Than Two Decades. The Content Of The Present Edition Has Been Class-Tested For Several Years At The Undergraduate And Postgraduate Level Classes At L.L.T., Kanpur. It Has Also Been Tested In Several Intensive Courses Offered By The Author Under Qip And Other Schemes To The Teachers Of Academic Institutions And Also Engineers Working With Utilities.

Academic Press Library in Signal Processing New Age International

This second volume, edited and authored by world leading experts, gives a review of the principles, methods and techniques of important and emerging research topics and technologies in communications and radar engineering. With this reference source you will: Quickly grasp a new area of research Understand the underlying principles of a topic and its application Ascertain how a topic relates to other areas and learn of the research issues yet to be resolved Quick tutorial reviews of important and emerging topics of research in array and statistical signal processing Presents core

principles and shows their application Reference content on core principles, technologies, algorithms and applications Comprehensive references to journal articles and other literature on which to build further, more specific and detailed knowledge Edited by leading people in the field who, through their reputation, have been able to commission experts to write on a particular topic

Intelligent Control of Robotic Systems Springer Science & Business Media

This book illustrates basic principles, along with the development of the advanced algorithms, to realize smart robotic systems. It speaks to strategies by which a robot (manipulators, mobile robot, quadrotor) can learn its own kinematics and dynamics from data. In this context, two major issues have been dealt with; namely, stability of the systems and experimental validations. Learning algorithms and techniques as covered in this book easily extend to other robotic systems as well. The book contains MATLAB- based examples and c-codes under robot operating systems (ROS) for experimental validation so that readers can replicate these algorithms in robotics platforms.

Vi Instru Using Labview Springer Nature

Smart Cities Cybersecurity and Privacy examines the latest research developments and their outcomes for safe, secure, and trusting smart cities residents. Smart cities improve the quality of life of citizens in their energy and water usage, healthcare, environmental impact, transportation needs, and many other critical city services. Recent advances in hardware and software, have fueled the rapid growth and deployment of ubiquitous connectivity between a city's physical and cyber components. This connectivity however also opens up many security vulnerabilities that must be mitigated. Smart Cities Cybersecurity and Privacy helps researchers, engineers, and city planners develop adaptive, robust, scalable, and reliable security and privacy smart city applications that can mitigate the negative implications associated with cyber-attacks and potential privacy invasion. It provides insights into networking and security architectures, designs, and models for the secure operation of smart city applications. Consolidates in one place state-of-the-art academic and industry research Provides a holistic and systematic framework for design, evaluating, and deploying the latest security solutions for smart cities Improves understanding and collaboration among all smart city stakeholders to develop more secure smart city architectures

Universities Press

A straightforward introduction to basic concepts and methodologies for digital photoelasticity, providing a foundation on which future researchers and students can develop their own ideas. The book thus promotes research into the formulation of problems in digital photoelasticity and the application of these techniques to industries. In one volume it provides data acquisition by DIP techniques, its analysis by statistical techniques, and its presentation by computer graphics plus the use of rapid prototyping technologies to speed up the entire process. The book not only presents the various techniques but also provides the relevant time-tested software codes. Exercises designed to support and extend the treatment are found at the end of each chapter.

Science, Technology, and the State in Cold War America PHI Learning Pvt. Ltd.

This book illustrates basic principles, along with the development of the advanced algorithms, to realize smart robotic systems. It speaks to strategies by which a robot (manipulators, mobile robot, quadrotor) can learn its own kinematics and dynamics from data. In this context, two major issues have been dealt with; namely, stability of the systems and experimental validations. Learning

algorithms and techniques as covered in this book easily extend to other robotic systems as well. The book contains MATLAB- based examples and c-codes under robot operating systems (ROS) for experimental validation so that readers can replicate these algorithms in robotics platforms.

Case Studies from IIT Kanpur John Wiley & Sons

Engineering Electromagnetics is a classic book that provides a comprehensive discussion on core concepts of the subject area. It follows an application-based approach, by supporting theoretical concepts with numerous solved examples and illustrations. This adapted edition focuses on enhancing the electrostatics portion and adding more solved examples. With all its careful revisions, the book is now a more useful resource for students of electrical engineering as well as electronics and communication engineering. Salient Features: 1. In-depth coverage of electrostatics and magnetostatics portions 2. A new chapter on Electromagnetic Radiation and Antennas 3. A focused chapter on Transmission Lines 4. Enhanced discussion on topics like vector analysis, properties of dielectric materials, interpretation of Maxwell's equations, etc. 5. Rich pedagogy: ★100+ solved examples ★100+ drill problems ★500+ review problems

Innovation, Incubation and Entrepreneurship JHU Press

This book focuses on promoting entrepreneurial ecosystems within universities and educational institutes. It especially emphasizes the thriving systems and practices existing within the Indian Institute of Technology Kanpur (IITK). It discusses cases and successes of the SIDBI Incubation and Innovation Centre in the Institute. This edited volume highlights the vision of IITK and describes a few of the major achievements of the past few years. It especially showcases the requirements and challenges of creating, sustaining, and boosting such entrepreneurial ecosystems and incubation centres. The contents of this book will be useful to researchers, administrators, and corporate collaborators working in the area of monetizing technology coming from educational institutions by converting it to successful products and business ideas.

Fundamentals and Innovations in Solar Energy Springer

Basic Electrical Engineering PHI Learning Pvt. Ltd.

Competing with the Soviets Springer

This Book Is A Result Of Teaching Courses In The Areas Of Computer Methods In Power Systems, Digital Simulation Of Power Systems, Power System Dynamics And Advanced Protective Relaying To The Undergraduate And Graduate Students In Electrical Engineering At I.I.T., Kanpur For A Number Of Years And Guiding Several Ph.D. And M.Tech. Thesis And B.Tech. Projects By The Author. The Contents Of The Book Are Also Tested In Several Industrial And Qip Sponsored Courses Conducted By The Author As A Coordinator. The Present Edition Includes A Sub-Section On Solution Procedure To Include Transmission Losses Using Dynamic Programming In The Chapter On Economic Load Scheduling Of Power System. In This Edition An Additional Chapter On Load Forecasting Has Also Been Included. The Present Book Deals With Almost All The Aspects Of Modern Power System Analysis Such As Network Equations And Its Formulations, Graph Theory, Symmetries Inherent In Power System Components And Its Formulations, Graph Theory, Symmetries Inherent In Power System Components And Development Of Transformation Matrices Based Solely Upon Symmetries, Feasibility Analysis And Modeling Of Multi-Phase Systems, Power System Modeling Including Detailed Analysis Of Synchronous Machines, Induction Machines And Composite Loads, Sparsity Techniques,

Economic Operation Of Power Systems Including Derivation Of Transmission Loss Equation From The Fundamental, Solution Of Algebraic And Differential Equations And Power System Studies Such As Load Flow, Fault Analysis And Transient Stability Studies Of A Large Scale Power System Including Modern And Related Topics Such As Advanced Protective Relaying, Digital Protection And Load Forecasting. The Book Contains Solved Examples In These Areas And Also Flow Diagrams Which Will Help On One Hand To Understand The Theory And On The Other Hand, It Will Help The Simulation Of Large Scale Power Systems On The Digital Computer. The Book Will Be Easy To Read And Understand And Will Be Useful To Both Undergraduate And Graduate Students In Electrical Engineering As Well As To The Engineers Working In Electricity Boards And Utilities Etc.

The Beginning of the End! New Age International

This volume comprises chapters on the cutting-edge research in photonics undertaken at IIT Kanpur. Photonics requires scientists and engineers to work closely together in addressing challenges which are interdisciplinary in nature. At IIT Kanpur, research is being pursued in several key areas of photonics namely fiber-optics, nanophotonics, quantum optics, optical spectroscopy and imaging, biophotonics, and photonic devices. This volume brings together contributions from experts to obtain a contemporary perspective in photonics research. The reader will find articles about coherent optical communications, novel photonic nanostructures, nano-structured materials for light control, optical tweezers with nanoscale applications, quantum coherence and entanglement, photodiode arrays and quantum metrology. The volume also includes chapters on cancer diagnostics with optical tomography, protein fluctuations at microsecond scale at single-molecule level, and visualization of motion in a droplet which are interdisciplinary in nature. The contents of this book will be of use to researchers, students, and professionals working across all domains of photonics.

The Green Guide to Environmental Courses and Careers (Green Career) Concept Publishing Company

2015 marks the beginning of the UN Decade of Sustainable Development. Sustainable development involves the incorporation of ecological principles in technology development and dissemination. It is in this context that the present book by Ms Megha Aggarwal is a timely contribution. The book covers a wide range of information dealing with agriculture, energy, engineering, medicine, architecture, finance, and environmental management. It should help the young students to become the architects of a sustainable future for our country. I hope the book will be read and used widely. □

MS SWAMINATHAN Father of the Indian Green Revolution As India gradually moves towards a □green□ economy, new avenues of employment are opening up for today□s youth. For students thinking about future course and career options, this one-of-its-kind handbook offers a rich body of information required to turn a green interest into a future opportunity. From environmental engineering, environmental science, and environmental law to agriculture, climate science, and zoology □ it profiles a range of undergraduate and postgraduate courses, and the broad spectrum of careers they lead to. Peppared with anecdotal accounts from well-known professionals and a handy listing of useful resources, The Green Guide to Environmental Courses and Careers is a must-have for any student keen on harnessing a green passion. The book is a timely contribution.... It should help the young students to become the architects of a sustainable future for our country. □ MS

Swaminathan

Applied Mathematics for Restructured Electric Power Systems Springer Nature

This volume explores and addresses the challenges of high-k gate dielectric materials, one of the major concerns in the evolving semiconductor industry and the International Technology Roadmap for Semiconductors (ITRS). The application of high-k gate dielectric materials is a promising strategy that allows further miniaturization of microelectronic components. This book presents a broad review of SiO₂ materials, including a brief historical note of Moore's law, followed by reliability issues of the SiO₂ based MOS transistor. It goes on to discuss the transition of gate dielectrics with an EOT ~ 1 nm and a selection of high-k materials. A review of the various deposition techniques of different high-k films is also discussed. High-k dielectrics theories (quantum tunneling effects and interface engineering theory) and applications of different novel MOSFET structures, like tunneling FET, are also covered in this book. The volume also looks at the important issues in the future of CMOS technology and presents an analysis of interface charge densities with the high-k material tantalum pentoxide. The issue of CMOS VLSI technology with the high-k gate dielectric materials is covered as is the advanced MOSFET structure, with its working structure and modeling. This timely volume will prove to be a valuable resource on both the fundamentals and the successful integration of high-k dielectric materials in future IC technology.

Proceedings of AICTC 2019 Springer

This book gathers selected papers presented at the 7th International Conference on Innovations in Electronics and Communication Engineering, held at Guru Nanak Institutions in Hyderabad, India. It highlights contributions by researchers, technocrats and experts regarding the latest technologies in electronic and communication engineering, and addresses various aspects of communication engineering, including signal processing, VLSI design, embedded systems, wireless communications, and electronics and communications in general. Covering cutting-edge technologies, the book offers a valuable resource, especially for young researchers.

High-k Gate Dielectric Materials Springer Nature

This book is designed for the course on Object Oriented Programming and C++ offered to students taking the DOEACC's 'A' level certificate examination. The book will also be useful to the Diploma students of Computer Science who take a paper on C++. Key features Comprehensive coverage of Object Oriented Programming. Programming Methodology discussed thoroughly. . Detailed discussion on Virtual Functions and Templates.. The last 5 Question papers of DOEACC 'A' level examinations included at the end of the book as an appendix.. Programming Methodology discussed thoroughly. Detailed discussion on Virtual Functions and Templates. DOEACC `A? level examination question papers included as an appendix.

Optimization, Control, and Computational Intelligence Springer
Contributed articles.

Intelligent Data Engineering and Analytics CRC Press

It is our great pleasure to welcome you to the 11th International Conference on Neural Information Processing (ICONIP 2004) to be held in Calcutta. ICONIP 2004 is organized jointly by the Indian Statistical Institute (ISI) and Jadavpur University (JU). We are confident that ICONIP 2004, like the previous conferences in this series, will provide a forum for fruitful interaction and the exchange of

ideas between the participants coming from all parts of the globe. ICONIP 2004 covers all major facets of computational intelligence, but, of course, with a primary emphasis on neural networks. We are sure that this meeting will be enjoyable academically and otherwise. We are thankful to the track chairs and the reviewers for extending their support in various forms to make a sound technical program. Except for a few cases, where we could get only two review reports, each submitted paper was reviewed by at least three referees, and in some cases the revised versions were again checked by the referees. We had 470 submissions and it was not an easy task for us to select papers for a four-day conference. Because of the limited duration of the conference, based on the review reports we selected only about 40% of the contributed papers. Consequently, it is possible that some good papers are left out. We again express our sincere thanks to all referees for accomplishing a great job. In addition to 186 contributed papers, the proceedings includes two plenary presentations, four invited talks and 18 papers in four special sessions. The proceedings is organized into 26 coherent topical groups.

Proceedings of the 9th International Conference on Frontiers in Intelligent Computing: Theory and Applications (FICTA 2021) Springer Nature

A guide to the role of static state estimation in the mitigation of potential system failures With contributions from a noted panel of experts on the topic, *Advances in Electric Power and Energy: Static State Estimation* addresses the wide-range of issues concerning static state estimation as a main energy control function and major tool for evaluating prevailing operating conditions in electric power systems worldwide. This book is an essential guide for system operators who must be fully aware of potential threats to the integrity of their own and neighboring systems. The contributors provide an overview of the topic and review common threats such as cascading black-outs to model-based anomaly detection to the operation of micro-grids and much more. The book also includes a discussion of an effective mathematical programming approach to state estimation in power systems. *Advances in Electric Power and Energy* reviews the most recent developments in the field and: Offers an introduction to the topic to help non-experts (and professionals) get up-to-date on static state estimation Covers the essential information needed to understand power system state estimation written by experts on the subject Discusses a mathematical programming approach Written for electric power system planners, operators, consultants, power system software developers, and academics, *Advances in Electric Power and Energy* is the authoritative guide to the topic with contributions from experts who review the most recent developments.