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Computational Intelligence Paradigms for Optimization Problems Using MATLAB®/SIMULINK® - S. Sumathi 2018-09-03

Considered one of the most innovative research directions, computational intelligence (CI) embraces techniques that use global search optimization, machine learning, approximate reasoning, and connectionist systems to develop efficient, robust, and easy-to-use solutions amidst multiple decision variables, complex constraints, and tumultuous environments. CI techniques involve a combination of learning, adaptation, and evolution used for intelligent applications. Computational Intelligence Paradigms for Optimization Problems Using MATLAB®/ Simulink® explores the performance of CI in terms of knowledge representation, adaptability, optimality, and processing speed for different real-world optimization problems. Focusing on the practical implementation of CI techniques, this book: Discusses the role of CI paradigms in engineering applications such as unit commitment and economic load dispatch, harmonic reduction, load frequency control and automatic voltage regulation, job shop scheduling, multidepot vehicle routing, and digital image watermarking Explains the impact of CI on power systems, control systems, industrial automation, and image processing through the above-mentioned applications Shows how to apply CI algorithms to constraint-based optimization problems using MATLAB® m-files and Simulink® models Includes experimental analyses and results of test systems Computational Intelligence Paradigms for Optimization Problems Using MATLAB®/ Simulink® provides a valuable reference for industry professionals and advanced undergraduate, postgraduate, and research students.

Introduction to Fuzzy Logic using MATLAB - S.N. Sivanandam 2006-10-28

This book provides a broad-ranging, but detailed overview of the basics of Fuzzy Logic. The fundamentals of Fuzzy Logic are discussed in detail, and illustrated with various solved examples. The book also deals with applications of Fuzzy Logic, to help readers more fully understand the concepts involved. Solutions to the problems are programmed using MATLAB 6.0, with simulated results. The MATLAB Fuzzy Logic toolbox is provided for easy reference.

AC to AC Converters - Narayanaswamy P R Iyer 2019-06-03

Power electronic converters can be broadly classified as AC to DC, DC to AC, DC to DC and AC to AC converters. AC to AC converters can be further classified as AC Controllers or AC regulators, Cycloconverters and Matrix converters. AC controllers and cycloconverters are fabricated using Silicon Controlled Rectifiers (SCR) whereas matrix converters are built using semiconductor bidirectional switches. This text book provides a summary of AC to AC Converter modelling excluding AC controllers. The software Simulink® by Mathworks Inc., USA is used to develop the models of AC to AC Converters presented in this text book. The term model in this text book refers to SIMULINK model. This text book is mostly suitable for researchers and practising professional engineers in the industry working in the area of AC to AC converters. Features Provides a summary of AC to AC Converter modelling excluding AC controllers Includes models for three phase AC to three phase AC matrix converters using direct and indirect space vector modulation algorithm Presents new applications such as single and dual programmable AC to DC rectifier with derivations for output voltage Displays Hardware-in-the

Loop simulation of a three phase AC to single phase AC matrix converter Provides models for three phase multilevel matrix converters, Z-source Direct and Quasi Z-source Indirect matrix converters; a model for speed control and brake by plugging of three phase induction motor and separately excited DC motors using matrix converter; a model for a new single phase and three phase sine wave direct AC to AC Converter without a DC link using three winding transformers and that for a square wave AC to square wave AC converter using a DC link; models for variable frequency, variable voltage AC to AC power supply; models for Solid State Transformers using Dual Active Bridge topology and a new direct AC to AC Converter topology; and models for cycloconverters and indirect matrix converters

Proceedings of the Third International Conference on Trends in Information, Telecommunication and Computing - Vinu V. Das 2012-09-14

Third International Conference on Recent Trends in Information, Telecommunication and Computing - ITC 2012. ITC 2012 will be held during Aug 03-04, 2012, Kochi, India. ITC 2012, is to bring together innovative academics and industrial experts in the field of Computer Science, Information Technology, Computational Engineering, and Communication to a common forum. The primary goal of the conference is to promote research and developmental activities in Computer Science, Information Technology, Computational Engineering, and Communication. Another goal is to promote scientific information interchange between researchers, developers, engineers, students, and practitioners.

Simulation of Some Power System, Control System and Power Electronics Case Studies Using Matlab and PowerWorld Simulator - Dr. Hedaya Mahmood Alasooly 2021-01-11

The book consists from three parts concerning simulation of some power system, control system and power electronics case studies using matlab and powerworld simulator programs • Part A: Simulation of Some Power Electronics Case Studies in Matlab Simpowersystem Blockset: • Part B: Control of DC Motor Using Different Control Strategies in Matlab: • Part C: Investigation of the Usefulness of the PowerWorld Simulator Program Developed by "Glover, Overbye & Sarma" in the Solution of Power System Problems: I. Part A: Simulation of Some Power Electronics Case Studies in Matlab Simpowersystem Blockset: This part covers some case studies that provide detailed, realistic examples of how to use SimPowerSystems in modeling power system dynamics in various types of application that use power electronics converters. The following case studies are simulated on the paper: 1- Thyristor-Based Static Var Compensator. 2. Transient Stability of a Power System with SVC and PSS. 3. GTO-Based STATCOM. 4. Control of load flow using UPFC. 5- Control of AC motor. 6- Control of DC motor. 7- VSC-Based HVDC Link. II. Part B: Control of DC Motor Using Different Control Strategies in Matlab: A simple model of a DC motor driving an inertial load has the angular speed of the load, ω , as the output and applied voltage, V , as the input. The system was used as an example in [1]. The ultimate goal of this paper is to control the angular rate by varying the applied voltage using different control strategies for comparison purpose. The comparison is made between the proportional controller, integral controller, proportional and integral controller, phase lag compensator, derivative controller, lead integral compensator, lead lag compensator, PID controller and the the linear quadratic tracker design

based on the optimal control theory. III. Part C: Investigation of the Usefulness of the PowerWorld Simulator Program Developed by "Glover, Overbye & Sarma" in the Solution of Power System Problems: The objective of this part is to investigate the usefulness of the power system simulator PowerWorld program developed by "Glover, Overbye & Sarma". The results obtained from the power simulator program were presented for different case studies. The power system network used in this study consists from 6 buses. Area 1 includes bus 1-5 while Bus 6 will be part of Area 1 in some case studies, or will form separate area 2 in other case studies for comparison purpose. Note that the Available Transfer Capability (ATC) analysis add-on which determines the maximum MW transfer possible between two parts of a power system without violating any limits, and the voltage adequacy and stability tool (VAST) add-on that can solve multiple power flow solutions in order to generate a PV curve for a particular transfer or a QV curve at a given bus, was not studied here because we don't have yet VAST add-on and the ATC add-on packages.

Innovations in Electrical and Electronic Engineering - Saad Mekhilef 2021-05-24

This book presents selected papers from the 2021 International Conference on Electrical and Electronics Engineering (ICEEE 2020), held on January 2-3, 2021. The book focuses on the current developments in various fields of electrical and electronics engineering, such as power generation, transmission and distribution; renewable energy sources and technologies; power electronics and applications; robotics; artificial intelligence and IoT; control, automation and instrumentation; electronics devices, circuits and systems; wireless and optical communication; RF and microwaves; VLSI; and signal processing. The book is a valuable resource for academics and industry professionals alike.

Computational Paradigm Techniques for Enhancing Electric Power Quality - L. Ashok Kumar 2018-11-15

This book focusses on power quality improvement and enhancement techniques with aid of intelligent controllers and experimental results. It covers topics ranging from the fundamentals of power quality indices, mitigation methods, advanced controller design and its step by step approach, simulation of the proposed controllers for real time applications and its corresponding experimental results, performance improvement paradigms and its overall analysis, which helps readers understand power quality from its fundamental to experimental implementations. The book also covers implementation of power quality improvement practices. Key Features Provides solution for the power quality improvement with intelligent techniques Incorporated and Illustrated with simulation and experimental results Discusses renewable energy integration and multiple case studies pertaining to various loads Combines the power quality literature with power electronics based solutions Includes implementation examples, datasets, experimental and simulation procedures

Transactions on Intelligent Welding Manufacturing - Shanben Chen 2020-11-18

The primary aim of this volume is to provide researchers and engineers from both academic and industry with up-to-date coverage of new results in the field of robotic welding, intelligent systems and automation. The book is mainly based on papers selected from the 2019 International Workshop on Intelligentized Welding Manufacturing (IWIWM'2019) in USA. The articles show that the intelligentized welding manufacturing (IWM) is becoming an inevitable trend with the intelligentized robotic welding as the key technology. The volume is divided into four logical parts: Intelligent Techniques for Robotic Welding, Sensing of Arc Welding Processing, Modeling and Intelligent Control of Welding Processing, as well as Intelligent Control and its Applications in Engineering.

Simulation of Some Power Electronics Case Studies In Matlab Simpowersystem Toolbox - Dr. Hidaia Mahmood Alassouli

Fundamentals of Mechatronics, SI Edition - Musa Jouaneh 2012-02-09

The objective of FUNDAMENTALS OF MECHATRONICS is to cover both hardware and software

aspects of mechatronics systems in a single text, giving a complete treatment to the subject matter. The text focuses on application considerations and relevant practical issues that arise in the selection and design of mechatronics components and systems. The text uses several programming languages to illustrate the key topics. Different programming platforms are presented to give instructors the choice to select the programming language most suited to their course objectives. A separate laboratory book, with additional exercises is provided to give guided hands-on experience with many of the topics covered in the text. Important Notice: Media content referenced within the product description or the product text may not be available in the ebook version.

Power Electronics with MATLAB - L. Ashok Kumar 2017-11-24

"Discusses the essential concepts of power electronics through MATLAB examples and simulations"--

Electric Drives - Ion Boldea 2016-09-15

Electric Drives provides a practical understanding of the subtleties involved in the operation of modern electric drives. The Third Edition of this bestselling textbook has been fully updated and greatly expanded to incorporate the latest technologies used to save energy and increase productivity, stability, and reliability. Every phrase, equation, number, and reference in the text has been revisited, with the necessary changes made throughout. In addition, new references to key research and development activities have been included to accurately reflect the current state of the art. Nearly 120 new pages covering recent advances, such as those made in the sensorless control of A.C. motor drives, have been added; as have two new chapters on advanced scalar control and multiphase electric machine drives. All solved numerical examples have been retained, and the 10 MATLAB®-Simulink® programs remain online. Thus, Electric Drives, Third Edition offers an up-to-date synthesis of the basic and advanced control of electric drives, with ample material for a two-semester course at the university level.

MATLAB and Simulink Crash Course for Engineers - Eklas Hossain 2022-03-07

MATLAB and Simulink Crash Course for Engineers is a reader-friendly introductory guide to the features, functions, and applications of MATLAB and Simulink. The book provides readers with real-world examples, exercises, and applications, and offers highly illustrated, step-by-step demonstrations of techniques for the modelling and simulation of complex systems. MATLAB coverage includes vectors and matrices, programs and functions, complex numbers, visualization, solving equations, numerical methods, optimization problems, and graphical user interfaces. The Simulink coverage includes commonly used Simulink blocks, control system simulation, electrical circuit analysis, electric power systems, power electronics, and renewable energy technology. This powerful tutorial is a great resource for students, engineers, and other busy technical professionals who need to quickly acquire a solid understanding of MATLAB and Simulink.

Journal of Zhejiang University - 2007

Comparative Performance Analysis of Thyristor and IGBT Based Induction Motor Soft Starters - Ajay Singh 2017-11-23

Bachelor Thesis from the year 2012 in the subject Engineering - Power Engineering, grade: 10.0, Trichandra College-Tribhuvan University (Institute of Engineering), course: Electrical Engineering, language: English, abstract: In this project, the performance of split-phase motor and three-phase induction motor drives for soft starting is evaluated. The pre systematically investigates and compares the characteristics of a variable voltage fed induction motor drive for two different types of soft starters; one based on IGBT and another based on Thyristor. The novelty of the work lies in the development of simple and flexible models for simulation purpose. This project investigates the influence of the parameters of the machine and of the soft starter on the dynamics of the induction machine start. The situations may reproduce actual situations occurred in practice, for example, the variation of initial voltage V_i , modification of the start time

and load value. In this project we have investigated the relation between Total Harmonic Distortion and Power Factor of the IGBT and Thyristor based soft starter. Using an already predefined fire angle characteristic the influence of the initial voltage was also evaluated. Discussion of these results and conclusions as to the near-optimum types of profiles are delineated based on voltage and current profile fed to induction motor, starting times, and distortion in current with change in firing angle.

Electromagnetic Interference and Electromagnetic Compatibility - L. Ashok Kumar 2023-10-02

Electromagnetic compatibility is concerned with the generation, transmission, and reception of electromagnetic energy. The book discusses about the basic principles of electromagnetic interference (EMI) and electromagnetic compatibility (EMC) including causes, events, and mitigation of issues. The design procedures for EMI filter, the types of filters, and filter implementation methods are explained. The simulation of printed circuit board designs using different software and a step-by-step method is discussed in detail. This book addresses the gap between theory and practice using case studies with design, experiments, and supporting analysis. Features: Discusses about the basic principles of EMI/EMC including causes and events Makes readers understand the problems in different applications because of EMI/EMC and the reducing methods Explores real-world case studies with code to provide hands-on experience Reviews design strategies for mitigation of noise Includes MATLAB, PSPICE, and ADS simulations for designing EMI Filter circuits. The book is aimed at graduate students and researchers in electromagnetics, circuit and systems, and electrical engineering.

Intelligent Computing Techniques for Smart Energy Systems - Anshuman Tripathi 2022-06-13

This book compiles the best selected research papers presented during the 2nd International Conference on Intelligent Computing Techniques for Smart Energy Systems (ICTSES 2021), held at Manipal University, Jaipur, Rajasthan, India. It presents the diligent work of the research community where intelligent computing techniques are applied in allied fields of engineering ranging from engineering materials to electrical engineering to electronics and communication engineering- to computer-related fields. The theoretical research concepts are supported with extensive reviews highlighting the trends in the possible and real-life applications of computational intelligence. The high-quality content with broad range of the topics is thoroughly peer-reviewed and published on suitable recommendations.

Power Electronics, Drives, and Advanced Applications - Vinod Kumar 2020-03-27

Concern for reliable power supply and energy-efficient system design has led to usage of power electronics-based systems, including efficient electric power conversion and power semiconductor devices. This book provides integration of complete fundamental theory, design, simulation and application of power electronics, and drives covering up-to-date subject components. It contains twenty-one chapters arranged in four sections on power semiconductor devices, basic power electronic converters, advanced power electronics converters, power supplies, electrical drives and advanced applications. Aimed at senior undergraduate and graduate students in electrical engineering and power electronics including related professionals, this book • Includes electrical drives such as DC motor, AC motor, special motor, high performance motor drives, solar, electrical/hybrid vehicle and fuel cell drives • Reviews advances in renewable energy technologies (wind, PV, hybrid power systems) and their integration • Explores topics like distributed generation, microgrid, and wireless power transfer system • Includes simulation examples using MATLAB®/Simulink and over four hundred solved, unsolved and review problems

Dynamic Simulation of Electric Machinery - Chee-Mun Ong 1998

This book and its accompanying CD-ROM offer a complete treatment from background theory and models to implementation and verification techniques for simulations and linear analysis of frequently studied machine systems. Every chapter of Dynamic Simulation of Electric Machinery

includes exercises and projects that can be explored using the accompanying software. A full chapter is devoted to the use of MATLAB and SIMULINK, and an appendix provides a convenient overview of key numerical methods used. Dynamic Simulation of Electric Machinery provides professional engineers and students with a complete toolkit for modeling and analyzing power systems on their desktop computers.

Electronic Devices and Amplifier Circuits with MATLAB Computing, Second Edition - Steven T. Karris 2008

This book is an undergraduate level textbook. The prerequisites for this text are first year calculus and physics, and a two-semester course in circuit analysis including the fundamental theorems and the Laplace transformation. This text begins with is an introduction to the nature of small signals used in electronic devices, amplifiers, definitions of decibels, bandwidth, poles and zeros, stability, transfer functions, and Bode plots. It continues with an introduction to solid state electronics, bipolar junction transistors, FETs op amps, integrated devices used in logic circuits, and their internal construction. It concludes with a discussion on amplifier circuits and contains several examples with MATLAB computations and Simulink models. A supplementary text to this title is our Digital Circuit Analysis & Design with Simulink Modeling and Introduction to CPLDs and FPGAs, ISBN 978-1-934404-06-5. For additional information contact the publisher at info@orchardpublications.com

The proceedings of the 10th Frontier Academic Forum of Electrical Engineering (FAFEE2022) - Qingxin Yang 2023-09-14

This book includes the original, peer-reviewed research papers from the 10th Frontier Academic Forum of Electrical Engineering (FAFEE 2022), held in Xi'an, China, in August 2022. It gathers the latest research, innovations, and applications in the fields of Electrical Engineering. The topics it covers include electrical materials and equipment, electrical energy storage and device, power electronics and drives, new energy electric power system equipment, IntelliSense and intelligent equipment, biological electromagnetism and its applications, and insulation and discharge computation for power equipment. Given its scope, the book benefits all researchers, engineers, and graduate students who want to learn about cutting-edge advances in Electrical Engineering.

Recent Trends and Advances in Artificial Intelligence and Internet of Things - Valentina E. Balas 2019-11-19

This book covers all the emerging trends in artificial intelligence (AI) and the Internet of Things (IoT). The Internet of Things is a term that has been introduced in recent years to define devices that are able to connect and transfer data to other devices via the Internet. While IoT and sensors have the ability to harness large volumes of data, AI can learn patterns in the data and quickly extract insights in order to automate tasks for a variety of business benefits. Machine learning, an AI technology, brings the ability to automatically identify patterns and detect anomalies in the data that smart sensors and devices generate, and it can have significant advantages over traditional business intelligence tools for analyzing IoT data, including being able to make operational predictions up to 20 times earlier and with greater accuracy than threshold-based monitoring systems. Further, other AI technologies, such as speech recognition and computer vision can help extract insights from data that used to require human review. The powerful combination of AI and IoT technology is helping to avoid unplanned downtime, increase operating efficiency, enable new products and services, and enhance risk management.

Power System Small Signal Stability Analysis and Control - Debasish Mondal 2020-02-20

Power System Small Signal Stability Analysis and Control, Second Edition analyzes severe outages due to the sustained growth of small signal oscillations in modern interconnected power systems. This fully revised edition addresses the continued expansion of power systems and the rapid upgrade to smart grid technologies that call for the implementation of robust and optimal controls. With a new chapter on MATLAB programs, this book describes how the application of power system damping controllers such as Power System Stabilizers and Flexible Alternating

Current Transmission System controllers—namely Static Var Compensator and Thyristor Controlled Series Compensator—can guard against system disruptions. Detailed mathematical derivations, illustrated case studies, the application of soft computation techniques, designs of robust controllers, and end-of-chapter exercises make it a useful resource to researchers, practicing engineers, and post-graduates in electrical engineering. Considers power system small signal stability and provides various techniques to mitigate it Offers a new and straightforward method of finding the optimal location of PSS in a multi-machine power system Includes MATLAB programs and simulations for practical applications

Mechatronics and Automation Technology - J. Xu 2023-01-04

With the development of science and technology, mechatronics and automation have changed the face of the traditional machinery manufacturing industry and become an important aspect of information technology and modern industrial production, with a huge impact in many diverse fields such as manufacturing, robotics, automation, the automobile industry and biomedicine. This book contains the proceedings of ICMAT 2022, the 2022 International Conference on Mechatronics and Automation Technology, held as a virtual event due to restrictions related to the COVID-19 pandemic, and hosted in Wuhan, China on 29 and 30 October 2022. The ICMAT conference is an ideal platform for bringing together researchers, practitioners, scholars, academics and engineers from all around the world to exchange the latest research results and stimulate scientific innovations. The conference received a total of 117 submissions, of which 82 papers were accepted for presentation and publication after a rigorous process of peer-review. The topics covered include mechanical manufacturing and equipment, robotics, information technology, automation technology, automotive systems, biomedicine and other related fields. The book provides an overview of technologies and applications in mechatronics and automation technology, as well as current research and development, and will be of interest to researchers, engineers, and educators working in the field.

Some Power Electronics Case Studies Using Matlab Simpowersystem Blockset - Dr. Hidaia Mahmood Alassouli 2021

Matlab SimPowerSystems is a modern design tool that allows scientists and engineers to rapidly and easily build models that simulate power systems. Not only can you draw the circuit topology rapidly, but your analysis of the circuit can include interactions with mechanical, thermal, control, and other disciplines. The paper covers some case studies that provide detailed, realistic examples of how to use SimPowerSystems in power system analysis. The following types of studies are covered on the paper: 1. Thyristor-Based Static Var Compensator: Study the steady-state and dynamic performance of a static var compensator (SVC) on a transmission system. 2. Transient Stability of a Power System with SVC and PSS: Study of the application of static var compensator (SVC) and power system stabilizers (PSS) to improve transient stability and power oscillation damping of the system. 3. GTO-Based STATCOM: Study the steady-state and dynamic performance of a static synchronous compensator (STATCOM) on a transmission system. 4. Control of load flow using UPFC: Study the steady-state and dynamic performance of a unified power flow controller (UPFC). 5. Variable-frequency Induction Motor Drive: Study of a PWM inverter is used as a variable-voltage, variable-frequency source to drive an induction motor in variable-speed operation. 6. Chopper-Fed DC Motor Drive: Study of a DC motor drive with armature voltage controlled by a GTO thyristor chopper. 7. VSC-Based HVDC Link: Modeling of a forced-commutated voltage-sourced converter high-voltage direct current (VSC-HVDC) transmission link. Index Terms--AC motor drives, DC motor drives, HVDC converters, Power system dynamic stability, Pulse width modulated power converters, Static VAR compensators, Thyristor converters.

Renewable Energy Systems - Viktor Perelmuter 2016-12-01

The development of renewable sources for electrical energy has become a mainstream focus in the field of electrical engineering. This book can be used by both engineers and researchers working to develop new electrical systems and investigate existing ones. Additionally, it can

serve as a guide for undergraduate and graduate students during their study of electrical fields. The electrical devices that are used in renewable sources have complicated inner structures, and methods of computer simulation make the development of these systems easier and faster. Simulink, and its toolbox SimPowerSystems, is the most popular means for simulation of electrical systems. The topic of wind-generator (WG) systems simulation merits detailed consideration; therefore, this text covers an in-depth exploration of the simulation of WG systems, systems with batteries, photovoltaic systems, fuel elements, microturbines, and hydroelectric systems.

Power Electronic Converters - Narayanaswamy P R Iyer 2018-03-09

Provides a step-by-step method for the development of a virtual interactive power electronics laboratory. The book is suitable for undergraduates and graduates for their laboratory course and projects in power electronics. It is equally suitable for professional engineers in the power electronics industry. The reader will learn to develop interactive virtual power electronics laboratory and perform simulations of their own, as well as any given power electronic converter design using SIMULINK with advanced system model and circuit component level model. Features Examples and Case Studies included throughout. Introductory simulation of power electronic converters is performed using either PSIM or MICROCAP Software. Covers interactive system model developed for three phase Diode Clamped Three Level Inverter, Flying Capacitor Three Level Inverter, Five Level Cascaded H-Bridge Inverter, Multicarrier Sine Phase Shift PWM and Multicarrier Sine Level Shift PWM. System models of power electronic converters are verified for performance using interactive circuit component level models developed using Simscape-Electrical, Power Systems and Specialized Technology block set. Presents software in the loop or Processor in the loop simulation with a power electronic converter examples.

Applications of Artificial Intelligence in Electrical Engineering - Khalid, Saifullah 2020-03-27

Artificial intelligence is increasingly finding its way into industrial and manufacturing contexts. The prevalence of AI in industry from stock market trading to manufacturing makes it easy to forget how complex artificial intelligence has become. Engineering provides various current and prospective applications of these new and complex artificial intelligence technologies. Applications of Artificial Intelligence in Electrical Engineering is a critical research book that examines the advancing developments in artificial intelligence with a focus on theory and research and their implications. Highlighting a wide range of topics such as evolutionary computing, image processing, and swarm intelligence, this book is essential for engineers, manufacturers, technology developers, IT specialists, managers, academicians, researchers, computer scientists, and students.

Electrotechnical Systems - Viktor Perelmuter 2020-10-15

Filling a gap in the literature, Electrotechnical Systems: Simulation with Simulink® and SimPowerSystems™ explains how to simulate complicated electrical systems more easily using SimPowerSystems™ blocks. It gives a comprehensive overview of the powerful SimPowerSystems toolbox and demonstrates how it can be used to create and investigate models of both classic and modern electrotechnical systems. Build from Circuit Elements and Blocks to System Models Building from simple to more complex topics, the book helps readers better understand the principles, features, and detailed functions of various electrical systems, such as electrical drives, power electronics, and systems for production and distribution of electrical energy. The text begins by describing the models of the main circuit elements, which are used to create the full system model, and the measuring and control blocks. It then examines models of semiconductor devices used in power electronics as well as models of DC and AC motors. The final chapter discusses the simulation of power production and transmission systems, including hydraulic turbine, steam turbine, wind, and diesel generators. The author also develops models of systems that improve the quality of electrical energy, such as active filters and various types

of static compensators. Get a Deeper Understanding of Electrical Systems and How to Simulate Them A companion CD supplies nearly 100 models of electrotechnical systems created using SimPowerSystems. These encompass adaptations of SimPowerSystems demonstrational models, as well as models developed by the author, including many important applications related to power electronics and electrical drives, which are not covered by the demonstrational models. In addition to showing how the models can be used, he supplies the theoretical background for each. Offering a solid understanding of how electrical systems function, this book guides readers to use SimPowerSystems to create and investigate electrical systems, including those under development, more effectively.

IEEE Conference Record of ... Industrial and Commercial Power Systems Technical Conference - 2005

Kesan perubahan kuasa pada sistem talian penghantaran dengan pemasangan dan tanpa pemasangan kawalan thyristor siri pampasan (TCSC) menggunakan perisian MATLAB/SIMULINK - Kamarul Azman Mohd. Zain 2016

Concentrated Solar Thermal Energy Technologies - Laltu Chandra 2017-10-04

The proceedings entitled "Concentrated Solar Thermal Technologies: Recent Trends and Applications" includes the peer-reviewed selected papers those are presented during NCSTET 2016. The sub-topics under concentrated solar thermal technologies and applications included in the book are Solar Field; Receiver and Heat Exchanger; Coating; Thermal Energy Storage; Cooling; Process Heat; and Smart Grid and Policy Research. The domains mentioned cover topics from resource-assessment, collection to conversion of solar energy for applications, like, heating, cooling and electricity. The proceedings also include invited lectures from domain experts. The edited work will be useful for beginners and for the advanced level researchers in the field of concentrated solar thermal technologies and their applications.

Software Tools for the Simulation of Electrical Systems - Ashok L. Kumar 2020-08-08

Simulation of Software Tools for Electrical Systems: Theory and Practice offers engineers and students what they need to update their understanding of software tools for electric systems, along with guidance on a variety of tools on which to model electrical systems—from device level to system level. The book uses MATLAB, PSIM, Pspice and PSCAD to discuss how to build simulation models of electrical systems that assist in the practice or implementation of simulation software tools in switches, circuits, controllers, instruments and automation system design. In addition, the book covers power electronic switches and FACTS controller device simulation model building with the use of Labview and PLC for industrial automation, process control, monitoring and measurement in electrical systems and hybrid optimization software HOMER is presented for researchers in renewable energy systems. Includes interactive content for numerical computation, visualization and programming for learning the software tools related to electrical sciences Identifies complex and difficult topics illustrated by useable examples Analyzes the simulation of electrical systems, hydraulic, and pneumatic systems using different software, including MATLAB, LABVIEW, MULTISIM, AUTOSIM and PSCAD

Electronics and Circuit Analysis Using MATLAB - John Okyere Attia 2018-10-08

The use of MATLAB is ubiquitous in the scientific and engineering communities today, and justifiably so. Simple programming, rich graphic facilities, built-in functions, and extensive toolboxes offer users the power and flexibility they need to solve the complex analytical problems inherent in modern technologies. The ability to use MATLAB effectively has become practically a prerequisite to success for engineering professionals. Like its best-selling predecessor, Electronics and Circuit Analysis Using MATLAB, Second Edition helps build that proficiency. It provides an easy, practical introduction to MATLAB and clearly demonstrates its use in solving a wide range of electronics and circuit analysis problems. This edition reflects recent MATLAB enhancements, includes new material, and provides even more examples and

exercises. New in the Second Edition: Thorough revisions to the first three chapters that incorporate additional MATLAB functions and bring the material up to date with recent changes to MATLAB A new chapter on electronic data analysis Many more exercises and solved examples New sections added to the chapters on two-port networks, Fourier analysis, and semiconductor physics MATLAB m-files available for download Whether you are a student or professional engineer or technician, Electronics and Circuit Analysis Using MATLAB, Second Edition will serve you well. It offers not only an outstanding introduction to MATLAB, but also forms a guide to using MATLAB for your specific purposes: to explore the characteristics of semiconductor devices and to design and analyze electrical and electronic circuits and systems.

Modeling of Dynamic Systems with Engineering Applications - Clarence W. de Silva 2017-10-16

MODELING OF DYNAMIC SYSTEMS takes a unique, up-to-date approach to systems dynamics and related controls coverage for undergraduate students and practicing engineers. It focuses on the model development of engineering problems rather than response analysis and simulation once a model is available, though these are also covered. Linear graphing and bond graph approaches are both discussed, and computational tools are integrated throughout. Electrical, mechanical, fluid, and thermal domains are covered, as are problems of multiple domains (mixed systems); the unified and integrated approaches taken are rapidly becoming the standard in the modeling of mechatronic engineering systems.

Electronique Appliquée, Electromécanique sous Simscape & SimPowerSystems (Matlab/Simulink) - Mohand Mokhtari 2012-07-05

Cet ouvrage permet d'apprendre à utiliser les Outils Simscape et SimpowerSystems pour modéliser et simuler des circuits électroniques, électromécaniques et électronique de puissance. Pour utiliser ces deux outils, la connaissance de MATLAB et SIMULINK est indispensable. Cet ouvrage possède trois types de chapitres : prise en main de l'outil, description des différentes bibliothèques avec quelques applications et enfin chapitre d'applications très utilisées dans les domaines universitaires et industriels.

Fundamentals of Electric Machines: A Primer with MATLAB - Warsame Hassan Ali 2019-06-12

An electric machine is a device that converts mechanical energy into electrical energy or vice versa. It can take the form of an electric generator, electric motor, or transformer. Electric generators produce virtually all electric power we use all over the world. Electric machine blends the three major areas of electrical engineering: power, control and power electronics. This book presents the relation of power quantities for the machine as the current, voltage power flow, power losses, and efficiency. This book will provide a good understanding of the behavior and its drive, beginning with the study of salient features of electrical dc and ac machines.

Renewable Power for Sustainable Growth - Atif Iqbal 2021-04-20

This book is a collection of papers presented at the International Conference on Renewable Power (ICRP 2020), held during 13–14 July 2020 in Rajouri, Jammu, India. The book covers different topics of renewable energy sources in modern power systems. The book focusses on smart grid technologies and applications, renewable power systems including solar PV, solar thermal, wind, power generation, transmission and distribution, transportation electrification and automotive technologies, power electronics and applications in renewable power system, energy management and control system, energy storage in modern power system, active distribution network, artificial intelligence in renewable power systems, and cyber-physical systems and Internet of things in smart grid and renewable power.

Emerging Research in Electronics, Computer Science and Technology - V Sridhar 2013-09-13

PES College of Engineering is organizing an International Conference on Emerging Research in Electronics, Computer Science and Technology (ICERECT-12) in Mandya and merging the event with Golden Jubilee of the Institute. The Proceedings of the Conference presents high quality, peer reviewed articles from the field of Electronics, Computer Science and Technology. The book

is a compilation of research papers from the cutting-edge technologies and it is targeted towards the scientific community actively involved in research activities.

Zhang-Gradient Control - Yunong Zhang 2020-11-24

This book introduces readers to using the simple but effective Zhang-gradient (ZG) method to solve tracking-control problems concerning various nonlinear systems, while also highlighting the applications of the ZG method to tracking control for practical systems, e.g. an inverted-pendulum-on-a-cart (IPC) system and a two-wheeled mobile robot (showing its potential applications). In addition to detailed theoretical analyses of ZG controllers, the book presents a

wealth of computer simulations to demonstrate the feasibility and efficacy of the controllers discussed (as well as the method itself). More importantly, the superiority of ZG controllers in overcoming the division-by-zero (DBZ) problem is also illustrated. Given its scope and format, the book is well suited for undergraduate and graduate students, as well as academic and industrial researchers in the fields of neural dynamics/neural networks, nonlinear control, computer mathematics, time-varying problem solving, modeling and simulation, analog hardware, and robotics.