

Simulink Model For Active Power Filter

Emerging Research in Computing, Information, Communication and Applications
 Advances in Electrical Control and Signal Systems
 Solar Photovoltaics Engineering. A Power Quality Analysis Using Matlab Simulation Case Studies
 Linear and Nonlinear System Modeling
 INTER-ENG 2020
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 Measuring Technology and Mechatronics Automation IV
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Emerging Research in Computing, Information, Communication and Applications John Wiley & Sons

This book provides an overview of power electronic converters for numerical simulations based on DigSILENT PowerFactory. It covers the working principles, key assumptions and implementation of models of different types of these power systems. The book is divided into three main parts: the first discusses high-voltage direct currents, while the second part examines distribution systems and micro-grids. Lastly, the third addresses the equipment and technologies used in modelling and simulation. Each chapter includes practical examples and exercises, and the accompanying software illustrates essential models, principles and performance using DigSILENT PowerFactory. Exploring various current topics in the field of modelling power systems, this book will appeal to a variety of readers, ranging from students to practitioners.

Advances in Electrical Control and Signal Systems MDPI

The renewable generation system is currently experiencing rapid growth in various power grids. The stability and dynamic response issues of power grids are receiving attention due to the increase in power electronics-based renewable energy. The main focus of this Special Issue is to provide solutions for power system planning and operation. Power electronics-based devices can offer new ancillary services to several industrial sectors. In order to fully include the capability of power conversion systems in the network integration of renewable generators, several studies should be carried out, including detailed studies of switching circuits, and comprehensive operating strategies for numerous devices, consisting of large-scale renewable generation clusters.

Solar Photovoltaics Engineering. A Power Quality Analysis Using Matlab Simulation Case Studies John Wiley & Sons

This book presents the select proceedings of the International Conference on Automation, Signal Processing, Instrumentation and Control (i-CASIC) 2020. The book mainly focuses on emerging technologies in electrical systems, IoT-based instrumentation, advanced industrial automation, and advanced image and signal processing. It also includes studies on the analysis, design and implementation of instrumentation systems, and high-accuracy and energy-efficient controllers. The contents of this book will be useful for beginners, researchers as well as professionals interested in instrumentation and control, and other allied fields.

Linear and Nonlinear System Modeling John Wiley & Sons

Wind power is currently considered as the fastest growing energy resource in the world. Technological advances and government subsidies have contributed in the rapid rise of Wind power systems. The Handbook on Wind Power Systems provides an overview on several aspects of wind power systems and is divided into four sections: optimization problems in wind power generation, grid integration of wind power systems, modeling, control and maintenance of wind facilities and innovative wind energy generation. The chapters are contributed by experts working on different aspects of wind energy generation and conversion.

INTER-ENG 2020 Springer Science & Business Media

This book gives a comprehensive and in-depth introduction to the development of active power decoupling technology in single-phase current-source converters. It covers cutting-edge topics such as virtual-impedance control and harmonic state-space modeling and presents topology construction principles, specific decoupling topologies, advanced decoupling controls, and stability analysis. This book will be an invaluable tool for researchers, engineers, and designers in the field of power electronics involved in designing power converters with high power density and reliability.

Handbook of Wind Power Systems Frontiers Media SA

Power quality describes a set of parameters of electric power and the load's ability to function properly under specific conditions. It is estimated that problems relating to power quality costs the European industry hundreds of billions of Euros annually. In contrast, financing for the prevention of these problems amount to fragments of these costs. Power Theories for Improved Power Quality addresses this imbalance by presenting and assessing a range of methods and problems related to improving the quality of electric power supply. Focusing particularly on active compensators and the DSP based control algorithms, Power Theories for Improved Power Quality introduces the fundamental problems of electrical power. This introduction is followed by chapters which discuss: 'Power theories' including their historical development and application to practical problems, operational principles of active compensator's DSP control based algorithms using examples and results from laboratory research, and the key areas of application for these methods and suggested practical solutions. Power Theories for Improved Power Quality is a key study resource for students in engineering and technical degrees as well as a reference for professional and practitioners in the electrical energy sector working with power quality.

Measuring Technology and Mechatronics Automation IV IOS Press

This book is a collection of research articles and critical review articles, describing the overall approach to energy management. The book emphasizes the technical issues that drive energy efficiency in context of power systems. This book contains case studies with and without solutions on modelling, simulation and optimization techniques. It covers some innovative topics such as medium voltage (MV) back-to-back (BTB) system, cost optimization of a ring frame unit in textile industry, rectenna for radio frequency (RF) energy harvesting, ecology and energy dimension in infrastructural designs, 2.4 kW three-phase inverter for aircraft application, study of automatic generation control (AGC) in a two area hydrothermal power system, energy-efficient and reliable depth-based routing protocol for underwater wireless sensor network, and power line communication using LabVIEW. This book is primarily targeted at researchers and senior graduate students, but is also highly useful for the industry professional and scientists.

Power Quality Enhancement of Wind Energy Systems Academic Press

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.

Processing, Estimation and Measurement of Signals Parameters in Public Distribution Networks John Wiley & Sons

Conventionally, the simulation of power engineering applications can be a challenge for both undergraduate and postgraduate students. For the easy implementation of several kinds of power structure and control structures of power engineering applications, simulators such as MATLAB/(Simulink and coding) are necessary, especially for students, to develop and test various circuits and controllers in all branches of the field of power engineering. This book presents three different applications of MATLAB in the power system domain. The book includes chapters that show how to simulate and work with MATLAB software for MATLAB professional applications of power systems. Moreover, this book presents techniques to simulate power matters easily using the related toolbox existing in MATLAB/Simulink.

Advances in Communication, Devices and Networking Springer Nature

Simulation of Power System with Renewables provides details on the modelling and efficient implementation of MATLAB, particularly with a renewable energy driven power system. The book presents a step-by-step approach to modelling implementation, including all major components used in current power systems operation, giving the reader the opportunity to learn how to gather models for conventional generators, wind farms, solar plants and FACTS control devices. Users will find this to be a central resource for modelling, building and simulating renewable power systems, including discussions on its limitations, assumptions on the model, and the implementation and analysis of the system. - Presents worked examples and equations in each chapter that address system limitations and flexibility - Provides step-by-step guidance for building and simulating models with required data - Contains case studies on a number of devices, including FACTS, and renewable generation

Power Quality in Microgrids Based on Distributed Generators kassel university press GmbH
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.

MATLAB Springer Nature

This book presents selected papers from the International Conference on Emerging Research in Computing, Information, Communication and Applications, ERCICA 2018. The conference provided an interdisciplinary forum for researchers, professional engineers and scientists, educators, and technologists to discuss, debate and promote research and technology in the emerging areas of computing, information, communication and their applications. The book discusses these research areas, providing a valuable resource for researchers and practicing engineers alike.

Renewable Power for Sustainable Growth Springer

This book discusses real applications of soft computing (SC) in power systems. These SC techniques, inspired by the human mind and biological behavior, have proven to be excellent tools to overcome the challenges faced in power systems and related areas. The techniques are robust and provide low-cost solutions while also offering an effective solution for studying and modeling the behavior of renewable energy generation, operation of grid-connected renewable energy systems, and sustainable decision-making among alternatives. The tolerance of SC techniques to imprecision, uncertainty, partial truth, and approximation makes them highly useful alternatives to conventional techniques. The rapid growth in SC techniques plays an important role in powerful representation, modeling paradigms and optimization mechanisms for solving power system issues such as power quality, reactive power control, oscillation and stability problems, renewable energy resource evaluation, design of energy efficiency systems, economic load dispatch problems or very different energy system applications in smart grids.

Soft Computing Applications for Advancements in Power Systems MDPI

Fuzzy systems and data mining are indispensable aspects of the digital technology on which we now all depend. Fuzzy logic is intrinsic to applications in the electrical, chemical and engineering industries, and also in the fields of management and environmental issues. Data mining is indispensable in dealing with big data, massive data, and scalable, parallel and distributed algorithms. This book presents the proceedings of FSDM 2023, the 9th International Conference on Fuzzy Systems and Data Mining, held from 10-13 November 2023 as a hybrid event, with some participants attending in Chongqing, China, and others online. The conference focuses on four main areas: fuzzy theory, algorithms and systems; fuzzy application; data mining; and the interdisciplinary field of fuzzy logic and data mining, and provides a forum for experts, researchers, academics and representatives from industry to share the latest advances in the field of fuzzy sets and data mining. This year, topics from two special sessions on granular-ball computing and the application of generative AI, as well as machine learning and neural networks, were also covered. A total of 363 submissions were received, and after careful review by the members of the international program committee, 110 papers were accepted for presentation at the conference and publication here, representing an acceptance rate of just over 30%. Covering a comprehensive range of current research and developments in fuzzy logic and data mining, the book will be of interest to all those working in the field of data science.

Advances in Automation, Signal Processing, Instrumentation, and Control Springer Nature

The book is a collection of high-quality peer-reviewed research papers presented in the Proceedings of International Conference on Power Electronics and Renewable Energy Systems (ICPERES 2014) held at Rajalakshmi Engineering College, Chennai, India. These research papers provide the latest developments in the broad area of Power Electronics and Renewable Energy. The book discusses wide variety of industrial, engineering and scientific applications of the emerging techniques. It presents invited papers from the inventors/originators of new applications and advanced technologies.

Advances in Electrical and Computer Technologies Academic Press

Provides students with an understanding of the modeling and practice in power system stability analysis and control design, as well as the computational tools used by commercial vendors Bringing together wind, FACTS, HVDC, and several other modern elements, this book gives readers everything they need to know about power systems. It makes learning complex power system concepts, models, and dynamics simpler and more efficient while providing modern viewpoints of power system analysis. Power System Modeling, Computation, and Control provides students with a new and detailed analysis of voltage stability; a simple example illustrating the BCU method of

transient stability analysis; and one of only a few derivations of the transient synchronous machine model. It offers a discussion on reactive power consumption of induction motors during start-up to illustrate the low-voltage phenomenon observed in urban load centers. Damping controller designs using power system stabilizer, HVDC systems, static var compensator, and thyristor-controlled series compensation are also examined. In addition, there are chapters covering flexible AC transmission Systems (FACTS)—including both thyristor and voltage-sourced converter technology—and wind turbine generation and modeling. Simplifies the learning of complex power system concepts, models, and dynamics Provides chapters on power flow solution, voltage stability, simulation methods, transient stability, small signal stability, synchronous machine models (steady-state and dynamic models), excitation systems, and power system stabilizer design Includes advanced analysis of voltage stability, voltage recovery during motor starts, FACTS and their operation, damping control design using various control equipment, wind turbine models, and control Contains numerous examples, tables, figures of block diagrams, MATLAB plots, and problems involving real systems Written by experienced educators whose previous books and papers are used extensively by the international scientific community Power System Modeling, Computation, and Control is an ideal textbook for graduate students of the subject, as well as for power system engineers and control design professionals.

Active Power Decoupling Technology in Single-Phase Current-Source Converters Springer Nature

An authoritative reference on the new generation of VSC-FACTS and VSC-HVDC systems and their applicability within current and future power systems VSC-FACTS-HVDC and PMU: Analysis, Modelling and Simulation in Power Grids provides comprehensive coverage of VSC-FACTS and VSC-HVDC systems within the context of high-voltage Smart Grids modelling and simulation. Readers are presented with an examination of the advanced computer modelling of the VSC-FACTS and VSC-HVDC systems for steady-state, optimal solutions, state estimation and transient stability analyses, including numerous case studies for the reader to gain hands-on experience in the use of models and concepts. Key features: Wide-ranging treatment of the VSC achieved by assessing basic operating principles, topology structures, control algorithms and utility-level applications. Detailed advanced models of VSC-FACTS and VSC-HVDC equipment, suitable for a wide range of power network-wide studies, such as power flows, optimal power flows, state estimation and dynamic simulations. Contains numerous case studies and practical examples, including cases of multi-terminal VSC-HVDC systems. Includes a companion website featuring MATLAB software and Power System Computer Aided Design (PSCAD) scripts which are provided to enable the reader to gain hands-on experience. Detailed coverage of electromagnetic transient studies of VSC-FACTS and VSC-HVDC systems using the de-facto industry standard PSCAD/EMTDC simulation package. An essential guide for utility engineers, academics, and research students as well as industry managers, engineers in equipment design and manufacturing, and consultants.

Power Theories for Improved Power Quality Springer Nature

The concept of the smart grid promises the world an efficient and intelligent approach of managing energy production, transportation, and consumption by incorporating intelligence, efficiency, and optimality into the power grid. Both energy providers and consumers can take advantage of the convenience, reliability, and energy savings achieved by real-time and intelligent energy management. To this end, the current power grid is experiencing drastic changes and upgrades. For instance, more significant green energy resources such as wind power and solar power are being integrated into the power grid, and higher energy storage capacity is being installed in order to mitigate the intermittency issues brought about by the variable energy resources. At the same time, novel power electronics technologies and operating strategies are being invented and adopted. For instance, Flexible AC transmission systems and phasor measurement units are two promising technologies for improving the power system reliability and power quality. Demand side management will enable the customers to manage the power loads in an active fashion. As a result, modeling and control of modern power grids pose great challenges due to the adoption of new smart grid technologies. In this book, chapters regarding representative applications of smart grid technologies written by world-renowned experts are included, which explain in detail various innovative modeling and control methods.

Modeling and Control of Sustainable Power Systems Springer

Provides insight on both classical means and new trends in the application of power electronic and artificial intelligence techniques in power system operation and control This book presents advanced solutions for power system controllability improvement, transmission capability enhancement and operation planning. The book is organized into three parts. The first part describes the CSC-HVDC and VSC-HVDC technologies, the second part presents the FACTS devices, and the third part refers to the artificial intelligence techniques. All technologies and tools approached in this book are essential for power system development to comply with the smart grid requirements. Discusses detailed operating principles and diagrams, theory of modeling, control strategies and physical installations around the world of HVDC and FACTS systems Covers a wide range of Artificial Intelligence techniques that are successfully applied for many power system problems, from planning and monitoring to operation and control Each chapter is carefully edited, with drawings and illustrations that helps the reader to easily understand the principles of operation or application Advanced Solutions in Power Systems: HVDC, FACTS, and Artificial Intelligence is written for graduate students, researchers in transmission and distribution networks, and power system operation. This book also serves as a reference for professional software developers and practicing engineers.

Advances in Power Systems and Energy Management John Wiley & Sons

Selected, peer reviewed papers from the Fourth International Conference on Measuring Technology and Mechatronics Automation (ICMTMA 2012), January 6-7, 2012, Sanya, China

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