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SANAI WESTON

Power Electronic Control in Electrical Systems John Wiley & Sons

The proceedings of SocProS 2013 serve as an academic bonanza for scientists and researchers working in the field of Soft Computing. This book contains theoretical as well as practical aspects of Soft Computing, an umbrella term for techniques like fuzzy logic, neural networks and evolutionary algorithms, swarm intelligence algorithms etc. This book will be beneficial for the young as well as experienced researchers dealing with complex and intricate real world problems for which finding a solution by traditional methods is very difficult. The different areas covered in the proceedings are: Image Processing, Cryptanalysis, Supply Chain Management, Newly Proposed Nature Inspired Algorithms, Optimization, Problems related to Medical and Health Care, Networking etc.

Dynamics and Control of Electric Transmission and Microgrids

John Wiley & Sons

Mathematical calculations for subsynchronous system modeling Subsynchronous Resonance in Power Systems provides in-depth guidance toward the parameters, modeling, and analysis of this complex subclass of power systems. Emphasizing field testing to determine the data required, this book facilitates thorough and efficient oscillation and damping modeling using eigenvalues of a system's linear model. Expert discussion provides step-by-step instruction for generator, network, and turbine-generator shaft models, followed by detailed tutorials for model testing and analysis based on IEEE, CORPALS, and SSR eigenvalue analysis. Comprehensive in scope and practical in focus, this book is an invaluable resource for anyone working with frequencies below 60 Hz.

Fault Location on Power Networks PHI Learning Pvt. Ltd.

This text concentrates on the fundamentals of protective relaying and aims to provide lasting information in intelligible language. It covers the relative qualities of modern transmission line systems, communications channels, three-terminal applications and program design for microprocessors, and also supplies an encyclopaedic bibliography listing professional papers useful to the relay engineer.

Transmission Line Protection Using Digital Technology

Springer Science & Business Media

Power converters and electric machines represent essential components in all fields of electrical engineering. In fact, we are heading towards a future where energy will be more and more electrical: electrical vehicles, electrical motors, renewables, storage systems are now widespread. The ongoing energy transition poses new challenges for interfacing and integrating different power systems. The constraints of space, weight, reliability, performance, and autonomy for the electric system have increased the attention of scientific research in order to find

more and more appropriate technological solutions. In this context, power converters and electric machines assume a key role in enabling higher performance of electrical power conversion. Consequently, the design and control of power converters and electric machines shall be developed accordingly to the requirements of the specific application, thus leading to more specialized solutions, with the aim of enhancing the reliability, fault tolerance, and flexibility of the next generation power systems.

Emerging Technologies in Data Mining and Information Security Elsevier

This textbook explores reactive power control and voltage stability and explains how they relate to different forms of power generation and transmission. Bringing together international experts in this field, it includes chapters on electric power analysis, design and operational strategies. The book explains fundamental concepts before moving on to report on the latest theoretical findings in reactive power control, including case studies and advice on practical implementation students can use to design their own research projects. Featuring numerous worked-out examples, problems and solutions, as well as over 400 illustrations, Reactive Power Control in AC Power Systems offers an essential textbook for postgraduate students in electrical power engineering. It offers practical advice on implementing the methods discussed in the book using MATLAB and DlgSILENT, and the relevant program files are available at extras.springer.com.

New Technologies for Power System Operation and Analysis CRC Press

The simulation of electromagnetic transients is a mature field that plays an important role in the design of modern power systems. Since the first steps in this field to date, a significant effort has been dedicated to the development of new techniques and more powerful software tools. Sophisticated models, complex solution techniques and powerful simulation tools have been developed to perform studies that are of supreme importance in the design of modern power systems. The first developments of transients tools were mostly aimed at calculating over-voltages. Presently, these tools are applied to a myriad of studies (e.g. FACTS and Custom Power applications, protective relay performance, simulation of smart grids) for which detailed models and fast solution methods can be of paramount importance. This book provides a basic understanding of the main aspects to be considered when performing electromagnetic transients studies, detailing the main applications of present electromagnetic transients (EMT) tools, and discusses new developments for enhanced simulation capability. Key features: Provides up-to-date information on solution techniques and software capabilities for simulation of electromagnetic transients. Covers key aspects that can expand the capabilities of a transient software tool (e.g. interfacing techniques) or speed up transients simulation (e.g. dynamic model averaging). Applies EMT-type tools to a wide spectrum of studies that range from fast electromagnetic

transients to slow electromechanical transients, including power electronic applications, distributed energy resources and protection systems. Illustrates the application of EMT tools to the analysis and simulation of smart grids.

Power System Dynamic Modelling and Analysis in Evolving Networks Newnes

Artificial intelligence (AI) can successfully help in solving real-world problems in power transmission and distribution systems because AI-based schemes are fast, adaptive, and robust and are applicable without any knowledge of the system parameters. This book considers the application of AI methods for the protection of different types and topologies of transmission and distribution lines. It explains the latest pattern-recognition-based methods as applicable to detection, classification, and location of a fault in the transmission and distribution lines, and to manage smart power systems including all the pertinent aspects. FEATURES Provides essential insight on uses of different AI techniques for pattern recognition, classification, prediction, and estimation, exclusive to power system protection issues Presents an introduction to enhanced electricity system analysis using decision-making tools Covers AI applications in different protective relaying functions Discusses issues and challenges in the protection of transmission and distribution systems Includes a dedicated chapter on case studies and applications This book is aimed at graduate students, researchers, and professionals in electrical power system protection, stability, and smart grids.

Power System Dynamics Springer Nature

The aim of this book is to familiarize the reader with the concept of electromagnetic time reversal, and introduce up-to-date applications of the concept found in the areas of electromagnetic compatibility and power systems. It is original in its approach to describing propagation and transient issues in power networks and power line communication, and is the result of the three main editors' pioneering research in the area.

Integration of Large Scale Wind Energy with Electrical Power Systems in China MDPI

Automatic Control in Power Generation, Distribution, and Protection covers the proceedings of the IFAC Symposium, held in Pretoria, Republic of South Africa on September 15-19, 1980. The book focuses on the methodologies, technologies, processes, and approaches involved in the adoption of automatic control in power generation, distribution, and protection. The selection first elaborates on decentralized and centralized automatic generation control; digital control methods for power station plants based on identified process models; and power generating unit mechanical and electrical system interaction during power system operating disturbances. The text then ponders on modern trends in power system protection; control of power generation and system control with emphasis on modern control theory; and electronics in future power systems. The manuscript takes a look at a specification for an operator load flow program in an energy management system; minimum MVAR generation as an effective criterion for reactive power dispatching; and influence of inaccurate input data on optimal short-term operation of power generation systems. The secondary voltage control of EDF network, directional protection for digital processor use, and securing high availability of protection relays and systems are also discussed. The selection is a dependable reference for readers interested in the application of automatic control in power generation, distribution, and protection.

Energy Research Abstracts Springer Science & Business Media

This book highlights recent research on Intelligent Systems and Nature Inspired Computing. It presents 212 selected papers from the 18th International Conference on Intelligent Systems Design and Applications (ISDA 2018) and the 10th World Congress on

Nature and Biologically Inspired Computing (NaBIC), which was held at VIT University, India. ISDA-NaBIC 2018 was a premier conference in the field of Computational Intelligence and brought together researchers, engineers and practitioners whose work involved intelligent systems and their applications in industry and the "real world." Including contributions by authors from over 40 countries, the book offers a valuable reference guide for all researchers, students and practitioners in the fields of Computer Science and Engineering.

Automatic Control in Power Generation, Distribution and Protection Springer

This Code is applicable to the design of steam turbine generator and gas turbine plant with new-build or extended unit capacity of 25MW or above...

Thyristor-Based FACTS Controllers for Electrical Transmission Systems Springer Science & Business Media

A static compensator (STATCOM), also known as static synchronous compensator, is a member of the flexible alternating current transmission system (FACTS) devices. It is a power-electronics based regulating device which is composed of a voltage source converter (VSC) and is shunt-connected to alternating current electricity transmission and distribution networks. The voltage source is created from a DC capacitor and the STATCOM can exchange reactive power with the network. It can also supply some active power to the network, if a DC source of power is connected across the capacitor. A STATCOM is usually installed in the electric networks with poor power factor or poor voltage regulation to improve these problems. In addition, it is used to improve the voltage stability of a network. This book covers STATCOMs from different aspects. Different converter topologies, output filters and modulation techniques utilized within STATCOMs are reviewed. Mathematical modeling of STATCOM is presented in detail and different STATCOM control strategies and algorithms are discussed. Modified load flow calculations for a power system in the presence of STATCOMs are presented. Several applications of STATCOMs in transmission and distribution networks are discussed in different examples and optimization techniques for defining the optimal location and ratings of the STATCOMs in power systems are reviewed. Finally, the performance of the network protection scheme in the presence of STATCOMs is described. This book will be an excellent resource for postgraduate students and researchers interested in grasping the knowledge on STATCOMs.

3rd International Conference, Power System Protection and Automation, 17-18 November, 2004, New Delhi, India Elsevier

This comprehensive text offers a detailed treatment of modelling of components and sub-systems for studying the transient and dynamic stability of large-scale power systems. Beginning with an overview of basic concepts of stability of simple systems, the book is devoted to in-depth coverage of modelling of synchronous machine and its excitation systems and speed governing controllers. Apart from covering the modelling aspects, methods of interfacing component models for the analysis of small-signal stability of power systems are presented in an easy-to-understand manner. The book also offers a study of simulation of transient stability of power systems as well as electromagnetic transients involving synchronous machines. Practical data pertaining to power systems, numerical examples and derivations are interspersed throughout the text to give students practice in applying key concepts. This text serves as a well-knit introduction to Power System Dynamics and is suitable for a one-semester course for the senior-level undergraduate students of electrical engineering and postgraduate students specializing in Power Systems. Contents: contents Preface 1. ONCE OVER LIGHTLY 2.

POWER SYSTEM STABILITY—ELEMENTARY ANALYSIS 3.
 SYNCHRONOUS MACHINE MODELLING FOR POWER SYSTEM
 DYNAMICS 4. MODELLING OF OTHER COMPONENTS FOR DYNAMIC
 ANALYSIS 5. OVERVIEW OF NUMERICAL METHODS 6. SMALL-
 SIGNAL STABILITY ANALYSIS OF POWER SYSTEMS 7. TRANSIENT
 STABILITY ANALYSIS OF POWER SYSTEMS 8. SUBSYNCHRONOUS
 AND TORSIONAL OSCILLATIONS 9. ENHANCEMENT AND
 COUNTERMEASURES Index

Smart Computing and Informatics John Wiley & Sons

This book presents selected papers from the 5th International Conference on Inventive Systems and Control (ICISC 2021), held on 7–8 January 2021 at JCT College of Engineering and Technology, Coimbatore, India. The book includes an analysis of the class of intelligent systems and control techniques that utilises various artificial intelligence technologies, where there are no mathematical models and systems available to make them remain controlled. Inspired by various existing intelligent techniques, the primary goal is to present the emerging innovative models to tackle the challenges faced by the existing computing and communication technologies. The proceedings of ICISC 2021 aim at presenting the state-of-the-art research developments, trends, and solutions for the challenges faced by the intelligent systems and control community with the real-world applications. The included research articles feature the novel and unpublished research works on intelligent system representation and control.

Proceedings of the International Conference on Information Systems Design and Intelligent Applications 2012 (India 2012)

held in Visakhapatnam, India, January 2012 CRC Press

New Technologies for Power System Operation and Analysis considers the very latest developments in renewable energy integration and system operation, including electricity markets and wide-area monitoring systems and forecasting. Helping readers quickly grasp the essential information needed to address renewable energy integration challenges, this new book looks at basic power system mathematical models, advanced renewable integration and system optimizations from transmission and distribution system sides. Sections cover wind, solar, gas and petroleum, making this a useful reference for all engineers interested in power system operation. Includes codes in MATLAB® and Python Provides a complete analysis of all new and relevant power system technologies Covers the impact on existing power system operations at the advanced level, with detailed technical insights

Intelligent Systems Design and Applications John Wiley & Sons

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

Electromagnetic Time Reversal Routledge

Within this book the fundamental concepts associated with the topic of power electronic control are covered alongside the latest equipment and devices, new application areas and associated computer-assisted methods. *A practical guide to the control of reactive power systems *Ideal for postgraduate and professional courses *Covers the latest equipment and computer-aided analysis.

Power Flow Control Solutions for a Modern Grid Using

SMART Power Flow Controllers Risk Management 1 Click Tong

An in-depth examination of large scale wind projects and electricity production in China Presents the challenges of electrical power system planning, design, operation and control carried out by large scale wind power, from the Chinese perspective Focuses on the integration issue of large scale wind power to the bulk power system, probing the interaction between wind power and bulk power systems Wind power development is a burgeoning area of study in developing countries, with much interest in offshore wind farms and several big projects under development English translation of the Chinese language original which won the "Fourth China Outstanding Publication Award nomination" in March 2013

Numerical Distance Protection Springer Nature

Fault Location on Power Lines enables readers to pinpoint the location of a fault on power lines following a disturbance. The nine chapters are organised according to the design of different locators. The authors do not simply refer the reader to manufacturers' documentation, but instead have compiled detailed information to allow for in-depth comparison. Fault Location on Power Lines describes basic algorithms used in fault locators, focusing on fault location on overhead transmission lines, but also covering fault location in distribution networks. An application of artificial intelligence in this field is also presented, to help the reader to understand all aspects of fault location on overhead lines, including both the design and application standpoints. Professional engineers, researchers, and postgraduate and undergraduate students will find Fault Location on Power Lines a valuable resource, which enables them to reproduce complete algorithms of digital fault locators in their basic forms.

Subsynchronous Resonance in Power Systems Springer

Never before has so much ground been covered in a single volume reference source. This five-part work is sure to be of great value to students, technicians and practicing engineers as well as equipment designers and manufacturers, and should become their one-stop shop for all information needs in this subject area. This book will be of interest to those working with: Static Drives, Static Controls of Electric Motors, Speed Control of Electric Motors, Soft Starting, Fluid Coupling, Wind Mills, Generators, Painting procedures, Effluent treatment, Electrostatic Painting, Liquid Painting, Instrument Transformers, Core Balanced CTs, CTs, VTs, Current Transformers, Voltage Transformers, Earthquake engineering, Seismic testing, Seismic effects, Cabling, Circuit Breakers, Switching Surges, Insulation Coordination, Surge Protection, Lightning, Over-voltages, Ground Fault Protections, Earthing, Earth fault Protection, Shunt Capacitors, Reactive control, Bus Systems, Bus Duct, & Rising mains *A 5-part guide to all aspects of electrical power engineering *Uniquely comprehensive coverage of all subjects associated with power engineering *A one-stop reference resource for power drives, their controls, power transfer and distribution, reactive controls, protection (including over voltage and surge protection), maintenance and testing electrical engineering