

An Improved Flux Observer For Sensorless Permanent Magnet

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Control of Permanent Magnet Synchronous Motors - Sadegh Vaez-Zadeh 2018-02-23
Permanent magnet synchronous (PMS) motors stand at the forefront of electric motor development due to their energy saving capabilities and performance potential. The motors have been developed in response to mounting environmental crises and growing electricity prices, and they have enabled the emergence of motor drive applications like those found in electric and hybrid vehicles, fly by wire, and drones. Control of Permanent Magnet Synchronous Motors is a timely advancement along that path as the first comprehensive, self-contained, and thoroughly up-to-date book devoted solely to the control of PMS motors. It offers a deep and extended analysis, design, implementation, and performance evaluation of major motor control methods, including Vector, Direct Torque, Predictive, Deadbeat, and Combined Control, in a systematic and coherent manner. All major Sensorless Control and Parameter Estimation methods are also studied. The book places great emphasis on energy saving control schemes.

ELECTRIMACS 2019 - Walter Zamboni 2020-04-25

This book collects a selection of papers presented at ELECTRIMACS 2019, the 13th international conference of the IMACS TC1 Committee, held in Salerno, Italy, on 21st-23rd May 2019. The conference papers deal with modelling, simulation, analysis, control, power management, design optimization, identification

and diagnostics in electrical power engineering. The main application fields include electric machines and electromagnetic devices, power electronics, transportation systems, smart grids, electric and hybrid vehicles, renewable energy systems, energy storage, batteries, supercapacitors and fuel cells, and wireless power transfer. The contributions included in Volume 1 are particularly focused on electrical engineering simulation aspects and innovative applications.

Applications in Electronics Pervading Industry, Environment and Society—Industrial Electronics and Cyber Physical Systems - Sergio Saponara 2021-09-02

This book features the manuscripts accepted for the Special Issue “Applications in Electronics Pervading Industry, Environment and Society—Sensing Systems and Pervasive Intelligence” of the MDPI journal Sensors. Most of the papers come from a selection of the best papers of the 2019 edition of the “Applications in Electronics Pervading Industry, Environment and Society” (APPLEPIES) Conference, which was held in November 2019. All these papers have been significantly enhanced with novel experimental results. The papers give an overview of the trends in research and development activities concerning the pervasive application of electronics in industry, the environment, and society. The focus of these papers is on cyber physical systems (CPS), with research proposals for new sensor acquisition and ADC (analog to digital converter) methods,

high-speed communication systems, cybersecurity, big data management, and data processing including emerging machine learning techniques. Physical implementation aspects are discussed as well as the trade-off found between functional performance and hardware/system costs.

Conference Proceedings of 2021 International Joint Conference on Energy, Electrical and Power Engineering - Wenping Cao 2022-11-13

This book will be a collection of the papers presented in the 2021 International Joint Conference on Energy, Electrical and Power Engineering (CoEEPE'21), covering new and renewable energy, electrical and power engineering. It is expected to report the latest technological developments in the fields developed by academic researchers and industrial practitioners, with a focus on component design, optimization and control algorithms in electrical and power engineering systems. The applications and dissemination of these technologies will benefit research society as new research directions are getting more and more inter-disciplinary which require researchers from different research areas to come together and form ideas jointly. It will also benefit the electrical engineering and power industry as we are now experiencing a new wave of industrial revolution, that is, electrification, intelligentization and digitalisation of our transport, manufacturing process and way of thinking.

Green Energy - Suman Lata Tripathi 2021-02-17

Like most industries around the world, the energy industry has also made, and continues to make, a long march toward "green" energy. The science has come a long way since the 1970s, and renewable energy and other green technologies are becoming more and more common, replacing fossil fuels. It is, however, still a struggle, both in terms of energy sources keeping up with demand, and the development of useful technologies in this area. To maintain the supply for electrical energy, researchers, engineers and other professionals in industry are continuously exploring new eco-friendly energy technologies and power electronics, such as solar, wind, tidal, wave, bioenergy, and fuel

cells. These technologies have changed the concepts of thermal, hydro and nuclear energy resources by the adaptation of power electronics advancement and revolutionary development in lower manufacturing cost for semiconductors with long time reliability. The latest developments in renewable resources have proved their potential to boost the economy of any country. Green energy technology has not only proved the concept of clean energy but also reduces the dependencies on fossil fuel for electricity generation through smart power electronics integration. Also, endless resources have more potential to cope with the requirements of smart building and smart city concepts. A valuable reference for engineers, scientists, chemists, and students, this volume is applicable to many different fields, across many different industries, at all levels. It is a must-have for any library.

Permanent Magnet Synchronous and Brushless DC Motor Drives - Ramu Krishnan 2017-12-19

Despite two decades of massive strides in research and development on control strategies and their subsequent implementation, most books on permanent magnet motor drives still focus primarily on motor design, providing only elementary coverage of control and converters. Addressing that gap with information that has largely been disseminated only in journals and at conferences, Permanent Magnet Synchronous and Brushless DC Motor Drives is a long-awaited comprehensive overview of power electronic converters for permanent magnet synchronous machines and control strategies for variable-speed operation. It introduces machines, power devices, inverters, and control, and addresses modeling, implementation, control strategies, and flux weakening operations, as well as parameter sensitivity, and rotor position sensorless control. Suitable for both industrial and academic audiences, this book also covers the simulation, low cost inverter topologies, and commutation torque ripple of PM brushless DC motor drives. Simulation of the motor drives system is illustrated with MATLAB® codes in the text. This book is divided into three parts—fundamentals of PM synchronous and brushless dc machines, power devices, inverters; PM synchronous motor drives, and brushless dc motor drives. With regard to the power

electronics associated with these drive systems, the author: Explores use of the standard three-phase bridge inverter for driving the machine, power factor correction, and inverter control Introduces space vector modulation step by step and contrasts with PWM Details dead time effects in the inverter, and its compensation Discusses new power converter topologies being considered for low-cost drive systems in PM brushless DC motor drives This reference is dedicated exclusively to PM ac machines, with a timely emphasis on control and standard, and low-cost converter topologies. Widely used for teaching at the doctoral level and for industrial audiences both in the U.S. and abroad, it will be a welcome addition to any engineer's library.

Model Predictive Control for AC Motors - Yaofei Han 2022

This book introduces how to improve the accuracy and robustness of model predictive control. Firstly, the disturbance observation- and compensation-based method is developed. Secondly, direct parameter identification methods are developed. Thirdly, the seldom-focused-on issues such as sampling and delay problems are solved in this book. Overall, this book solves the problems in a systematic and innovative way. Chapter 2 is available open access under a Creative Commons Attribution 4.0 International License via link.springer.com.

Control and Mechatronics - Bodgan Wilamowski 2018-10-08

The Industrial Electronics Handbook, Second Edition combines traditional and newer, more specialized knowledge that will help industrial electronics engineers develop practical solutions for the design and implementation of high-power applications. Embracing the broad technological scope of the field, this collection explores fundamental areas, including analog and digital circuits, electronics, electromagnetic machines, signal processing, and industrial control and communications systems. It also facilitates the use of intelligent systems—such as neural networks, fuzzy systems, and evolutionary methods—in terms of a hierarchical structure that makes factory control and supervision more efficient by addressing the needs of all production components. Enhancing its value, this fully updated collection presents research and global trends as published in the IEEE

Transactions on Industrial Electronics Journal, one of the largest and most respected publications in the field. Control and Mechatronics presents concepts of control theory in a way that makes them easily understandable and practically useful for engineers or students working with control system applications. Focusing more on practical applications than on mathematics, this book avoids typical theorems and proofs and instead uses plain language and useful examples to: Concentrate on control system analysis and design, comparing various techniques Cover estimation, observation, and identification of the objects to be controlled—to ensure accurate system models before production Explore the various aspects of robotics and mechatronics Other volumes in the set: Fundamentals of Industrial Electronics Power Electronics and Motor Drives Industrial Communication Systems Intelligent Systems

Technological Developments in Education and Automation - Magued Iskander 2010-01-30

Technological Developments in Education and Automation includes set of rigorously reviewed world-class manuscripts dealing with the increasing role of technology in daily lives including education and industrial automation Technological Developments in Education and Automation contains papers presented at the International Conference on Industrial Electronics, Technology & Automation and the International Conference on Engineering Education, Instructional Technology, Assessment, and E-learning which were part of the International Joint Conferences on Computer, Information and Systems Sciences and Engineering

Life System Modeling and Intelligent Computing - Minrui Fei 2010-09

This book is part II of a two-volume work that contains the refereed proceedings of the International Conference on Life System Modeling and Simulation, LSMS 2010 and the International Conference on Intelligent Computing for Sustainable Energy and Environment, ICSEE 2010, held in Wuxi, China, in September 2010. The 194 revised full papers presented were carefully reviewed and selected from over 880 submissions and recommended for publication by Springer in two volumes of

Lecture Notes in Computer Science (LNCS) and one volume of Lecture Notes in Bioinformatics (LNBI). This particular volume of Lecture Notes in Computer Science (LNCS) includes 55 papers covering 7 relevant topics. The 56 papers in this volume are organized in topical sections on advanced evolutionary computing theory and algorithms; advanced neural network and fuzzy system theory and algorithms; modeling and simulation of societies and collective behavior; biomedical signal processing, imaging, and visualization; intelligent computing and control in distributed power generation systems; intelligent methods in power and energy infrastructure development; intelligent modeling, monitoring, and control of complex nonlinear systems.

Proceedings of Symposium on Power Electronic and Renewable Energy Systems

Control - Sankarsan Mohapatro 2021-07-09

This book includes high-quality research papers presented at Symposium on Power Electronic and Renewable Energy Systems Control (PERESC 2020), which is held at the School of Electrical Sciences, IIT Bhubaneswar, Odisha, India, during 4-5 December 2020. The book covers original work in power electronics which has greatly enabled integration of renewable and distributed energy systems, control of electric machine drives, high voltage system control and operation. The book is highly useful for academicians, engineers, researchers and students to be familiar with the latest state of the art in power electronics technology and its applications.

Speed Sensorless Induction Motor Drives for Electrical Actuators: Schemes, Trends and Tradeoffs - Malik E. Elbuluk 1997

Proceedings of the Eighth Asia International Symposium on Mechatronics - Baoyan Duan 2022-07-29

The book presents high-quality papers from the Eighth Asia International Symposium on Mechatronics (AISM 2021). It discusses the latest technological trends and advances in electromechanical coupling and environmental adaptability design of electronic equipment, sensing and measurement, mechatronics in manufacturing and automations, energy harvesting & storage, robotics, automation and

control systems. It includes papers based on original theoretical, practical and experimental simulations, development, applications, measurements, and testing. The applications and solutions discussed in the book provide excellent reference material for future product development.

Recent Developments of Electrical Drives - Slawomir Wiak 2007-06-08

This book presents papers covering a wide spectrum of theory and practice, deeply rooted in engineering problems at a high practical and theoretical level. The contents explore theory, control systems and applications, the heart of the matter in electrical drives.

Proceedings of the ... SICE Annual Conference - Keisoku Jidō Seigyo Gakkai (Japan). Gakujiutsu Kōenkai 2004

Development of Adaptive Speed Observers for Induction Machine System Stabilization

- Ahmed A. Zaki Diab 2020-01-03

This book describes the development of an adaptive state observer using a mathematical model to achieve high performance for sensorless induction motor drives. This involves first deriving an expression for a modified gain rotor flux observer with a parameter adaptive scheme to estimate the motor speed accurately and improve the stability and performance of sensorless vector-controlled induction motor drives. This scheme is then applied to the controls of a photovoltaic-motor water-pumping system, which results in improved dynamic performance under different operating conditions. The book also presents a robust speed controller design for a sensorless vector-controlled induction motor drive system based on H^∞ theory, which overcomes the problems of the classical controller.

AC Electric Motors Control - Fouad Giri 2013-03-25

The complexity of AC motor control lies in the multivariable and nonlinear nature of AC machine dynamics. Recent advancements in control theory now make it possible to deal with long-standing problems in AC motors control. This text expertly draws on these developments to apply a wide range of model-based control design methods to a variety of AC motors. Contributions from over thirty top researchers

explain how modern control design methods can be used to achieve tight speed regulation, optimal energetic efficiency, and operation reliability and safety, by considering online state variable estimation in the absence of mechanical sensors, power factor correction, machine flux optimization, fault detection and isolation, and fault tolerant control. Describing the complete control approach, both controller and observer designs are demonstrated using advanced nonlinear methods, stability and performance are analysed using powerful techniques, including implementation considerations using digital computing means. Other key features:

- Covers the main types of AC motors including triphase, multiphase, and doubly fed induction motors, wound rotor, permanent magnet, and interior PM synchronous motors
- Illustrates the usefulness of the advanced control methods via industrial applications including electric vehicles, high speed trains, steel mills, and more
- Includes special focus on sensorless nonlinear observers, adaptive and robust nonlinear controllers, output-feedback controllers, fault detection and isolation algorithms, and fault tolerant controllers

This comprehensive volume provides researchers and designers and R&D engineers with a single-source reference on AC motor system drives in the automotive and transportation industry. It will also appeal to advanced students in automatic control, electrical, power systems, mechanical engineering and robotics, as well as mechatronic, process, and applied control system engineers.

Control Strategies of Permanent Magnet Synchronous Motor Drive for Electric Vehicles - Chiranjit Sain 2022-09-19

To reduce the emissions of greenhouse gasses and maintain environmental sustainability, electric vehicles play a vital role in a modern energy-efficient environment. Permanent magnet synchronous motors (PMSMs) are widely employed in electric vehicle technology due to their high dynamic response, better torque-speed characteristics, noiseless operation, high power density, high efficiency and power factor as compared to other conventional motor drives. This book demonstrates the development of various control strategies and illustrates the dynamic performance intensification of a PMSM

drive. To ensure the faster dynamic behaviour and flexibility in control under various operating conditions, the performance of a PMSM drive has been explained. Finally, control strategies have been executed through mathematical modelling and illustration of several case studies for optimal operation. Features: Introduces performance indicators in a self-controlled PMSM machine to justify the dynamic behaviour Discusses comparative performance study and optimization of the drive performance Provides a detailed comparative performance analysis between classical and fuzzy logic controllers in a PMSM drive Includes illustrations and case studies using mathematical modelling and real-time test results Discusses the state of the art in solar-powered energy-efficient PMSM drives with various issues This book is aimed at researchers, graduate students and libraries in electrical engineering with specialization in electric vehicles.

Handbook of Distributed Generation - Ramesh Bansal 2017-03-07

This book features extensive coverage of all Distributed Energy Generation technologies, highlighting the technical, environmental and economic aspects of distributed resource integration, such as line loss reduction, protection, control, storage, power electronics, reliability improvement, and voltage profile optimization. It explains how electric power system planners, developers, operators, designers, regulators and policy makers can derive many benefits with increased penetration of distributed generation units into smart distribution networks. It further demonstrates how to best realize these benefits via skillful integration of distributed energy sources, based upon an understanding of the characteristics of loads and network configuration.

Energy Efficiency in Electric Devices, Machines and Drives - Gorazd Štumberger 2020-06-18

This Special Issue deals with improvements in the energy efficiency of electric devices, machines, and drives, which are achieved through improvements in the design, modelling, control, and operation of the system. Properly sized and placed coils of a welding transformer can reduce the required iron core size and improve the efficiency of the welding system

operation. New structures of the single-phase field excited flux switching machine improve its performance in terms of torque, while having higher back-EMF and unbalanced electromagnetic forces. A properly designed rotor notch reduces the torque ripple and cogging torque of interior permanent magnet motors for the drive platform of electric vehicles, resulting in lower vibrations and noise. In the field of modelling, the torque estimation of a Halbach array surface permanent magnet motor with a non-overlapping winding layout was improved by introducing an analytical two-dimensional subdomain model. A general method for determining the magnetically nonlinear two-axis dynamic models of rotary and linear synchronous reluctance machines and synchronous permanent magnet machines is introduced that considers the effects of slotting, mutual interaction between the slots and permanent magnets, saturation, cross saturation, and end effects. Advanced modern control solutions, such as neural network-based model reference adaptive control, fuzzy control, senseless control, torque/speed tracking control derived from the 3D non-holonomic integrator, including drift terms, maximum torque per ampere, and maximum efficiency characteristics, are applied to improve drive performance and overall system operation.

Industrial and Technological Applications of Power Electronics Systems - Ryszard Strzelecki
2021-09-02

The Special Issue "Industrial and Technological Applications of Power Electronics Systems" focuses on: - new strategies of control for electric machines, including sensorless control and fault diagnosis; - existing and emerging industrial applications of GaN and SiC-based converters; - modern methods for electromagnetic compatibility. The book covers topics such as control systems, fault diagnosis, converters, inverters, and electromagnetic interference in power electronics systems. The Special Issue includes 19 scientific papers by industry experts and worldwide professors in the area of electrical engineering.

Advanced Direct Thrust Force Control of Linear Permanent Magnet Synchronous Motor - Muhammad Ali Masood Cheema
2020-02-13
This book explores the direct thrust force control

(DTFC) of tubular surface-mount linear permanent magnet synchronous motors (linear PMSMs). It presents a detailed account and analysis of several advanced nonlinear control schemes, based on the direct thrust control principle, to achieve a reduction in steady-state ripple in thrust force with faster transient response, and describes their experimental validation. It also provides rigorous details of the dynamic modelling of linear PMSMs from a control system perspective, and demonstrates the superior control performance of the proposed techniques compared to the current state-of-the-art techniques. Lastly, the book proposes and validates a stator flux observer for sensorless speed estimation comprising a linear state observer and an improved sliding mode component.

Reluctance Electric Machines - Ion Boldea
2018-07-20

Electric energy is arguably a key agent for our material prosperity. With the notable exception of photovoltaic generators, electric generators are exclusively used to produce electric energy from mechanical energy. More than 60% of all electric energy is used in electric motors for useful mechanical work in various industries. This book presents the modeling, performance, design, and control of reluctance synchronous and flux-modulation machines developed for higher efficiency and lower cost. It covers one- and three-phase reluctance synchronous motors in line-start applications and various reluctance flux-modulation motors in pulse width modulation converter-fed variable speed drives. FEATURES Presents basic and up-to-date knowledge about the topologies, modeling, performance, design, and control of reluctance synchronous machines. Includes information on recently introduced reluctance flux-modulation electric machines (switched- flux, flux-reversal, Vernier, transverse flux, claw pole, magnetic-gear dual-rotor, brushless doubly fed, etc.). Features numerous examples and case studies throughout. Provides a comprehensive overview of all reluctance electric machines.

Proceedings of the Power Conversion Conference - 2002

Torque Control - Moulay Tahar Lamchich
2011-02-10

This book is the result of inspirations and contributions from many researchers, a collection of 9 works, which are, in majority, focalised around the Direct Torque Control and may be comprised of three sections: different techniques for the control of asynchronous motors and double feed or double star induction machines, oriented approach of recent developments relating to the control of the Permanent Magnet Synchronous Motors, and special controller design and torque control of switched reluctance machine.

Electrical Information and Mechatronics and Applications - Xu Dong Wang 2011-12-08

These are the proceedings of the International Conference on Electrical Information and Mechatronics (ICEIM2011), held on the 23-25 December 2011 in Jiaozuo (China), which served as a platform for the exchange of related expertise. ICEIM 2011 drew together researchers from various disciplines, such as Sustainable Electrical Information and Mechatronics. The 177 papers are grouped into the chapters: Mechanical Power Engineering, Automatic and Mechanics Engineering, Optical Electrical Magnetic and Composite Materials, Mechatronic Systems Modeling and Identification, Mechatronics Engineering and Applications, Mechanical Design and Manufacturing Technology, Sensors and Detection, Fault Diagnosis and Signal Processing, Image Processing in Engineering Design, Computer-Aided Design and Simulation, and Systems Analysis and Decision. The work serves as a briefing on the current state-of-the-art of this important topic.

Mechanics And Architectural Design - Proceedings Of 2016 International Conference - Peng-sheng Wei 2016-11-24

The 2016 International Conference on Mechanics and Architectural Design (MAD2016) were held in Suzhou, Jiangsu, China, 14 - 15 May 2016. The main objective of this conference is to provide a platform for researchers, academics and industrial professionals to present their research findings in the fields of Architecture, Mechanical and Civil Engineering. This proceedings consists of 90 articles selected after peer-review. It consists of 6 articles in Mechanics, and 84 articles covering research and development in Civil Engineering;

addressing issues in building architecture and structure. Most of these projects were funded by the Chinese research agencies.

Position Sensorless Control Techniques for Permanent Magnet Synchronous Machine Drives - Gaolin Wang 2019-11-15

The book focuses on position sensorless control for PMSM drives, addressing both basic principles and experimental evaluation. It provides an in-depth study on a number of major topics, such as model-based sensorless control, saliency-based sensorless control, position estimation error ripple elimination and acoustic noise reduction. Offering a comprehensive and systematic overview of position sensorless control and practical issues it is particularly suitable for readers interested in the sensorless control techniques for PMSM drives. The book is also a valuable resource for researchers, engineers, and graduate students in fields of ac motor drives and sensorless control.

Sensorless AC Electric Motor Control - Alain Glumineau 2015-03-16

This monograph shows the reader how to avoid the burdens of sensor cost, reduced internal physical space, and system complexity in the control of AC motors. Many applications fields—electric vehicles, wind- and wave-energy converters and robotics, among them—will benefit. Sensorless AC Electric Motor Control describes the elimination of physical sensors and their replacement with observers, i.e., software sensors. Robustness is introduced to overcome problems associated with the unavoidable imperfection of knowledge of machine parameters—resistance, inertia, and so on—encountered in real systems. The details of a large number of speed- and/or position-sensorless ideas for different types of permanent-magnet synchronous motors and induction motors are presented along with several novel observer designs for electrical machines. Control strategies are developed using high-order, sliding-mode and quasi-continuous-sliding-mode techniques and two types of observer-controller schemes based on backstepping and sliding-mode techniques are described. Experimental results validate the performance of these observer and controller configurations with test trajectories of significance in difficult sensorless-AC-machine

problems. Control engineers working with AC motors in a variety of industrial environments will find the space-and-cost-saving ideas detailed in *Sensorless AC Electric Motor Control* of much interest. Academic researchers and graduate students from electrical, mechanical and control-engineering backgrounds will be able to see how advanced theoretical control can be applied in meaningful real systems.

Advanced Control Systems for Electric Drives - Adel Merabet 2020-12-07

This book provides extensive information about advanced control techniques in electric drives. Multiple control and estimation methods are studied for position and speed tracking in different drives. Artificial intelligence tools, such as fuzzy logic and neural networks, are used for specific applications using electric drives.

Proceedings of the 2nd International Conference on Intelligent Technologies and Engineering Systems (ICITES2013) - Jengnan Juang 2014-04-18

This book includes the original, peer reviewed research papers from the conference, *Proceedings of the 2nd International Conference on Intelligent Technologies and Engineering Systems (ICITES2013)*, which took place on December 12-14, 2013 at Cheng Shiu University in Kaohsiung, Taiwan. Topics covered include: laser technology, wireless and mobile networking, lean and agile manufacturing, speech processing, microwave dielectrics, intelligent circuits and systems, 3D graphics, communications and structure dynamics and control.

2020 23rd International Conference on Electrical Machines and Systems (ICEMS) - IEEE Staff 2020-11-24

To provide an opportunity for scientists and experts to present the latest research developments in the field of electrical machines and systems (rotating and other machines, power electronics, motion control, and motor drives) and to exchange useful information and experiences in research, trends and applications

The Industrial Electronics Handbook - Five Volume Set - Bogdan M. Wilamowski 2011-03-04

Industrial electronics systems govern so many different functions that vary in complexity-from the operation of relatively simple applications,

such as electric motors, to that of more complicated machines and systems, including robots and entire fabrication processes. The *Industrial Electronics Handbook, Second Edition* combines traditional and new *Variable Speed Generators* - Ion Boldea 2015-09-03

Variable Speed Generators, the second of two volumes in the *Electric Generators Handbook*, provides extensive coverage of variable speed generators in distributed generation and renewable energy applications around the world. The book delves into the steady state, transients, control, and design of claw-pole-rotor synchronous, induction, permanent-magnet-(PM)-assisted synchronous, and switched reluctance starter alternators for electric hybrid vehicles. It discusses PM synchronous, transverse flux PM, and flux reversal PM generators for low-speed wind and hydro energy conversion. It also explores linear motion alternators for residential and spacecraft applications. Numerous design and control examples illustrate the exposition. Fully revised and updated to reflect the last decade's worth of progress in the field, this Second Edition adds new sections that: Address the ride-through control of doubly fed induction generators under unbalanced voltage sags Consider the control of stand-alone doubly fed induction generators under unbalanced nonlinear loads Detail a stand-alone squirrel cage induction generator (SCIG) with AC output and a low-rating pulse-width modulated (PWM) converter Present a twin stator winding SCIG with 50 percent rating inverter and diode rectifier, and a dual stator winding induction generator with nested cage rotor Examine interior permanent magnet claw-pole-alternator systems for more vehicle braking energy recuperation, and high power factor Vernier PM generators Depict a PM-assisted reluctance synchronous motor/generator for an electric hybrid vehicle, and a double stator switched reluctance generator with segmented rotor Describe the grid to stand-alone transition motion-sensorless dual-inverter control of permanent magnet synchronous generators with asymmetrical grid voltage sags and harmonics filtering The promise of renewable, sustainable energy rests on our ability to design innovative power systems that are able to harness energy

from a variety of sources. Variable Speed Generators, Second Edition supplies state-of-the-art tools necessary to design, validate, and deploy the right power generation technologies to fulfill tomorrow's complex energy needs.

Electric Generators Handbook - Two Volume Set - Ion Boldea 2018-10-08

Electric Generators Handbook, Second Edition: Two-Volume Set supplies state-of-the-art tools necessary to design, validate, and deploy the right power generation technologies to fulfill tomorrow's complex energy needs. The first volume, Synchronous Generators, explores large- and medium-power synchronous generator topologies, steady state, modeling, transients, control, design, and testing. Numerous case studies, worked-out examples, sample results, and illustrations highlight the concepts. Fully revised and updated to reflect the last decade's worth of progress in the field, the Second Edition adds coverage of high-power wind generators with fewer or no PMs, PM-assisted DC-excited salient pole synchronous generators, autonomous synchronous generators' control, line switching parameter identification for isolated grids, synthetic back-to-back load testing with inverter supply, and more. The second volume, Variable Speed Generators, provides extensive coverage of variable speed generators in distributed generation and renewable energy applications around the world. Numerous design and control examples illustrate the exposition. Fully revised and updated to reflect the last decade's worth of progress in the field, the Second Edition adds material on doubly fed induction generator control under unbalanced voltage sags and nonlinear loads, interior permanent magnet claw-pole-alternator systems, high power factor Vernier PM generators, PM-assisted reluctance synchronous motors/generators for electric hybrid vehicles, and more.

Integration of Electric Vehicles and Battery Storage Systems - Hrvoje Pandžić 2021-04-22

Achieving the goal of green and environmentally friendly energy systems is not possible without the concept of energy storage. Such storage should charge when renewable generation, e.g., photovoltaics and wind farms, is abundant and discharge during periods of its scarcity. Although pumped hydropower plants have been

widely used as extremely large capacity energy storage, the recent technological developments in lithium-based batteries have made them economically feasible. The major advantages of batteries over a conventional energy storage system, i.e., hydropower, include its modularity and ease of integration with the transport system. This Special Issue is thus focused on both stationary batteries and mobile batteries in electric vehicles. Both should be used to provide flexibility and balancing services to power systems. While stationary batteries are focused solely on the power system, the batteries within electric vehicles need to primarily fulfill the task of providing energy for transportation. This is why their use in power systems is secondary. However, due to generally long parking periods, they can become a detrimental asset in terms of balancing the power system.

Proceedings of the ... Annual Conference of the IEEE Industrial Electronics Society - IEEE Industrial Electronics Society. Conference 2004

Emerging Developments in the Power and Energy Industry - Rodolfo Dufo-López

2019-10-31

Power and Energy Engineering are important and pressing topics globally, covering issues such as shifting paradigms of energy generation and consumption, intelligent grids, green energy and environmental protection. The 11th Asia-Pacific Power and Energy Engineering Conference (APPEEC 2019) was held in Xiamen, China from April 19 to 21, 2019. APPEEC has been an annual conference since 2009 and has been successfully held in Wuhan (2009 & 2011), Chengdu (2010 & 2017), Shanghai (2012 & 2014), Beijing (2013 & 2015), Suzhou (2016) and Guilin (2018), China. The objective of APPEEC 2019 was to provide scientific and professional interactions for the advancement of the fields of power and energy engineering. APPEEC 2019 facilitated the exchange of insights and innovations between industry and academia. A group of excellent speakers have delivered keynote speeches on emerging technologies in the field of power and energy engineering. Attendees were given the opportunity to give oral and poster presentations and to interface with invited experts.

Mechatronics and Computational

Mechanics - Sally Gao 2013-02-13

The collection includes selected, peer reviewed papers from the 2012 International Conference on Mechatronics and Computational Mechanics (ICMCM 2012), 20-21st December, 2012, Dubai, UAE. Volume is indexed by Thomson Reuters CPCI-S (WoS). The papers are grouped as follows: Chapter 1: Mechatronics and Control; Chapter 2: Applied Mechanics and Mechanical Engineering; Chapter 3: Applied Materials Engineering; Chapter 4: Organization of Manufacture, Engineering Management and Information Technologies.

Electrical Power Systems and Computers - Xiaofeng Wan 2011-06-21

This volume includes extended and revised versions of a set of selected papers from the

International Conference on Electric and Electronics (EEIC 2011) , held on June 20-22 , 2011, which is jointly organized by Nanchang University, Springer, and IEEE IAS Nanchang Chapter. The objective of EEIC 2011 Volume 3 is to provide a major interdisciplinary forum for the presentation of new approaches from Electrical Power Systems and Computers, to foster integration of the latest developments in scientific research. 133 related topic papers were selected into this volume. All the papers were reviewed by 2 program committee members and selected by the volume editor Prof. Xiaofeng Wan. We hope every participant can have a good opportunity to exchange their research ideas and results and to discuss the state of the art in the areas of the Electrical Power Systems and Computers.