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[Electric Motor Drives](#) Oct 04 2022 Electronic Control of Machines develops a systematic approach to motor drives. This book places emphasis on practice through the use of extensive modeling, simulation and analysis to help readers better understand the subject. Detailed industrial applications help readers relate theory to practice. KEY TOPICS: This extensive book cover numerous topics including: system level analysis, design and integration of the motor drives; and modeling and analysis of electrical machines and drive systems. MARKET: For readers with an interest in electric drives and power electronics.

Handbook of Automotive Power Electronics and Motor Drives Dec 26 2021 Initially, the only electric loads encountered in an automobile were for lighting and the starter motor. Today, demands on performance, safety, emissions, comfort, convenience, entertainment, and communications have seen the working-in of seemingly innumerable advanced electronic devices. Consequently, vehicle electric systems require larger capacities and more complex configurations to deal with these demands. Covering applications in conventional, hybrid-electric, and electric vehicles, the Handbook of Automotive Power Electronics and Motor Drives provides a comprehensive reference for automotive electrical systems. This authoritative handbook features contributions from an outstanding international panel of experts from industry and academia, highlighting existing and emerging technologies. Divided into five parts, the Handbook of Automotive Power Electronics and Motor Drives offers an overview of automotive power systems, discusses semiconductor devices, sensors, and other components, explains different power electronic converters, examines electric machines and associated drives, and details various advanced electrical loads as well as battery technology for automobile applications. As we seek to answer the call for safer, more efficient, and lower-emission vehicles from regulators and consumer insistence on better performance, comfort, and entertainment, the technologies outlined in this book are vital for engineering advanced vehicles that will satisfy these criteria.

Electric Motors and Drives Nov 05 2022 "Electric Motors and Drives is intended for non-specialist users of electric motors and drives, filling the gap between maths- and theory-based academic textbooks and the more prosaic 'handbooks', which provide useful detail but little opportunity for the development of real insight and understanding. The book explores all of the widely-used modern types of motor and drive, including conventional and brushless D.C., induction motors and servo drives, providing readers with the knowledge to select the right technology for a given job." "The third edition includes additional diagrams and worked examples throughout. New topics include digital interfacing and control of drives, direct torque control of induction motors and current-fed operation in DC drives. The material on brushless servomotors has also been expanded."--BOOK JACKET.

Instrument Engineers' Handbook, (Volume 2) Third Edition Sep 10 2020 This third edition of the Instrument Engineers' Handbook-most complete and respected work on process instrumentation and control-helps you:

[Electric Motor Drives and their Applications with Simulation Practices](#) Feb 25 2022 Electric Motor Drives and Its Applications with Simulation Practices provides comprehensive coverage of the concepts of electric motor drives and their applications, along with their simulation using MATLAB and other software tools. The book helps engineers and students improve their software skills by learning to simulate various electric drives and applications and assists with new ideas in the simulation of electrical, electronics and instrumentation systems. Covering power electronic converter fed drives and simulation model building using all possible software as well as the operation and relevant applications discussed, the book provides a number of examples and step-by-step procedures for successful implementation. Intended for engineers, students and research scholars in industry who are working in the field of power electronics and drives, this book provides a brief introduction to simulation software under different environments. Provides an in-depth analysis of Electric motors and drives, specifically focused on practical approaches Includes simulations of electric drives using best proven software tools like MATLAB and PSIM Details step-by-step approaches for creating and applying simulation of electric drives

High Frequency Conducted Emission in AC Motor Drives Fed By Frequency Converters Dec 02 2019 Provides a concise and thorough reference for designing electrical and electronic systems that employ adjustable speed drives Electrical and electronic systems that employ adjustable speed drives are being increasingly used in present-day automation applications. They are considered by many application engineers as one of the most interfering components, especially in a contemporarily faced industrial environment. This book fills the gap between the high-level academic knowledge in the electromagnetic compatibility (EMC) field and the recommended practical rules for assuring electromagnetic compatibility margin. It focuses on finding and formulating the issues that often occur with the generation and propagation of conducted emission in AC motor drives fed by frequency converters, rather than proposing specific solutions for dealing with them. It also features explanations of selected academic backgrounds of EMC and presents practical case studies. The book starts with an introduction to conducted emission in adjustable speed drives. It then goes on to offer in-depth chapters covering conducted emission origins in switch-mode power converters; conducted emission generation by frequency converter in adjustable speed drives (ASD); propagation of motor side originated conducted emission towards the power grid; modeling of conducted emission in ASD; broadband behavior of ASD components; and impact of a motor feeding cable on CM currents generated in ASD. In addition, this resource: Presents state-of-the-art analysis of undesirable high frequency phenomena accompanying AC motor speed control Discusses the fundamentals of phenomena of electromagnetic interference (EMI) generation in switch mode static converters Provides methodology of modeling-conducted EMI generation and propagation in ASD High Frequency Conducted Emission in AC Motor Drives Fed By Frequency Converters: Sources and Propagation Paths will appeal to scholars and a wide range of professionals who are involved in the stages of development, design, and application of adjustable speed drives in accordance with ever-increasing EMC requirements.

High Frequency Conducted Emission in AC Motor Drives Fed By Frequency Converters Aug 22 2021 Provides a concise and thorough reference for designing electrical and electronic systems that employ adjustable speed drives Electrical and electronic systems that employ adjustable speed drives are being increasingly used in present-day automation applications. They are considered by many application engineers as one of the most interfering components, especially in a contemporarily faced industrial environment. This book fills the gap between the high-level academic knowledge in the electromagnetic compatibility (EMC) field and the recommended practical rules for assuring electromagnetic compatibility margin. It focuses on finding and formulating the issues that often occur with the generation and propagation of conducted emission in AC motor drives fed by frequency converters, rather than proposing specific solutions for dealing with them. It also features explanations of selected academic backgrounds of EMC and presents practical case studies. The book starts with an introduction to conducted emission in adjustable speed drives. It then goes on to offer in-depth chapters covering conducted emission origins in switch-mode power converters; conducted emission generation by frequency converter in adjustable speed drives (ASD); propagation of motor side originated conducted emission towards the power grid; modeling of conducted emission in ASD; broadband behavior of ASD components; and impact of a motor feeding cable on CM currents generated in ASD. In addition, this resource: Presents state-of-the-art analysis of undesirable high frequency phenomena accompanying AC motor speed control Discusses the fundamentals of phenomena of electromagnetic interference (EMI) generation in switch mode static converters Provides methodology of modeling-conducted EMI generation and propagation in ASD High Frequency Conducted Emission in AC Motor Drives Fed By Frequency Converters: Sources and Propagation Paths will appeal to scholars and a wide range of professionals who are involved in the stages of development, design, and application of adjustable speed drives in accordance with ever-

increasing EMC requirements.

Permanent Magnet Synchronous Motor Drives for Gearless Traction Elevators Oct 24 2021 This book focuses on the control strategies for gearless permanent magnet synchronous motor traction elevators. Both basic principles and experimental evaluation have been addressed. This is achieved by providing in-depth study on a number of major topics such as speed detection at low-speed operation, starting torque strategy based on dichotomy and staircase methods, fuzzy self-tuning method, MPC and ADRC, etc. The comprehensive and systematic treatment of control strategies for cost-effective gearless PMSM traction elevators and practical issues are the major features of the book, which is particularly suited for readers who are interested to learn the control strategies for cost-effective gearless PMSM traction elevators. The book benefits researchers, engineers, and graduate students in the fields of ac motor drives and control strategies for cost-effective gearless PMSM traction elevators, etc.

Energy-Efficient Electric Motors, Revised and Expanded Nov 12 2020 This detailed reference provides guidelines for the selection and utilization of electric motors for improved reliability, performance, energy-efficiency, and life-cycle cost. Completely revised and expanded, the book reflects the recent state of the field, as well as recent developments in control electronics, the economics of energy-efficient motors and systems, and advanced power electronic drivers. It includes five new chapters covering key topics such as the fundamentals of power electronics applicable to electric motor drives, adjustable speed drives and their applications, advanced switched reluctance motor drives, and permanent magnet and brushless DC motor drives.

Power Electronics and Motor Drives Apr 29 2022 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, electromechanical 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. Power Electronics and Motor Drives facilitates a necessary shift from low-power electronics to the high-power varieties used to control electromechanical systems and other industrial applications. This volume of the handbook: Focuses on special high-power semiconductor devices Describes various electrical machines and motors, their principles of operation, and their limitations Covers power conversion and the high-efficiency devices that perform the necessary switchover between AC and DC Explores very specialized electronic circuits for the efficient control of electric motors Details other applications of power electronics, aside from electric motors—including lighting, renewable energy conversion, and automotive electronics Addresses power electronics used in very-high-power electrical systems to transmit energy Other volumes in the set: Fundamentals of Industrial Electronics Control and Mechatronics Industrial Communication Systems Intelligent Systems

Electrotechnology in Mining Jul 09 2020 Both mining and electrical engineers need to bear in mind the following specific requirements of electrical applications in mining. 1) Economy of electrical plant and equipment in relation to the cost price of the extracted mineral ores, governed by the specific exploitation conditions, 2) Reliability of electrical plant and equipment for extractive operations, operational efficiency, and plant and personnel safety. 3) Special safeguards to counteract the additional hazards posed by the use of electric power, and by electrical phenomena in general. The book has been written along these lines, dealing with those topics which highlight the aspects of electrical engineering of relevance for mining engineers and aspects of mining operations that electrical engineers need, to meet the above-mentioned basic requirements governing the introduction and use of electrical plants and systems in mines. This book is intended as a text book and will be of use to students, and colleges as well as to mining and electrical engineers.

Electric Motor Drive Installation and Troubleshooting Jun 27 2019 "Designed for technicians in the field who are responsible for installing, programming, troubleshooting, and retrofitting electric motor drives. This industry-leading resource begins with electric motor principles, power requirements, and control methods and focuses on the safe operation, installation, startup, and troubleshooting of electric motor drives. . . . Also included in this edition is the latest NFPA 70E® safety information."--Back cover.

Power Electronics and Motor Drive Systems Aug 29 2019 Power Electronics and Motor Drive Systems is designed to aid electrical engineers, researchers, and students to analyze and address common problems in state-of-the-art power electronics technologies. Author Stefanos Manias supplies a detailed discussion of the theory of power electronics circuits and electronic power conversion technology systems, with common problems and methods of analysis to critically evaluate results. These theories are reinforced by simulation examples using well-known and widely available software programs, including SPICE, PSIM, and MATLAB/SIMULINK. Manias expertly analyzes power electronic circuits with basic power semiconductor devices, as well as the new power electronic converters. He also clearly and comprehensively provides an analysis of modulation and output voltage, current control techniques, passive and active filtering, and the characteristics and gating circuits of different power semiconductor switches, such as BJTs, IGBTs, MOSFETs, IGCTs, MCTs and GTOs. Includes step-by-step analysis of power electronic systems Reinforced by simulation examples using SPICE, PSIM, and MATLAB/SIMULINK Provides 110 common problems and solutions in power electronics technologies

Reduced DC-link Capacitance AC Motor Drives May 19 2021 This book focuses on the advanced control of reduced dc-link capacitance AC motor drives. Compared with the conventional AC motor drives, the reduced DC-link capacitance motor drives could reduce the cost, enhance the reliability and improve the power density. The control strategies proposed in this book are verified by experimental results, which include high power factor control, drive system stability control, beat phenomenon suppression, enhanced flux-weakening control, anti-overvoltage control, etc. The major features of this book are the systematic analysis, effective and optimized control of the practical issues in industry application, which could help readers to learn the reduced dc-link capacitance PMSM drives and promote the drive system application. This book could benefit researchers, engineers, and students in the field of AC motor drives.

Switched Reluctance Motor Drives Aug 02 2022 The switched reluctance machine (SRM) is the least expensive electrical machine to produce, yet one of the most reliable. As such, research has blossomed during the last decade, and the SRM and variable drive systems using SRMs are receiving considerable attention from industry. Because they require a power electronic converter and controller to function, however, successful realization of an SRM variable drive system demands an understanding of the converter and controller subsystems and their integration with the machine. Switched Reluctance Motor Drives provides that understanding. It presents a unified view of the machine and its drive system from all of its system and subsystem aspects. With a careful balance of theory and implementation, the author develops the analysis and design of SRMs from first principles, introduces a wide variety of power converters available for driving the SRM, and systematically presents both low- and high-performance controllers. The book includes an in-depth study of acoustic noise and its minimization along with application examples that include comparisons between ac and dc drives and SRM drive. The result is the first book that provides a state-of-the-art knowledge of SRMs, power converters, and their use with both sensor-based and sensorless controllers. Switched Reluctance Motor Drives enables both students and engineers to learn all aspects of SRM drive systems and appreciate the interdependence of the various subsystems in performance optimization.

Vector Control of AC Drives May 07 2020 Alternating current (AC) induction and synchronous machines are frequently used in variable speed drives with applications ranging from computer peripherals, robotics, and machine tools to railway traction, ship propulsion, and rolling mills. The notable impact of vector control of AC drives on most traditional and new technologies, the multitude of practical configurations proposed, and the absence of books treating this subject as a whole with a unified approach were the driving forces behind the creation of this book. Vector Control of AC Drives examines the remarkable progress achieved worldwide in vector control from its introduction in 1969 to the current technology. The book unifies the treatment of vector control of induction and synchronous motor drives using the concepts of general flux orientation and the feed-forward (indirect) and feedback (direct) voltage and current vector control. The concept of torque vector control is also introduced and applied to all AC motors. AC models for drive applications developed in complex variables (space phasors), both for induction and synchronous motors, are used throughout the book. Numerous practical implementations of vector control are described in considerable detail, followed by representative digital simulations and test results taken from the recent literature. Vector Control of AC Drives will be a welcome addition to the reference collections of electrical and mechanical engineers involved with machine and system design.

Speed Sensorless Induction Motor Drives for Electrical Actuators: Schemes, Trends and Tradeoffs Jan 27 2022

Power Electronics and Motor Drives Mar 29 2022 Power Electronics and Motor Drives: Advances and Trends, Second Edition is the perfect resource to keep the electrical engineer up-to-speed on the latest advancements in technologies, equipment and applications. Carefully structured to include both traditional topics for entry-level and more advanced applications for the experienced engineer, this reference sheds light on the rapidly growing field of power electronic operations. New content covers converters, machine models and new control methods such as fuzzy logic and neural network control. This reference will help engineers further understand recent technologies and gain practical understanding with its inclusion of many industrial applications. Further supported by a glossary per chapter, this book gives engineers and researchers a critical reference to learn from real-world examples and make future decisions on power electronic technology and applications. Provides many practical examples of industrial applications Updates on the newest electronic topics with content added on

fuzzy logic and neural networks Presents information from an expert with decades of research and industrial experience

Permanent Magnet Brushless DC Motor Drives and Controls Sep 22 2021 An advanced introduction to the simulation and hardware implementation of BLDC motor drives A thorough reference on the simulation and hardware implementation of BLDC motor drives, this book covers recent advances in the control of BLDC motor drives, including intelligent control, sensorless control, torque ripple reduction and hardware implementation. With the guidance of the expert author team, readers will understand the principle, modelling, design and control of BLDC motor drives. The advanced control methods and new achievements of BLDC motor drives, of interest to more advanced readers, are also presented. Focuses on the control of PM brushless DC motors, giving readers the foundations to the topic that they can build on through more advanced reading Systematically guides readers through the subject, introducing basic operational principles before moving on to advanced control algorithms and implementations Covers special issues, such as sensorless control, intelligent control, torque ripple reduction and hardware implementation, which also have applications to other types of motors Includes presentation files with lecture notes and Matlab coding on a companion website for the book

Energy Efficiency in Electric Motors, Drives, Power Converters and Related Systems Apr 17 2021 Today, there is a great deal of attention focused on sustainable growth worldwide. The increase in efficiency in the use of energy may even, in this historical moment, bring greater benefit than the use of renewable energies. Electricity appears to be the most sustainable of energies and the most promising hope for a planet capable of growing without compromising its own health and that of its inhabitants. Power electronics and electrical drives are the key technologies that will allow energy savings through the reduction of energy losses in many applications. This Special Issue has collected several scientific contributions related to energy efficiency in electrical equipment. Some articles are dedicated to the use and optimization of permanent magnet motors, which allow obtaining the highest level of efficiency. Most of the contributions describe the energy improvements that can be achieved with power electronics and the use of suitable control techniques. Last but not least, some articles describe interesting solutions for hybrid vehicles, which were created mainly to save energy in the smartest way possible.

Permanent Magnet Synchronous and Brushless DC Motor Drives Sep 03 2022 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.

Permanent Magnet Synchronous and Brushless DC Motor Drives Jul 01 2022 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.

Power Electronics And Motor Drives: Advances And Trends Oct 12 2020

A New SCR Based Alternating Current Motor Drive with Wide Speed Range Feb 13 2021

Guide to European Electric Motors Feb 02 2020 A title in the well established, practical, and much used series of European Guides. Guide to European Electric Motors, Drives and Controls is compiled with the help of and benefit from the day-to-day practical experience of electric motor, drives and controls users, manufacturers and suppliers. It is not simply another treatise or textbook on motors although basic theory is comprehensively covered. Technically advanced and practical information shows users why problems or deficiencies with one design, leads to the use of another. Both electrical power supplies, their associated features and load considerations are covered, together with speed and torque controls systems using the latest solid state technologies. CONTENTS INCLUDE: Units, preferred numbers and standards Electric circuit analysis Basic motor theory and components Materials used in motors Motor loads and mechanical aspects Electrical supply systems Direct current motors construction and characteristics Asynchronous 3-phase motors - construction and characteristics Starting, reversing and braking 3-phase asynchronous motors Asynchronous single-phase motors - construction and characteristics Synchronous motors - construction and characteristics Control motors - construction and characteristics Equivalent circuits and performance assessment IC classifications Motors for potentially hazardous areas and motor cooling systems.

Design and Control of Electrical Motor Drives Mar 05 2020

Switched Reluctance Motor Drives Mar 17 2021 Electric motors are the largest consumer of electric energy and they play a critical role in the growing market for electrification. Due to their simple construction, switched reluctance motors (SRMs) are exceptionally attractive for the industry to respond to the increasing demand for high-efficiency, high-performance, and low-cost electric motors with a more secure supply chain. **Switched Reluctance Motor Drives: Fundamentals to Applications** is a comprehensive textbook covering the major aspects of switched reluctance motor drives. It provides an overview of the use of electric motors in the industrial, residential, commercial, and transportation sectors. It explains the theory behind the operation of switched reluctance motors and provides models to analyze them. The book extensively concentrates on the fundamentals and applications of SRM design and covers various design details, such as materials, mechanical construction, and controls. Acoustic noise and vibration is the most well-known issue in switched reluctance motors, but this can be reduced significantly through a multidisciplinary approach. These methodologies are explained in two chapters of the book. The first covers the fundamentals of acoustic noise and vibration so readers have the necessary tools to analyze the problems and explains the surface waves, spring-mass models, forcing harmonics, and mode shapes that are utilized in modeling and analyzing acoustic noise and vibration. The second applies these fundamentals to switched reluctance motors and provides examples for determining the sources of any acoustic noise in switched reluctance motors. In the final chapter two SRM designs are presented and proposed as replacements for permanent magnet machines in a residential HVAC application and a hybrid-electric propulsion application. It also shows a high-power and compact converter design for SRM drives. Features: Comprehensive coverage of switched reluctance motor drives from fundamental principles to design, operation, and applications A specific chapter on electric motor usage in industrial, residential, commercial, and transportation applications to address the benefits of switched reluctance machines Two chapters address acoustic noise and vibration in detail Numerous illustrations and practical examples on the design, modeling, and analysis of switched reluctance motor drives Examples of switched reluctance motor and drive design

Design of Industrial Electric Motor Drives Jan 15 2021

Sensorless Control of AC Motor Drives Jul 29 2019 Complete with a tutorial introduction, this convenient anthology of the foremost technical papers on sensorless control of AC motor drives discusses the full range of methods and schemes for cost-effective speed sensorless operation of induction motors, position sensorless operation of PM motors, sensorless operation of synchronous motors, and switched reluctance motors.

Switched Reluctance Motor Drives May 31 2022 Electric motors are the largest consumer of electric energy and they play a critical role in the growing market for electrification. Due to their simple construction, switched reluctance motors (SRMs) are exceptionally attractive for

the industry to respond to the increasing demand for high-efficiency, high-performance, and low-cost electric motors with a more secure supply chain. Switched Reluctance Motor Drives: Fundamentals to Applications is a comprehensive textbook covering the major aspects of switched reluctance motor drives. It provides an overview of the use of electric motors in the industrial, residential, commercial, and transportation sectors. It explains the theory behind the operation of switched reluctance motors and provides models to analyze them. The book extensively concentrates on the fundamentals and applications of SRM design and covers various design details, such as materials, mechanical construction, and controls. Acoustic noise and vibration is the most well-known issue in switched reluctance motors, but this can be reduced significantly through a multidisciplinary approach. These methodologies are explained in two chapters of the book. The first covers the fundamentals of acoustic noise and vibration so readers have the necessary tools to analyze the problems and explains the surface waves, spring-mass models, forcing harmonics, and mode shapes that are utilized in modeling and analyzing acoustic noise and vibration. The second applies these fundamentals to switched reluctance motors and provides examples for determining the sources of any acoustic noise in switched reluctance motors. In the final chapter two SRM designs are presented and proposed as replacements for permanent magnet machines in a residential HVAC application and a hybrid-electric propulsion application. It also shows a high-power and compact converter design for SRM drives. Features: Comprehensive coverage of switched reluctance motor drives from fundamental principles to design, operation, and applications A specific chapter on electric motor usage in industrial, residential, commercial, and transportation applications to address the benefits of switched reluctance machines Two chapters address acoustic noise and vibration in detail Numerous illustrations and practical examples on the design, modeling, and analysis of switched reluctance motor drives Examples of switched reluctance motor and drive design

Electric Vehicle Machines and Drives Sep 30 2019 A timely comprehensive reference consolidates the research and development of electric vehicle machines and drives for electric and hybrid propulsions • Focuses on electric vehicle machines and drives • Covers the major technologies in the area including fundamental concepts and applications • Emphasis the design criteria, performance analyses and application examples or potentials of various motor drives and machine systems • Accompanying website includes the simulation models and outcomes as supplementary material

Applied Intelligent Control of Induction Motor Drives Nov 24 2021 Induction motors are the most important workhorses in industry. They are mostly used as constant-speed drives when fed from a voltage source of fixed frequency. Advent of advanced power electronic converters and powerful digital signal processors, however, has made possible the development of high performance, adjustable speed AC motor drives. This book aims to explore new areas of induction motor control based on artificial intelligence (AI) techniques in order to make the controller less sensitive to parameter changes. Selected AI techniques are applied for different induction motor control strategies. The book presents a practical computer simulation model of the induction motor that could be used for studying various induction motor drive operations. The control strategies explored include expert-system-based acceleration control, hybrid-fuzzy/PI two-stage control, neural-network-based direct self control, and genetic algorithm based extended Kalman filter for rotor speed estimation. There are also chapters on neural-network-based parameter estimation, genetic-algorithm-based optimized random PWM strategy, and experimental investigations. A chapter is provided as a primer for readers to get started with simulation studies on various AI techniques. Presents major artificial intelligence techniques to induction motor drives Uses a practical simulation approach to get interested readers started on drive development Authored by experienced scientists with over 20 years of experience in the field Provides numerous examples and the latest research results Simulation programs available from the book's Companion Website This book will be invaluable to graduate students and research engineers who specialize in electric motor drives, electric vehicles, and electric ship propulsion. Graduate students in intelligent control, applied electric motion, and energy, as well as engineers in industrial electronics, automation, and electrical transportation, will also find this book helpful. Simulation materials available for download at www.wiley.com/go/chanmotor

Electric Motors and Drives Jul 21 2021 Electric Motors and Drives is intended for non-specialist users of electric motors and drives, filling the gap between theory-based academic textbooks and the more prosaic 'handbooks', which provide useful detail but little opportunity for the development of real insight and understanding. The book explores all of the widely-used modern types of motor and drive, including conventional and brushless D.C., induction motors and servo drives, providing readers with the knowledge to select the right technology for a given job. Austin Hughes' approach, using a minimum of maths, has established Electric Motors and Drives as a leading guide for engineers, and the key to a complex subject for a wider readership, including technicians, managers and students. Acquire essential practical knowledge of motors and drives, with a minimum of math and theory Updated material on the latest and most widely-used modern motors and drives New edition includes additional diagrams and worked examples throughout

Control Strategies of Permanent Magnet Synchronous Motor Drive for Electric Vehicles Jun 19 2021 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.

Brushless Permanent-magnet and Reluctance Motor Drives Oct 31 2019 A presentation of the theory of brushless d.c. drives to help engineers appreciate the potential of such motors and apply them more widely, by taking into account developments in permanent-magnet materials, power semiconductor, electronic control and motor design.

Electrical Engineer's Reference Book Dec 14 2020 For ease of use, this edition has been divided into the following subject sections: general principles; materials and processes; control, power electronics and drives; environment; power generation; transmission and distribution; power systems; sectors of electricity use. New chapters and major revisions include: industrial instrumentation; digital control systems; programmable controllers; electronic power conversion; environmental control; hazardous area technology; electromagnetic compatibility; alternative energy sources; alternating current generators; electromagnetic transients; power system planning; reactive power plant and FACTS controllers; electricity economics and trading; power quality. *An essential source of techniques, data and principles for all practising electrical engineers *Written by an international team of experts from engineering companies and universities *Includes a major new section on control systems, PLCs and microprocessors

Handbook of Automotive Power Electronics and Motor Drives Apr 05 2020 Initially, the only electric loads encountered in an automobile were for lighting and the starter motor. Today, demands on performance, safety, emissions, comfort, convenience, entertainment, and communications have seen the working-in of seemingly innumerable advanced electronic devices. Consequently, vehicle electric systems require larger capacities and more complex configurations to deal with these demands. Covering applications in conventional, hybrid-electric, and electric vehicles, the Handbook of Automotive Power Electronics and Motor Drives provides a comprehensive reference for automotive electrical systems. This authoritative handbook features contributions from an outstanding international panel of experts from industry and academia, highlighting existing and emerging technologies. Divided into five parts, the Handbook of Automotive Power Electronics and Motor Drives offers an overview of automotive power systems, discusses semiconductor devices, sensors, and other components, explains different power electronic converters, examines electric machines and associated drives, and details various advanced electrical loads as well as battery technology for automobile applications. As we seek to answer the call for safer, more efficient, and lower-emission vehicles from regulators and consumer insistence on better performance, comfort, and entertainment, the technologies outlined in this book are vital for engineering advanced vehicles that will satisfy these criteria.

Electric Motors: Application And Control Jun 07 2020

Electric Motor Drives in Power Plants Jan 03 2020

Entrepreneurship in Power Semiconductor Devices, Power Electronics, and Electric Machines and Drive Systems Aug 10 2020 Entrepreneurship in Power Semiconductor Devices, Power Electronics, and Electric Machines and Drive Systems introduces the basics of entrepreneurship and a methodology for the study of entrepreneurship in electrical engineering and other engineering fields. Entrepreneurship is considered here in three fields of electrical engineering, viz. power semiconductor devices, power electronics and electric machines and drive systems, and their current practice. It prepares the reader by providing a review of the subject matter in the three fields, their current status in research and development with analysis aspect as needed, thus allowing readers to gain self-sufficiency while reading the book. Each field's emerging applications, current market and future market forecasts are introduced to understand the basis and need for emerging startups. Practical learning is introduced in: (i) power semiconductor devices entrepreneurship through the prism of 20 startups in detail, (ii) power electronics entrepreneurship through 28 startup companies arranged under various application fields and (iii) electric machines and drive

systems entrepreneurship through 15 startups in electromagnetic and 1 in electrostatic machines and drive systems. The book: (i) demystifies entrepreneurship in a practical way to equip engineers and students with entrepreneurship as an option for their professional growth, pursuit and success; (ii) provides engineering managers and corporate-level executives a detailed view of entrepreneurship activities in the considered three fields that may potentially impact their businesses, (iii) provides entrepreneurship education in an electrical engineering environment and with direct connection and correlation to their fields of study and (iv) endows a methodology that can be effectively employed not only in the three illustrated fields of electrical engineering but in other fields as well. This book is for electrical engineering students and professionals. For use in undergraduate and graduate courses in electrical engineering, the book contains discussion questions, exercise problems, team and class projects, all from a practical point of view, to train students and assist professionals for future entrepreneurship endeavors.

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