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Advances in Smart Vehicular Technology, Transportation, Communication and Applications  
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Machine Design  
Non-conventional Electrical Machines  
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Advances in Intelligent Automation and Soft Computing  
Sensors and Actuators in Mechatronics  
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Development of Brushless Self-excited and Self-regulated Synchronous Generating System for Wind and Hydro Generators  
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Linear Synchronous Motors  
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Handbook of Electric Motors  
Advances in Intelligent Information Hiding and Multimedia Signal Processing  
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The proceedings of the 10th Frontier Academic Forum of Electrical Engineering (FAFEE2022)  
Permanent Magnet Motor Technology  
Proceedings of the 2015 International Conference on Electrical and Information Technologies for Rail Transportation

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Advances in Smart Vehicular Technology, Transportation, Communication and Applications Springer Nature

This volume of *Advances in Intelligent Systems and Computing* highlights papers presented at the 12th International Conference on Genetic and Evolutionary Computing (ICGEC 2018). Held from 14 to 17 December 2018 in Changzhou, Jiangsu, China, the conference was co-sponsored by Springer, Changzhou College of Information Technology, Fujian Provincial Key Lab of Big Data Mining and Applications, Fujian University of Technology, National Demonstration Center for Experimental Electronic Information and Electrical Technology Education, Fujian University of Technology, Tajen University, National University of Kaohsiung, and Shandong University of Science and Technology, China. The conference is intended as an international forum for the researchers and professionals in all areas of genetic and evolutionary computing.

The Role of Primary Motor Cortex as a Marker for and Modulator of Pain Control and Emotional-Affective Processing John Wiley & Sons

Considered to be the first book devoted to the subject, *Linear Synchronous Motors: Transportation and Automation Systems, Second Edition* evaluates the state of the art, demonstrating the technological innovations that are improving the design, construction, and performance of modern control systems. This new edition not only illustrates the development of linear synchronous motor drives, but it also discusses useful techniques for selecting a motor that will meet the specific requirements of linear electrical drives. New Features for the Second Edition: Several updated and expanded sections, as well as two new chapters on FEM Even more numerical examples, calculations, and mathematical models Broadened target audience that includes researchers, scientists, students, and more Evaluating trends and practical techniques for achieving optimal system performance, the authors showcase ready-to-implement solutions for common roadblocks in this process. The book presents fundamental equations and calculations used to determine and evaluate system operation, efficiency, and reliability, with an exploration of modern computer-aided design of linear synchronous motors, including the finite element approach. It covers topics such as linear sensors and stepping motors, magnetic levitation systems, elevators, and factory automation systems. It also features case studies on flat PM, tubular PM, air-cored, and hybrid linear synchronous motors, as well as 3D finite element method analysis of tubular linear reluctance motors, and linear oscillatory actuators. With such an exceptional presentation of practical tools and conceptual illustrations, this volume is an especially powerful resource. It will benefit readers from all walks by providing numerical examples, models, guidelines, and diagrams to help develop a clear understanding of linear synchronous motor operations, characteristics, and much more.

*Machine Design* CRC Press

Collection of selected, peer reviewed papers from the 2013 International Conference on

Mechatronics, Robotics and Automation (ICMRA 2013), June 13-14, 2013, Guangzhou, China. Volume is indexed by Thomson Reuters CPCI-S (WoS). The 447 papers are grouped as follows: Chapter 1: Theory of Mechanisms and Dynamic Systems; Chapter 2: Design and Control in Modern Mechantronics System Engineering; Chapter 3: Robotics and Real World Applications; Chapter 4: Sensor, Actuator Technology and Wireless Sensor Networks Applications; Chapter 5: Fluid and Flow Engineering, Control Technology; Chapter 6: Voice, Image and Video Processing, Recognition Technologies; Chapter 7: Signal Processing Systems Design and Implementation; Chapter 8: Measurement, Detection and Monitoring, Testing and Instruments; Chapter 9: Artificial Intelligence Techniques and Optimization Algorithms; Chapter 10: Intelligent Control Systems, Automation and Power Engineering; Chapter 11: Electronics/Microelectronics and Embedded Systems; Chapter 12: Computer Applications in Industry and Engineering, Computational and Mathematical Methods and Modelling; Chapter 13: Materials and Processing Technologies; Chapter 14: Product Design and Manufacture; Chapter 15: Industrial Engineering, Management and Education Engineering Applications.

**Non-conventional Electrical Machines** BoD – Books on Demand

With countless electric motors being used in daily life, in everything from transportation and medical treatment to military operation and communication, unexpected failures can lead to the loss of valuable human life or a costly standstill in industry. To prevent this, it is important to precisely detect or continuously monitor the working condition of a motor. *Electric Machines: Modeling, Condition Monitoring, and Fault Diagnosis* reviews diagnosis technologies and provides an application guide for readers who want to research, develop, and implement a more effective fault diagnosis and condition monitoring scheme—thus improving safety and reliability in electric motor operation. It also supplies a solid foundation in the fundamentals of fault cause and effect. Combines Theoretical Analysis and Practical Application Written by experts in electrical engineering, the book approaches the fault diagnosis of electrical motors through the process of theoretical analysis and practical application. It begins by explaining how to analyze the fundamentals of machine failure using the winding functions method, the magnetic equivalent circuit method, and finite element analysis. It then examines how to implement fault diagnosis using techniques such as the motor current signature analysis (MCSA) method, frequency domain method, model-based techniques, and a pattern recognition scheme. Emphasizing the MCSA implementation method, the authors discuss robust signal processing techniques and the implementation of reference-frame-theory-based fault diagnosis for hybrid vehicles. *Fault Modeling, Diagnosis, and Implementation in One Volume* Based on years of research and development at the Electrical Machines & Power Electronics (EMPE) Laboratory at Texas A&M University, this book describes practical analysis and implementation strategies that readers can use in their work. It brings together, in one volume, the fundamentals of motor fault conditions, advanced fault modeling theory, fault diagnosis techniques, and low-cost DSP-based fault diagnosis implementation strategies.

*Manufacturing Science and Technology, ICMST2011* CRC Press

From large-scale industrial systems to components in consumer applications, mechatronics has woven itself into the very fabric of modern technology. Among the most important elements of mechatronic systems are electromagnetic sensors and electromechanical actuators. Cultivated over years of industrial and research experience, *Sensors and Actuators in Mechatronics: Design and Applications* builds a practical understanding of the features and functions of various electromagnetic and electromechanical devices necessary to meet specific industrial requirements. This work focuses on various components that receive less attention in the available literature, such as magnetic sensors, linear and latching solenoid actuators, stepper motors, rotary actuators, and other special magnetic devices including magnetic valves and heart pumps. Each chapter follows a consistent format, working from theory to design, applications, and numerical problems and solutions. Although the crux of the coverage is design and application, the author also discusses optimization and testing, introduces magnetic materials, and shares his enlightened perspective on the social and business aspects of developing world-class technologies. Examples from mainly the automotive industry illustrate the wide variety of mechatronic devices presented. Providing a complete picture from conception to completion, *Sensors and Actuators in Mechatronics: Design and Applications* places critical tools in the hands of any researcher or engineer seeking to develop innovative mechatronic systems.

*Advances in Intelligent Automation and Soft Computing* CRC Press

This book presents papers from the International Conference on Power Transmissions 2016, held in Chongqing, China, 27th-30th October 2016. The main objective of this conference is to provide a forum for the most recent advances, addressing the challenges in modern mechanical transmissions. The conference proceedings address all aspects of gear and power transmission technology and a range of applications. The presented papers are catalogued into three main tracks, including design, simulation and testing, materials and manufacturing, and industrial applications. The design, simulation and testing track covers topics such as new methods and designs for all types of transmissions, modelling and simulation of power transmissions, strength, fatigue, dynamics and reliability of power transmissions, lubrication and sealing technologies and theories, and fault diagnosis of power transmissions. In the materials and manufacturing track, topics include new materials and heat treatment of power transmissions, new manufacturing technologies of power transmissions, improved tools to predict future demands on production systems, new technologies for ecologically sustainable productions and those which preserve natural resources, and measuring technologies of power transmissions. The proceedings also cover the novel industrial applications of power transmissions in marine, aerospace and railway contexts, wind turbines, the automotive industry, construction machinery, and robots.

**Sensors and Actuators in Mechatronics** Trans Tech Publications Ltd

This book gathers papers presented during the 4th International Conference on Electrical Engineering and Control Applications. It covers new control system models, troubleshooting tips and complex system requirements, such as increased speed, precision and remote capabilities. Additionally, the papers discuss not only the engineering aspects of signal processing and various practical issues in the broad field of information transmission, but also novel technologies for communication networks and modern antenna design. This book is intended for researchers,

engineers and advanced postgraduate students in the fields of control and electrical engineering, computer science and signal processing, as well as mechanical and chemical engineering.

*Advances in Guidance, Navigation and Control* Springer Nature

Comprehensively covers the fundamental scientific principles and technologies that are used in the design of modern computer-controlled machines and processes. Covers embedded microcontroller based design of machines Includes MATLAB®/Simulink®-based embedded control software development Considers electrohydraulic motion control systems, with extensive applications in construction equipment industry Discusses electric motion control, servo systems, and coordinated multi-axis automated motion control for factory automation applications Accompanied by a website hosting a solution manual

*Mechatronics, Robotics and Automation* World Scientific

This book features research presented at the 1st International Conference on Artificial Intelligence and Applied Mathematics in Engineering, held on 20-22 April 2019 at Antalya, Manavgat (Turkey). In today's world, various engineering areas are essential components of technological innovations and effective real-world solutions for a better future. In this context, the book focuses on problems in engineering and discusses research using artificial intelligence and applied mathematics. Intended for scientists, experts, M.Sc. and Ph.D. students, postdocs and anyone interested in the subjects covered, the book can also be used as a reference resource for courses related to artificial intelligence and applied mathematics.

**Finite Element Method** Springer

The electric vehicle and plug-in hybrid electric vehicle play a fundamental role in the forthcoming new paradigms of mobility and energy models. The electrification of the transport sector would lead to advantages in terms of energy efficiency and reduction of greenhouse gas emissions, but would also be a great opportunity for the introduction of renewable sources in the electricity sector. The chapters in this book show a diversity of current and new developments in the electrification of the transport sector seen from the electric vehicle point of view: first, the related technologies with design, control and supervision, second, the powertrain electric motor efficiency and reliability and, third, the deployment issues regarding renewable sources integration and charging facilities. This is precisely the purpose of this book, that is, to contribute to the literature about current research and development activities related to new trends in electric vehicle power trains.

*Proceedings of the 4th International Conference on Electrical Engineering and Control Applications*  
The Electrochemical Society

The late 1980s saw the beginning of the PM brushless machine era, with the invention of high-energy density permanent magnets (PM) and the development of power electronics. Although induction motors are now the most popular electric motors, the impact of PM brushless machines on electromechanical drives is significant. Today, PM machines come second to induction machines. Replacement of electromagnetic field excitation systems by PMs brings the following benefits: No electrical energy is absorbed by the field excitation system and thus there are no excitation losses, causing substantial increase in efficiency Higher power density (kW/kg) and/or torque density (Nm/kg) than electromagnetic excitation Better dynamic performance than motors with electromagnetic excitation (higher magnetic flux density in the air gap) Simplification of construction

and maintenance Less expensive for some types of machines Modern Permanent Magnet Electric Machines: Theory and Control serves as a textbook for undergraduate power engineering students who want to supplement and expand their knowledge in the fundamentals of magnetism, soft magnetic materials, permanent magnets (PMs), calculation of magnetic circuits with PMs, modern PM brushed DC machines and their controls, modern PM brushless DC motors and drive control, and modern PM generators. The book can help students learn more about electrical machines and can serve as a prescribed text for teaching elective undergraduate courses such as modern permanent magnet electrical machines. Since the book is written in a simple scientific language and without redundant mathematics, it can also be used by practicing engineers and managers employed in electrical machinery or electromagnetic device industries.

Mechatronics with Experiments kassel university press GmbH

This book consists of one hundred and seventeen selected papers presented at the 2015 International Conference on Electronics, Electrical Engineering and Information Science (EEEIS2015), which was held in Guangzhou, China, during August 07-09, 2015. EEEIS2015 provided an excellent international exchange platform for researchers to share their knowledge and results and to explore new areas of research and development. Global researchers and practitioners will find coverage of topics involving Electronics Engineering, Electrical Engineering, Computer Science, Technology for Road Traffic, Mechanical Engineering, Materials Science and Engineering Management. Experts in these fields contributed to the collection of research results and development activities. This book will be a valuable reference for researchers working in the field of Electronics, Electrical Engineering and Information Science. Contents: Electronics EngineeringElectrical EngineeringComputer Science and ApplicationTechnology for Road TrafficMechanical EngineeringMaterial Science and Material Processing TechnologyEngineering Management Readership: Researchers working in the field of Electronics, Electrical Engineering and Information Science.

Electric Machines John Wiley & Sons

The proceedings collect the latest research trends, methods and experimental results in the field of electrical and information technologies for rail transportation. The topics cover intelligent computing, information processing, communication technology, automatic control, and their applications in rail transportation etc. The proceedings can be a valuable reference work for researchers and graduate students working in rail transportation, electrical engineering and information technologies.

*Energy-Efficient Electric Motors, Revised and Expanded* CRC Press

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.

Electronics, Electrical Engineering and Information Science Springer Nature

Presents applied theory and advanced simulation techniques for electric machines and drives This

book combines the knowledge of experts from both academia and the software industry to present theories of multiphysics simulation by design for electrical machines, power electronics, and drives. The comprehensive design approach described within supports new applications required by technologies sustaining high drive efficiency. The highlighted framework considers the electric machine at the heart of the entire electric drive. The book also emphasizes the simulation by design concept—a concept that frames the entire highlighted design methodology, which is described and illustrated by various advanced simulation technologies. Multiphysics Simulation by Design for Electrical Machines, Power Electronics and Drives begins with the basics of electrical machine design and manufacturing tolerances. It also discusses fundamental aspects of the state of the art design process and includes examples from industrial practice. It explains FEM-based analysis techniques for electrical machine design—providing details on how it can be employed in ANSYS Maxwell software. In addition, the book covers advanced magnetic material modeling capabilities employed in numerical computation; thermal analysis; automated optimization for electric machines; and power electronics and drive systems. This valuable resource: Delivers the multi-physics know-how based on practical electric machine design methodologies Provides an extensive overview of electric machine design optimization and its integration with power electronics and drives Incorporates case studies from industrial practice and research and development projects Multiphysics Simulation by Design for Electrical Machines, Power Electronics and Drives is an incredibly helpful book for design engineers, application and system engineers, and technical professionals. It will also benefit graduate engineering students with a strong interest in electric machines and drives.

**Genetic and Evolutionary Computing** Springer

This book highlights recent advances in intelligent data analysis, computational intelligence, signal processing, and all associated applications of artificial intelligence. It gathers papers presented at the ECC 2017, the Fourth Euro-China Conference on Intelligent Data Analysis and Applications. The aim of the ECC was to provide an internationally respected forum for scientific research in the broad areas of intelligent data analysis, computational intelligence, signal processing, and all associated applications of artificial intelligence (AI). The fourth installment of the ECC was jointly organized by the University of Málaga, Spain; the VŠB - Technical University of Ostrava, Czech Republic; and Fujian University of Technology, Fuzhou, China. The conference took place in Málaga, Spain on October 9–11, 2017.

**Multiphysics Simulation by Design for Electrical Machines, Power Electronics and Drives**

Trans Tech Publications Ltd

The sensory and motor cortical homunculi proposed by Walter Penfield were a major landmark for the anatomical mapping of the brain. More than 60 years after, the development of new tools to investigate brain function non-invasively has increased our knowledge about the structure and functions of the primary motor Cortex (M1) beyond motor control in both humans and animals. This book highlights the role of the motor cortex that goes way beyond motor functioning. We were interested in both theoretical and empirical contributions related to electrophysiological, pharmacological, neuroimaging, and neuromodulatory studies exploring the role of M1 on non-motor functions, such as pain, abnormal neuroplasticity that may lead to chronic pain conditions; or the relationship between M1 and mental imagery or emotion. This book is comprised of 15 articles

published in this edited volume as a research topic collection in Frontiers in Human Neuroscience titled “The Role of Primary Motor Cortex as a Marker and Modulator of Pain Control and Emotional-Affective Processing.”

**Modern Permanent Magnet Electric Machines** Trans Tech Publications Ltd

Presenting current issues in electric motor design, installation, application, and performance, this second edition serves as the most authoritative and reliable guide to electric motor utilization and assessment in the commercial and industrial sectors. Covering topics ranging from motor energy and efficiency to computer-aided design and equipment selection, this reference assists professionals in all aspects of electric motor maintenance, repair, and optimization. It has been expanded by more than 40 percent to explore the most influential technologies in the field including electronic controls, superconducting generators, recent analytical tools, new computing capabilities, and special purpose motors.

**Maxwell Instruction Book** CRC Press

The developments of electrical machines are due to the convergence of material progress, improved calculation tools, and new feeding sources. Among the many recent machines, the authors have chosen, in this first book, to relate the progress in slow speed machines, high speed machines, and superconducting machines. The first part of the book is dedicated to materials and an overview of magnetism, mechanic, and heat transfer.

Power Transmissions John Wiley & Sons

This book presents select proceedings of the International Conference on Intelligent Automation and Soft Computing (IASC2021). Various topics covered in this book include AI algorithm, neural networks, pattern recognition, machine learning, blockchain technology, system engineering, computer vision and image processing, adaptive control and robotics, big data and data processing, networking and security. The book is a valuable reference for beginners, researchers, and professionals interested in artificial intelligence, automation, and soft computing.