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Due to increasing industry 4.0
practices, massive industrial

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process data is now available for researchers for modelling and optimization. Artificial Intelligence methods can be applied to the ever-increasing process data to achieve robust control against foreseen and

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unforeseen system fluctuations. Smart computing techniques, machine learning, deep learning, computer vision, for example, will be inseparable from the highly automated factories of tomorrow. Effective

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cybersecurity will be a must for all Internet of Things (IoT) enabled work and office spaces. This book addresses metaheuristics in all aspects of Industry 4.0. It covers metaheuristic applications in IoT,

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cyber physical systems, control systems, smart computing, artificial intelligence, sensor networks, robotics, cybersecurity, smart factory, predictive analytics and more.
Key features: Includes industrial

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case studies. Includes chapters on cyber physical systems, machine learning, deep learning, cybersecurity, robotics, smart manufacturing and predictive analytics. surveys current trends and challenges in metaheuristics

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and industry 4.0. Metaheuristic Algorithms in Industry 4.0 provides a guiding light to engineers, researchers, students, faculty and other professionals engaged in exploring and implementing

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industry 4.0 solutions in various systems and processes.

This conference will feature plenary speeches, tutorials, and technical sessions on HVDC technologies, including LCC HVDC, VSC HVDC, HVDC power

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grids, and DC power systems
Permanent magnet synchronous
(PMS) motors stand at the
forefront of electric motor
development due to their energy
saving capabilities and
performance potential. The

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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

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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

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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,

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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

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saving control schemes.

The procedure followed in the project begins with a brief introduction of the features that the studied motor, a permanent magnet synchronous motor (PMSM), has. The fact that the

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motor is synchronous permanent magnet has to do with its greater efficiency in comparison with the induction motor, which is the most used nowadays. Then, the project is conducted in two steps. The first one is the study

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of the PMSM mathematical modelling and the subsequent control method applied. The second one is the study of a sensorless control algorithm. Traditionally for speed dependent applications, some

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kind of sensor is used to read the motor speed and position and feed the value back to the controller. However, extra sensors require extra physical space in the application and it also introduces another source

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of failure in the system. Thus, with the additional purposes of reducing cost and maintenance needs, the sensor can be replaced by an estimator that mathematically estimates the speed or position of the rotor. All

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these implementations have been simulated with MATLAB/Simulink based on the mathematical models. To design a controlled drive, the stability characteristics of PMSM under open-loop control (without

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having any feedback for speed) are analysed. The analysis shows that the PMSM becomes unstable after exceeding a certain applied speed. After tuning the controllers, it has been analysed that the maximum

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speed that the closed-loop can control with a reasonable settling time is 750 rpm. The more speed that the motor achieves, the more settling time appears. Thus, there is an upper limit for the speed. For all the

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simulations, an optimal speed of 550 rpm has been used. The control structure and the design of the controllers are described. A rotor position estimation technique for sensorless operation is studied. The

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estimator uses predictor-corrector method where the difference between the estimated current and the measured current (current error) is used to correct a predicted rotor position. More investigations are

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still required for accurate rotor position estimation.

Advances in Technologies for
Generation, Transmission and
Storage

Control of Permanent Magnet
Synchronous Motors

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World Congress on Engineering
and Computer Science 2014
Automation, Control and Energy
Efficiency in Complex Systems
Metaheuristic Algorithms in
Industry 4.0
2020 4th International

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Conference on HVDC (HVDC)
Issues in Engineering Research
and Application: 2013 Edition is
a ScholarlyEditions™ book that
delivers timely, authoritative,
and comprehensive information
about Noise Control Engineering.

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The editors have built Issues in Engineering Research and Application: 2013 Edition on the vast information databases of ScholarlyNews.™ You can expect the information about Noise Control Engineering in this

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book to be deeper than what you can access anywhere else, as well as consistently reliable, authoritative, informed, and relevant. The content of Issues in Engineering Research and Application: 2013 Edition has

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been produced by the world ' s
leading scientists, engineers,
analysts, research institutions,
and companies. All of the
content is from peer-reviewed
sources, and all of it is written,
assembled, and edited by the

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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

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systems, including robots and entire fabrication processes. The Industrial Electronics Handbook, Second Edition combines traditional and new
This book includes high-quality research papers presented at

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3rd International Conference on Sustainable Communication Networks and Applications (ICSCN 2021), which is held at Surya Engineering College (SEC), Erode, India, during 29-30 July 2021. This book includes novel

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and state-of-the-art research discussions that articulate and report all research aspects, including theoretical and experimental prototypes and applications that incorporate sustainability into emerging

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applications. The book discusses and articulates emerging challenges in significantly reducing the energy consumption of communication systems and also explains development of a sustainable

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and energy-efficient mobile and wireless communication network. It includes best selected high-quality conference papers in different fields such as Internet of Things, cloud computing, data mining, artificial

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intelligence, machine learning,
autonomous systems, deep
learning, neural networks,
renewable energy sources,
sustainable wireless
communication networks, QoS,
network sustainability, and

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many other related areas.

*Introduces cutting-edge control systems to a wide readership of engineers and students *The first book on neuro-fuzzy control systems to take a practical, applications-based approach,

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backed up with worked
examples and case studies
*Learn to use VHDL in real-
world applications Introducing
cutting edge control systems
through real-world applications
Neural networks and fuzzy logic

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based systems offer a modern control solution to AC machines used in variable speed drives, enabling industry to save costs and increase efficiency by replacing expensive and high-maintenance DC motor systems.

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The use of fast micros has revolutionised the field with sensorless vector control and direct torque control. This book reflects recent research findings and acts as a useful guide to the new generation of control

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systems for a wide readership of advanced undergraduate and graduate students, as well as practising engineers. The authors guide readers quickly and concisely through the complex topics of neural

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networks, fuzzy logic, mathematical modelling of electrical machines, power systems control and VHDL design. Unlike the academic monographs that have previously been published on

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each of these subjects, this book combines them and is based round case studies of systems analysis, control strategies, design, simulation and implementation. The result is a guide to applied control systems

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design that will appeal equally to students and professional design engineers. The book can also be used as a unique VHDL design aid, based on real-world power engineering applications.

Smart Intelligent Computing and

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Applications

IAS'93

Permanent Magnet Synchronous
and Brushless DC Motor Drives

Conference Record of the 1993

IEEE Industry Applications

Conference, Twenty-eighth IAS

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Annual Meeting

Speed Sensorless Induction

Motor Drives for Electrical

Actuators: Schemes, Trends and

Tradeoffs

Applications and Performance

This monograph shows the

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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

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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

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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

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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

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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

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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

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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.

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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

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meaningful real systems.

The European Photovoltaic Solar Energy Conferences are dedicated to accelerating the impetus towards sustainable development of global PV markets. The 16th in the series,

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held in Glasgow UK, brought together more than 1500 delegates from 72 countries, and provided an important and vital forum for information exchange in the field. The Conference Proceedings place

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on record a new phase of market development and scientific endeavour in the PV industry, representing current and innovative thinking in all aspects of the science, technology, markets and

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business of photovoltaics. In three volumes, the Proceedings present some 790 papers selected for presentation by the scientific review committee of the 16th European Photovoltaic Solar Energy Conference. The

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comprehensive range of topics covered comprise: *

- Fundamentals, Novel Devices and New Materials
- * Thin Film Cells and Technologies
- * Space Cells and Systems
- * Crystalline Silicon Solar Cells and

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Technologies * PV Integration
in Buildings * PV Modules and
Components of PV Systems *
Implementation, Strategies,
National Programs and
Financing Schemes * Market
Deployment in Developing

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Countries These proceedings are an essential reference for all involved in the global PV industry- scientists, researchers, technologists and those with an interest in global market trends. The conference

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was organised by WIP-
Renewable Energies, Munich,
Germany.

This book focuses on the issues
of integrating large-scale
renewable power generation
into existing grids. The issues

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covered in this book include different types of renewable power generation along with their transmission and distribution, storage and protection. It also contains the development of medium voltage

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converters for step-up-
transformer-less direct grid
integration of renewable
generation units, grid codes and
resiliency analysis for large-
scale renewable power
generation, active power and

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frequency control and HVDC transmission. The emerging SMES technology for controlling and integrating large-scale renewable power systems is also discussed. Since the protection issues with large-

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scale distributed renewable power systems are different compared to the existing protection system for one way power flow, this book includes a new protection technique for renewable generators along

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with the inclusion of current status of smart grid. This book is a good reference for the researchers who are working the area of renewable power generation and smart grids. The proceedings covers

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advanced and multi-disciplinary research on design of smart computing and informatics. The theme of the book broadly focuses on various innovation paradigms in system knowledge, intelligence and sustainability

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that may be applied to provide realistic solution to varied problems in society, environment and industries. The volume publishes quality work pertaining to the scope of the conference which is extended

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towards deployment of emerging computational and knowledge transfer approaches, optimizing solutions in varied disciplines of science, technology and healthcare.
Selected Proceedings of

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ICIEES '17

Engineering Embedded Systems
Issues in Engineering Research
and Application: 2013 Edition
Intelligent and Efficient
Electrical Systems
Robust Advanced Design

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Techniques and Applications
Advanced Control Systems for
Electric Drives

**This book comprises select
papers from the international
conference on Research in
Intelligent and Computing in**

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Engineering (RICE 2019) held at Hanoi University of Industry, Hanoi, Vietnam. The volume focuses on current research on various computing models such as centralized, distributed, cluster, grid and cloud. The

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contents cover recent advances in wireless sensor networks, mobile ad hoc networks, internet of things, machine learning, grid and cloud computing, and their various applications. The book will help researchers as well as

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professionals to gain insight into the rapidly evolving fields of internet computing and data mining.

Despite two decades of massive strides in research and development on control

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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

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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

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converters for permanent magnet synchronous machines and control strategies for variable-speed operation. It introduces machines, power devices, inverters, and control, and addresses modeling,

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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

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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

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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

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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

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**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**

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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

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and for industrial audiences both in the U.S. and abroad, it will be a welcome addition to any engineer's library.

This book provides extensive information about advanced control techniques in electric

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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

Acces PDF Implementation Of Sensorless Speed Control For Induction using electric drives.

An interesting alternative for today's high efficiency variable speed drives is the Permanent Magnet-Assisted Synchronous Reluctance Motor drive, which belongs to the family of

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brushless synchronous AC motor drives. Generally, the reluctance torque of this motor is significant compared to the Permanent Magnet electrical torque. The advantage of increased reluctance torque is

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the decreased need of expensive permanent magnet (PM) material, which makes this solution thus cheaper than the respective permanent magnet motor. Also due to its synchronous operation,

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sensorless rotational control is possible along with higher power factor and better efficiency compared to the induction motor (IM). Therefore, this thesis first deals with the implementation of a vector

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control strategy for speed control of the PMA-synRM motor that can be applied to a washing machine application. The machine is supplied by a current controlled voltage source PWM inverter to control the

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instantaneous stator currents which are decided by the reference speed. Secondly, the thesis focuses on the sensorless speed operation of the PMA-SynRM to take advantage of the lower costs as well as increased

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system reliability which otherwise is not possible using the delicate speed or position sensors. The concept involves estimation of the rotor speed and/or position. There are several speed estimation

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**techniques proposed by
researchers and among them
the observer based technique is
proven and commonly used in
the industry. The only
requirements of the observer
system are a very fast signal**

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processor, specialized and optimized to perform complex mathematical calculations. The feasibility and effectiveness of the control techniques are verified using the experimental results, implemented using the

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Texas Instruments

**TMS320F2812 eZDSP controller
board and the overall motor
drive system in the laboratory.**

ICEECA 2019, 17–19 December

2019, Constantine, Algeria

Mechatronics and Automatic

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Control Systems

**DSP Based Sensorless Control
of Induction Motors
Handbook of Research on
Emerging Technologies for
Electrical Power Planning,
Analysis, and Optimization**

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**Transactions on Engineering
Technologies
Intelligent Computing in
Engineering
Advances in Machine Learning
Research and Application / 2012
Edition is a ScholarlyEditions™**

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**eBook that delivers timely,
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information about Machine
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Advances in Machine Learning
Research and Application / 2012
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Machine Learning in this eBook to
be deeper than what you can
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Research and Application / 2012**

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Edition has been produced by the world's leading scientists, engineers, analysts, research institutions, and companies. All of the content is from peer-reviewed sources, and all of it is written, assembled, and edited by the editors at ScholarlyEditions™ and

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available exclusively from us. You now have a source you can cite with authority, confidence, and credibility. More information is available at <http://www.ScholarlyEditions.com/>. Robust control has been a topic of active research in the last three

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**decades culminating in H_2/H_∞
and μ design methods followed
by research on parametric
robustness, initially motivated by
Kharitonov's theorem, the
extension to non-linear time delay
systems, and other more recent
methods. The two volumes of**

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Recent Advances in Robust Control give a selective overview of recent theoretical developments and present selected application examples. The volumes comprise 39 contributions covering various theoretical aspects as well as different application areas. The first

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volume covers selected problems in the theory of robust control and its application to robotic and electromechanical systems. The second volume is dedicated to special topics in robust control and problem specific solutions. Recent Advances in Robust Control will be

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a valuable reference for those interested in the recent theoretical advances and for researchers working in the broad field of robotics and mechatronics. This book is aimed at serving researchers, engineers, scientists, and engineering graduate and PhD

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students of engineering and physical science together with individuals interested in engineering and science. This book focuses on the application of engineering methods to complex systems including transportation, building, and manufacturing, with

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approaches representing a wide variety of disciplines of engineering and science. Throughout the book, great emphases are placed on engineering applications of complex systems, as well as the methodologies of automation, including artificial intelligence,

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automated and intelligent control, energy analysis, energy modelling, energy management, and optimised energy efficiency. The significant impact of recent studies that have been selected for presentation are of high interest in engineering complex systems. An attempt has

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been made to expose the reading audience of engineers and researchers to a broad range of theoretical and practical topics. The topics contained in the present book are of speci?c interest to engineers who are seeking expertise in transportation,

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building, and manufacturing technologies as well as mathematical modelling of complex systems, engineering approaches to engineering complex problems, automation via artificial intelligence methods, automated and intelligent control, and energy systems. The

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primary audience of this book are researchers, graduate students, and engineers in mechanical engineering, control engineering, computer engineering, electrical engineering, and science disciplines. In particular, the book can be used for training graduate

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and PhD students as well as senior undergraduate students to enhance their knowledge by taking a graduate or advanced undergraduate course in the areas of complex systems, control systems, energy systems, and engineering applications. The

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covered research topics are also of interest to engineers and academia who are seeking to expand their expertise in these areas.

Achieving the goal of green and environmentally friendly energy systems is not possible without the concept of energy storage. Such

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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

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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

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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

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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.

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**Proceedings of the 2013
International Conference on
Mechatronics and Automatic
Control Systems (ICMS2013)
Proceedings of the 7th International
Conference on Innovation,
Communication and Engineering
(ICICE 2018), November 9-14, 2018,**

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Hangzhou, China

**Proceedings of the Second
International Conference on SCI
2018, Volume 2**

**Large Scale Renewable Power
Generation**

Physics, Programs, Circuits

Recent Advances in Robust Control

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This volume contains thirty-nine revised and extended research articles, written by prominent researchers participating in the World Congress on Engineering and Computer Science 2014,

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**held in San Francisco,
October 22-24 2014. Topics
covered include engineering
mathematics, electrical
engineering, circuit design,
communications systems,
computer science, chemical**

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**engineering, systems
engineering and
applications of engineering
science in industry. This
book describes some
significant advances in
engineering technologies**

Acces PDF Implementation Of
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**and also serves as an
excellent source of
reference for researchers
and graduate students.
The book reports on the
latest advances and
applications of nonlinear**

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control systems. It consists of 30 contributed chapters by subject experts who are specialized in the various topics addressed in this book. The special chapters have been brought out in

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the broad areas of nonlinear control systems such as robotics, nonlinear circuits, power systems, memristors, underwater vehicles, chemical processes, observer design, output

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**regulation, backstepping
control, sliding mode
control, time-delayed
control, variables structure
control, robust adaptive
control, fuzzy logic control,
chaos, hyperchaos, jerk**

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**systems, hyperjerk systems,
chaos control, chaos
synchronization, etc. Special
importance was given to
chapters offering practical
solutions, modeling and
novel control methods for**

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**the recent research
problems in nonlinear
control systems. This book
will serve as a reference
book for graduate students
and researchers with a basic
knowledge of electrical and**

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**control systems
engineering. The resulting
design procedures on the
nonlinear control systems
are emphasized using
MATLAB software.
This book examines**

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mechatronics and automatic control systems. The book covers important emerging topics in signal processing, control theory, sensors, mechanic manufacturing systems and automation.

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**The book presents papers
from the 2013 International
Conference on Mechatronics
and Automatic Control
Systems in Hangzhou, held
in China during August
10-11, 2013.**

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This book gathers papers presented during the 4th International Conference on Electrical Engineering and Control Applications. It covers new control system models, troubleshooting tips

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and complex system requirements, such as increased speed, precision and remote capabilities. Additionally, the papers discuss not only the engineering aspects of

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**signal processing and
various practical issues in
the broad field of
information transmission,
but also novel technologies
for communication networks
and modern antenna design.**

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**This book is intended for
researchers, engineers and
advanced postgraduate
students in the fields of
control and electrical
engineering, computer
science and signal**

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**processing, as well as
mechanical and chemical
engineering.**

**Sensorless Speed Control of
Permanent Magnet-assisted
Synchronous Reluctance
Motor (PMA-synRM)**

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**Proceedings of ICSCN 2021
Advances of Science and
Technology
Fundamentals, Theory, and
Design
Sensorless AC Electric Motor
Control**

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**Proceedings of the
International Conference
Held in Glasgow 1-5 May
2000**

This volume represents the
proceedings of the 7th
International Conference on

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Innovation, Communication and Engineering (ICICE 2018), which was held in P.R. China, November 9-14, 2018. The conference aimed to provide an integrated communication platform for researchers in a wide range of fields including

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information technology, communication science, applied mathematics, computer science, advanced material science, and engineering. Hopefully, the conference and resulting proceedings will enhance interdisciplinary collaborations

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between science and engineering technologists in academia and industry within this unique international network.

Electric drives are everywhere, and with the looming promise of electric vehicles and renewable energy, they will become more

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complex and the demands on their capabilities will continue to increase. To keep up with these trends, students require hands-on knowledge and a keen understanding of the subtleties involved in the operation of modern electric drives. The best-

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selling first edition of Electric Drives provided such an understanding, and this Second Edition offers the same approach with up-to-date coverage of all major types of electric drives, both constant and variable speed. This book provides a self-

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contained treatment of low-, medium-, and large-power drives illustrated by numerous application examples, problems, digital simulation results, and test results for both steady state and dynamic operation. This edition features updated material

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in every chapter, including references; new material on AC brush series motors, capacitor-split inductor motors, single-phase PMSMs and switched reluctance motors, and tooth-wound PMSMs, all with numerical examples; new case

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studies on AC synchronous and induction motors; and a new chapter on control of electric generators. The companion CD-ROM features the full text, class slides for instructors, and MATLAB® simulations of 10 closed-loop drives, two of which

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are new to this edition. With a practical, hands-on approach, *Electric Drives, Second Edition* is the ideal textbook to help students design, simulate, build, and test modern electric drives, from simple to complex.

This volume of *Advances in*

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Intelligent and Soft Computing
contains accepted papers
presented at SOCO 2014, CISIS
2014 and ICEUTE 2014, all
conferences held in the beautiful
and historic city of Bilbao
(Spain), in June 2014. Soft
computing represents a

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collection or set of computational techniques in machine learning, computer science and some engineering disciplines, which investigate, simulate, and analyze very complex issues and phenomena. After a through peer-review process, the 9th SOCO

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2014 International Program Committee selected 31 papers which are published in these conference proceedings. In this relevant edition a special emphasis was put on the organization of special sessions. One special session was

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organized related to relevant topics as: Soft Computing Methods in Manufacturing and Management Systems. The aim of the 7th CISIS 2014 conference is to offer a meeting opportunity for academic and industry-related researchers belonging to the

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various, vast communities of Computational Intelligence, Information Security, and Data Mining. The need for intelligent, flexible behaviour by large, complex systems, especially in mission-critical domains, is intended to be the catalyst and

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the aggregation stimulus for the overall event. After a thorough peer-review process, the CISIS 2014 International Program Committee selected 23 papers and the 5th ICEUTE 2014 International Program Committee selected 2 papers

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which are published in these conference proceedings as well. This book presents selected papers from International Conference on Intelligent and Efficient Electrical Systems (ICIEES'17). The volume brings together content from both

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industry and academia. The book focuses on energy efficiency in electrical systems and covers en trende topics such as control of renewable energy systems. The collaborative industry-academia perspective of the conference ensures that equal emphasis is

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laid on novel topics and practical applications. The contents of this volume will prove useful to researchers and practicing engineers alike.

Sixteenth European Photovoltaic
Solar Energy Conference
Advances in Machine Learning

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Research and Application: 2012
Edition

Advances and Applications in
Nonlinear Control Systems
9th EAI International
Conference, ICAST 2021, Hybrid
Event, Bahir Dar, Ethiopia,
August 27-29, 2021,

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Proceedings, Part I

The Industrial Electronics

Handbook - Five Volume Set

Advanced Linear Machines and

Drive Systems

Air quality is

deteriorating, the globe is

warming, and petroleum

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resources are decreasing.
The most promising solutions
for the future involve the
development of effective and
efficient drive train
technologies. This
comprehensive volume meets
this challenge and

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opportunity by integrating
the wealth of disparate
information found in
scattered pape

This is a textbook for
graduate and final-year-
undergraduate computer-
science and electrical-

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engineering students interested in the hardware and software aspects of embedded and cyberphysical systems design. It is comprehensive and self-contained, covering everything from the basics

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to case-study
implementation. Emphasis is
placed on the physical
nature of the problem domain
and of the devices used. The
reader is assumed to be
familiar on a theoretical
level with mathematical

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tools like ordinary differential equation and Fourier transforms. In this book these tools will be put to practical use.

Engineering Embedded Systems begins by addressing basic material on signals and

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systems, before introducing
to electronics. Treatment of
digital electronics
accentuating synchronous
circuits and including high-
speed effects proceeds to
micro-controllers, digital
signal processors and

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programmable logic.

Peripheral units and decentralized networks are given due weight. The properties of analog circuits and devices like filters and data converters are covered to the extent

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desirable by a systems architect. The handling of individual elements concludes with power supplies including regulators and converters. The final section of the text is composed of four

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case studies: • electric-drive control, permanent magnet synchronous motors in particular; • lock-in amplification with measurement circuits for weight and torque, and moisture; • design of a

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simple continuous wave radar that can be operated to measure speed and distance; and • design of a Fourier transform infrared spectrometer for process applications. End-of-chapter exercises will assist the

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student to assimilate the tutorial material and these are supplemented by a downloadable solutions manual for instructors. The "pen-and-paper" problems are further augmented with laboratory activities. In

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addition to its student market, Engineering Embedded Systems will assist industrial practitioners working in systems architecture and the design of electronic measurement systems to keep up to date

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with developments in
embedded systems through
self study.

As the demand for efficient
energy sources continues to
grow around the globe,
electrical systems are
becoming more essential in

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an effort to meet these increased needs. As these systems are being utilized more frequently, it becomes imperative to find ways of optimizing their overall function. The Handbook of Research on Emerging

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Technologies for Electrical Power Planning, Analysis, and Optimization features emergent methods and research in the systemic and strategic planning of energy usage. Highlighting theoretical perspectives and

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empirical research, this handbook is a comprehensive reference source for researchers, practitioners, students, and professionals interested in the current advancements and efficient use in power systems.

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This book collects the latest theoretical and technological concepts in the design and control of various linear machines and drive systems. Discussing advances in the new linear machine topologies,

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integrated modeling, multi-objective optimization techniques, and high-performance control strategies, it focuses on emerging applications of linear machines in transportation and energy

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systems. The book presents both theoretical and practical/experimental results, providing a consistent compilation of fundamental theories, a compendium of current research and development

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activities as well as new
directions to overcome
critical limitations.

International Joint
Conference

SOCO'14-CISIS'14-ICEUTE'14

Electric Drives, Second
Edition

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Engineering Innovation and
Design

Study and Implementation of
a PMSM & Study of a
Sensorless Control Method
Theory and Applications in
Robotics and
Electromechanics

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Permanent Magnet Synchronous
Motor Drives for Gearless
Traction Elevators

*In case of induction motor,
the independent control of
flux and torque is achieved
by resolving the motor*

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current into two components, one contributing to flux and other to the torque. Here Rotor flux oriented vector control is presented and the implementation results are

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shown. To implement rotor flux oriented control, information of rotor flux is required, which is calculated using rotor flux model through speed feedback. For sensorless control, the speed

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and flux are estimated with the help of open loop calculation of the motor equations. Implementation of the above control algorithm requires high speed sampling of measured

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currents, their processing and calculations. These calculations are done with the help of software using TMS320F2812 digital signal processor. The induction motor model is first

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*developed and tested using
different reference frames.
The model is then simulated
for rotor flux oriented vector
control and then sensorless
control.*

This helpful resource covers

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a large range of information regarding electrical actuators. In particular, robustness, a very problematic issue, is fully explored in a dedicated chapter. The text also deals

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with the estimate of non-measurable mechanical variables by examining the estimate of load moment, then observation of the positioning of a command without mechanical sensor.

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Finally, it examines the conditions needed to measure variables and real implementation of numerical algorithms. This is a key working resource for electrical engineers.

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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

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*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*

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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

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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,

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*which overcomes the
problems of the classical
controller.*

*Development of Adaptive
Speed Observers for
Induction Machine System
Stabilization*

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*Neural and Fuzzy Logic
Control of Drives and Power
Systems*

*Integration of Electric
Vehicles and Battery
Storage Systems*

Sustainable Communication

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Networks and Application

Electrical Actuators

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