Reading free Power converters and ac electrical drives with linear neural networks energy power electronics and machines (Download Only)

Applied Control of Electrical Drives Power Converters and AC Electrical Drives with Linear Neural Networks Power Electronics and Ac Drives Modeling, Simulation and Control of Electrical Drives A First Course on Electrical Drives High Performance AC Drives ELECTRIC DRIVES Control of Electrical Drives Advanced Electrical Drives Electrical Machine Drives Control Modern Power Electronics and AC Drives High-Power Converters and AC Drives Variable Speed AC Drives with Inverter Output Filters Electric Machines and Electric Drives Fundamentals of Electrical Drives Electric Drives Fundamentals of Electrical Drives Power Electronics, Drives, and Advanced Applications Power Electronics and Motor Drives Fundamentals of Electric Drives Fundamentals of Electrical Drives Vector Control of AC Drives Basics of Electrical Drives High Performance Control of AC Drives with Matlab/Simulink Basics of Electrical Drives Advanced Control of Electrical Drives and Power Electronic Converters PID and Predictive Control of Electrical Drives and Power Converters using MATLAB / Simulink Introduction to Electric Power and Drive Systems Practical Variable Speed Drives and Power Electronics Modern Electrical Drives High Performance Control of AC Drives with Matlab / Simulink Models Electrical Machines and Drives Control in Power Electronics and Electrical Drives Vector Control and Dynamics of AC Drives Control of Electric Machine Drive Systems Electrical Drives and Controls Power Electronics and Electric Drives for Traction Applications PID and Predictive Control of Electrical Drives and Power Converters using MATLAB / Simulink Control in Power Electronics and Electrical Drives Power Electronics and Variable Frequency Drives

Applied Control of Electrical Drives 2015-09-17 provides an overall understanding of all aspects of ac electrical drives from the motor and converter to the implemented control algorithm with minimum mathematics needed demonstrates how to implement and debug electrical drive systems using a set of dedicated hardware platforms motor setup and software tools in vissimtm and plecstm no expert programming skills required allowing the reader to concentrate on drive development enables the reader to undertake real time control of a safe low voltage and low cost experimental drive this book puts the fundamental and advanced concepts behind electric drives into practice avoiding involved mathematics whenever practical this book shows the reader how to implement a range of modern day electrical drive concepts without requiring in depth programming skills it allows the user to build and run a series of ac drive concepts ranging from very basic drives to sophisticated sensorless drives hence the book is the only modern resource available that bridges the gap between simulation and the actual experimental environment engineers who need to implement an electrical drive or transition from sensored to sensorless drives as well as students who need to understand the practical aspects of working with electrical drives will greatly benefit from this unique reference

Power Converters and AC Electrical Drives with Linear Neural Networks 2017-12-19 the first book of its kind power converters and ac electrical drives with linear neural networks systematically explores the application of neural networks in the field of power electronics with particular emphasis on the sensorless control of ac drives it presents the classical theory based on space vectors in identification discusses control of electrical drives and power converters and examines improvements that can be attained when using linear neural networks the book integrates power electronics and electrical drives with artificial neural networks ann organized into four parts it first deals with voltage source inverters and their control it then covers ac electrical drive control focusing on induction and permanent magnet synchronous motor drives the third part examines theoretical aspects of linear neural networks particularly the neural exin family the fourth part highlights original applications in electrical drives and power quality ranging from neural based parameter estimation and sensorless control to distributed generation systems from renewable sources and active power filters simulation and experimental results are provided to validate the theories written by experts in the field this state of the art book requires basic knowledge of electrical machines and power electronics as well as some familiarity with control systems signal processing linear algebra and numerical analysis offering multiple paths through the material the text is suitable for undergraduate and postgraduate students theoreticians practicing engineers and researchers involved in applications of anns

Power Electronics and Ac Drives 1986 thanks to advances in power electronics device design digital signal processing technologies and energy efficient algorithms ac motors have become the backbone of the power electronics industry variable frequency drives vfd s together with ie3 and ie4 induction motors permanent magnet motors and synchronous reluctance motors have emerged as a new generation of greener high performance technologies which offer improvements to process and speed control product quality energy consumption and diagnostics analytics primarily intended for professionals and advanced students who are working on sensorless control predictive control direct torque control speed control and power quality and optimisation techniques for electric drives this edited book surveys state of the art novel control techniques for different types of ac machines the book provides a framework of different modeling and control algorithms using matlab simulink and presents design simulation and experimental verification techniques for the design of lower cost and more reliable and performant systems

Modeling, Simulation and Control of Electrical Drives 2019-07-27 the aim of revision is mainly to acquaint the students with the recent trends in the development of electric motors used as prime movers in electric drive systems the chapter on introduction to solid state controlled drives has been expanded to include sections on increasingly used brushless dcmotors and switched reluctance motors a separate chapter on the more commonly used position control drive motors namely stepper motors has been also incorporated the drives used in the fast growing petroleum industry have been included in the chapter on industrialapplications

A First Course on Electrical Drives 1989 variable speed is one of the important requirements in most of the electric drives earlier dc motors were the only drives that were used in industries requiring eration over a wide range of speed with step less variation or requiring fine ac racy of speed control such drives are known as high performance drives ac tors because of being highly coupled non linear devices can not provide fast dynamic response with normal controls however recently because of ready availability of power electronic devices and digital signal processors ac motors are beginning to be used for high performance drives field oriented control or

vector control has made a fundamental change with regard to dynamic perfo ance of ac machines vector control makes it possible to control induction or s chronous motor in a manner similar to control scheme used for the separately cited dc motor recent advances in artificial intelligence techniques have also contributed in the improvement in performance of electric drives this book presents a comprehensive view of high performance ac drives it may be considered as both a text book for graduate students and as an up to date monograph it may also be used by r d professionals involved in the impro ment of performance of drives in the industries the book will also be beneficial to the researchers pursuing work on sensorless and direct torque control of electric drives as up to date references in these topics are provided

High Performance AC Drives 2010-09-08 this book provides a comprehensive introduction to the fundamental concepts of electric drives and is eminently suited as a textbook for b e b tech amie and diploma courses in electrical engineering it can also be used most effectively by all those preparing for gate and upsc competitive examinations as well as by practising engineers the topics which range from principles and techniques to industrial applications include characteristic features of drives methods of braking and speed control electromagnetic and solid state control of motors motor ratings transients in drive systems and operation of stepper motors

ELECTRIC DRIVES 1999-01-01 electrical drives play an important role as electromechanical energy convert ers in transportation material handling and most production processes the ease of controlling electrical drives is an important aspect for meeting the in creasing demands by the user with respect to flexibility and precision caused by technological progress in industry as well as the need for energy conser vation at the same time the control of electrical drives has provided strong incentives to control engineering in general leading to the development of new control structures and their introduction to other areas of control this is due to the stringent operating conditions and widely varying specifications a drive may alternately require control of torque acceleration speed or position and the fact that most electric drives have in contrast to chem ical or thermal processes well defined structures and consistent dynamic characteristics during the last years the field of controlled electrical drives has undergone rapid expansion due mainly to the advances of semiconductors in the form of power electronics as well as analogue and digital signal electronics eventu ally culminating in microelectronics and microprocessors the introduction of electronically switched solid state power converters has renewed the search for adjustable speed ac motor drives not subject to the limitations of the mechanical commutator of dc drives which dominated the field for a century

Control of Electrical Drives 2001-08-10 this book provides a unique approach to derive model based torque controllers for all types of lorentz force machines i e dc synchronous and induction machines the rotating transformer model forms the basis for the generalized modeling approach of rotating field machines which leads to the development of universal field oriented control algorithms contrary to this direct torque control algorithms using observer based methods are developed for switched reluctance machines tutorials are included at the end of each chapter and the reader is encouraged to execute these tutorials in order to gain familiarity with the dynamic behavior of drive systems this updated edition uses plecs simulation and vector processing tools that were specifically adopted for the purpose of these hands on tutorials hence advanced electrical drives encourages learning by doing and the experienced drive specialist may find the simulation tools useful to design high performance torque controllers although it is a powerful reference in its own right when used in conjunction with the companion texts fundamentals of electrical drives and applied control of electrical drives this book provides a uniquely comprehensive reference set that takes readers all the way from understanding the basics of how electrical drives work to deep familiarity with advanced features and models to a mastery of applying the concepts to actual hardware in practice teaches readers to perform insightful analysis of ac electrical machines and drives introduces new modeling methods and modern control techniques for switched reluctance drives updated to use plecs simulation tools for modeling electrical drives including new and more experimental results numerous tutorials at end of each chapter to learn by doing step by step includes extra material featuring build and play lab modules for lectures and self study

Advanced Electrical Drives 2020-08-21 this comprehensive text examines existing and emerging electrical drive technologies the authors clearly define the most basic electrical drive concepts and go on to explain the most important details while maintaining a solid connection to the theory and design of the associated electrical machines also including links to a number of industrial applications the authors take their investigation of electrical drives beyond theory to examine a number of practical aspects of electrical drive control and application

key features provides a comprehensive summary of all aspects of controlled speed electrical drive technology including control and operation handling of electrical drives is solidly linked to the theory and design of the associated electrical machines added insight into problems and functions are illustrated with clearly understandable figures offers an understanding of the main phenomena associated with electrical machine drives considers the problem of bearing currents and voltage stresses of an electrical drive includes up to date theory and design guidelines taking into account the most recent advances this book s rigorous coverage of theoretical principles and techniques makes for an excellent introduction to controlled speed electrical drive technologies for electrical engineering msc or phd students studying electrical drives it also serves as an excellent reference for practicing electrical engineers looking to carry out design analyses and development of controlled speed electrical drives

Electrical Machine Drives Control 2016-11-14 quot a clear understanding of power electronics and ac drives is crucially important in a wide range of modern systems from household appliances to automated factories and it requires cross disciplinary expertise that many engineers lack now in modern power electronics and ac drives one of the world s leading experts covers every aspect of the topic including crucial innovations such as artificial intelligence advanced estimation and sensorless control this book is not only important as an advanced reference but also covers the material for one senior level and two graduate level courses book jacket

Modern Power Electronics and AC Drives 2002 a comprehensive reference of the latest developments in mv drive technology in the area of power converter topologies this new edition reflects the recent technological advancements in the mv drive industry such as advanced multilevel converters and drive configurations it includes three new chapters control of synchronous motor drives transformerless mv drives and matrix converter fed drives in addition there are extensively revised chapters on multilevel voltage source inverters and voltage source inverter fed drives this book includes a systematic analysis on a variety of high power multilevel converters illustrates important concepts with simulations and experiments introduces various megawatt drives produced by world leading drive manufacturers and addresses practical problems and their mitigations methods this new edition provides an in depth discussion and analysis of various control schemes for the mv synchronous motor drives examines new technologies developed to eliminate the isolation transformer in the mv drives discusses the operating principle and modulation schemes of matrix converter mc topology and multi module cascaded matrix converters cmcs for mv drives and their application in commercial mv drives bin wu is a professor and senior nserc rockwell automation industrial research chair in power electronics and electric drives at ryerson university canada he is a fellow of institute of electrical and electronics engineers ieee engineering institute of canada eic and canadian academy of engineering cae dr wu has published more than 400 papers and holds more than 30 granted pending us european patents he co authored several books including power conversion and control of wind energy systems and model predictive control of wind energy conversion systems both by wiley ieee press mehdi narimani is a postdoctoral research associate with the department of electrical and computer engineering at ryerson university canada and rockwell automation canada he is a senior member of ieee dr narimani is author co author of more than 50 technical papers and four us european patents issued pending review his current research interests include power conversion high power converters control of power electronics and renewable energy systems

High-Power Converters and AC Drives 2017-01-17 the advance of variable speed drives systems vsds engineering highlights the need of specific technical guidance provision by electrical machines and drives manufacturers so that such applications can be properly designed to present advantages in terms of both energy efficiency and expenditure this book presents problems and solutions related to inverter fed electrical motors practically orientated the book describes the reasons theory and analysis of those problems various solutions for individual problems are presented together with the complete design process modelling and simulation examples with matlab simulink on the companion website a key focus of variable speed ac drives with inverter output filters is to examine the state variables estimation and motor control structures which have to be modified according to the used solution filter in most control systems the structure and parameters are taken into account to make it possible for precise control of the motor this methodology is able to include modifications and extensions depending on specific control and estimation structures highly accessible this is an invaluable resource for practising r d engineers in drive companies power electronics control engineers and manufacturers of electrical drives senior undergraduate and postgraduate students in electronics and control engineering will also find it of value

Variable Speed AC Drives with Inverter Output Filters 2015-11-23 this book brings together the concepts of irtf and ufo to present a comprehensive and insightful analysis of ac electrical drives in terms of modelling and control the book includes build and play modules and a cd with realtime simulation tools

Electric Machines and Electric Drives 2013-09 electric drives provides a practical understanding of the subtleties involved in the operation of modern electric drives the third edition of this bestselling textbook has been fully updated and greatly expanded to incorporate the latest technologies used to save energy and increase productivity stability and reliability every phrase equation number and reference in the text has been revisited with the necessary changes made throughout in addition new references to key research and development activities have been included to accurately reflect the current state of the art nearly 120 new pages covering recent advances such as those made in the sensorless control of a c motor drives have been added as have two new chapters on advanced scalar control and multiphase electric machine drives all solved numerical examples have been retained and the 10 matlab simulink programs remain online thus electric drives third edition offers an up to date synthesis of the basic and advanced control of electric drives with ample material for a two semester course at the university level

Fundamentals of Electrical Drives 2011-10 encouraged by the response to the first edition and to keep pace with recent developments fundamentals of electrical drives second edition incorporates greater details on semi conductor controlled drives includes coverage of permanent magnet ac motor drives and switched reluctance motor drives and highlights new trends in drive technology contents were chosen to satisfy the changing needs of the industry and provide the appropriate coverage of modern and conventional drives with the large number of examples problems and solutions provided fundamentals of electrical drives second edition will continue to be a useful reference for practicing engineers and for those preparing for engineering service examinations

Electric Drives 2016-09-15 concern for reliable power supply and energy efficient system design has led to usage of power electronics based systems including efficient electric power conversion and power semiconductor devices this book provides integration of complete fundamental theory design simulation and application of power electronics and drives covering up to date subject components it contains twenty one chapters arranged in four sections on power semiconductor devices basic power electronic converters advanced power electronics converters power supplies electrical drives and advanced applications aimed at senior undergraduate and graduate students in electrical engineering and power electronics including related professionals this book includes electrical drives such as dc motor ac motor special motor high performance motor drives solar electrical hybrid vehicle and fuel cell drives reviews advances in renewable energy technologies wind pv hybrid power systems and their integration explores topics like distributed generation microgrid and wireless power transfer system includes simulation examples using matlab simulink and over four hundred solved unsolved and review problems

Fundamentals of Electrical Drives 2002-06-13 the industrial electronics handbook second edition combines traditional and newer more specialized knowledge that will help industrial electronics engineers develop practical solutions for the design and implementation of high power applications embracing the broad technological scope of the field this collection explores fundamental areas including analog and digital circuits electronics electromagnetic machines signal processing and industrial control and communications systems it also facilitates the use of intelligent systems such as neural networks fuzzy systems and evolutionary methods in terms of a hierarchical structure that makes factory control and supervision more efficient by addressing the needs of all production components enhancing its value this fully updated collection presents research and global trends as published in the ieee transactions on industrial electronics journal one of the largest and most respected publications in the field 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

Power Electronics, Drives, and Advanced Applications 2020-03-27 this text fills a need for a textbook that

presents the basic topics and fundamental concepts underlying electric machines power electronics and electric drives for electrical engineering students at the undergraduate level most existing books on electric drives concentrate either on converters and waveform analysis ignoring mechanical load dynamics or on motor characteristics giving short shrift to analysis of converters and controllers this book provides a complete overview of the subject at the right level for ee students the book takes readers through the analysis and design of a complete electric drives system including coverage of mechanical loads motors converters sensing and controllers in addition to serving as a text this book serves as a useful and practical reference for professional electric drives engineers

Power Electronics and Motor Drives 2018-10-03 suitable for undergraduate and postgraduate courses in electrical drives this book covers topics on dynamics and control of electrical drives selection of motor power rating dc induction and synchronous motor drives stepper motor and switched reluctance motor drives permanent magnet ac and brushless dc motor drives and more

Fundamentals of Electric Drives 2000 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

Fundamentals of Electrical Drives 2001 in this book fundamentals of electrical drives are discussed keeping in mind the students of electrical engineering dynamics of electrical drives characteristics of dc and ac motors while starting running and braking determination of rating and heating of motors are described in detail drives used in various industries are discussed in a separate chapter industrial applications solved examples and problems are given at the end of most of the chapters the book acquaints the students with the recent trends in the development of electric motors used as prime movers in electric drive systems the chapter on introduction to solid state controlled drives has been expanded to include sections on increasingly used brushless dc motors and switched reluctance motors a separate chapter on the more commonly used position control drive motors namely stepper motors has been also incorporated amazon in

Vector Control of AC Drives 2017-11-22 high performance control of ac drives with matlab simulink explore this indispensable update to a popular graduate text on electric drive techniques and the latest converters used in industry the second edition of high performance control of ac drives with matlab simulink delivers an updated and thorough overview of topics central to the understanding of ac motor drive systems the book includes new material on medium voltage drives covering state of the art technologies and challenges in the industrial drive system as well as their components and control current source inverter based drives pwm techniques for multilevel inverters and low switching frequency modulation for voltage source inverters this book covers three phase and multiphase more than three phase motor drives including their control and practical problems faced in the field e g adding lc filters in the output of a feeding converter are considered the new edition contains links to matlab simulink models and powerpoint slides ideal for teaching and understanding the material contained within the book readers will also benefit from the inclusion of a thorough introduction to high performance drives including the challenges and requirements for electric drives and medium voltage industrial applications an exploration of mathematical and simulation models of ac machines including dc motors and squirrel cage induction motors a treatment of pulse width modulation of power electronic dc ac converter including the classification of pwm schemes for voltage source and current source inverters examinations of harmonic injection pwm and field oriented control of ac machines voltage source and current source inverter fed drives and their control modelling and control of multiphase motor drive system supported with a companion website hosting

online resources perfect for senior undergraduate msc and phd students in power electronics and electric drives high performance control of ac drives with matlab simulink will also earn a place in the libraries of researchers working in the field of ac motor drives and power electronics engineers in industry

Basics of Electrical Drives 2015 discusses fundamentals of electrical drives this book describes in detail dynamics of electrical drives characteristics of dc and ac motors while starting running and braking and determination of rating and heating of motors

High Performance Control of AC Drives with Matlab/Simulink 2021-04-06 this contributed volume is written by key specialists working in multidisciplinary fields in electrical engineering linking control theory power electronics artificial neural networks embedded controllers and signal processing the authors of each chapter report the state of the art of the various topics addressed and present results of their own research laboratory experiments and successful applications the presented solutions concentrate on three main areas of interest motion control in complex electromechanical systems including sensorless control fault diagnosis and fault tolerant control of electric drives new control algorithms for power electronics converters the chapters and the complete book possess strong monograph attributes important practical and theoretical problems are deeply and accurately presented on the background of an exhaustive state of the art review many results are completely new and were never published before well known control methods like field oriented control foc or direct torque control dtc are referred as a starting point for modifications or are used for comparison among numerous control theories used to solve particular problems are nonlinear control robust control adaptive control lyapunov techniques observer design model predictive control neural control sliding mode control signal filtration and processing fault diagnosis and fault tolerant control

Basics of Electrical Drives 2015 a timely introduction to current research on pid andpredictive control by one of the leading authors on thesubject pid and predictive control of electric drives and powersupplies using matlab simulink examines the classical controlsystem strategies such as pid control feed forward control andcascade control which are widely used in current practice the authors share their experiences in actual design andimplementation of the control systems on laboratory test beds taking the reader from the fundamentals through to moresophisticated design and analysis the bookcontains sections on closed loop performance analysis in bothfrequency domain and time domain presented to help the designer inselection of controller parameters and validation of the controlsystem continuous time model predictive control systems aredesigned for the drives and power supplies and operationalconstraints are imposed in the design discrete time model predictive control systems are designed basedon the discretization of the physical models which will appeal toreaders who are more familiar with sampled data control system soft sensors and observers will be discussed for low costimplementation resonant control of the electric drives andpower supply will be discussed to deal with the problems of bias insensors and unbalanced three phase ac currents brings together both classical control systems and predictivecontrol systems in a logical style from introductory through toadvanced levels demonstrates how simulation and experimental results are usedto support theoretical analysis and the proposed designalgorithms matlab and simulink tutorials are given in each chapter to showthe readers how to take the theory to applications includes matlab and simulink software using xpc target forteaching purposes a companion website is available researchers and industrial engineers and graduate students onelectrical engineering courses will find this a valuableresource

Advanced Control of Electrical Drives and Power Electronic Converters 2016-09-30 an introduction to the analysis of electric machines power electronic circuits electric drive performance and power systems this book provides students with the basic physical concepts and analysis tools needed for subsequent coursework in electric power and drive systems with a focus on tesla s rotating magnetic field organized in a flexible format it allows instructors to select material as needed to fit their school s power program the first chapter covers the fundamental concepts and analytical methods that are common to power and electric drive systems the subsequent chapters offer introductory analyses specific to electric machines power electronic circuits drive system performance and simulation and power systems in addition this book provides students with an analytical base on which to build in advanced follow on courses examines fundamental power conversions dc dc ac dc and dc ac harmonics and distortion describes the dynamic computer simulation of a brushless dc drive to illustrate its performance with both a sinusoidal inverter voltage approximation and more realistic stator six step drive applied voltages includes in chapter short problems numerous worked examples and end of chapter problems to help readers review and more fully understand each topic

PID and Predictive Control of Electrical Drives and Power Converters using MATLAB / Simulink 2014-12-17 variable frequency drive vfd frequency drives reductiemotor

Introduction to Electric Power and Drive Systems 2017-02-28 electrical drives lie at the heart of most industrial processes and make a major contribution to the comfort and high quality products we all take for granted they provide the controller power needed at all levels from megawatts in cement production to milliwatts in wrist watches other examples are legion from the domestic kitchen to public utilities the modern electrical drive is a complex item comprising a controller a static converter and an electrical motor some can be programmed by the user some can communicate with other drives semiconductor switches have improved intelligent power modules have been introduced all of which means that control techniques can be used now that were unimaginable a decade ago nor has the motor side stood still high energy permanent magnets semiconductor switched reluctance motors silicon micromotor technology and soft magnetic materials produced by powder technology are all revolutionising the industry but the electric drive is an enabling technology so the revolution is rippling throughout the whole of industry

Practical Variable Speed Drives and Power Electronics 2003-07-30 a comprehensive guide to understanding ac machines with exhaustive simulation models to practice design and control nearly seventy percent of the electricity generated worldwide is used by electrical motors worldwide huge research efforts are being made to develop commercially viable three and multi phase motor drive systems that are economically and technically feasible focusing on the most popular ac machines used in industry induction machine and permanent magnet synchronous machine this book illustrates advanced control techniques and topologies in practice and recently deployed examples are drawn from important techniques including vector control direct torque control nonlinear control predictive control multi phase drives and multilevel inverters key features include systematic coverage of the advanced concepts of ac motor drives with and without output filter discussion on the modelling analysis and control of three and multi phase ac machine drives including the recently developed multi phase phase drive system and double fed induction machine description of model predictive control applied to power converters and ac drives illustrated together with their simulation models end of chapter questions with answers and powerpoint slides available on the companion website wiley com go aburub control this book integrates a diverse range of topics into one useful volume including most the latest developments it provides an effective guideline for students and professionals on many vital electric drives aspects it is an advanced textbook for final year undergraduate and graduate students and researchers in power electronics electric drives and motor control it is also a handy tool for specialists and practicing engineers wanting to develop and verify their own algorithms and techniques

Modern Electrical Drives 2013-06-29 this book aims to offer a thorough study and reference textbook on electrical machines and drives the basic idea is to start from the pure electromagnetic principles to derive the equivalent circuits and steady state equations of the most common electrical machines in the first parts although the book mainly concentrates on rotating field machines the first two chapters are devoted to transformers and dc commutator machines the chapter on transformers is included as an introduction to induction and synchronous machines their electromagnetics and equivalent circuits chapters three and four offer an in depth study of induction and synchronous machines respectively starting from their electromagnetics steady state equations and equivalent circuits are derived from which their basic properties can be deduced the second part discusses the main power electronic supplies for electrical drives for example rectifiers choppers cycloconverters and inverters much attention is paid to pwm techniques for inverters and the resulting harmonic content in the output waveform in the third part electrical drives are discussed combining the traditional rotating field and dc commutator electrical machines treated in the first part and the power electronics of part two field orientation of induction and synchronous machines are discussed in detail as well as direct torque control in addition also switched reluctance machines and stepping motors are discussed in the last chapters finally part 4 is devoted to the dynamics of traditional electrical machines also for the dynamics of induction and synchronous machine drives the electromagnetics are used as the starting point to derive the dynamic models throughout part 4 much attention is paid to the derivation of analytical models but of course the basic dynamic properties and probable causes of instability of induction and synchronous machine drives are discussed in detail as well with the derived models for stability in the small as starting point in addition to the study of the stability in the small a chapter is devoted to large scale dynamics as well e g sudden short circuit of synchronous machines the textbook is used as the course text for the bachelor s and master s programme in electrical and mechanical engineering at the faculty of

engineering and architecture of ghent university parts 1 and 2 are taught in the basic course fundamentals of electric drives in the third bachelor part 3 is used for the course controlled electrical drives in the first master while part 4 is used in the specialised master on electrical energy

High Performance Control of AC Drives with Matlab / Simulink Models 2012-04-13 contains 97 papers which provide a valuable overview of the latest technical innovations in this rapidly expanding field areas of development which receive particular attention include the emergence of power switching transistors the application of microprocessors to regulation and control of static converters and electrical drives the use of more sophisticated control strategies and the utilization of power electronics in new application fields

Electrical Machines and Drives 2018-01-20 electric drive systems is an area of great change and increasing commercial importance in industry today written by experts in the field this book takes account of recent developments these have been due largely to the advances in power electronics and computer control in turn they have made possible the implementation of a c drive systems in place of d c topics include inverter machine dynamics constant speed behavior and the development of conventional equivalent circuits vector controlled systems and current regulators

Control in Power Electronics and Electrical Drives 2014-06-28 a unique approach to sensorless control and regulator design of electric drives based on the author s vast industry experience and collaborative works with other industries control of electric machine drive systems is packed with tested implemented and verified ideas that engineers can apply to everyday problems in the field originally published in korean as a textbook this highly practical updated version features the latest information on the control of electric machines and apparatus as well as a new chapter on sensorless control of ac machines a topic not covered in any other publication the book begins by explaining the features of the electric drive system and trends of development in related technologies as well as the basic structure and operation principles of the electric machine it also addresses steady state characteristics and control of the machines and the transformation of physical variables of ac machines using reference frame theory in order to provide a proper foundation for the material the heart of the book reviews several control algorithms of electric machines and power converters explaining active damping and how to regulate current speed and position in a feedback manner seung ki sul introduces tricks to enhance the control performance of the electric machines and the algorithm to detect the phase angle of an ac source and to control dc link voltages of power converters topics also covered are vector control control algorithms for position speed sensorless drive of ac machines methods for identifying the parameters of electric machines and power converters the matrix algebra to model a three phase ac machine in d q n axes every chapter features exercise problems drawn from actual industry experience the book also includes more than 300 figures and offers access to an ftp site which provides matlab programs for selected problems the book s practicality and realworld relatability make it an invaluable resource for professionals and engineers involved in the research and development of electric machine drive business industrial drive designers and senior undergraduate and graduate students to obtain instructor materials please send an email to pressbooks ieee org to visit this book s ftp site to download matlab codes please click on this link ftp ftp wiley com public sci tech med electric machine matlab codes are also downloadable from wiley booksupport site at booksupport wiley com

Vector Control and Dynamics of AC Drives 1996 power electronics and electric drives for traction applications offers a practical approach to understanding power electronics applications in transportation systems ranging from railways to electric vehicles and ships it is an application oriented book for the design and development of traction systems accompanied by a description of the core technology the first four introductory chapters describe the common knowledge and background required to understand the preceding chapters after that each application specific chapter highlights the significant manufacturers involved provides a historical account of the technological evolution experienced distinguishes the physics and mechanics and where possible analyses a real life example and provides the necessary models and simulation tools block diagrams and simulation based validations key features surveys power electronics state of the art in all aspects of traction applications presents vital design and development knowledge that is extremely important for the professional community in an original simple clear and complete manner offers design guidelines for power electronics traction systems in high speed rail ships electric hybrid vehicles elevators and more applications application specific chapters co authored by traction industry expert learning supplemented by tutorial sections case studies and matlab simulink based simulations with data from practical systems a valuable reference for application engineers in traction industry responsible for design and development of products as well as traction industry researchers developers and

graduate students on power electronics and motor drives needing a reference to the application examples

Control of Electric Machine Drive Systems 2011-04-20 a timely introduction to current research on pid and predictive control by one of the leading authors on the subject pid and predictive control of electric drives and power supplies using matlab simulink examines the classical control system strategies such as pid control feed forward control and cascade control which are widely used in current practice the authors share their experiences in actual design and implementation of the control systems on laboratory test beds taking the reader from the fundamentals through to more sophisticated design and analysis the book contains sections on closed loop performance analysis in both frequency domain and time domain presented to help the designer in selection of controller parameters and validation of the control system continuous time model predictive control systems are designed for the drives and power supplies and operational constraints are imposed in the design discrete time model predictive control systems are designed based on the discretization of the physical models which will appeal to readers who are more familiar with sampled data control system soft sensors and observers will be discussed for low cost implementation resonant control of the electric drives and power supply will be discussed to deal with the problems of bias in sensors and unbalanced three phase ac currents brings together both classical control systems and predictive control systems in a logical style from introductory through to advanced levels demonstrates how simulation and experimental results are used to support theoretical analysis and the proposed design algorithms matlab and simulink tutorials are given in each chapter to show the readers how to take the theory to applications includes matlab and simulink software using xpc target for teaching purposes a companion website is available researchers and industrial engineers and graduate students on electrical engineering courses will find this a valuable resource

Electrical Drives and Controls 2004 this original contributed volume combines the individual expertise of eleven world renowned professionals to provide comprehensive authoritative coverage of state of the art power electronics and ac drive technology featuring an extensive introductory chapter by power electronics expert bimal k bose and more than 400 figures power electronics and variable frequency drives covers each of the field s component disciplines and drives all in one complete resource broad in scope and unique in its presentation this volume belongs on the bookshelf of every industry engineer professor graduate student and researcher involved in this fast growing multidisciplinary field it is an essential for teaching research development and design

Power Electronics and Electric Drives for Traction Applications 2016-09-13

PID and Predictive Control of Electrical Drives and Power Converters using MATLAB / Simulink 2015-03-02

Control in Power Electronics and Electrical Drives 1974

Power Electronics and Variable Frequency Drives 1997