

1. Record Nr.	UNINA9910790150003321
Autore	Abu-Rub Haithem
Titolo	High performance control of AC drives with MATLAB/Simulink models [[electronic resource] /] / Haitham Abu-Rub, Atif Iqbal, Jaroslaw Guzinski
Pubbl/distr/stampa	Chichester, West Sussex ; ; Hoboken, NJ, : Wiley, 2012
ISBN	1-119-94210-1 1-280-58869-1 9786613618528 1-119-96924-7 1-119-96923-9
Descrizione fisica	1 online resource (502 p.)
Classificazione	SCI064000
Altri autori (Persone)	IqbalAtif GuzinskiJaroslaw
Disciplina	621.46
Soggetti	Electric motors, Alternating current - Computer simulation Electric motors, Alternating current - Automatic control
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Note generali	Description based upon print version of record.
Nota di bibliografia	Includes bibliographical references and index.
Nota di contenuto	Machine generated contents note: Chapter 1: Introduction to High Performance Drives 1.1 Preliminary Remarks 1.2 General Overview of High Performance Drives 1.3 Challenges and Requirements for Electric Drives for Industrial Applications 1.4 Organization of the Book References Chapter 2: Mathematical and Simulation Models of AC Machines 2.1 Preliminary Remarks 2.2 DC Motors 2.2.1 Separately Excited DC Motor Control 2.2.2 Series DC Motor Control 2.3 Squirrel Cage Induction Motor 2.3.1 Space vector representation 2.3.2 Per unit model of Induction Motor 2.3.3 Double Fed Induction Generator (DFIG) 2.4 Mathematical Model of Permanent Magnet Synchronous Motor Problems References Chapter 3: Pulse Width Modulation of Power Electronic DC-AC Converter 3.1 Preliminary Remarks 3.2 Classification of Pulse Width Modulation Schemes for Voltage source inverter 3.3 Pulse Width Modulated Inverters 3.3.1 Single Phase Half Bridge Inverters 3.3.1.1 Matlab/Simulink Model of Half Bridge Inverter 3.3.2 Single Phase Full Bridge Inverters 3.3.2.1 Matlab/Simulink Model of

Single-phase Full-Bridge Inverter 3.4 Three-phase PWM voltage source inverter 3.4.1 Carrier based Sinusoidal PWM 3.4.2 Third Harmonic Injection Carrier-based PWM 3.4.3 Carrier-based PWM With Offset Addition 3.4.4 Space Vector PWM 3.4.5 Discontinuous Space Vector PWM 3.4.6 Matlab/Simulink Model for space vector PWM 3.4.7 Space Vector PWM in Over-modulation Region 3.4.8 Artificial Neural Network Based PWM 3.5 Relationship Between Carrier-based PWM and Space Vector PWM 3.6 Multi-level Inverters 3.6.1 Diode Clamped Multi-level Inverters 3.6.2 Flying Capacitor Type Multi-level Inverter 3.6.3 Cascaded H-Bridge Multi-level Inverter 3.7 Impedance Source or Z-Source Inverter 3.7.1 Circuit Analysis 3.7.2 Carrier-based Simple Boost PWM control of a Z-source Inverter 3.7.3 Carrier-based Maximum Boost PWM control of a Z-source Inverter 3.7.4 Matlab/Simulink model of Z-source inverter 3.8 Quasi Impedance Source or qZSI Inverter 3.8.1 Matlab/Simulink model of qZ-source inverter 3.9 Dead Time Effect in a Multi-phase Inverter 3.10 Summary References Chapter 4: Field Oriented Control of AC Machines 4.1 Introduction 4.2 Induction Machines Control 4.2.1 Control of Induction Motor using V/f method 4.2.2 Vector Control of Induction Motor [4.1-4.16] 4.2.3 Direct and Indirect Field Oriented Control 4.2.4 Rotor and stator flux computation 4.2.5 Adaptive flux observer 4.2.6 Stator Flux Orientation 4.2.7 Field Weakening Control 4.3 Vector Control of Double Fed Induction Generator (DFIG) 4.3.1 Introduction 4.3.2 Vector Control of DFIG connected with the Grid (abModel) 4.3.3 Simulation Results 4.4 Control of Permanent Magnet Synchronous Machine 4.4.1 Introduction 4.4.2 Vector Control of PMSM in dq axis 4.4.3 Vector Control of PMSM in a-baxis using PI controller 4.4.4 Scalar Control of PMSM Exercises Additional tasks Possible tasks for DFIG References Chapter 5: XXXXXXXXXX Chapter 6: Nonlinear Control of Electrical Machines Using Nonlinear Feedback 6.1 Introduction 6.2 dynamic system linearization using non-linear feedback 6.3 Nonlinear Control of Separately Excited DC Motor 6.3.1 Matlab/Simulink Nonlinear Control Model 6.3.2 Nonlinear Control Systems 6.3.3 Speed Controller 6.3.4 Control for variable m 6.3.5 Field Current Controller 6.3.6 Simulation Results 6.4 Multiscalar model (MM) of induction motor 6.4.1 Multiscalar variables 6.4.2 Nonlinear linearization of induction motor fed by voltage controlled VSI 6.4.3 Design of system control 6.4.4 Nonlinear linearization of induction motor fed by current controlled VSI 6.4.5 Stator oriented nonlinear control system (based on Y_s, i_s) 6.4.6 Rotor-Stator Fluxes based Model 6.4.7 Stator Oriented Multiscalar Model 6.4.8 Multiscalar Control of Induction Motor 6.4.9 Induction Motor Model 6.4.10 State Transformation 6.4.11 Decoupled IM Model 6.5 MM of double fed induction machine (DFIM) 6.6 Nonlinear Control of Permanent Magnet Synchronous Machine 6.6.1 Nonlinear Control of PMSM for a dq motor model 6.6.2 Nonlinear Vector Control of PMSM in a-baxis 6.6.3 PMSM in a-b(x-y) axis 6.6.4 Transformation 6.6.5 Control System 6.6.6 Simulation Results Problems References Chapter 7: Five-Phase Induction Motor Drive System 7.1 Preliminary remarks 7.2 Advantages and Applications of Multi-phase drives 7.3 Modelling and Simulation of a Five-phase Induction motor drive 7.3.1 Five-phase Induction motor model 7.3.1.1 Phase variable model 7.3.1.2 Model transformation 7.3.1.3 Machine model in an arbitrary common reference frame 7.3.1.4 Matlab/Simulink model of main fed five-phase induction motor drive 7.3.2 Five-phase Two-level Voltage source Inverter Model 7.3.2.A Ten-Step Mode of Operation 7.3.2.A.1 Fourier analysis of the five-phase inverter output voltages 7.3.2.A.2 Matlab/Simulink Modelling for Ten-step Mode 7.3.2.A.3 Prototype of a five-phase VSI for ten-step operation 7.3.2.A.4 Experimental Results

for Ten-Step mode 7.3.2.A.5 PWM mode of operation of five-phase VSI
7.3.3 PWM Schemes of a Five-phase VSI 7.3.3.1 Carrier-based
Sinusoidal PWM scheme 7.3.3.2 Matlab/Simulink simulation of Carrier-
based sinusoidal PWM 7.3.3.3 5th Harmonic Injection Based pulse width
modulation scheme 7.3.3.4 Matlab/Simulink simulation of 5th
harmonic injection PWM 7.3.3.5 Offset addition based pulse width
modulation scheme 7.3.3.6 Space Vector Pulse Width Modulation
Scheme 7.3.3.7 Matlab/Simulink model of SVPWM 7.4 Indirect Rotor
Field Oriented Control of Five-phase induction motor 7.4.1
Matlab/Simulink Model of Field oriented control of five-phase Induction
machine 7.5 Field Oriented Control of Five-phase induction motor with
current control in the Synchronous reference frame 7.6 Model
Predictive Control (MPC) 7.6.1 MPC Applied to a Five-phase Two-Level
VSI 7.6.2 Matlab/Simulink of MPC for Five-phase VSI 7.7 Summary 7.8
Bibliography Chapter 8: Sensorless Speed Control of AC Machines 8.1
Preliminary Remarks 8.2 Sensorless Control of Induction Motor 8.2.1
Observer 1 8.2.2 Observer 2 8.2.3 Observer 3 8.2.4 MRAS- (closed
loop) speed estimator 8.2.5 The use of power measurements 8.3
Sensorless Control of PMSM 8.3.1 Control system of PMSM 8.3.2
Adaptive backstepping observer 8.3.3 Model Reference Adaptive
System for PMSM 8.3.4 Simulation Results 8.4 MRAS-Based Sensorless
Control of Five-Phase Induction Motor Drive 8.4.1 MRAS-BASED SPEED
ESTIMATOR 8.4.2 Simulation Results References Chapter 9: Selected
Problems of Induction Motor Drives with Voltage Inverter and Inverter
Output Filters 9.1 Drives and filters - overview 9.2 Three phase to two
phase transformations 9.3 Voltage and current common mode
component 9.3.1 Matlab/Simulink model of induction motor drive with
PWM inverter and common mode voltage 9.4 Induction motor common
mode circuit 9.5 Bearing current types and reduction methods 9.5.1
Common mode choke 9.5.2 Common mode transformers 9.5.3
Common mode voltage reduction by PWM modifications 9.6 Inverter
output filters 9.6.1 Selected structures of inverter output filters 9.6.2
Inverter output filters design 9.6.3 Motor choke 9.6.4 Matlab/Simulink
model of induction motor drive with PWM inverter and differential mode
(normal mode) LC filter 9.7 Estimation problems in the drive with filters
9.7.1 Introduction 9.7.2 Speed observer with disturbances model 9.7.3
Simple observer based on motor stator models 9.8 Motor control
problems in the drive with filters 9.8.1 Introduction 9.8.2 Field oriented
control 9.8.3 Nonlinear field oriented control 9.8.4 Nonlinear
multiscalar control 9.9 Predictive current control in the drive system
with output filter 9.9.1 Control system 9.9.2 Predictive current
controller 9.9.3 EMF estimation technique 9.10 Problems 9.11
Questions 9.12 References Index.

Sommario/riassunto

"This book will provide an initial guideline to students and
professionals. It focuses on the advanced control of AC machines and
will keep the readers abreast with the latest technology"--

2. Record Nr.	UNICAMPANIAVAN00056432
Autore	Rayleigh, John W. S.
Titolo	1 / by John William Strutt Rayleigh ; with a historical introduction by Robert Bruce Lindsay
Pubbl/distr/stampa	New York, : Dover, 1945
ISBN	978-04-86602-92-9
Edizione	[2. ed]
Descrizione fisica	XLII, 480 p. ; 22 cm
Soggetti	76-XX - Fluid mechanics [MSC 2020]
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia