

Read Book Vector
Control Of Ac
Drives
Vector

**Control Of
Ac Drives**

This book addresses the vector control of three-phase AC machines, in particular induction motors with squirrel-cage rotors (IM), permanent magnet

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synchronous motors (PMSM) and doubly-fed induction machines (DFIM), from a practical design and development perspective. The main focus is on the application of IM and PMSM in electrical drive systems, where field-orientated

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control has been successfully established in practice. It also discusses the use of grid-voltage oriented control of DFIMs in wind power plants.

This second, enlarged edition includes new insights into flatness-based nonlinear control of IM, PMSM and DFIM. The book

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is useful for practitioners as well as development engineers and designers in the area of electrical drives and wind-power technology. It is a valuable resource for researchers and students.

The book deals with the problem area of

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the vector control of the three-phase AC machines like that one of the induction motor with squirrel-cage rotor (IMSR), the permanentmagnet excited synchronous motor (PMSM) and that one of the doubly fed induction machine (DFIM) from the view of the practical

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development. It is primarily about the use of the IMSR as well as the PMSM in the electrical drive systems, at which the method of the field-oriented control has been successful in the practice, and about the use of the grid voltage oriented controlled DFIM in

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the wind power plants. After a summary of the basic structure of a field-oriented controlled three-phase AC drive, the main points of the design and of the application are explained. The detailed description of the design rules forms the main emphasis of the book. The

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description is expanded and made understandable by numerous formulae, pictures and diagrams. Using the basic equations, first the continuous and then the discrete machine models of the IMSR as well as of the PMSM are derived. The vectorial two-

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dimensional current controllers, which are designed with help of the discrete models, are treated in detail in connection with other essential problems like system boundary condition and control variable limitation. Several alternative controller configurations are

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introduced. The voltage vector modulation, the field orientation and the coordinate transformations are treated also from the view of the practical handling. The problems like the parameter identification, parameter adaptation

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and the management of machine states, which are normally regarded as abstract, are so represented that the book reader does not receive only attempts but also comprehensible solutions for his system. The practical style in the description of the design rules of

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the drive systems are also continued consistently for the wind power systems using the DFIM. The represented control concept is proven practically and can be regarded as pioneering for new developments. The introduced control structures of the three

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machine types have led to a relatively mature stage of development in the practice. Some disadvantages have nevertheless remained at these linear control concepts, which have to be cleared only with nonlinear controllers. Going out from the structural nonlinearity

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of the machines, the suitable nonlinear models are derived. After that, nonlinear controllers are designed on the basis of the method of the "exact linearization" which proves to be the most suitable in comparison with other methods like "backstepping-based

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or passivity-based designs".

After a brief introduction to the main law of physics and fundamental concepts inherent in electromechanical conversion, Vector Control of Induction Machines introduces the standard mathematical models

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for induction machines – whichever rotor technology is used – as well as several squirrel-cage induction machine vector-control strategies. The use of causal ordering graphs allows systematization of the design stage, as well as standardization

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of the structure of control devices.

Vector Control of Induction Machines suggests a unique approach aimed at reducing parameter sensitivity for vector controls based on a theoretical analysis of this sensitivity. This analysis naturally leads to the

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introduction of control strategies that are based on the combination of different controls with different robustness properties, through the use of fuzzy logic supervisors. Numerous applications and experiments confirm the validity of this simple solution, which

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is both reproducible and applicable to other complex systems. Vector Control of Induction Machines is written for researchers and postgraduate students in electrical engineering and motor drive design. Vector-control AC Drives. Student

Read Book Vector Control Of Ac Drives Manual

Power Converters and
AC Electrical Drives
with Linear Neural
Networks

High Performance
Control of AC Drives
with Matlab /
Simulink Models

Electric Drives
Field oriented control
(vector control) for AC
induction motor drive

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using state feedback
linearization

*This is a reference
source for
practising
engineers
specializing in
electric power
engineering and
industrial
electronics. It
begins with the*

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basic dynamic models of induction motors and progresses to low- and high-performance drive systems.

Alternating current (AC) induction and synchronous machines are

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*frequently used in
variable speed
drives with
applications
ranging from
computer
peripherals,
robotics, and
machine tools to
railway traction,
ship propulsion,
and rolling mills.*

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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

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*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*

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*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*

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*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*

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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

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*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

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AC Drives will be a welcome addition to the reference collections of electrical and mechanical engineers involved with machine and system design. Electrical drives lie at the heart of

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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

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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,

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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,

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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-

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energy permanent magnets, semiconductor switched reluctance motors, silicon micromotor technology, and soft magnetic materials produced by powder technology are all

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revolutionising the industry. But the electric drive is an enabling technology, so the revolution is rippling throughout the whole of industry. Vector Control of Induction Machines

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*Modern Power
Electronics and AC
Drives*

*Vector Control of
Synchronous
Machine Drives
Sensorless Vector
and Direct Torque
Control*

Nowadays, vector
control of

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induction motor drives are increasingly employed in industrial drive systems, motor works on best performance at certain voltage and frequency for certain loads. This project describes a

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generalized
model of the
three-phase
induction motor
by using vector
control method
and its computer
simulation using
MATLAB/SIMULINK,
it presents the
advances made in
vector control
as applied to
high performance

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AC motor drives.
By using this
application, it
can achieve
speed control by
controlling the
reference speed
value and torque
value to keep
the
electromagnetic
torque at a
constant value.
Machine models

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in d-q
representation,
implementation
issues with AC
induction motor,
inverters and
converters,
parameter
effects for
induction motor
vector control
are dealt with
and simulation
results from the

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project are presented and discussed by computational calculation and graphs to support this theory. The large scope in this model can lead the algorithm designers to direct their

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efforts to the promising areas and avoid impossible tasks. From this project, the readers can approximately understand the principle of vector control in three-phase AC induction motor drive.

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In recent years, vector-controlled a.c. drives have taken over from more conventional d.c. drives. This book examines the sensorless vector-controlled drives and direct torque-controlled

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drives, and
looks at their
applications.
The first book
of its kind,
Power Converters
and AC
Electrical
Drives with
Linear Neural
Networks
systematically
explores the
application of

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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,

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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

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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,

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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

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fourth part
highlights
original
applications in
electrical
drives and power
quality, ranging
from neural-
based parameter
estimation and
sensorless
control to
distributed
generation

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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

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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

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analysis.

Offering multiple paths through the material, the text is suitable for undergraduate and postgraduate students, theoreticians, practicing engineers, and researchers

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involved in
applications of
ANNs.

Control of
Induction Motors
Modern
Electrical
Drives
High-Power
Converters and
AC Drives
Desensitisation
and Optimisation
Through Fuzzy

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Logic

High Performance

Control of AC

Drives with

Matlab/Simulink

**Dynamics is a
science**

**concerned with
movement and
changes. In the
most general
approach it
relates to life
processes as**

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well as behavior
in nature in
rest. It governs
small particles,
technical
objects,
conversion of
matter and
materials but
also concerns
people, groups
of people in
their individual
and, in

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particular,
social
dimension. In
dynamics we
always have to
do with causes
or stimuli for
motion, the
rules of
reaction or
behavior and its
result in the
form of
trajectory of

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changes. This book is devoted to dynamics of a wide class of specific but very important objects such as electromechanical systems. This is a very rigorous discipline and has a long tradition, as

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its theoretical
bases were
formulated in
the first half
of the XIX
century by d'
Alembert,
Lagrange,
Hamilton,
Maxwell and
other prominent
scientists, but
their crucial
results were

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based on
previous
pioneering
research of
others such as
Copernicus,
Galileo,
Newton... This
book in its
theoretical
foundations is
based on the
principle of
least action

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which governs
classical as
well as
relativistic
mechanics and
electromagnetism
and leads to
Lagrange's
equations which
are applied in
the book as
universal method
to construct
equations of

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motion of electrical
mechanical
systems. It
gives common and
coherent grounds
to formulate
mathematical
models for all
lumped
parameters' electrical
mechanical
systems, which
are vital in our
contemporary

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industry and
civilized
everyday life.
From these
remarks it seems
that the book is
general and
theoretical but
in fact it is a
very practical
one concerning
modern
electrical
drives in a

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broad sense,
including electr
omechanical
energy
conversion,
induction motor
drives,
brushless DC
drives with a
permanent magnet
excitation and
switched
reluctance
machines (SRM) .

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And of course
their control,
which means
shaping of their
trajectories of
motion using
modern tools,
their designed
autonomy in
keeping a track
according to our
programmed
expectations.

The problems

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presented in the book are widely illustrated by characteristics, trajectories, dynamic courses all computed by use of developed simulation models throughout the book. There are some classical subjects and the

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history of the
discipline is
discussed but
finally all
modern tools and
means are
presented and
applied. More
detailed
descriptions
follow in
abstracts for
the particular
chapters. The

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author hopes
kind readers
will enjoy and
profit from
reading this
book.

Electric Motor
Control: DC, AC,
and BLDC Motors
introduces
practical drive
techniques of
electric motors
to enable stable

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and efficient control of many application systems, also covering basic principles of high-performance motor control techniques, driving methods, control theories and power converters.

Electric motor

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drive systems
play a critical
role in home
appliances,
motor vehicles,
robotics,
aerospace and
transportation,
heating
ventilating and
cooling
equipment's,
robotics,
industrial

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machinery and
other commercial
applications.

The book
provides
engineers with
drive techniques
that will help
them develop
motor drive
system for their
applications.

Includes
practical

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solutions and
control
techniques for
industrial motor
drive
applications
currently in use
Contains
MATLAB/Simulink
simulation files
Enables
engineers to
understand the
applications and

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advantages of
electric motor
drive systems
A unique
approach to
sensorless
control and
regulator design
of electric
drives Based on
the author's
vast industry
experience and
collaborative

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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.

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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

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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

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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

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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

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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

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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.

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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

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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

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and offers
access to an FTP
site, which
provides MATLAB
programs for
selected
problems. The
book's
practicality and
realworld
reliability
make it an
invaluable
resource for

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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

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instructor
materials please
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at <http://booksupport.wiley.com>
Power
Electronics and
Motor Drive
Systems
Control of
Electric Machine
Drive Systems
Vector Control

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Control Of Ac
Drives

of Induction
Motor Using
MATLAB

Vector Control
of AC Drives
Vector-Control
AC Drives

Vector Control and
Dynamics of AC
Drives Oxford
University Press

Continued advances
in power electronics
and computer control

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technology make possible the implementation of a.c. drive systems in place of d.c. The a.c. systems are usually more efficient, and more reliable, more controllable and require a cheaper motor construction. These are strong commercial reasons driving change. The

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disadvantage is a degree of complexity in the drive control system; this book explains that complexity.

For upper level undergraduate and graduate level courses in electrical engineering, as well as a reference book for professionals and researchers. This text

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presents the basics of electrical power conversion and control through the use of power semiconductor switches. In addition, by demonstrating the practical applications of power electronics and motion control using AC electrical machines in transportation and

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industry, among other uses, Modern Power Electronics and AC Drives reflects the latest advances in industrial automation.

Electric Motor Control
Student manual
Simulation A Vector
Control OF Induction
Motor Model
DC, AC, and BLDC
Motors

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Practical Variable
Speed Drives and
Power Electronics

***Annotation A
comprehensive
guide to the
technology
underlying
drives, motors
and control
units, this
title contains
a wealth of***

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Drives

***technical
information for
the practising
drives and
electrical
engineer.***

***A comprehensive
guide to
understanding
AC machines
with exhaustive
simulation
models to***

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Drives

***practice design
and control***

***Nearly seventy
percent of the
electricity
generated
worldwide is
used by
electrical
motors.***

***Worldwide, huge
research
efforts are***

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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

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***machines used
in industry –
induction
machine and
permanent
magnet
synchronous
machine – this
book
illustrates
advanced
control
techniques and***

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Control Of Ac
Drives

*topologies in
practice and
recently
deployed.
Examples are
drawn from
important
techniques
including
Vector Control,
Direct Torque
Control,
Nonlinear*

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Drives

***Control,
Predictive
Control, multi-
phase drives
and multilevel
inverters. Key
features
include:
systematic
coverage of the
advanced
concepts of AC
motor drives***

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*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-*

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Drives

***phase-phase
drive system
and double fed
induction
machine;
description of
model
predictive
control applied
to power
converters and
AC drives,
illustrated***

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***together with
their
simulation
models; end-of-
chapter
questions, with
answers and
PowerPoint
slides
available on
the companion
website [www.wil
ey.com/go/aburu](http://www.wiley.com/go/aburu)***

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b_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

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***professionals
on many vital
electric drives
aspects. It is
an advanced
textbook for
final year
undergraduate
and graduate
students, and
researchers in
power
electronics,***

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***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.***

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***Induction
Machines
Handbook:
Transients,
Control
Principles,
Design and
Testing
presents a
practical up-to-
date treatment
of intricate
issues with***

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Drives

***induction
machines (IM)
required for
design and
testing in both
rather
constant- and
variable-speed
(with power
electronics)
drives. It
contains ready-
to-use***

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***industrial
design and
testing
knowledge, with
numerous case
studies to
facilitate a
thorough
assimilation of
new knowledge.
Individual
Chapters 1
through 14***

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***discuss in
detail the
following:
Three- and
multiphase IM
transients
Single-phase
source IM
transients Supe
r-high-
frequency
models and
behavior of IM***

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Motor

***specifications
and design
principles IM
design below
100 kW and
constant V_1 and
 f_1 IM design
above 100 kW
and constant V_1
and f_1 IM
design
principles for***

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*variable speed
Optimization
design Single-
phase IM design
Three-phase IM
generators
Single-phase IM
generators
Linear
induction
motors Testing
of three-phase
IMs Single-*

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*phase IM
testing Fully
revised and
amply updated
to add the new
knowledge of
the last
decade, this
third edition
includes
special
sections on
Multiphase IM*

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*models for
transients
Doubly fed IMs
models for
transients Cage-
rotor
synchronized
reluctance
motors Cage-
rotor PM
synchronous
motor Transient
operation of*

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***self-excited
induction
generator
Brushless
doubly fed
induction motor
/generators
Doubly fed
induction
generators with
D.C. output
Linear
induction motor***

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***control with
end effect
Recent trends
in IM testing
with power
electronics
Cage-PM rotor
line-start IM
testing Linear
induction motor
(LIM) testing
This up-to-date
book discusses***

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in detail the transients, control principles, and design and testing of various IMs for line-start and variable-speed applications in various topologies, with numerous

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***case studies.
It will be of
direct
assistance to
academia and
industry in
conceiving,
designing,
fabricating,
and testing IMs
(for the
future) of
various***

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*industries,
from home
appliances,
through
robotics, e-
transport, and
renewable
energy
conversion.*

*Vector Control
of Three-Phase
AC Machines
System*

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Drives

***Development in
the Practice
Vector Control
of Ac Drives
Electrical
Machine Drives
Control
Vector-control
AC Drives
Electric Drives
provides a
practical***

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Drives

***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***

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expanded to incorporate the latest technologies used to save energy and increase productivity, stability, and reliability. Every phrase, equation,

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***number, and
reference in the
text has been
revisited, with
the necessary
changes made
throughout. In
addition, new
references to
key research
and
development***

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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.

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***motor drives,
have been
added; as have
two new
chapters on
advanced scalar
control and
multiphase
electric machine
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drive systems.
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includes new
material on
medium voltage
drives, covering
state-of-the-art
technologies
and challenges
in the industrial
drive system, as***

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***well as their
components,
and control,
current source
inverter-based
drives, PWM
techniques for
multilevel
inverters, and
low switching
frequency
modulation for***

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inverters. This
book covers
three-phase and
multiphase
(more than
three-phase)
motor drives
including their
control and
practical
problems faced***

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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

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the challenges
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requirements
for electric
drives and
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industrial
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models of AC
machines,
including DC
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squirrel cage
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motors A
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***field of AC
motor drives
and power
electronics
engineers in
industry.
Variable speed
is one of the
important
requirements in
most of the
electric drives.***

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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

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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

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***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***

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***performance
drives. Field
oriented control
or vector control
has made a
fundamental
change with
regard to
dynamic perfo-
mance of ac
machines.
Vector control***

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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

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in artificial intelligence techniques have also contributed in the improvement in performance of electric drives. This book presents a comprehensive view of high

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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

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***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***

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***as up-to date
references in
these topics are
provided.***

***Graph. Darst
Vector Control
of AC Machines
Induction
Machines
Handbook
Vector control
of synchronous***

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machine drives
An Introduction
*The Field Orientation
Principle was first
formulated by Haase,
in 1968, and Blaschke,
in 1970. At that time,
their ideas seemed
impractical because of
the insufficient means
of implementation.
However, in the early
eighties, technological*

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advances in static power converters and microprocessor-based control systems made the high-performance a. c. drive systems fully feasible. Since then, hundreds of papers dealing with various aspects of the Field Orientation Principle have appeared every year in the technical literature, and

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numerous commercial high-performance a. c. drives based on this principle have been developed. The term "vector control" is often used with regard to these systems. Today, it seems certain that almost all d. c. industrial drives will be ousted in the foreseeable future, to be, in major part,

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superseded by a. c. drive systems with vector controlled induction motors. This transition has already been taking place in industries of developed countries. Vector controlled a. c. drives have been proven capable of even better dynamic performance than d. c. drive systems, because of higher

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allowable speeds and shorter time constants of a. c. motors. It should be mentioned that the Field Orientation Principle can be used in control not only of induction (asynchronous) motors, but of all kinds of synchronous motors as well. Vector controlled drive systems with the so called brushless d. c.

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motors have found many applications in high performance drive systems, such as machine tools and industrial robots.

This contributed volume is written by key specialists working in multidisciplinary fields in electrical engineering, linking control theory, power electronics, artificial

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*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*

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*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*

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*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*

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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

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design, model predictive control, neural control, sliding mode control, signal filtration and processing, fault diagnosis, and fault tolerant control.

"Alternating current (AC) induction and synchronous machines are frequently used in variable speed drives with applications ranging from computer

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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

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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

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*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*

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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

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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." --Provided by publisher.

Modelling Analysis and

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Control

*Vector control of AC
drives. 1. Vector control
of induction machine
drives*

*Modeling and Control
of AC Machine using
MATLAB®/SIMULIN
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*The Field Orientation
Principle in Control of
Induction Motors
Vector Control and
Dynamics of AC Drives*

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Power Electronics and Motor Drive Systems is designed to aid electrical engineers, researchers, and students to analyze and address common problems in state-of-the-art power electronics technologies. Author Stefanos Manias supplies a detailed

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clearly and
comprehensively
provides an analysis
of modulation and
output voltage,
current control
techniques, passive
and active filtering,
and the
characteristics and
gating circuits of
different power
semiconductor
switches, such as

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MOSFETs, IGCTs,
MCTs and GTOs.
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analysis of power
electronic systems
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simulation examples
using SPICE, PSIM,
and
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Provides 110
common problems
and solutions in

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power electronics
technologies

This book introduces electrical machine modeling and control for electrical engineering and science to graduate, undergraduate students as well as researchers, who are working on modeling and control of electrical machines. It

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targets electrical engineering students who have no time to derive mathematical equations for electrical machines in particular induction machine (IM) and doubly fed induction machines (DFIM). The main focus is on the application of field oriented control technique to

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induction motor (IM) and doubly fed induction motor (DFIM) in details, and since the induction motors have many drawback using this technique, therefore the application of a nonlinear control technique (feedback linearization) is applied to a reduced order model of DFIM

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to enhance the performance of doubly fed induction motor. Features Serves as text book for electrical motor modeling, simulation and control; especially modeling of induction motor and doubly fed induction motor using different frame of references. Vector

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control (field oriented control) is given in more detailed, and is applied to induction motor. A nonlinear controller is applied to a reduced model of an doubly induction motor associated with a linear observer to estimate the unmeasured load torque, which is used to enhance the

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performance of the vector control to doubly fed induction motor. Access to the full

MATLAB/SIMULINK blocks for simulation and control.

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High Performance AC
Drives

Transients, Control
Principles, Design and

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Testing

Dynamics and Control
of Electrical Drives

Advanced Control of
Electrical Drives and

Power Electronic
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understanding
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installation,
operation and
troubleshooting
of Variable
Speed Drives
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topics such as*

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, control
wiring,
operating
modes, braking
types,
automatic
restart,
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electrostatic
discharge and
EMC/EMI issues*

· **Essential**

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*reading for
electrical
engineers and
those using
VSDs for
applications
such as
pumping,
ventilation,
conveyors and
hoists in
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handling and

other

industrial

contexts

This

comprehensive

text examines

existing and

emerging

electrical

drive

technologies.

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design of the associated electrical machines. Also including links to a number of industrial applications, the authors take their investigation of electrical drives beyond

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*theory to
examine a
number of
practical
aspects of
electrical
drive control
and
application.
Key features: *
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*and design of
the associated
electrical
machines. Added
insight into
problems and
functions are
illustrated
with clearly
understandable
figures. **
*Offers an
understanding*

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*of the main
phenomena
associated with
electrical
machine drives.
* Considers the
problem of
bearing
currents and
voltage
stresses of an
electrical
drive. **

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excellent
introduction to
controlled-
speed
electrical
drive
technologies
for Electrical
Engineering MSc
or PhD students
studying
electrical*

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drives.

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latest cutting-

edge technology

in high-power

converters and

medium voltage

drives, and

provides a

complete

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various
converter
topologies,
modulation
techniques,
practical drive
configurations,
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schemes.*

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with more than*

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250

*illustrations,
the author
illustrates key
concepts with
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problems, along
with*

*accompanying
solutions, are
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