Vector Control Of An Induction Motor Based On A Dsp | 581b131e2ae15255dd4bbb39e8c9dbbe

Vector Control of Induction Motors Considering Magnetic Saturation
Colloquium on Vector Control and Direct Torque Control of Induction Motors
Vector Control of Three-Phase AC Machines
Control of Induction Motor Using Vector Control
Vector Control of Induction Machines
Field oriented control (vector control) for AC induction motor drive using state feedback linearization
Simulation and Implementation of Vector Control of Induction Motors
Vector Control of Induction Motor Using MATLAB
Vector Control of an Induction Motor Based on a DSP
Microprocessor Implementation of Vector Control System for AC Induction Motor
High Performance Sensorless Vector Control of Induction Motor Drives
Vector Control of Induction Motors
Vector Control of an Induction Machine
Simplified Fuzzy Logic Controller Based Indirect Vector Control of an Induction Motor Drive
Modeling and Vector Control of Three-phase Induction Motor when Two Phases of the Stator are Open Circuit
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The Field Orientation Principle in Control of Induction Motors
Analysis and Simulation of Vector Control Induction Motor Drive by Using MATLAB
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Vector Control of Induction Motor Using Fuzzy-neural Network
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Sensorless Vector Control of Induction Motor Drive - A Model Based Approach
An Alternative Implementation of Vector Control for Induction Motors
Vector Control of Three-Phase AC Machines
Vector Control of Induction Machines Considering the Stray Load Losses
Vector Control and Dynamics of AC Drives
Vector Control and Direct Torque Control of Induction Motors, IEE Colloquium on
Vector Control of Induction Motor Using MATLAB
Vector Control of
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 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 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 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 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.

In this study, a mathematical dynamic model of an induction motor as influenced by magnetic circuit saturation is developed. Moreover, a modified structure of indirect vector controller scheme is proposed which involves the saturated value of the magnetizing inductance. In order to overcome the disadvantages of the vector control drive system such as speed sensor and parameter sensitivity, two proposed control systems have been developed. In the first system, a simultaneous stator resistance and motor speed estimation based on a modified Model Reference Adaptive System (MRAS) has been used to obtain accurate estimation for motor speed taking the effect of magnetic flux saturation into account. Online magnetizing inductance estimation has been presented to consider the effect of saturation in the proposed system. In the second system, an effective online method for rotor resistance estimation based on a modified MRAS to achieve high-precise control in a wide range of motor speed taking the effect of magnetic circuit saturation into account.

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.

Nowadays, vector control of 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 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 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 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 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 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.

Continued advances in power electronics and computer control 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 disadvantage is a degree of complexity in the drive control system; this book explains that complexity.

Sensorless Vector Control of Induction Motor Drive - A Model Based Approach.

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

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

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