

1. Record Nr.	UNINA9910141520303321
Autore	Alacoque Jean-Claude
Titolo	Direct eigen control for induction machines and synchronous motors / / Jean-Claude Alacoque
Pubbl/distr/stampa	[Piscataway, New Jersey] : , : IEEE Xplore, , [2012]
ISBN	1-118-46063-4 1-283-71520-1 1-118-46062-6
Edizione	[1st edition]
Descrizione fisica	1 online resource (287 p.)
Collana	Wiley - IEEE
Disciplina	621.46
Soggetti	Electric motors - Automatic control Electric machinery, Induction - Automatic control Control theory Eigenfunctions
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	Acknowledgements v -- Contents vi -- Foreword x -- Foreword xii -- Preface xiv -- 1 Formulation of the motor control problem xiv -- 1.1 Electromagnetic torque xiv -- 1.2 Response time in tracking mode and on disturbances xv -- 1.3 Limitations xvi -- 2 Field orientation controls xviii -- 3 Sliding mode control families xviii -- 4 Objectives of a new motor control xx -- 5 Objectives of this work xxiii -- Chapter 1 - Induction machine 1 -- 1 Electrical equations and equivalent circuits 1 -- 1.1 Definitions and notations 1 -- 1.2 Equivalent electrical circuits 2 -- 1.3 Differential equation system 4 -- 1.4 Interpretation of electrical relations 6 -- 2 State-space equation system working out 11 -- 2.1 State-space equations in the fixed plane 13 -- 2.2 State-space equations in the complex plane 16 -- 2.3 Complex state-space equation discretization 17 -- 2.4 Evolution matrix diagonalization 19 -- 2.4.1 Eigenvalues 19 -- 2.4.2 Transfer matrix algebraic calculation 20 -- 2.4.3 Transfer matrix inversion 21 -- 2.5 Projection of state- space vectors in the eigenvector basis 23 -- 3 Discretized state-space equation inversion 24 -- 3.1 Introduction of the rotating frame 24 -- 3.2 State-space vector calculations in the eigenvector basis 27 -- 3.3

Control calculation - eigenstate-space equation system inversion	34
4 Control	35
4.1 Constitution of the set-point state-space vector	35
4.2 Constitution of the initial state-space vector	38
4.3 Control process	38
4.3.1 Real-time implementation	38
4.3.2 Measure filtering	41
4.3.3 Transition and input matrix calculations	41
4.3.4 Kalman's filter, observation and prediction	42
4.3.5 Synoptic of measurement, filtering and prediction	44
4.4 Limitations	47
4.4.1 Voltage limitation	48
4.4.2 Current limitation	51
4.4.3 Operating area and limits	51
4.4.4 Set-point limit algebraic calculations	52
4.5 Example of implementation	65
4.5.1 Adjustment of flux and torque - Limitations in traction operation	65
4.5.2 Adjustment of flux and torque - Limitations in electrical braking	68
4.5.3 Free evolution - Short-circuit torque	70
5 Conclusion on the induction machine control	74
Chapter 2 - Surface mounted permanent magnet synchronous motor.	76
1 Electrical equations and equivalent circuit	77
1.1 Definitions and notations:	77
1.2 Equivalent electrical circuit	77
1.3 Differential equation system	79
2 Working out of the state-space equation system	80
2.1 State-space equations in the fixed plane	81
2.2 State-space equations in the complex plane	83
2.3 Complex state-space equation discretization	84
2.4 Evolution matrix diagonalization	85
2.4.1 Eigenvalues	85
2.4.2 Transfer matrix calculation	85
2.4.3 Transfer matrix inversion	87
2.5 Projection of state-space vectors in the eigenvector basis	88
3 Discretized state-space equation inversion	88
3.1 Introduction of the rotating frame	88
3.2 State-space vector calculations in the eigenvector basis	89
3.3 Control computation - Eigenstate-space equations inversion	95
4 Control	98
4.1 Constitution of set-point state-space vector	98
4.2 Constitution of the initial state-space vector	99
4.3 Control process	100
4.3.1 Real-time implementation	100
4.3.2 Measure filtering	102
4.3.3 Transition and control matrix calculations	103
4.3.4 Kalman's filter, observation and prediction	104
4.3.5 Synoptic of measurement, filtering and prediction	106
4.4 Limitations	110
4.4.1 Voltage limitation	111
4.4.2 Current limitation	114
4.4.3 Operating area and limits	114
4.4.4 Set-point limit calculations	115
4.5 Example of implementation	128
4.5.1 Adjustment of torque - Limitations in traction operation	129
4.5.2 Adjustment of torque - Limitations in electrical braking	131
4.5.3 Free evolution - Short-circuit torque	132
5 Conclusion on SMPM-SM	138
Chapter 3 - Interior permanent magnet synchronous motor	139
1 Electrical equations and equivalent circuits	140
1.1 Definitions and notations	140
1.2 Equivalent electrical circuits	141
1.3 Differential equation system	142
2 Working out of the state-space equation system	146
2.1 State-space equations in the fixed plane	147
2.2 State-space equations in the complex plane	149
2.3 State-space equation discretization	149
2.4 Evolution matrix diagonalization	149
2.4.1 Eigenvalues	150
2.4.2 Transfer matrix calculation	152
2.4.3 Transfer matrix inversion	153
2.5 Projection of state-space vectors in the eigenvector basis	154
3 Discretized state-space equation inversion	155
3.1 Rotating reference frame	155
3.2 State-space vector calculations in the eigenvector basis	155
3.2.1 Calculation of third and fourth coordinates of the state-space equation	160
3.2.2 Calculation of the first and the second coordinate of the state-space eigenvector	162
3.3 Control calculation - Eigenstate-space equations inversion	162
4 Control	165
4.1 Constitution of the set-point state-space vector	165
4.2 Constitution of the initial state-space vector	168
4.3 Control process	169
4.3.1 Real-time implementation	170
4.3.2	

Measure filtering 172 -- 4.3.3 Transition and input matrix calculations 174 -- 4.3.4 Kalman's filter 176 -- 4.3.5 Synoptic of measurement, filtering and prediction 179 -- 4.4 Limitations 183 -- 4.4.1 Voltage limitation 184 -- 4.4.2 Current limitation 192 -- 4.4.3 Operating area and limits 193 -- 4.4.4 Set-point limit calculation 194 -- 4.5 Example of implementation 208 -- 4.5.1 Adjustment of torque - Limitations in traction mode 209 -- 4.5.2 Adjustment of torque - Limitations in electrical braking 212 -- 4.5.3 Free evolution - Short-circuit torque 214 -- 5 Conclusions on the IPM-SM 219 -- Chapter 4 - Inverter supply - LC Filter 220 -- 1 Electrical equations and equivalent circuit 220 -- 1.1 Definitions and notations 220 -- 1.2 Equivalent electrical circuit 221 -- 1.3 Differential equation system 222 -- 2 Working out of the state-space equation system 222.
 2.1 State-space equations in a fixed frame 223 -- 2.2 State-space equations in the complex plane 224 -- 2.3 State-space equation discretization 224 -- 2.4 Evolution matrix diagonalization 225 -- 2.4.1 Eigenvalues 225 -- 2.4.2 Transfer matrix calculation 226 -- 2.4.3 Transfer matrix inversion 227 -- 3 Discretized state-space equation inversion 228 -- 3.1 Evolution matrix diagonalization 228 -- 3.2 State-space equation discretization 228 -- 3.3 State-space vector calculations in the eigenvector basis 229 -- 4 Control 231 -- 4.1 Constitution of the set-point state-space vector 231 -- 4.2 Constitution of the initial state-space vector 232 -- 4.3 Inversion - Line current control by the useful current 232 -- 4.4 Capacitor voltage control by the useful current 235 -- 4.5 General case - Control by the useful current 237 -- 4.6 Example of implementation 239 -- 4.6.1 Lack of capacitor voltage stabilization 239 -- 4.6.2 Capacitor voltage stabilization 240 -- 5 Conclusions on power LC filter stabilization 243 -- Conclusion 245 -- Appendix 1 - Calculation of vectorial PWM 248 -- 1 PWM types 248 -- 2 Work out of control voltage vector 249 -- 3 Other examples of a vectorial PWM 252 -- 3.1 Unsymmetrical vectorial PWM 252 -- 3.2 Symmetrical triangular wave based PWM 253 -- 3.3 Synchronous PWM 254 -- 4 Sampled shape of the voltage and current waves 255 -- Appendix 2 - Transfer matrix calculation 257 -- 1 First eigenvector calculation 257 -- 2 Second eigenvector calculation 258 -- 3 Third eigenvector calculation 260 -- 4 Fourth eigenvector calculation 262 -- 5 Transfer matrix calculation 263 -- Appendix 3 - Transfer matrix inversion 264 -- 1 Transfer matrix determinant calculation 265 -- 2 First row, first column 265 -- 3 First row, second column 266 -- 4 First row, third column 266 -- 5 First row, fourth column 266 -- 6 Second row, first column 267 -- 7 Second row, second column 267 -- 8 Second row, third column 267 -- 9 Second row, fourth column 268 -- 10 Third row, first column 268.
 11 Third row, second column 268 -- 12 Third row, third column 268 -- 13 Third row, fourth column 268 -- 14 Fourth row, first column 269 -- 15 Fourth row, second column 269 -- 16 Fourth row, third column 269 -- 17 Fourth row, fourth column 269 -- 18 Inverse transfer matrix calculation 269 -- Appendix 4 - State-space eigenvector calculation 270 -- Appendix 5 - F and G matrices calculation 274 -- 1 Transition matrix calculation 274 -- 2 Discretized input matrix calculation 278 -- References 280 -- Index 284 --.

Sommario/riassunto

Clear presentation of a new control process applied to induction machine (IM), surface mounted permanent magnet synchronous motor (SMPM-SM) and interior permanent magnet synchronous motor (IPM-SM) Direct Eigen Control for Induction Machines and Synchronous Motors provides a clear and concise explanation of a new method in alternating current (AC) motor control. Unlike similar books on the market, it does not present various control algorithms for each type of

AC motor but explains one method designed to control all AC motor types: Induction Machine (IM), Su

2. Record Nr.	UNINA9910971804203321
Titolo	Water resources sector strategy : strategic directions for World Bank engagement
Pubbl/distr/stampa	Washington, DC, : World Bank, 2004
ISBN	1-280-08481-2 9786610084814 0-585-49753-2
Edizione	[1st ed.]
Descrizione fisica	vi, 78 pages : illustrations ; ; 28 cm
Disciplina	333.91/009172/4
Soggetti	Water-supply - Developing countries - Management Water-supply - Economic aspects - Developing countries Water-supply, Agricultural - Developing countries - Management Industrial water supply - Developing countries - Management Water resources development - Developing countries - Planning Economic development projects - Developing countries - Planning
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Note generali	Bibliographic Level Mode of Issuance: Monograph
Nota di bibliografia	Includes bibliographical references.
Nota di contenuto	Intro -- CONTENTS -- Acknowledgments -- Overview and executive summary -- Progress in ideas and practice -- Scope and methodology of this Strategy -- The main messages of this Strategy -- Notes -- 1. Introduction and development context -- The gloomy arithmetic of water -- Water resources management and development are critical to the World Bank's strategic objectives of sustainable economic growth and poverty reduction -- The World Bank's borrowers face a wide range of water development and management challenges -- Water management must make a series of important transitions -- The scope of this Strategy -- Key strategic issues in the main water-using sectors -- Notes -- 2. Stocktaking and evaluation -- Building on the 1993 Strategy and consulting with stakeholders -- There is broad consensus

on what constitutes good water resources management, but all countries are far from managing water resources according to these principles -- A wide variety of water resources challenges in the regions -- World Bank engagement in water resources development and management -- The great challenge is making progress, not achieving perfection -- The World Bank position on the "Guidelines" of the World Commission on Dams -- The comparative advantage of the World Bank and the need to revise business practices -- Notes -- 3. Strategic options and possible business implications -- The additionality and focus of this Strategy -- Developing a portfolio of analytic work that informs management decisions and recognizes differences -- Working with partners -- Finding new sources of financing for water resources infrastructure -- Dealing with risk and developing a more effective business model -- How the World Bank is organized and staffed for water resources management -- Notes -- 4. What the Strategy might mean for World Bank engagement: Some examples from the regions. Illustration 1: What the new sector Strategy might mean in Brazil -- Illustration 2: What the new sector Strategy might mean in Central Asia -- Illustration 3: What the new sector strategy might mean in India, in particular in the state of Andhra Pradesh -- Illustration 4: What the new Sector Strategy might mean in Nigeria -- Illustration 5: What the new Strategy might mean in the Philippines -- Illustration 6: What the new sector Strategy might mean in Yemen -- Illustration 7: What the new sector Strategy might mean for the World Bank's work on international waters: The Nile Basin Initiative -- Implementing the sector Strategy in the World Bank's operations: What these examples show -- Notes -- Abbreviations -- Annex 1: The World Bank position on the Report of the World Commission on Dams -- Support for strategic planning, and a dams planning and management action plan -- World Bank policies -- Summary.

Sommario/riassunto

The strategy in this book focuses on how to improve the development and management of water resources while providing the principles that link resource management to the specific water-using sectors.
