High Performance Control of AC Drives with Matlab / Simulink Models

Description:
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.

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.

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