



#### Advanced Control Systems for Electric Drives

#### Recent Developments of Electrical Drives

The volume LNCS 12226 constitutes the revised selected papers from the four workshops collocated with the 17th International Conference on Software Engineering and Formal Methods, SEFM 2019. The 13 full papers presented together with 7 short papers in this volume were carefully reviewed and selected from a total of 45 submissions. They stem from the following workshops: CoSim-CPS 2019 – 3rd International Workshop on Formal Co-Simulation of Cyber-Physical Systems; ASYDE 2019 – 1st International Workshop on Cognition: Interdisciplinary Foundations, Models and Applications; and FOCLASA 2019 – 17th International Workshop on Foundations of Coordination Languages and Self-Adaptive Systems?

Electrical drives play an important part as electromechanical energy converters in transportation, materials handling and most production processes. This book presents a unified treatment of complete electrical drive systems, including the mechanical parts, electrical machines, and power converters and control. Since it was first published in 1985 the book has found its way onto many desks in industry and universities all over the world. For the second edition the text has been thoroughly revised and updated, with the aim of offering the reader a general view of the field of controlled electrical drives, which are maintaining and extending their importance as the most flexible source of controlled mechanical energy.

Electrification is an evolving paradigm shift in the transportation industry toward more efficient, higher performance, safer, smarter, and more reliable vehicles. There is in fact a clear trend to move from internal combustion engines (ICEs) to more integrated electrified powertrains. Providing a detailed overview of this growing area, *Advanced Electric Drive Vehicles* begins with an introduction to the automotive industry, an explanation of the need for electrification, and a presentation of the fundamentals of conventional vehicles and ICEs. It then proceeds to address the major components of electrified vehicles—i.e., power electronic converters, electric machines, electric motor controllers, and energy storage systems. This comprehensive work: Covers more electric vehicles (MEVs), hybrid electric vehicles (HEVs), plug-in hybrid electric vehicles (PHEVs), range-extended electric vehicles (REEVs), and all-electric vehicles (EVs) including battery electric vehicles (BEVs) and fuel cell vehicles (FCVs) Describes the electrification technologies applied to nonpropulsion loads, such as power steering and air-conditioning systems Discusses hybrid battery/ultra-capacitor energy storage systems, as well as 48-V electrification and belt-driven starter generator systems Considers vehicle-to-grid (V2G) interface and electrical infrastructure issues, energy management, and optimization in advanced electric drive vehicles Contains numerous illustrations, practical examples, case studies, and challenging questions and problems throughout to ensure a solid understanding of key concepts and applications *Advanced Electric Drive Vehicles* makes an ideal textbook for senior-level undergraduate or graduate engineering courses and a user-friendly reference for researchers, engineers, managers, and other professionals interested in transportation electrification.

This book provides extensive information about advanced control techniques in electric drives. Multiple control and estimation methods are studied for position and speed tracking in different drives. Artificial intelligence tools, such as fuzzy logic and neural networks, are used for specific applications using electric drives.

Dynamics and Control of Electrical Drives

Vector Control of AC Drives

Control of Electrical Drives

Applied Control of Electrical Drives

Electric Motors and Drives

This book provides a representative set of modern methodologies and applications, including new topics in the field, discussing a wide range of issues and treating them in depth. The book describes analytical processes for fault diagnosis of automatic control systems, examines modern sensors and actuators as well as measurement techniques, considers multidimensional feedback control and image restoration procedures, among other topics.

Current Trends and Modern Methodologies

An Introduction

Proceedings of the Third IFAC Symposium, Lausanne, Switzerland, 12-14 September 1983