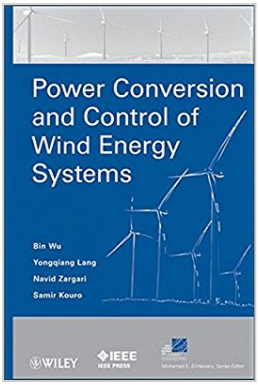

Power Conversion and Control of Wind Energy Systems

By Bin Wu, Yongqiang Lang, Navid Zargari, Samir Kouro

Power Conversion and Control of Wind Energy Systems By Bin Wu, Yongqiang Lang, Navid Zargari, Samir Kouro

The book presents the latest power conversion and control technology in modern wind energy systems. It has nine chapters, covering technology overview and market survey, electric generators and modeling, power converters and modulation techniques, wind turbine characteristics and configurations, and control schemes for fixed- and variable-speed wind energy systems. The book also provides in-depth steady-state and dynamic analysis of squirrel cage induction generator, doubly fed induction generator, and synchronous generator based wind energy systems.

To illustrate the key concepts and help the reader tackle real-world issues, the book contains more than 30 case studies and 100 solved problems in addition to simulations and experiments. The book serves as a comprehensive reference for academic researchers and practicing engineers. It can also be used as a textbook for graduate students and final year undergraduate students.

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Power Conversion and Control of Wind Energy Systems By Bin Wu, Yongqiang Lang, Navid Zargari, Samir Kouro Bibliography

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Editorial Review

Review
"I highly recommend the essential and very in depth book Power Conversion and Control of Wind Energy Systems by Bin Wu, Ph.D., Yongqiang Lang, Ph.D., Navid Zargari, Ph.D., and Samir Kouro, Ph.D., to any academics, practicing engineers, consultants, electrical and energy industry executives, government policy makers, and graduate and senior undergraduate students seeking a complete and comprehensive reference textbook that covers all aspects of wind power conversion and control of wind energy conversion systems (WECS). This is a landmark book that is a must for anyone serious about the subject, and about the principles that underpin wind energy systems." (Blog Business World, 1 March 2012)

"Considering that the wind energy is now highly competitive and is being emphasized all over the world, this book is extremely important and very timely. It is expected to be of wide demand in the world. The book is of unique quality, and no such book currently exists in the market. The primary emphasis of the book is power conversion and control of wind energy conversion systems. It gives comprehensive and in-depth analysis on wind generators, power converters and control systems of various types of wind generation systems. There are adequate explanatory materials on different types of wind turbines, and basics of wind energy systems. The book is very well-organized with physical explanations, mathematical analysis, computer simulation, experimental results, and worked-out examples. There are a large number of worked-out problems at the end of the book which are extremely important. It is a unique book with optimal balance of theory and practical discussion. It is a complete book for designers of wind generation systems and can serve as textbook for undergraduate/graduate courses in universities.
—Dr. Bimal K. Bose, Condra Chair of Excellence/Emeritus in Power Electronics, University of Tennessee

From the Back Cover

The most comprehensive analysis available on various practical wind energy systems

Wind energy is one of the fastest growing renewable energy resources of the past decade. This book is dedicated to the state-of-the-art power conversion and control of wind energy conversion systems (WECS) from an electrical engineering perspective, providing a thorough analysis of wind generators, system configurations, power converters, control schemes, and dynamic/steady-state performance of various practical wind energy systems.

The book begins with market survey, wind turbine technology, wind energy system classifications, and grid codes for wind power integration. The fundamentals of wind energy systems are reviewed, as are commonly used wind generators. The book goes on to discuss various power converters for wind energy conversion and characteristics of major WECS, including fixed-speed induction generator, variable-speed squirrel cage induction generator, doubly fed induction generator, and synchronous generator based wind energy systems.

Throughout, important concepts are illustrated with simulations and experiments, and design guidance is provided with tables, charts, and graphs. To help the reader understand the principle and operation of various WECS, more than 30 case studies are given in various chapters and more than 100 solved problems are included in a dedicated appendix. This book not only serves as a valuable reference for academic researchers, practicing engineers, and consultants, but also as a textbook for graduate and senior-year

undergraduate students.

" . . . this book is extremely important and very timely. It is expected to be of wide demand in the world. . . . It gives comprehensive and in-depth analysis on wind generators, power converters, and control systems of various types of wind generation systems. . . . The book is very well organized with physical explanations, mathematical analysis, computer simulations, experimental results, and worked-out examples. . . . It is a unique book with optimal balance of theory and practical discussion." —Dr. Bimal K. Bose, Condra Chair of Excellence/Emeritus in Power Electronics, University of Tennessee

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BIN WU, PhD, is a Professor in the Department of Electrical and Computer Engineering at Ryerson University (Canada). He is an NSERC/Rockwell Automation Industrial Research Chair and the founder of the Laboratory for Electric Drive Applications and Research (LEDAR). He is a Fellow of the Institute of Electrical and Electronics Engineers, Engineering Institute of Canada, and Canadian Academy of Engineering.

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