Modeling and Control of Fuel Cells: Distributed Generation Applications
M. H. Nehrir, C. Wang

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DESCRIPTION

The only book available on fuel cell modeling and control with distributed power generation applications

The emerging fuel cell (FC) technology is growing rapidly in its applications from small-scale portable electronics to large-scale power generation. This book gives students, engineers, and scientists a solid understanding of the FC dynamic modeling and controller design to adapt FCs to particular applications in distributed power generation.

The book begins with a fascinating introduction to the subject, including a brief history of the U.S. electric utility formation and restructuring. Next, it provides coverage of power deregulation and distributed generation (DG), DG types, fuel cell DGs, and the hydrogen economy. Building on that foundation, it covers:

• Principle operations of fuel cells

• Dynamic modeling and simulation of PEM and solid-oxide fuel cells

• Principle operations and modeling of electrolyzers
Power electronic interfacing circuits for fuel cell applications

- Control of grid-connected and stand-alone fuel cell power generation systems

- Hybrid fuel cell–based energy system case studies

- Present challenges and the future of fuel cells

MATLAB/SIMULINK-based models and their applications are available via a companion Web site. Modeling and Control of Fuel Cells is an excellent reference book for students and professionals in electrical, chemical, and mechanical engineering and scientists working in the FC area.

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**ABOUT THE AUTHOR**

**M. HASHEM NEHRIR**, PhD, is a Professor of Electrical and Computer Engineering at Montana State University-Bozeman. His primary areas of interest include modeling and control of power systems, alternative energy power generation systems, and applications of intelligent controls to power systems. In addition to this book, he is the author of two textbooks and the author or coauthor of numerous technical papers. He is a member of the IEEE PES Energy Development and Power Generation Committee and currently is Vice Chair of the IEEE PES Energy Development Subcommittee.

**CAISHENG WANG**, PhD, is Assistant Professor at Wayne State University in Detroit, Michigan. He has worked in the areas of both large power systems and distributed generation systems, including alternative energy sources. As a part of his doctoral research, during 2002–2006, Dr. Wang was involved in fuel cell modeling and control and design of hybrid alternative energy power generation sources, including fuel cells.

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