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Fuel cell modeling and control

By Ramos Paja, Carlos Andres

Condition: New. Publisher/Verlag: LAP Lambert Academic Publishing | A power electronics approach | This book gives a theoretical background on fuel cell analysis and control. It gives practical and experimental considerations to improve fuel cell operation and offers theoretical tools for designing fuel cell power systems. Also, the state of the art in fuel cell modeling, emulation and control for power electronics applications is analyzed. A new modeling approach based on electrochemical equations and circuit-based load connection is introduced. This model is useful to evaluate interactions between fuel cells and electrical loads. A second fuzzy-based modeling technique is proposed for emulation purposes, reproducing accurately the fuel cell dynamics with short computational time. The implementation of a fuel cell emulation system is also described and analyzed. Different topologies for fuel cell power systems are also proposed and analyzed, thus giving a selection criterion based on the load profile. Dynamic constraints are designed for safe and efficient fuel cell operation, and a methodology for identification of the optimal operation conditions is proposed. Finally, this study led to propose a novel strategy for minimizing the fuel consumption in fuel cell power systems. | Format: Paperback | Language/Sprache: english | 265 gr | 188...



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