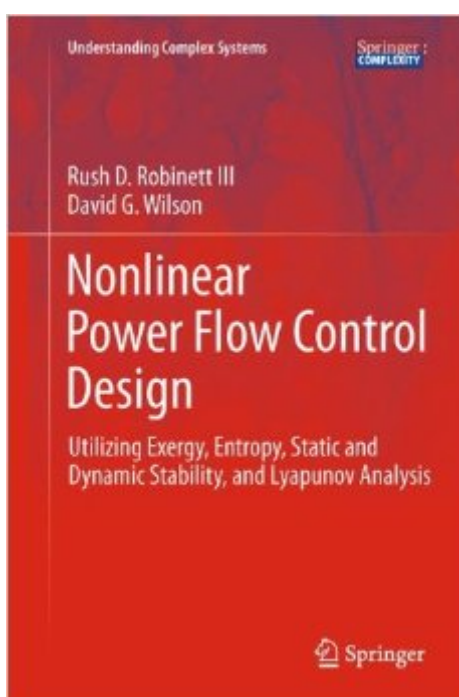# Nonlinear Power Flow Control Design: Utilizing Exergy, Entropy, Static And Dynamic Stability, And Lyapunov Analysis (Understanding Complex Systems)

# Synopsis

This book presents an innovative control system design process motivated by renewable energy electric grid integration problems. The concepts developed result from the convergence of research and development goals which have important concepts in common: exergy flow, limit cycles, and balance between competing power flows. A unique set of criteria is proposed to design controllers for a class of nonlinear systems. A combination of thermodynamics with Hamiltonian systems provides the theoretical foundation which is then realized in a series of connected case studies. It allows the process of control design to be viewed as a power flow control problem, balancing the power flowing into a system against that being dissipated within it and dependent on the power being stored in it â " an interplay between kinetic and potential energies. Human factors and the sustainability of self-organizing systems are dealt with as advanced topics.

# Book Information

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