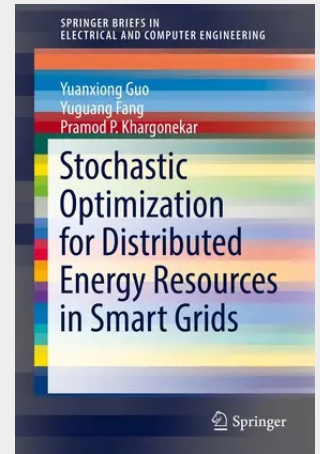


Stochastic Optimization for Distributed Energy Resources in Smart Grids

This brief focuses on stochastic energy optimization for distributed energy resources in smart grids. Along with a review of drivers and recent developments towards distributed energy resources, this brief presents research challenges of integrating millions of distributed energy resources into the grid. The brief then proposes a novel three-level hierarchical architecture for effectively integrating distributed energy resources into smart grids. Under the proposed hierarchical architecture, distributed energy resource management algorithms at the three levels (i.e., smart home, smart neighborhood, and smart microgrid) are developed in this brief based on stochastic optimization that can handle the involved uncertainties in the system.

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