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Applications of Big Data and Artificial Intelligence in Smart Energy Systems, Volume 1

Smart Energy System: Design and its State-of-The Art Technologies

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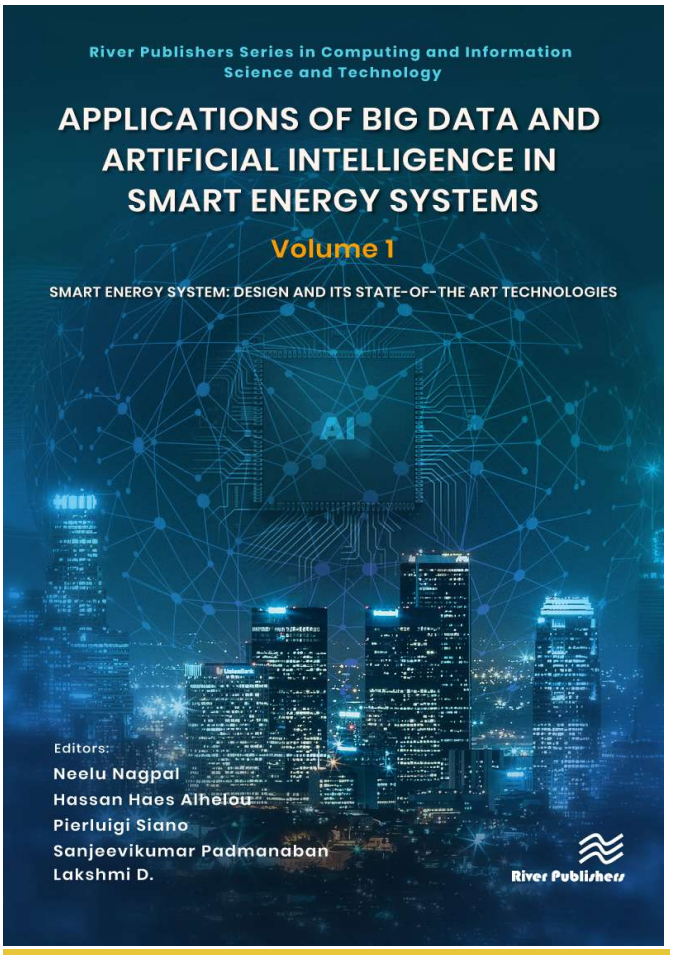
This book covers smart grid applications of various big data analytics, artificial intelligence, and machine learning technologies for demand prediction, decision-making processes, policy, and energy management. The book delves into new technologies such as the Internet of Things, BlockChain for smart home solutions, and smart city solutions in depth in the context of modern power systems.

In the era of propelling traditional energy systems to evolve towards smart energy systems, systems, including power generation energy storage systems, and electricity consumption have become more dynamic. The quality and reliability of power supply are impacted by the sporadic and rising use of electric vehicles, and domestic and industrial loads. Similarly, with the integration of solid state devices, renewable sources, and distributed generation, power generation processes are evolving in a variety of ways. Several cutting-edge technologies are necessary for the safe and secure operation of power systems in such a dynamic setting, including load distribution automation, energy regulation and control, and energy trading.

Technical topics discussed in the book include:

- Hybrid smart energy system technologies
- Smart meters
- Energy demand forecasting
- Use of different protocols and communication in smart energy systems
- Power quality and allied issues and mitigation using AI
- Intelligent transportation
- Virtual power plants
- AI based smart energy business models
- Smart home solutions
- Blockchain solutions for smart grids.



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Smart grid, micro-grid, power system planning, cyber security, system flexibility, modern power system; power infrastructure; distributed energy resources, machine learning, deep learning, internet of things, blockchain, peer to peer network, renewable energy resources, electric vehicle, energy internet, smart sensors, smart metering, net zero energy buildings, vehicle to grid, energy management system, advanced metering infrastructure, intelligent transportation system, home energy management system, convolutional neural networks, long short term memory, linear regression, recurrent neural networks, deep neural networks, virtual power plants

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