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Altri autori (Persone)	BeebyStephen WhiteNeil (Neil M.)
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Nota di contenuto	Energy Harvesting for Autonomous Systems; Contents; Chapter 1 Introduction; 1.1 Background and Motivation; 1.2 Typical System Architecture; 1.3 Intended Readership for This Book; Reference; Chapter 2 Wireless Devices and Sensor Networks; 2.1 Introduction; 2.2 Energy Requirements of Autonomous Devices; 2.2.1 From Mobile Phones to MP3 Players; 2.2.2 Radio Frequency Identification (RFID); 2.2.3 Wireless Sensor Networks; 2.3 Enabling Technologies: Devices and Peripherals; 2.3.1 Low-Power Microcontrollers and Transceivers; 2.3.2 Sensors, Peripherals, and Interfaces; 2.4 Wireless Communication. 2.4.1 Communication Protocols and Power Requirements2.4.2 Energy-Aware Communication Protocols; 2.5 Energy-Awareness in Embedded Software; 2.5.1 Operating Systems and Software Architectures; 2.6 Alternative Nonrenewable Power Sources; 2.6.1 Direct Transmission; 2.7 Discussion; References; Chapter 3 Photovoltaic Energy Harvesting; 3.1 Introduction; 3.2 Background; 3.2.1 Semiconductor Basics; 3.3 Solar Cell Characteristics; 3.4 Module Characteristics; 3.5 Irradiance Standards; 3.5.1 Outdoor Operation; 3.5.2 Indoor Operation; 3.6

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 3.6.3 Module Losses3.7 Device Technologies; 3.7.1 Silicon Wafers;
 3.7.2 Single Crystal and Multicrystalline Devices; 3.7.3 Amorphous
 Silicon; 3.7.4 Thin Film Polycrystalline Silicon; 3.7.5 Multijunction
 Silicon; 3.7.6 Cadmium Telluride/Cadmium Sulphide; 3.7.7 Copper
 Indium (Gallium) Disselenide; 3.7.8 Single and Multijunction III-V Cells;
 3.7.9 Emergent Technologies; 3.8 Photovoltaic Systems; 3.8.1 Basic
 System; 3.8.2 Charge Controllers; 3.8.3 DC-DC Converters and
 Maximum Power Point Tracking; 3.8.4 Miniaturization and Low-Power
 Systems; 3.8.5 Device Technology; 3.8.6 Systems Considerations.
 3.9 SummaryReferences; Chapter 4 Kinetic Energy Harvesting; 4.1
 Introduction; 4.2 Kinetic Energy-Harvesting Applications; 4.2.1 Human;
 4.2.2 Industrial; 4.2.3 Transport; 4.2.4 Structural; 4.3 Inertial
 Generators; 4.4 Transduction Mechanisms; 4.4.1 Piezoelectric
 Generators; 4.4.2 Electromagnetic Transduction; 4.4.3 Electrostatic
 Generators; 4.4.4 Transduction Damping Coefficients; 4.4.5 Microscale
 Implementations; 4.5 Operating Frequency Range; 4.5.1 Frequency
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 4.7.2 Conventional Generators for Industrial and Transport
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 4.8 Conclusions and Future Possibilities; 4.8.1 Piezoelectric Generators;
 4.8.1 Piezoelectric Generators; 4.8.2 Electromagnetic Generators; 4.8.3
 Electrostatic Generators; 4.8.4 Summary; Acknowledgments;
 References; Chapter 5 Thermoelectric Energy Harvesting; 5.1
 Introduction; 5.2 Principles of Thermoelectric Devices; 5.2.1
 Thermoelectric Effects; 5.2.2 Thermoelectric Devices; 5.3 Infl uence of
 Materials, Contacts, and Geometry.

Sommario/riassunto

This unique resource provides a detailed understanding of the options for harvesting energy from localized, renewable sources to supply power to autonomous wireless systems. You are introduced to a variety of types of autonomous system and wireless networks and discover the capabilities of existing battery-based solutions, RF solutions, and fuel cells. The book focuses on the most promising harvesting techniques, including solar, kinetic, and thermal energy. You also learn the implications of the energy harvesting techniques on the design of the power management electronics in a system. This i.
