Mechanical and Chemical Engineering (EMSE) 2020, held at National Institute of Technology Delhi. Various topics covered in this book include clean materials, solar energy systems, wind energy systems, power optimization, grid integration of renewable energy, smart storage technologies, and other advanced materials with potential applications in the context of sustainability and energy applications. A smart city structure integrates smart materials, sensors, actuators, signal processors, communication networks, power sources, diagnostic signal processing, control strategies, strategic design, and life-cycle management strategies. It should function optimally and safely in its environment and have minimal adverse impact on the physical, chemical, and biological properties of the environment. It should also be able to contribute a degree of protection to its local environment.

Sensors

This book explains the design and implementation of piezoelectric energy harvesting devices based on fluid-structure interaction. There is currently an increase in demand for low power electronic instruments in a range of settings, and recent advances have driven their energy consumption downward. As a result, the need for alternative or supplementary power supplies is growing. The present environment is of growing significance to the design, optimization, and practical implementation of piezoelectric energy harvesters. This book covers the fundamentals, modeling, fabrication, testing, and optimization of piezoelectric energy harvesters with various applications. The book presents new approaches to scavenging energy from the environment and provides an alternative method for solving energy consumption problems. The book is suitable for researchers and students in the field of piezoelectric energy harvesting. It is also useful for the development of new energy harvesting devices and energy harvesting technologies for various applications. The book is a valuable reference source for academics, industry professionals, and scientists working toward the future of energy.

The purpose of this book is to provide an updated view of latest research advances in the design of efficient small-scale energy harvesters through contributions of international researchers. The book covers the physics of the energy conversion, the design and implementation of piezoelectric energy harvesting devices based on fluid-structure interaction. This book explains the design and implementation of piezoelectric energy harvesting devices based on fluid-structure interaction. It is a comprehensive and accessible introduction for researchers and students working in the field of piezoelectric energy harvesting. It provides an in-depth understanding of the principles and methods for the design and implementation of piezoelectric energy harvesting devices based on fluid-structure interaction. The book presents new approaches to scavenging energy from the environment and provides an alternative method for solving energy consumption problems. The book is a valuable reference source for academics, industry professionals, and scientists working toward the future of energy.

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