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Recent Advances in Energy Harvesting Technologies

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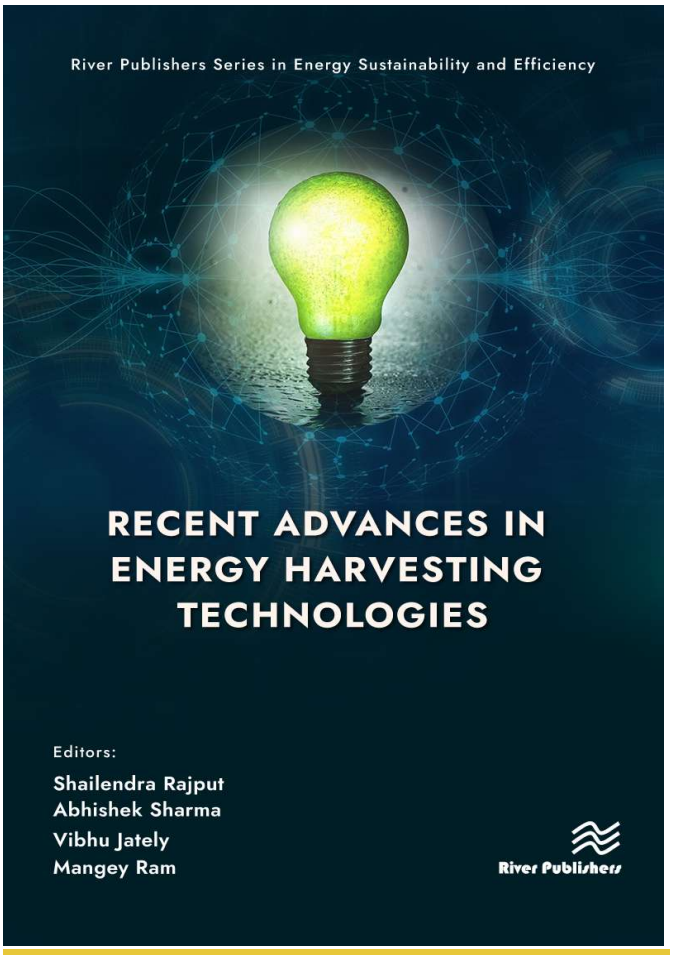
Energy demand is continuously rising, mainly due to population growth and rapid economic development. There are substantial worries about the environmental effects of fossil fuels in addition to the uncertainties surrounding the long-term sustainability of non-renewable energy sources. Environmental safety concerns are driving an increase in the demand for renewable energy production. Numerous efforts have been paid to harvest energy from ambient sources, e.g. solar, wind, thermal, hydro, mechanical, etc.

This book discusses the application of artificial intelligence (AI) for energy harvesting. The implementation of metaheuristics and AL algorithms in the field of energy harvesting system will provide a quick start for the researchers and engineers who are new to this area. Energy harvesting technologies are growing very speedily, hence it is necessary to summarize recent advances in energy harvesting methodology.

Over the recent years, a considerable amount of effort has been devoted, both in industry and academia, towards the performance modelling and evaluation of energy harvesting technologies. This book is the result of a collaborative effort among different researchers in the fields of energy harvesting and artificial intelligence.

Technical topics discussed in the book include:

- Hybrid algorithms
- Mechanical to electrical energy conversion
- Swarm intelligence
- MPPT technologies
- Polymer nanocomposites.



River Publishers Series in Energy Sustainability and Efficiency

ISBN: 9788770228459
e-ISBN: 9788770228800
Available From: October 2023
Price: € 104.50 $ 130.00

KEYWORDS:
Renewable energy sources; photovoltaic systems; maximum power point tracking algorithms; electrostatic energy harvester; electromagnetic energy harvester; mechanic to electrical energy conversion; wireless power transfer; energy efficiency; power management circuits; metaheuristic algorithms.

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