
Advanced Renewable Energy Sources Gopal Nath Tiwari Book

Techno-Societal 2016

Power Converter of Electric Machines, Renewable Energy Systems, and
Transportation

Handbook of Environmental Remediation

Handbook of Emerging Materials for Sustainable Energy

Fundamentals of Biofuel Production Processes

Energy, Ecology and Environment

Understanding the Global Energy Crisis

The Renewable Energy-Water-Environment Nexus

MATLAB Model of an Optimized Battery Charge Controller

Sustainable Design for Global Equilibrium

Power Systems Operation with 100% Renewable Energy Sources

Advanced Manufacturing Systems and Innovative Product Design

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CRC Press

This book gathers selected papers presented at International Conference on Machine Learning, Advances in Computing, Renewable Energy and Communication (MARC 2020), held in Krishna Engineering College, Ghaziabad, India, during December 17-18, 2020. This book discusses key concepts, challenges, and potential solutions in connection with established and emerging topics in advanced computing, renewable energy, and network communications.

Power Converter of Electric Machines, Renewable Energy Systems, and Transportation Elsevier

This book is an ideal reference text for teaching renewable energy to engineering and science students, as well as a reference book for

scientists and professionals doing self study on the subject. The book has twelve chapters and starts with the definition and classification of renewable and non renewable energy and their status at global level. This chapter also contains the basic heat transfer mechanisms and laws of thermodynamics. It then deals with availability of solar radiation at different latitudes and energy and exergy analysis of flat plate collector, solar air collector, solar concentrator, evacuated tube collector, solar water heating system, solar distillation and solar cooker. The following chapter discusses the basics of semiconductor, its characteristics, working, characteristics of solar cell in dark and daylight situation, fundamentals of characteristic curves of semiconductor, fundamentals of PV module and array and some PVT systems. Detailed discussion on biomass, bio-fuels and biogas and their applications and the

power produced by them, namely bio-power, is covered in the following chapters. Other renewable energy sources like hydropower, wind and geothermal are then covered as well as a chapter dealing with the working principle, basic theory and the capability to produce power from ocean thermal, tidal, wave and animal energy conversion systems. Subsequently, net CO₂ mitigation, carbon credit, climate change and environmental impacts of all renewable energy resources are all covered followed by a discussion on the techno-economic feasibility of any energy sources as the backbone of its success and hence energy and economic analysis. The chapters deal the overall exergy of renewable energy sources by using the thermal and mechanical power and electrical energy as output. SI units are used throughout the book in solving various exercises in each chapter and conversion units of various physical and chemical parameters of metals and non-metals

are also given in appendices.

Handbook of Environmental Remediation Elsevier

Advanced Biofuels: Applications, Technologies, and Environmental Sustainability presents recent developments and applications of biofuels in the field of internal combustion engines, with a primary focus on the recent approaches of biodiesel applications, low emission alternative fuels, and environmental sustainability. Editors Dr. Azad and Dr. Rasul, along with their team of expert contributors, combine a collection of extensive experimental investigations on engine performance and emissions and combustion phenomena using different types of oxygenated fuel with in-depth research on fuel applications, an analysis of available technologies and resources, energy efficiency improvement methods, and applications of oxygenated fuel for the sustainable environment. Academics, researchers, engineers and technologists will develop a greater understanding of the relevant concepts and solutions to the global issues related to

achieving alternative energy application for future energy security, as well as environmental sustainability in medium and large-scale industries.

- Fills a gap in the literature on alternative fuel applications with in-depth research and experimental investigations of different approaches, technologies and applications -

Considers the important issue of sustainability using case studies to deepen understanding - Includes energy security within various industries, including aviation and transport

Handbook of Emerging Materials for Sustainable Energy Springer

This book focuses on holistic approaches of applying sustainable practices in all sectors of building, infrastructure, and energy to achieve a best-balanced global energy, building, infrastructure, transportation, and water technology (EBITW) regime. It presents a series of solutions based on innovative research and applications for building a sustainable Earth for future generations. The goal of this book is to define the context of instigation for thinking through the

scientific theories and practical applications of sustainability mechanisms to confirm a global equilibrium by the implementation of the following main practices: Sustainable Energy, Sustainable Architectural and Engineering Design Technology, Sustainable Environment and Society, and Sustainable Earth.

Fundamentals of Biofuel Production Processes Purdue University Press

This book presents selected papers from the International Conference on Renewable Energy Systems (ICRES 2020). It throws light over the state of the art of renewable energy sources and their technological advances. Renewable energy sources discussed in this book include solar, wind, biomass, fuel cells, hydropower, hydrogen, nuclear, and geothermal. This book comprehensively explains each of these sources, materials associated, technological development, economics and their impact on the environment. As the renewable energy sources are intermittent, they require specific power electronic converter to convert the generated power into useful form

that can be used for utility. Hence, this book describes different forms of power converter such as AC-DC, DC-DC, DC-AC and AC-AC. Advanced power semiconductor devices, their gate drive and protection circuits, heat sink design and magnetic components for power converter are the additional topics included in this book. The topics covered in these proceedings will have a large impact among academicians, researchers, policy makers, scientists, practitioners and students in fields of electronics and electrical engineering, energy engineering, automotive engineering, and so on.

Energy, Ecology and Environment Royal Society of Chemistry

This book focuses on holistic approaches to sustainability in all sectors of environment, energy, building, and infrastructure to achieve the best-balanced global environmental, energy, building, infrastructure, transportation, and water technologies (EBITWs). It presents a series of solutions based on innovative research and applications for building a sustainable Earth for future generations.

Simply, the goal of this book is to define the context of instigation to think through the scientific theories and practical technical applications of sustainability for building a better planet. Naturally this book explains a series of mechanisms to develop a sustainable world by implementing mainly practicing the following areas of Sustainable Energy, Sustainable Housing and Building Technology, Sustainable Water, Infrastructure, and Transportation Technology, Sustainable Environment which are, very much interconnected to secure a global environmental equilibrium.

Understanding the Global Energy Crisis MDPI

The construction industry, a cornerstone of modern development, must meet the growing demand for new buildings while minimizing environmental impact. As global populations rise and living standards improve, the need for sustainable building practices has never been more apparent. Traditional construction methods and materials contribute significantly to carbon emissions, resource

depletion, and biodiversity loss. Addressing these issues requires innovative solutions that balance development needs with environmental stewardship. Innovations in Energy Efficient Construction Through Sustainable Materials offers a comprehensive response to this pressing problem. The book explores pioneering approaches to building design and construction, focusing on the use of alternative, low-carbon materials and advanced technologies. It provides an in-depth analysis of current and future trends in sustainable construction, covering topics such as recycling waste materials, utilizing biodegradable resources, and implementing energy-efficient designs. By presenting a variety of research fields and practical applications, the book bridges the gap between theoretical concepts and real-world solutions, making it an essential resource for industry professionals, researchers, and advanced students.

The Renewable Energy-Water-Environment Nexus Edward Elgar Publishing

This volume discusses advances in applied

nonlinear optimal control, comprising both theoretical analysis of the developed control methods and case studies about their use in robotics, mechatronics, electric power generation, power electronics, micro-electronics, biological systems, biomedical systems, financial systems and industrial production processes. The advantages of the nonlinear optimal control approaches which are developed here are that, by applying approximate linearization of the controlled systems' state-space description, one can avoid the elaborated state variables transformations (diffeomorphisms) which are required by global linearization-based control methods. The book also applies the control input directly to the power unit of the controlled systems and not on an equivalent linearized description, thus avoiding the inverse transformations met in global linearization-based control methods and the potential appearance of singularity problems. The method adopted here also retains the known advantages of optimal control, that is, the best trade-off between accurate tracking of

reference setpoints and moderate variations of the control inputs. The book's findings on nonlinear optimal control are a substantial contribution to the areas of nonlinear control and complex dynamical systems, and will find use in several research and engineering disciplines and in practical applications.

MATLAB Model of an Optimized Battery Charge Controller Royal Society of Chemistry

The U.S. government has made safeguarding of weapons-grade plutonium and highly enriched uranium an international policy priority, and convened The 2010 Nuclear Security Summit in Washington, D.C., on April 12 and 13, 2010. Forty six governments sent delegations to the summit and twenty nine of them made national commitments to support nuclear security. During the Summit, India announced its commitment to establish a Global Centre for Nuclear Energy Partnership. The Centre is to be open to international participation through academic exchanges, training, and research and development efforts.

India-United States Cooperation on Global Security is the summary of a workshop held by the U.S. National Academy of Sciences (NAS) together with its partner of more than 15 years, the National Institute for Advanced Studies (NIAS) in Bangalore, India. The workshop identified and examined potential areas for substantive scientific and technical cooperation between the two countries on issues related to nuclear material security. Technical experts from India and the United States focused on topics of nuclear material security and promising opportunities for India and the United States to learn from each other and cooperate. This report discusses nuclear materials management issues such as nuclear materials accounting, cyber security, physical security, and nuclear forensics.

Sustainable Design for Global Equilibrium

Royal Society of Chemistry
Green and Sustainable Approaches Using Wastes for the Production of Multifunctional Nanomaterials focuses on the examination of green synthesis utilizing green

waste materials derived from home and industrial applications. This book also examines the current state of material generations, future problems and their industrial constraints, and the synthesis of NMs for various applications such as medicinal, agriculture, environmental, food and beverage storage, and so on. The book includes the most recent practical and theoretical aspects of the use of waste materials released in the fabrication of various types of valuable nanomaterials, such as metal, metal oxide, polymeric, and graphene, among others. This is a relatively new concept in waste utilization, and green synthesis is a viable resource in making NPs. This book will also be valuable for waste management professionals who need proper disposal techniques for by-products. - Provides various types of waste management helps to develop innovative ideas - Discusses waste to valuable wealth, waste resources management, approaches to focus sustainable development, pollution reduction, and alternative options for smooth recovery of

resources - Contains advanced information about green nanotechnology Power Systems Operation with 100% Renewable Energy Sources Springer Heavy industrialization in the past few decades has caused several global environmental issues including poor air quality, climate change, and outdoor air pollution-related diseases. As such, consumer pressure coupled with strict governmental policies have influenced firms to adopt and implement green practices in their supply chain and business operations in order to improve socio-environmental sustainability. Global Perspectives on Green Business Administration and Sustainable Supply Chain Management is an essential reference book that discusses innovative green practices including recycling, remanufacturing, reduction in waste and adoption of renewable energy in manufacturing. It also examines environmentally friendly policies that have been adopted by many European and Western countries. Featuring coverage on a broad range of topics such as

energy analysis, environmental protections, and logistics development, this book is ideally designed for managers, operations managers, executives, manufacturers, environmentalists, researchers, industry practitioners, academicians, and students.

Advanced Manufacturing Systems and Innovative Product Design IGI Global The present monograph offers a detailed and in-depth analysis of the topic of Intelligent Control for Electric Power Systems and Electric Vehicles. First, Nonlinear optimal control and Lie algebra-based control (Control based on approximate linearization and Global linearization-based control concepts) is analyzed. Next, Differential flatness theory and flatness-based control methods (Global linearization-based control with the use of differential flatness theory and Flatness-based control of nonlinear dynamical systems in cascading loops) is treated. Following the control theoretic part Control of DC and PMLDLC electric motors (Control of DC motors through a DC-DC converter and Control of Per- manent Magnet

Brushless DC motors) is presented. Besides, Control of VSI-fed three-phase and multi-phase PMSMs (Nonlinear optimal control VSI-fed three-phase PMSMs and Nonlinear optimal control VSI-fed six-phase PMSMs) is explained. Additionally, Control of energy conversion chains based on PMSMs (Control of wind-turbine and PMSM-based electric power unit and Control of a PMSM-driven gas-compression unit) is studied. Besides, Control of energy conversion chains based on Induction Machines (Control of the VSI-fed three-phase induction motor, Control of an induction motor-driven gas compressor and Control of induction generator-based shipboard microgrids) is explained. Next, Control of multi-phase machines in gas processing and power units (Control of gas-compressors actuated by 5-phase PMSMs and Control of 6-phase induction generators in renewable energy units) is introduced. Moreover, Control of Spherical Permanent Magnet Synchronous Motors and Switched Reluctance Motors (Control of spherical permanent magnet synchronous motors,

Control of switched reluctance motors for electric traction and Adaptive control for switched reluctance motors) is analyzed. Furthermore, Control of traction and powertrains in Electric Vehicles and Hybrid Electric Vehicles (Control of multi-phase motors in the traction system in electric vehicles and Control of synchronous machines and converters in power-chains of hybrid electric vehicles) is explained. Finally, Control of renewable power units and heat management units (Control of residential microgrids with Wind Generators, Fuel Cells and PVs and Control of heat pumps for thermal management in electric vehicles) is treated. The new control methods which are proposed by the monograph treat the control problem of the complex nonlinear dynamics of electric power systems and electric vehicles without the need for complicated state-space model transformations and changes of state variables. The proposed control schemes are modular and scalable and can be applied to a large class of dynamic models of electric power systems

and electric vehicles. They have a clear and easy-to-implement algorithmic part, while they also exhibit a moderate computational load. The proposed control schemes foster the optimized exploitation of renewable energy sources and the reliable integration of renewable energy units in the power grid. Besides, they support the transition to electromotion and the deployment of the use of electric vehicles. The manuscript is suitable for teaching nonlinear control, estimation and fault diagnosis topics with emphasis to electric power systems and to electric vehicle traction and propulsion systems both at late undergraduate and postgraduate levels. *Alternative Fuels and Advanced Combustion Techniques as Sustainable Solutions for Internal Combustion Engines* National Academies Press Environmental sustainability with rapid industrialization is one of the current major global challenges. Industries are the key drivers of the world economy. But they are also the major polluters of the environment due to the discharge of partially

treated/untreated toxic and hazardous wastes containing organic and inorganic pollutants, which cause severe environmental (soil and water) pollution and toxic effects in living beings. So the adequate treatment of industrial wastes to degrade/detoxify pollutants is of the utmost importance for environmental safety and for promoting the sustainable development of our society with low environmental impacts. **Bioremediation: Green Approaches for a Clean and Sustainable Environment** showcases the latest information on the different bioremediation approaches used for the many types of industrial pollutants and are dedicated to environmental safety. This book provides a detailed knowledge about the natural as well as anthropogenic sources of different types of toxic pollutants, such as toxic metals, dyes, pesticides, petroleum hydrocarbons and plastics; their fate and transport into the environment; their ecotoxicological effects and health hazards; and different approaches used for their bioremediation for the environmental

clean-up. **Key Features:** Covers the different aspects of environmental problems and their remedies with up-to-date developments in the field of bioremediation of industrial/environmental pollutants Serves as an invaluable source of knowledge for a wide range of students, scientists, and researchers in microbiology, biotechnology, environmental sciences with the fundamental and advanced knowledge about the environmental pollution, challenges, and bioremediation of toxic pollutants
[Renewable Power for Sustainable Growth](#)
 Cambridge Scholars Publishing
 Innovation under Uncertainty presents original research and insights on innovation in carbon-free energy technologies. Valentina Bosetti and Michela Catenacci provide a complete and informative assessment of the current potentials and limits and offer
India-United States Cooperation on Global Security Springer Nature
 This book contains enhanced way of battery charging that increases battery durability where

energy source is variable such as solar, wind, tidal energy etc. The charging algorithm is applied to enhance durability of a lead acid battery charged by a photovoltaic cell. Batteries are charged best when it is charged in three different stages. In this method, battery is first charged with trickle current, after a certain voltage it is charged with bulk charging current then again after a certain voltage it is charged with a constant voltage. The current and the voltage supplied by the variable source is unpredictable. To maintain the desired current and voltage at different times a DC-DC converter is used. A micro-controller is to be used to control the gate pulse of DC-DC converter to control battery charging current and voltage. This charging technique can be used for various applications like Hybrid Electric Vehicle battery charging, Head light battery charging of coalmine workers, solar panel charged batteries used for domestic purpose etc.
Bioremediation IGI Global
 This book comprises select papers presented at the Conference on Innovative Product Design

and Intelligent Manufacturing System (IPDIMS 2020). The book discusses the latest methods and advanced tools from different areas of design and manufacturing technology. The main topics covered include design methodologies, industry 4.0, smart manufacturing, and advances in robotics among others. The contents of this book are useful for academics as well as professionals working in the areas of industrial design, mechatronics, robotics, and automation.

Advanced Technologies for Solar Photovoltaics Energy Systems Springer Nature

The book is a complete treatise on renewable energy sources and also includes issues relating to biofuels. It aims to serve as a text for undergraduate and postgraduate students in relevant disciplines and a reference for all the professionals in the related fields.

Global Sustainability

SUBRATA PANDEY

Power converters and electric machines represent essential components in all fields of electrical engineering. In fact, we are heading

towards a future where energy will be more and more electrical: electrical vehicles, electrical motors, renewables, storage systems are now widespread. The ongoing energy transition poses new challenges for interfacing and integrating different power systems. The constraints of space, weight, reliability, performance, and autonomy for the electric system have increased the attention of scientific research in order to find more and more appropriate technological solutions. In this context, power converters and electric machines assume a key role in enabling higher performance of electrical power conversion. Consequently, the design and control of power converters and electric machines shall be developed accordingly to the requirements of the specific application, thus leading to more specialized solutions, with the aim of enhancing the reliability, fault tolerance, and flexibility of the next generation power systems.

Machine Learning, Advances in Computing, Renewable Energy and Communication CRC

Press

This book focusses on various options of taking up ventures for starting entrepreneurship in small/large scale in the field of renewable energy technologies. The book covers the fundamentals of entrepreneurship, renewable energy resources, their technologies involved and applications along with financial evaluations. The book will cater to the needs of students, researchers, various stakeholders, entrepreneurs etc. by providing valuable information on renewable energy technologies and their applications in developing entrepreneurship and establishing enterprise at individual level, specifically focusing on low carbon technology for sustenance of environment which is becoming increasingly important. Note: Taylor and Francis does not sell or distribute the print editions of this title in India, Pakistan, Nepal, Bhutan, Bangladesh and Sri Lanka.

Building Integrated Photovoltaic Thermal Systems Springer Nature
Environmental remediation technologies to control or prevent

pollution from hazardous waste material is a growing research area in academia and industry, and is a matter of utmost concern to public health, to improve ecology and to facilitate the redevelopment of a contaminated site. Recently, in situ and ex situ remediation technologies have been developed to rectify the contaminated sites, utilizing various tools and devices through physical, chemical, biological, electrical, and thermal processes to restrain, remove, extract, and immobilize mechanisms to minimize the contamination effects. This handbook brings altogether classical and

emerging techniques for hazardous wastes, municipal solid wastes and contaminated water sites, combining chemical, biological and engineering control methods to provide a one-stop reference. This handbook presents a comprehensive and thorough description of several remediation techniques for contaminated sites resulting from both natural processes and anthropogenic activities. Providing critical insights into a range of treatments from chemical oxidation, thermal treatment, air sparging, electrokinetic remediation, stabilization/solidification, permeable reactive barriers, thermal

desorption and incineration, phytoremediation, biostimulation and bioaugmentation, bioventing and biosparging through ultrasound-assisted remediation methods, electrochemical remediation methods, and nanoremediation, this handbook provides the reader an inclusive and detailed overview and then discusses future research directions. Closing chapters on green sustainable remediation, economics, health and safety issues, and environmental regulations around site remediation will make this a must-have handbook for those working in the field.

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